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Rio de Janeiro - RJ

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TO	6
TOTAL	**1561**

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STATE	**CARDIO CASE PRESENTATION**	**ORAL PRESENTATION**	**POSTER**	**MODERATED POSTER**	**TOTAL**
AC	0	0	6	0	6
AL	1	0	11	0	12
AM	0	0	11	0	11
AP	0	0	3	0	3
BA	0	0	44	1	45
CE	1	0	90	1	92
DF	2	0	31	0	33
ES	0	0	21	1	22
GO	0	1	22	0	23
INTERNATIONAL	2	2	62	2	67
MA	0	0	19	0	19
MG	2	5	177	1	185
MS	0	0	8	0	8
MT	0	0	8	0	9
PA	0	1	88	1	90
PB	0	0	45	1	46
PE	1	0	35	0	36
PI	0	0	8	0	8
PR	1	1	75	1	78
RJ	1	4	184	4	195
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RO	0	0	7	0	7
RR	0	0	3	0	3
RS	0	0	110	0	110
SC	0	2	32	0	34
SE	0	1	11	0	12
SP	3	5	365	4	377
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IBRAIM MASCIARELLI FRANCISCO PINTO	BRAZIL
ROBERTO KALIL FILHO	BRAZIL
CARLOS GUN	BRAZIL
PROTÁSIO LEMOS DA LUZ	BRAZIL
LUIZ EDUARDO MASTROCOLA	BRAZIL
BRUNO CARAMELLI	BRAZIL
MAURICIO WAJNGARTEN	BRAZIL
TIAGO COSTA BIGNOTO	BRAZIL
SANDRIGO MANGINI	BRAZIL
RONEY ORISMAR SAMPAIO	BRAZIL
MARCELO BISCEGLI JATENE	BRAZIL
ELIZABETH REGINA GIUNCO ALEXANDRE	BRAZIL
MAURICIO IBRAHIM SCANAVACCA	BRAZIL
MAX GRINBERG	BRAZIL
FLÁVIO TARASOUTCHI	BRAZIL
ALMIR S. FERRAZ	BRAZIL
IZO HELBER	BRAZIL
JOSÉ EDUARDO KRIEGER	BRAZIL
FABIO BISCEGLI JATENE	BRAZIL
VALDIR AMBRÓSIO MOISÉS	BRAZIL
CARLOS ALBERTO CORDEIRO HOSSRI	BRAZIL
LUCAS HOLLANDA OLIVEIRA	BRAZIL
MONICA SAMUEL AVILA	BRAZIL
WALTER JOSÉ GOMES	BRAZIL
SILVIA MOREIRA AYUB FERREIRA	BRAZIL
GUILHERME FENELON	BRAZIL
GLAUCYLARA REIS GEOVANINI	BRAZIL

GUSTAVO IENO JUDAS	BRAZIL
CAROLINA GIUSTI BUZO	BRAZIL
FABIANA HANNA RACHED	BRAZIL
CELSO AMODEO	BRAZIL
FELIX JOSE RAMIRES	BRAZIL
FABIO DE FREITAS GUIMARAES GUERRA	BRAZIL
FERNANDO NOBRE	BRAZIL
ADALBERTO MENEZES LORGA FILHO	BRAZIL
JOÃO CARLOS FERREIRA LEAL	BRAZIL
LILIA NIGRO MAIA	BRAZIL
ANA PAULA DAMIANO	BRAZIL
CLAUDIO PINHO	BRAZIL
JOSE FRANCISCO KERR SARAIVA	BRAZIL
CLARA WEKSLER	BRAZIL
IARA ATIE MALAN	BRAZIL
ALEXANDRE SICILIANO COLAFRANCESCHI	BRAZIL
FELIPE NEVES DE ALBUQUERQUE	BRAZIL
LILIAN SOARES DA COSTA	BRAZIL
WOLNEY DE ANDRADE MARTINS	BRAZIL
JACQUELINE SAMPAIO DOS SANTOS MIRANDA	BRAZIL
CLAUDIO TINOCO MESQUITA	BRAZIL
ANTONIO CLAUDIO LUCAS DA NOBREGA	BRAZIL
ERIKA MARIA GONÇALVES CAMPANA	BRAZIL
ALEX DOS SANTOS FELIX	BRAZIL
PEDRO PAULO NOGUERES SAMPAIO	BRAZIL
HUGO TANNUS FURTADO DE MENDONCA FILHO	BRAZIL
ELIZABETE VIANA DE FREITAS	BRAZIL
ROBERTO GAMARSKI	BRAZIL
JOSE AIRTON DE ARRUDA	BRAZIL
BARBARA CAMPOS ABREU MARINO	BRAZIL
JOSÉ LUIZ BARROS PENA	BRAZIL
WILLIAM ANTONIO M. ESTEVES	BRAZIL
MARILDES LUIZA DE CASTRO	BRAZIL
MÁRCIA DE MELO BARBOSA	BRAZIL
MARSELHA MARQUES BARRAL MONTESSI	BRAZIL

FRANK NUNES	BRAZIL
ELMIRO SANTOS RESENDE	BRAZIL
MARCO STEPHAN LOFRANO ALVES	BRAZIL
EMILTON LIMA JÚNIOR	BRAZIL
MANOEL FERNANDES CANESIN	BRAZIL
ARTUR HADDAD HERDY	BRAZIL
GUILHERME LOUREIRO FIALHO	BRAZIL
AMBERSON VIEIRA DE ASSIS	BRAZIL
MARIA CLAUDIA DUTRA BARCELLOS GUTERRES DA COSTA	BRAZIL
RENATO ABDALA KARAM KALIL	BRAZIL
ALEXANDRE SCHAAN DE QUADROS	BRAZIL
MAURICIO PIMENTEL	BRAZIL
PATRICIA MARTINS MOURA BARRIOS	BRAZIL
ANDRÉ LUÍS CÂMARA GALVÃO	BRAZIL
CARLOS KALIL	BRAZIL
PAULO ZIELINSKY	BRAZIL
LUIS BECK DA SILVA NETO	BRAZIL
FERNANDO LUIS SCOLARI	BRAZIL
MARCO WAINSTEIN	BRAZIL
EMILIO HIDEYUKI MORIGUCHI	BRAZIL
PAULO ROBERTO SCHVARTZMAN	BRAZIL
FERNANDO ANTIBAS ATIK	BRAZIL
MAURICIO MILANI	BRAZIL
JORGE YUSSEF AFIUNE	BRAZIL
LUCAS CRONEMBERGER MAIA MENDES	BRAZIL
VITOR SALVATORE BARZILAI	BRAZIL
PATRICIA BANDEIRA MOREIRA RUEDA GERMANO	BRAZIL
PAULO CÉSAR BRANDÃO VEIGA JARDIM	BRAZIL
SAYURI INUZUKA	BRAZIL
TANNAS JATENE	BRAZIL
CAROLINE CONSUELO DE SOUSA	BRAZIL
WALLACE ANDRE PEDRO DA SILVA	BRAZIL
HUEVERSON JUNQUEIRA NEVES	BRAZIL
JULIO CESAR DE OLIVEIRA	BRAZIL
JOAO ROBERTO GEMELLI	BRAZIL

LUCÉLIA BATISTA NEVES CUNHA MAGALHÃES	BRAZIL
FÁBIO VILAS-BOAS PINTO	BRAZIL
LUIZ EDUARDO FONTELES RITT	BRAZIL
ISABEL CRISTINA BRITTO GUIMARAES	BRAZIL
MARCOS MACHADO BAROJAS	BRAZIL
LUIZ PEREIRA DE MAGALHÃES	BRAZIL
FABIO SERRA SILVEIRA	BRAZIL
DARIO CELESTINO SOBRAL FILHO	BRAZIL
FERNANDO RIBEIRO DE MORAES NETO	BRAZIL
CATARINA VASCONCELOS CAVALCANTI	BRAZIL
ALEXANDRE JORGE GOMES DE LUCENA	BRAZIL
MARIA ALAYDE MENDONCA ROMERO RIVERA	BRAZIL
ROBERTA RODRIGUES NOLASCO CARDOSO	BRAZIL
LENINE ANGELO ALVES SILVA	BRAZIL
REGINA COELI MARQUES DE CARVALHO	BRAZIL
KLEBIA MAGALHÃES PEREIRA CASTELLO BRANCO	BRAZIL
JOÃO DAVID DE SOUZA NETO	BRAZIL
EDUARDO ARRAIS ROCHA	BRAZIL
ANTONIO DELDUQUE DE ARAUJO TRAVESSA	BRAZIL
MONICA REGINA HOSANNAH DA SILVA E SILVA	BRAZIL
GUILHERME RAFAEL SANT ANNA ATHAYDE	BRAZIL
ADELLE CRISTINE LIMA CARDOZO	BRAZIL
AGNALDO PISCOPO	BRAZIL
ALEXANDRA OLIVEIRA DE MESQUITA	BRAZIL
ALEXSANDRO ALVES FAGUNDES	BRAZIL
ÁLVARO CÉSAR CATTANI	BRAZIL
ANA GABRIELA CALDAS GIOVANINI	BRAZIL
ANA LUIZA FERREIRA SALES	BRAZIL
ANDERSON DONELLI DA SILVEIRA	BRAZIL
ANDRE ASSIS LOPES DO CARMO	BRAZIL
ANDRÉ CHUSTER DE SOUZA	BRAZIL
ANDRE PACHECO SILVA	BRAZIL
ANDREA MABILDE PETRACCO	BRAZIL
ANIBAL PIRES BORGES	BRAZIL
ANTONIO CARLOS AVANZA JUNIOR	BRAZIL

ARIANE VIEIRA SCARLATELLI MACEDO	BRAZIL
BENHUR DAVI HENZ	BRAZIL
BRENO DE ALENCAR ARARIPE FALCAO	BRAZIL
BRUNO BISELLI	BRAZIL
BRUNO DE SOUZA PAOLINO	BRAZIL
BRUNO PEREIRA VALDIGEM	BRAZIL
BRUNO RAMOS NASCIMENTO	BRAZIL
CAMILA VEIGA BARBOSA	BRAZIL
CARLOS EDUARDO ROCHITTE	BRAZIL
CARLOS JOSE DORNAS GONÇALVES BARBOSA	BRAZIL
CARLOS VINICIUS DE QUEIROZ BAPTISTA	BRAZIL
CAROLINE PORTALET NICO	BRAZIL
CHARLES SLATER	BRAZIL
CRISTIANO DE OLIVEIRA DIETRICH	BRAZIL
DANIEL FURTADO VIDIGAL	BRAZIL
DANIEL SOUTO SILVEIRA	BRAZIL
DANIELA CALDERARO	BRAZIL
EDUARDO COSTA DUARTE BARBOSA	BRAZIL
EDUARDO TARASCONI RUSCHEL	BRAZIL
ESTELA SUZANA KLEIMAN HOROWITZ	BRAZIL
FABIO ANTONIO GAIOTTO	BRAZIL
FABIO SANDOLI DE BRITO JUNIOR	BRAZIL
FABRICIO SARMENTO VASSALLO	BRAZIL
FLAVIA CRISTINA NAVARRO	BRAZIL
GABRIELA NUNES LEAL	BRAZIL
GERMANO EMILIO CONCEIÇÃO SOUZA	BRAZIL
GIORDANO BRUNO DE OLIVEIRA PARENTE	BRAZIL
GIULIO CESAR GEQUELIM	BRAZIL
GLAUCIA MARIA MORAES DE OLIVEIRA	BRAZIL
GUILHERME AUGUSTO TEODORO ATHAYDE	BRAZIL
HUMBERTO GRANER MOREIRA	BRAZIL
ILAN GOTTLIEB	BRAZIL
INGRID TREMPER	BRAZIL
IVAN ROMERO RIVERA	BRAZIL
JOÃO LUIZ DE ALENCAR ARARIPE FALCÃO	BRAZIL

JOBERTO PINHEIRO SENA	BRAZIL
JOSE ALBUQUERQUE DE FIGUEIREDO NETO	BRAZIL
JOSÉ CARLOS DA COSTA ZANON	BRAZIL
JOSE MARIO BAGGIO JUNIOR	BRAZIL
JULIANE DANTAS SEABRA GARCEZ	BRAZIL
KÁRILA SCARDUELLI LUCIANO	BRAZIL
LARISSA SANTOS NOVAIS	BRAZIL
LEONARDO MARTINS PIRES	BRAZIL
LÍDIA ANA ZYTYNSKI MOURA	BRAZIL
LOUISE FREIRE LUIZ	BRAZIL
LUCIANA SACILOTTO	BRAZIL
LUCIANA SILVEIRA NINA DE AZEVEDO	BRAZIL
LUIZ CLAUDIO DANZMANN	BRAZIL
LUIZ EDUARDO GUISELLI GALLINA	BRAZIL
MÁRCIO JANSEN DE OLIVEIRA FIGUEIREDO	BRAZIL
MARCO PAULO TOMAZ BARBOSA	BRAZIL
MARCUS VINICIUS SANTOS ANDRADE	BRAZIL
MARCUS VINICIUS SIMÕES	BRAZIL
MARIA ANGELICA BINOTTO	BRAZIL
MARIA ANTONIETA ALBANEZ ALBUQUERQUE DE MEDEIROS LOPES	BRAZIL
MARIA TEREZA SAMPAIO DE SOUSA LIRA	BRAZIL
MÁRIO DE SEIXAS ROCHA	BRAZIL
MILENA DOS SANTOS BARROS CAMPOS	BRAZIL
MURILLO DE OLIVEIRA ANTUNES	BRAZIL
PEDRO ALVES LEMOS NETO	BRAZIL
PEDRO FERNANDES RIBEIRO	BRAZIL
PEDRO SILVIO FARSKY	BRAZIL
RENATA MATTOS SILVA	BRAZIL
RENATO KAUFMAN	BRAZIL
RICARDO REINALDO BERGO	BRAZIL
ROBERTO DISCHINGER MIRANDA	BRAZIL
ROBERTO ESTRAZULAS MAYER	BRAZIL
ROBERTO VIEIRA BOTELHO	BRAZIL
RODRIGO COELHO SEGALOTE	BRAZIL
RODRIGO OTAVIO BOUGLEUX ALÔ	BRAZIL

ROGERIO EDUARDO GOMES SARMENTO LEITE	BRAZIL
SHEYLA CRISTINA TONHEIRO FERRO DA SILVA	BRAZIL
SILVIA HELENA CARDOSO BOGHOSSIAN	BRAZIL
TATIANE MASCARENHAS SANTIAGO EMERICH	BRAZIL
THAIS CHANG VALENTE	BRAZIL
THAÍS DE CARVALHO VIEIRA	BRAZIL
THAISSA SANTOS MONTEIRO	BRAZIL
TIAGO LUIZ LUZ LEIRIA	BRAZIL
VIVIANA DE MELLO GUZZO LEMKE	BRAZIL
ADRIANO NUNES KOCHI	BRAZIL
LOUISA GNATIUC FRIEDRICHS	BRAZIL
DEEPA SRINIVASAN	BRAZIL
SVETLANA STOICA	BRAZIL
JEAN JACQUES NOUBIAP	BRAZIL
ADRIAN BEDNAREK	BRAZIL
KENEILWE NKGOLA MMOPI	BRAZIL
MATTHEW DURSTENFELD	BRAZIL
SANDRA OFORI	BRAZIL
HASAN FARHAN	BRAZIL
KGANETSO KGANETSO	BRAZIL
KAVITA SINGH	BRAZIL
HARISH RANJANI	BRAZIL
ROBIN WILLIXHOFER	BRAZIL
ZAINAB DAKHIL	BRAZIL
F. AAYSHA CADER	BRAZIL
HOOI MIN LIM	BRAZIL
VIVIENNE GUAN	BRAZIL
RAGHUPATHY ANCHALA	BRAZIL
ANDREINA CARBONE	BRAZIL
JOSÉ RAMÓN GONZÁLEZ JUANATEY	SPAIN
EDUARDO CHUQUIURE-VALENZUELA	BRAZIL
ADENIYI OGINNI	BRAZIL
SANDEEPA KARKI	BRAZIL
AHMADOU JINGI	BRAZIL
ABRAHAM BABU	BRAZIL

RUFUS ADEDOYIN	BRAZIL
QIANG TU	BRAZIL
GEORGE AKOWUA MENSAH	UNITED STATES
BRUCE NEAL	BRAZIL
LUISA PIGATTO KALIL	BRAZIL
ALBERTO FRANCISCO PICCOLOTTO NACCARATO	BRAZIL
ANA CAROLINA NORONHA CAMPOS BERBEL	BRAZIL
AURORA FELICE CASTRO ISSA	BRAZIL
EDUARDO NAGIB GAUI	BRAZIL
FERNANDO JOSE LIANZA DIAS	BRAZIL
JOSE ANTONIO FRANCHINI RAMIRES	BRAZIL
MARIANNA DEWAY ANDRADE	BRAZIL
LUIZ ANTONIO MACHADO CESAR	BRAZIL
JOSÉ ANTONIO MARIN NETO	BRAZIL
LUIS HENRIQUE WOLFF GOWDAK	BRAZIL
ANTÔNIO CARLOS SOBRAL SOUSA	BRAZIL
OTAVIO RIZZI COELHO	BRAZIL
ÁLVARO AVEZUM JUNIOR	BRAZIL
MARCELO CHIARA BERTOLAMI	BRAZIL
PEDRO PIMENTEL FILHO	BRAZIL
SERGIO EMANUEL KAISER	BRAZIL
ELIZABETH DA ROSA DUARTE	BRAZIL
DALTON BERTOLIM PRÉCOMA	BRAZIL
ANTONIO CARLOS PALANDRI CHAGAS	BRAZIL
CARLOS AUGUSTO HOMEM DE MAGALHÃES CAMPOS	BRAZIL
LEOPOLDO SOARES PIEGAS	BRAZIL
GILSON SOARES FEITOSA	BRAZIL
JADELSON PINHEIRO DE ANDRADE	BRAZIL
JAQUELINE SCHOLZ	BRAZIL
CLAUDINE MARIA ALVES FEIO	BRAZIL
FERNANDO AUGUSTO ALVES DA COSTA	BRAZIL
VIVIANE ZORZANELLI ROCHA GIRALDEZ	BRAZIL
VIVIANE TIEMI HOTTA	BRAZIL
RAFAELA ANDRADE PENALVA FREITAS	BRAZIL

ALINE MARCADENTI DE OLIVEIRA	BRAZIL
ANA CARLA DANTAS CAVALCANTI	BRAZIL
ANGELO AMATO VINCENZO DE PAOLA	BRAZIL
ANGELO RONCALLI RAMALHO SAMPAIO	BRAZIL
ARISTÓTELES COMTE DE ALENCAR FILHO	BRAZIL
BRUNO MAHLER MIOTO	BRAZIL
CAMILA QUAGLIO BERTINI	BRAZIL
CARLOS ALBERTO PASTORE	BRAZIL
CARLOS COSTA MAGALHAES	BRAZIL
CARLOS SCHERR	BRAZIL
CÍDIO HALPERIN	BRAZIL
CLAUDIO MARCELO BITTENCOURT DAS VIRGENS	BRAZIL
CLEONICE DE CARVALHO COELHO MOTA	BRAZIL
CRISTIANE NUNES MARTINS	BRAZIL
DANIEL BORN	BRAZIL
DANIEL BRANCO DE ARAUJO	BRAZIL
DANIEL MEDEIROS MOREIRA	BRAZIL
DANIELA REGINA AGOSTINHO	BRAZIL
DAVID COSTA DE SOUZA LE BIHAN	BRAZIL
DIRCEU RODRIGUES ALMEIDA	BRAZIL
EDUARDO NANI	BRAZIL
ENEIDA REJANE RABELO DA SILVA	BRAZIL
FABIO ARGENTA	BRAZIL
FERDINAND GILBERT SARAIVA DA SILVA MAIA	BRAZIL
FERNANDO BASSAN	BRAZIL
FREDERICO DE MORAIS RIBEIRO	BRAZIL
GERSON CIPRIANO JUNIOR	BRAZIL
GUILHERME SAMPAIO SOUZA	BRAZIL
IRAN CASTRO	BRAZIL
ISABELA CALDANA SCARAMEL	BRAZIL
ISIS BEGOT KRAINER	BRAZIL
JORGE ILHA GUIMARAES	BRAZIL
JOSE TELES DE MENDONÇA	BRAZIL
JOSE WANDERLEY NETO	BRAZIL
JUAN CARLOS YUGAR TOLEDO	BRAZIL

JULIANA DANTAS DE OLIVEIRA	BRAZIL
JULIANA DE MELO VELLOZO PEREIRA TINOCO	BRAZIL
KARLA RODRIGUES DO ESPIRITO SANTO	BRAZIL
KERGINALDO PAULO TORRES	BRAZIL
LIVIA ADAMS GOLDRAICH	BRAZIL
LUCIANA DINIZ NAGEM JANOT DE MATOS	BRAZIL
LUCIANA DORNFELD BICHUETTE	BRAZIL
LUIZ CARLOS DO NASCIMENTO SIMOES	BRAZIL
MAGALY ARRAIS DOS SANTOS	BRAZIL
MÁRCIA REGINA SIMAS TORRES KLEIN	BRAZIL
MARCIO HIROSHI MINAME	BRAZIL
MARCO ANTONIO MOTA GOMES	BRAZIL
MARCUS VINICIUS DE OLIVEIRA CATTEM	BRAZIL
MARIA CLARA NOMAN DE ALENCAR	BRAZIL
MARIA ELIANE CAMPOS MAGALHÃES	BRAZIL
MARIA TEREZA SA LEITAO RAMOS BORGES	BRAZIL
MARIANA DE ANDRADE AMARAL	BRAZIL
MAURICIO SANT'ANA	BRAZIL
MONICA MARIA PENA QUINTÃO	BRAZIL
NIVALDO MENEZES FILGUEIRAS FILHO	BRAZIL
PAULO ERNESTO LEAES	BRAZIL
PAULO MANUEL PÊGO FERNANDES	BRAZIL
PAULO ROBERTO FERREIRA ROSSI	BRAZIL
RENATA BRUM MARTUCCI	BRAZIL
RENATO LOPES PELAQUIM	BRAZIL
RITA SIMONE LOPES MOREIRA	BRAZIL
ROBERTO ESPORCATTE	BRAZIL
ROBERTO LUIZ MARINO	BRAZIL
ROBERTO MUNIZ FERREIRA	BRAZIL
RONALDO ALTENBURG ODEBRECHT CURI GISMONDI	BRAZIL
RUI MANUEL DOS SANTOS POVOA	BRAZIL
SARAH FAGUNDES GROBE	BRAZIL
SERGIO CHERMONT	BRAZIL
SILVIA MARINHO MARTINS ALVES	BRAZIL
VERA MARIA CURY SALEMI	BRAZIL

VINICIUS JOSE DA SILVA NINA	BRAZIL
VIVIAN LERNER AMATO	BRAZIL
JONATAS MELO NETO	BRAZIL
MIRNA DE SOUSA	BRAZIL
ANGELA MARIA PONTES BANDEIRA DE OLIVEIRA	BRAZIL
MARIA EULALIA THEBIT PFEIFFER	BRAZIL
MAURICIO JARAMILLO HINCAPIE	BRAZIL
LUIZ CLAUDIO MOREIRA LIMA	BRAZIL
MARIO RICARDO AMAR	BRAZIL
GUSTAVO S DUQUE	BRAZIL
NELSON SAMESIMA	BRAZIL
TATIANA DE CARVALHO ANDREUCI TORRES LEAL	BRAZIL
JOSÉ AUGUSTO BARRETO	BRAZIL
IDELZUITA LEANDRO LIPORACE	BRAZIL
MARCOS JOSE GOMES MAGALHAES	BRAZIL
OLIMPIO RIBEIRO FRANÇA NETO	BRAZIL
ANDRE CASARSA MARQUES	BRAZIL
LUCIANO MOREIRA BARACIOLI	BRAZIL
ANTONIO AURÉLIO DE PAIVA FAGUNDES JUNIOR	BRAZIL
LUCIANO JANUSSI VACANTI	BRAZIL
EMERSON COSTA PORTO	BRAZIL
MARIO WIEHE	BRAZIL
MARIO FRITSCH TOROS NEVES	BRAZIL
ANDRE LUIZ CERQUEIRA DE ALMEIDA	BRAZIL
ELAINE DOS REIS COUTINHO	BRAZIL
FERNANDO HENPIN YUE CESENA	BRAZIL
HARRY CORREA FILHO	BRAZIL
PAULO EDUARDO BALLVE BEHR	BRAZIL
PAULO RICARDO FRANCIOZI DE GOIS	BRAZIL
ANDREA LOPES LIPOLIS	BRAZIL
SAMIR SAADEDDINE JUNIOR	BRAZIL
ABRÃO JOSE MELHEM JÚNIOR	BRAZIL
DEBORA HOFFMANN LORO	BRAZIL
MARCO TÚLIO VILAÇA CASTAGNA	BRAZIL
MARIA EMILIA LUENEBERG	BRAZIL

GUSTAVO FREITAS FEITOSA	BRAZIL
WILLYAN ISSAMU NAZIMA	BRAZIL
GUILHERME DALCOL TORRES DE AMORIM	BRAZIL
RENATA DE SÁ CASSAR	BRAZIL
VICTOR LIRA RIBEIRO GONCALVES DE CARVALHO	BRAZIL
MARIO LINS PEIXOTO	BRAZIL
ADEGIL HENRIQUE MIGUEL DA SILVA	BRAZIL
LUISA CAMPOS CALDEIRA BRANT	BRAZIL
DENISE DE SOUZA	BRAZIL
CAMILA SARTORI	BRAZIL
CAROLINA INDA	BRAZIL
FRANCINE NUNES PEREIRA	BRAZIL
GABRIELA BRITO PIRES	BRAZIL
TAINÁ SPESSATO	BRAZIL
DOUGLAS FONSECA CAMPOS	BRAZIL
RODRIGO ALMEIDA SOUZA	BRAZIL
SILVIO HENRIQUE BARBERATO	BRAZIL
MONICA DE MONICO MAGALHAES	BRAZIL
ORLANDO OTÁVIO DE MEDEIROS	BRAZIL
MATEUS PAIVA MARQUES FEITOSA	BRAZIL
CARLOS EDUARDO CORDEIRO SOARES	BRAZIL
DANIEL BOUCHABKI DE ALMEIDA DIEHL	BRAZIL
LEANDRO COUMBIS OU MANDALOUFAS	BRAZIL
LUDIMILLA PEREIRA TARTUCE	BRAZIL
RAPHAEL ROSSI FERREIRA	BRAZIL
ROBSON BUENO DE CARVALHO	BRAZIL
SIDNEY MUNHOZ JUNIOR	BRAZIL
DANIEL SOARES SOUSA	BRAZIL
RENATO TAMBELLINI ARNONI	BRAZIL
FRANCISCO DINIZ AFFONSO COSTA	BRAZIL
BRUNO AZEVEDO DA CRUZ	BRAZIL
JOAO MANSUR FILHO	BRAZIL
JOSE GERALDO DE CASTRO AMINO	BRAZIL
LUIZ ANTONIO RIBEIRO INTROCASO	BRAZIL
PAULO ROBERTO PEREIRA DE SANT ANA	BRAZIL

DONALDY GUSTAVO DA SILVA SAMPAIO	BRAZIL
EMILIO CESAR ZILLI	BRAZIL
GIULIANO MINOR ZORTEA	BRAZIL
PAULO SERGIO RODRIGUES OLIVEIRA	BRAZIL
FLAVIA SANTOS GUIMARÃES MACHADO	BRAZIL
FRANCISCO REZENDE SILVEIRA	BRAZIL
RODRIGO CAETANO PIMENTEL	BRAZIL
ALCIRLEY DE ALMEIDA	BRAZIL
ANDRE GUSTAVO DA SILVA REZENDE	BRAZIL
DANIELA GARCIA MORENO CABRAL MARTINS	BRAZIL
JOSÉ CARLOS PACHON MATEOS	BRAZIL
RODRIGO DO SOUTO DA SILVA SA	BRAZIL
DINALDO CAVALCANTI DE OLIVEIRA	BRAZIL
FERNANDO LUIZ DE MELO BERNARDI	BRAZIL
MARIA SANALI MOURA DE OLIVEIRA PAIVA	BRAZIL
ROBERTA SIUFFO SCHNEIDER	BRAZIL
DANILO GUERCIO FERNANDES	BRAZIL
RENATA RODRIGUES TEIXEIRA DE CASTRO	BRAZIL
SERAFIM FERREIRA BORGES	BRAZIL
MAURICIO VENANCIO SPERANDIO	BRAZIL
IMARA CORREIA DE QUEIROZ BARBOSA	BRAZIL
SILVIO MARQUES PÓVOA JUNIOR	BRAZIL
ELZO THIAGO BRITO MATTAR	BRAZIL
FERNANDA MARCIANO CONSOLIM COLOMBO	BRAZIL
JOSÉ FERNANDO VILELA MARTIN	BRAZIL
MARCOS PAULO LACERDA BERNARDO	BRAZIL
GERSON LUIZ BREDT JUNIOR	BRAZIL
EDUARDO MONTEIRO DE JESUS	BRAZIL
ESMERALCI FERREIRA	BRAZIL
CLAUDIA CAMINHA ESCOSTEGUY	BRAZIL
FLÁVIO ANTÔNIO DE OLIVEIRA BORELLI	BRAZIL
COSTANTINO COSTANTINE	BRAZIL
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FRANCISCO JOSÉ GONDIM PITANGA	BRAZIL
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16265

CORONARY FLOW RESERVE, NOT ISCHEMIA, PREDICTS LONG-TERM MORTALITY: A 10-YEAR RB-82 PET STUDY

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Introduction/Background: Revascularization strategies guided by ischemic burden have not consistently translated into improved outcomes. Consequently, alternative markers may better predict prognosis and guide management in chronic coronary syndromes. Coronary flow reserve (CFR) assessed by positron emission tomography (PET) integrates the functional impact of both epicardial and microvascular disease. Although prior studies have demonstrated the prognostic value of CFR, long-term data beyond 10 years remain scarce. Objectives: To evaluate the long-term prognostic value of CFR compared with myocardial ischemia in symptomatic stable patients with suspected coronary artery disease (CAD) undergoing Rb-82 PET imaging. Methods: We prospectively analyzed 353 patients (53% men; mean age 63 years) referred for stress myocardial perfusion imaging with Rb-82 PET. The primary endpoint was all-cause mortality. CFR was quantified, and ischemia was assessed using the summed difference score (SDS). Median follow-up was 9.7 years (IQR 3.9-12.5). Cox regression analysis was used to identify independent predictors of mortality. Results and Conclusions: Results: During follow-up, 200 deaths occurred. Reduced CFR identified patients at higher risk of death, with early divergence and sustained separation of survival curves over a decade (log-rank p < 0.001) (Figure). In multivariable analysis, CFR emerged as the strongest independent predictor of mortality (HR 0.60, 95% CI 0.48–0.74; p < 0.001), along with age, diabetes, chronic kidney disease, and left ventricular ejection fraction (Table). In contrast, ischemic burden was not independently associated with outcomes. Conclusions: In symptomatic outpatients with suspected CAD undergoing Rb-82 PET imaging, CFR outperforms myocardial ischemia for long-term mortality prediction. These findings underscore the incremental and durable prognostic value of CFR over more than a decade of follow-up.

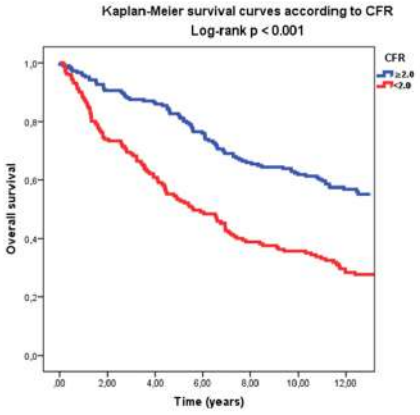


Table. Predictors of all-cause mortality

Variable	HR (95% CI)	p-value
CFR (per unit increase)	0.60 (0.48–0.74)	<0.001
Chronic kidney disease	2.46 (1.78–3.38)	<0.001
Age (per 10 years)	1.25 (1.10–1.42)	0.001
LVEF (per 5% increase)	0.93 (0.90–0.97)	0.001
Diabetes mellitus	1.42 (1.05–1.92)	0.021
SDS (ischemic burden)	0.99 (0.96–1.03)	0.663

CAD = coronary artery disease; CFR = coronary flow reserve; LVEF = left ventricular ejection fraction; SDS = summed difference score; HR = hazard ratio; CI = confidence interval.

21080

EXERCISE TRAINING IMPROVES MYOCARDIAL PERFUSION, PHYSICAL CAPACITY, AND REDUCES PAIN IN INDIVIDUALS WITH MICROVASCULAR ANGINA: A RANDOMIZED CONTROLLED CLINICAL TRIAL

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Introduction/Background: Introduction: Microvascular angina (MVA) is a frequent syndrome, characterized by myocardial ischemia in the absence of coronary obstruction, with an impact on quality of life. Despite pharmacological treatment, many individuals remain symptomatic, highlighting the need for additional therapeutic approaches. Objectives: Objectives: To evaluate the effect of exercise training on myocardial ischemia, physical capacity, and quality of life, including pain, in individuals with MVA. Methods: Methods: Randomized controlled clinical trial, with 2:1 allocation to the exercise training group (G-TF=34; 57.1±8.9 years, 20 women) and control group (GC=18; 54.6±9.8 years, 12 women). The study was approved by a Research Ethics Committee (no. 13090/2011) and registered in the Brazilian Clinical Trials Registry (ReBEC; RBR-9p4kst). A total of 52 patients with MVA were investigated, characterized by typical chest pain, absence of obstructive coronary artery disease on catheterization, and presence of myocardial ischemia confirmed by myocardial perfusion scintigraphy. At baseline and after three months of follow-up, patients underwent myocardial perfusion scintigraphy with 99mTc-Sestamibi (stress/rest), cardiopulmonary exercise testing, and the SF-36 quality of life questionnaire. The G-TF performed moderate-intensity aerobic exercise training on a treadmill, 3 times/week, for 12 weeks. Statistical analysis was performed using mixed-effects models (group x time), with a significance level of 5%. Results and Conclusions: Results: The groups were similar regarding baseline clinical characteristics such as age, body mass index, and left ventricular ejection fraction (p>0.05). The G-TF showed a significant reduction in the summed difference score (7.9±6 vs 2.8±4.4; p=0.02) and summed stress score (9±6.3 vs 4±5.9; p=0.01), as well as a reduction in the number of ischemic segments (6.6±3.6 vs 2.4±3.6; p=0.02) and the percentage of the left ventricle affected (11.6±8.8% vs 4.2±6.5%; p=0.02). Additionally, an increase in VO□peak was observed (18.3±4.5 vs 20.7±5.2 mL/kg/min; p=0.002), along with a significant improvement in quality of life, with emphasis on the Pain domain (p<0.0001). No significant changes were observed in the control group. Conclusions: Exercise training reduces myocardial ischemia and improves physical capacity and quality of life, with emphasis on the control of anginal symptoms, in individuals with MVA, reinforcing its role as an effective non-pharmacological therapeutic strategy.

Heart Failure / Transplantation / Ventricular Assist Devices / Cardiomyopathies



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20173

COGNITIVE FRAILTY AND MORTALITY AMONG PATIENTS ON THE WAITING LIST FOR HEART TRANSPLANTATION: A PROSPECTIVE COHORT STUDY

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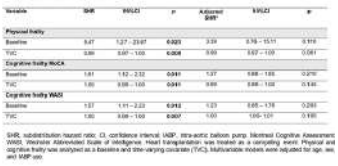
Introduction/Background: Frailty is an important prognostic factor in patients with heart failure and in transplant candidates, while cognitive impairment remains an under-recognized component that may further worsen clinical outcomes. Objectives: This prospective study aimed to determine the prevalence of physical and cognitive frailty among heart transplant candidates and their association with mortality. Methods: Physical frailty was assessed using the Fried criteria; cognition was evaluated using the MoCA (cognitive screening) and WASI (general intellectual functioning); and depressive symptoms were measured using the BDI. Cognitive frailty was defined as the presence of ≥3 of 6 criteria in a modified Fried phenotype, which incorporated cognitive impairment as an additional domain. Results and Conclusions: A total of 150 patients listed for heart transplantation within the previous 30 days were included at a tertiary center in Brazil. The study population was predominantly male (70%), with Chagas disease etiology (35%), and a mean age of 49.8 ± 10.4 years. Physical frailty was present in 78.7% of patients, cognitive frailty in 88.7% (MoCA) and 86.7% (WASI), and depressive symptoms in 44%, which were significantly associated with physical frailty (p = 0.021). During 1-year follow-up, 41.3% of patients died and 67.3% underwent transplantation. Physical frailty was associated with an increased risk of early mortality after listing (initial SHR = 5.47; p = 0.023), with significant attenuation of this effect over time (TVC SHR = 0.99; p = 0.008). A similar pattern was observed for cognitive frailty, measured by both MoCA (initial SHR = 1.61; p = 0.011; TVC SHR = 1.00; p = 0.011) and WASI (initial SHR = 1.57; p = 0.012; TVC SHR = 1.00; p = 0.007), indicating a reduction in its impact on mortality risk over time. However, after multivariable adjustment, neither physical nor cognitive frailty remained independently associated with overall mortality. Physical and cognitive frailty were highly prevalent among heart transplant candidates and showed a time-dependent association with early mortality risk. After adjustment for disease severity markers, this association lost significance, suggesting that frailty may, at least in part, reflect the underlying clinical status at the time of listing rather than acting as an independent prognostic factor. These findings also raise questions regarding the adequacy of the Fried phenotype as a frailty assessment tool in this specific population.

Table 1 - Prevalence of physical frailty, cognitive frailty, and depressive symptoms

	Value (n=150)
Physical frailty score (0–5 points)	3.3 ± 1.1
Physical frailty components	
Unintentional weight loss	84 (56.0)
Exhaustion	70 (46.7)
Reduced handgrip strength	66 (44.0)
Slow gait speed	127 (84.7)
Low physical activity level	149 (99.3)
Physical frailty classification	
Non-frail (0 points)	0 (0.0)
Pre-frail (1–2 points)	32 (21.3)
Frail (≥ 3 points)	118 (78.7)
Cognitive frailty WASI (0–6 points)	4.2 ± 1.2
CogF classification – WASI	
Non-frail (< 3 points)	20 (13.3)
Frail (≥ 3 points)	130 (86.7)
Cognitive frailty MoCA (0–6 points)	4.2 ± 1.3
CogF classification – MoCA	
Non-frail (< 3 points)	17 (11.3)
Frail (≥ 3 points)	133 (88.7)
Beck Depression Inventory (BDI) total score	14.6 ± 9.0
BDI classification	
No depressive symptoms	84 (56.0)
Mild symptoms	38 (25.3)
Moderate symptoms	16 (10.7)
Severe symptoms	12 (8.0)

Categorical variables are expressed as absolute number and percentage [n (%)], and continuous variables as mean ± standard deviation. MoCA = Montreal Cognitive Assessment; WASI = Wechsler Abbreviated Scale of Intelligence; BDI= Beck Depression Inventory.

Table 2 - Physical and cognitive frailty in relation to all-cause mortality in a competing-risk analysis



SHR, subdistribution hazard ratio; CI, confidence interval; IABP, intra-aortic balloon pump; Montreal Cognitive Assessment; WASI, Wechsler Abbreviated Scale of Intelligence. Heart transplantation was treated as a competing event. Physical and cognitive frailty was analyzed as a baseline and time-varying covariate (TVC). Multivariable models were adjusted for age, sex, and IABP use.

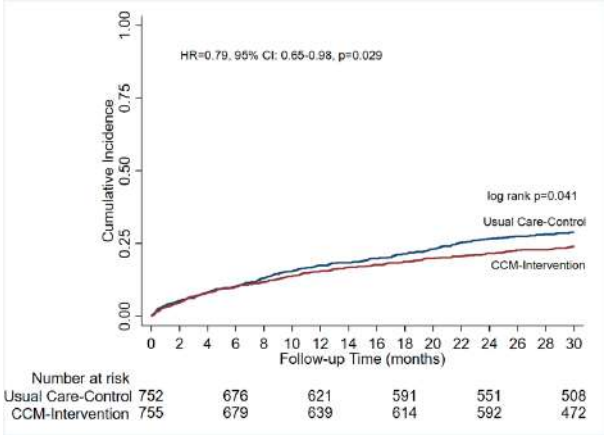
17106

IMPACT OF NURSE-LED MHEALTH ASSISTED COLLABORATIVE CARE ON ALL-CAUSE MORTALITY IN HFREF: THE TIME-HF CLUSTER RCT IN INDIA

PANNIYAMMAKAL JEEMON1; SIVADASANPILLAI HARIKRISHNAN1; SANJAY GANAPATHY1; NAVYA ANIKKADY1; SUNAIB ISMAIL1; GOVINDAN UNNI2; BAHULEYAN GOPALAN CHARANTHARALYIL3; MEERA PILLAI4; RACHEAL DANIEL5; RAJEEV EDAKKUTTY6; STIGI JOSEPH7; INDIA TIME-HF COLLABORATORS8;

(1) SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES AND TECHNOLOGY - INDIA; (2) JUBILEE MISSION HOSPITAL - INDIA; (3) ANANTHAPURI HOSPITAL - INDIA; (4) KIMS TRIVANDRUM - INDIA; (5) NIMS KOLLAM - INDIA; (6) COOPERATIVE HOSPITAL CALICUT - INDIA; (7) LITTLE FLOWER ANAGAMALI - INDIA; (8) TIME-HF COLLABORATORS - INDIA;

Introduction/Background: HFrEF drives high mortality and hospitalizations in India amid resource limits and fragmented care. The TIME-HF cluster RCT tested the effectiveness of a nurse-led, mHealth-facilitated collaborative care model to enhance treatment optimization and self-management on all-cause mortality. Objectives: To evaluate the effectiveness of a nurse-led, mHealth-facilitated collaborative care model to enhance treatment optimization and self-management on all-cause mortality in heart failure patients with reduced ejection fraction in India. Methods: We conducted a parallel-group, cluster-randomised controlled trial involving 1,507 adults with HFrEF across 22 centres in India. Clusters were assigned to the intervention or control arm in a 1:1 ratio using computer-generated random numbers. Participant enrolment occurred on a rolling basis over 6 to 12 months, and each patient was followed for at least 2 years after recruitment. The intervention comprised three sequential components: (1) screening and risk stratification; (2) support for lifestyle modification, including nutritional counselling, tobacco and alcohol cessation, physical activity planning, daily weight monitoring, evaluation for cognitive behavioural therapy, and recognition of warning symptoms, alongside pharmacologic optimisation; and (3) a nurse-facilitated, mHealth-supported disease management programme incorporating structured self-care education, active follow-up, and continuous monitoring of clinical status outside hospital settings. The main outcome for the present analysis was all-cause mortality. We performed survival analysis, including Cox proportional hazards models, to assess the intervention's effect, adjusting for the clustered study design. Results and Conclusions: Among the 1,507 participants (752 in the usual care group and 755 in the intervention group), 77.6% were men, with a mean age of 61.9 years (SD = 12.1). Over half (57.3%) resided in rural areas, and 70.1% had not completed ten years of schooling. Hypertension and diabetes were reported by 56.2% and 62% of participants, respectively, while 18.4% had chronic kidney disease. Ischemic heart disease was the underlying cause in 77.4% of cases. There were 216 mortality events (28.72%) in the usual care group, compared to 180 (23.84) in the intervention group. In the multivariable Cox proportional hazards model, the intervention group showed a 20% reduction in mortality compared with the control group (HR = 0.798, 95% CI: 0.652–0.977; p = 0.029, Figure 1).



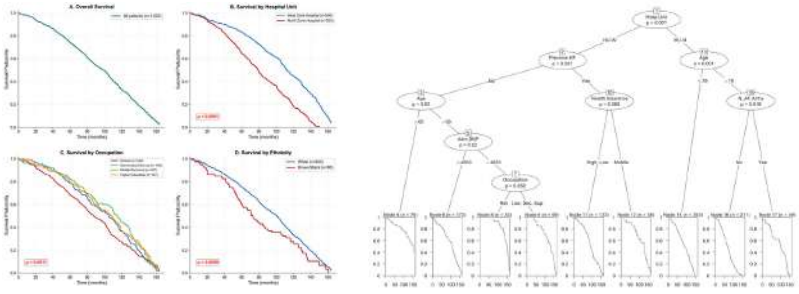
16721

THE SOCIOECONOMIC GRADIENT ECLIPSES CLINICAL SEVERITY IN DETERMINING LONG-TERM MORTALITY AFTER DECOMPENSATED HEART FAILURE

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Introduction/Background: Conventional prognostic scores for decompensated heart failure (DHF) incorporate up to 13 clinical variables yet exclude social determinants of health (SDH). In highly unequal urban settings, the independent prognostic weight of SDH versus biological factors remains unquantified. Objectives: To compare the prognostic weight of SDH against conventional clinical variables for long-term mortality in DHF patients treated under standardized protocols at two tertiary centers in socioeconomically contrasting zones of Rio de Janeiro. Methods: Retrospective analysis of 1,023 consecutive DHF patients (2011–2021) at two private tertiary centers in the West Zone (Municipal HDI 0.959) and North Zone (HDI 0.814). All patients received standardized heart failure protocols. Primary outcome: all-cause mortality over median 6.9-year follow-up (IQR 4.4–9.9). Cox model with Elastic Net regularization selected from 26 predictors. Fine–Gray competing risk models estimated subdistribution hazards. Survival trees identified intersecting vulnerability phenotypes. Missing data addressed by multiple imputation. Results and Conclusions: Median age 78 years (IQR 68–85); 54.0% male; LVEF 45% (IQR 34–58%). Total mortality: 766 (74.9%); in-hospital: 110 (10.8%); post-discharge: 656 (64.1%). In the Cox–Elastic Net model, North Zone hospital admission was the strongest determinant (HR 2.43, 95%CI 2.06–2.86; P<0.001), exceeding all clinical and echocardiographic variables. Brown/Black ethnicity independently increased mortality (HR 1.44, 95%CI 1.12–1.86; P=0.005). Prior HF (HR 1.32; P=0.002) and diabetes (HR 1.18; P=0.036) were retained. Severe LV dysfunction exhibited a paradoxical apparent protective effect (HR 0.57), attributable to competing early in-hospital death (Fine–Gray SHR 2.25). Survival trees identified patients ≥79 years at the North Zone hospital with prior arrhythmias as the highest-risk phenotype. Female sex was protective post-discharge (HR 0.80; P=0.007). In DHF patients under standardized protocols, SDH—intra-urban hospital location and ethnicity—were the strongest independent determinants of long-term mortality, surpassing all clinical variables. The apparent protective effect of severe dysfunction reflects survivor bias from competing early mortality. These findings support integrating SDH into heart failure risk stratification.



19034

VUTRISIRAN IN PATIENTS WITH TRANSTHYRETIN AMYLOIDOSIS WITH CARDIOMYOPATHY IN HELIOS-B WHO HAD PROGRESSED ON TAFAMIDIS

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Introduction/Background: In the HELIOS-B study, vutrisiran met the primary endpoint, reducing the risk of all-cause mortality (ACM) and cardiovascular (CV) events versus placebo in patients with transthyretin amyloid cardiomyopathy (ATTR-CM). All secondary endpoints were met, with benefit observed in the overall and vutrisiran monotherapy populations. Although not powered, vutrisiran also showed a trend for improvement in patients receiving baseline tafamidis. Objectives: To evaluate, in post-hoc analyses, the impact of vutrisiran on CV events and ACM in patients identified as tafamidis progressors (patients in baseline tafamidis subgroup who enrolled in the study due to disease progression). Methods: HELIOS-B (NCT04153149) is a phase 3, international, double-blind, placebo-controlled study with an ongoing prespecified open-label extension. Tafamidis progression was defined by investigator assessment at baseline. The primary endpoint was a composite of ACM and recurrent CV events (CV hospitalization or urgent heart failure visit), analyzed during the double-blind period (up to 36 months) using a modified Anderson-Gill model. ACM was assessed through 42 months using a Cox proportional hazards model. Results and Conclusions: 654 patients were treated in HELIOS-B, including 259 patients receiving baseline tafamidis. Reasons for enrolling while on tafamidis were disease progression (n=61; 23.6%), potential clinical benefit without having progressed (n=164; 63.3%), and other/unknown (n=34; 13.1%). Cause of progression was cardiac disease for 60 patients and neuropathy for 14 patients (Table). In the subgroup identified as tafamidis progressors (n=61) vutrisiran showed favorable trends, with a 41% reduction in risk of the composite endpoint (HR 0.59; 95% CI 0.22–1.58; p=0.29, Figure) and a 56% reduction in ACM (HR 0.44; 95% CI 0.13–1.48; p=0.08) versus placebo, consistent with the overall population and the baseline tafamidis subgroup. All patients in the tafamidis progressors subgroup experienced at least one adverse event; with 4 (14.3%) deaths in the vutrisiran arm vs. 9 (27.3%) in placebo. Overall, there were a lack of adverse events in patients receiving dual therapy. CONCLUSIONS: In post-hoc analyses of HELIOS-B, patients with ATTR-CM progressing under tafamidis showed a favorable trend in reducing incidence of composite ACM and recurrent CV events with vutrisiran treatment. Originally presented at HFA 2025. Presenter: Ândrea V F Chaves, on behalf of the authors

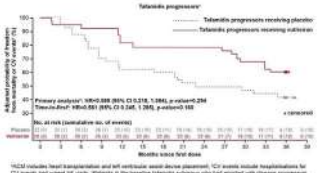
Table. Baseline characteristics

	Overall population (N=654)	Baseline tafamidis (n=259)	Tafamidis progressors* (n=61)
Age, years, median (range)	77.0 (45.0–85.0)	76.0 (45.0–85.0)	77.0 (64.0–85.0)
Male sex, n (%)	605 (92.5)	244 (94.2)	60 (98.4)
wtATTR, n (%)	578 (88.4)	231 (89.2)	56 (91.8)
NYHA Class, n (%)			
I	84 (12.8)	57 (22.0)	19 (31.1)
II	508 (77.7)	167 (64.5)	37 (60.7)
III	62 (9.5)	35 (13.5)	5 (8.2)
NYHA Class I/II and age <75 years, n (%)	421 (64.4)	170 (65.6)	44 (72.1)
NT-proBNP >3000 ng/L, n (%)	185 (28.3)	58 (22.4)	16 (26.2)
Previous HF hospitalization, n (%)	221 (33.8)	88 (34.0)	24 (39.3)
6MWT distance, m, mean (SD)	374.6 (100.0)	384.9 (98.7)	393.0 (85.9)
Time from start of tafamidis therapy, months, median (range)	10.8 (1.1–65.5)	10.8 (1.1–65.5)	13.2 (1.1–65.5)
Type of disease progression on tafamidis, n (%)[b]	—	—	
Cardiac			60 (98.4)
Heart failure			45 (73.8)
Arrhythmia			24 (39.3)
Increased cardiac biomarkers			14 (23.0)
Worsening renal function related to HF			5 (8.2)
Other			5 (8.2)
Neuropathy			14 (23.0)

*Patients in the baseline tafamidis subgroup who had enrolled with disease progression while on tafamidis; [b]Calculated as a percentage of patients with disease progression; [c]Percentages may not total 100% as patients may have had more than one reason for progression

6MWT, 6-minute walk test; HF, heart failure; NT-proBNP, N-terminal pro-B-type natriuretic peptide; NYHA, New York Heart Association; wtATTR, wild-type transthyretin amyloidosis

Figure. Adjusted Kaplan-Meier plots of time to ACM* or first CV event† during the double-blind period



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20203

PATHOLOGICAL Q-WAVE IN PATIENTS WITHOUT PREVIOUS MYOCARDIAL INFARCTION: PROGNOSTIC IMPACT AND ECHOCARDIOGRAPHIC CORRELATION

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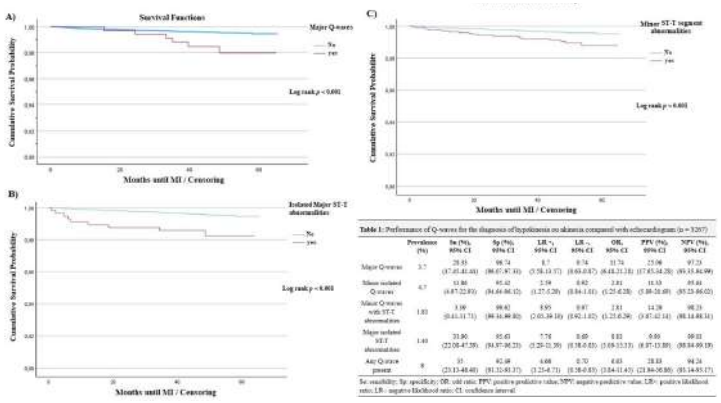


Table 1: Performance of Q-waves for the diagnosis of hypokinesia on akinesia compared with echocardiogram (n = 3267)

	Prevalence (%)	Se (%), 95% CI	Sp (%), 95% CI	LR +, 95% CI	LR -, 95% CI	OR, 95% CI	PPV (%), 95% CI	NPV (%), 95% CI
Major Q-waves	3.7	28.53 (17.45-41.63)	96.74 (96.07-97.33)	8.7 (5.58-13.57)	0.74 (0.60-0.87)	11.74 (8.48-21.18)	25.06 (17.85-34.20)	97.23 (95.11-98.99)
Minor isolated Q-waves	6.7	53.86 (4.87-22.83)	95.42 (94.64-96.12)	2.59 (1.27-5.20)	0.92 (0.84-1.01)	2.81 (1.25-6.28)	16.53 (5.88-35.89)	95.61 (95.23-96.02)
Major Q-waves with ST-T abnormalities	1.83	3.99 (0.61-11.71)	99.82 (99.61-99.92)	8.95 (2.03-39.10)	0.97 (0.92-1.02)	2.81 (1.23-6.26)	14.28 (3.87-42.14)	98.21 (98.14-98.34)
Major isolated ST-T abnormalities	1.41	31.96 (22.08-47.29)	95.45 (94.97-96.23)	7.76 (5.29-11.39)	0.85 (0.78-0.93)	9.11 (5.69-13.13)	9.86 (8.97-13.89)	99.01 (98.84-99.18)
Any Q-wave present	9	35 (23.13-48.68)	92.38 (91.72-93.17)	4.68 (3.23-6.73)	0.70 (0.58-0.83)	6.83 (3.84-11.63)	28.83 (23.86-34.80)	94.24 (93.14-95.17)

Se: sensibility; Sp: specificity; OR: odd ratio; PPV: positive predictive value; NPV: negative predictive value; LR+: positive likelihood ratio; LR-: negative likelihood ratio; CI: confidence interval

Introduction/Background: Pathological Q-waves on the electrocardiogram (ECG) are traditionally considered markers of prior or silent myocardial infarction (MI). Their prognostic value in asymptomatic populations remains uncertain. Objectives: To evaluate the diagnostic performance of pathological Q-waves for detecting segmental wall motion abnormalities on the echocardiogram and their prognostic impact for predicting acute MI compared with other ECG abnormalities. Methods: We conducted a cross sectional and longitudinal analyses of data from a large multicentric Brazilian cohort. Diagnostic performance of pathological Q-waves for hypokinesia or akinesia in the echocardiogram was assessed and sensitivity, specificity, positive and negative predictive values and likelihood ratios (Sn, Sp, PPV, NPV, LR+, LR-) were calculated. Correlations were evaluated with Spearman's rank test. Cumulative MI incidence over a 5 year follow-up was compared between patients with pathological Q-waves and those with other ECG abnormalities using Kaplan Meier curves and adjusted for confounding variables with Cox proportional hazards models. Adjustment variables included sex, age, hypertension, diabetes, smoking and dyslipidemia. Statistical significance was set at p<0.05 and 95% confidence interval. Results and Conclusions: Among 3,267 echocardiograms, major Q-waves showed high Sp, but low Sn for segmental abnormalities (Sp 96.7%; Sn 28.3%; LR+ 8.7. LR-8.7; PPV 25.0%; NPV 97.2%) with weak correlation correlation (ρ = 0.18) (Table 1). Moderate correlations were observed between minor Q waves with ST-T abnormalities (ρ = 0.61) and isolated ST-T abnormalities (ρ = 0.76). In the multivariate model, 14,415 ECGs were evaluated and major Q-waves were not associated with incident MI after full adjustment (HR 1.9; CI 0.85-4.6; p = 0.11). Isolated major ST–T (HR 2.41; CI 1.018-4.8; p=0.015) and minor ST–T (HR 1.73; CI 1.01-2.9; p=0.045) remained independently associated with MI (Figure 1). Isolated Major Q-waves were not independent predictors of MI and its correlation to segmental wall abnormalities was poor when compared to other ECG findings, such as ST-T abnormalities. Our results emphasize the importance of adopting a probabilistic approach to ECG interpretation. In asymptomatic individuals, Q-waves should be interpreted cautiously and complementary evaluation with imaging studies may be helpful when the pre-test probability of previous MI is low or dubious.

Cardiovascular Genetics



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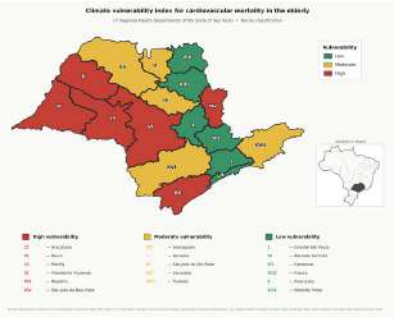
18786

REGIONAL INEQUALITIES IN CLIMATE VULNERABILITY TO CARDIOVASCULAR MORTALITY IN OLDER ADULTS IN THE STATE OF SÃO PAULO, BRAZIL

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Introduction/Background: Heat waves increase cardiovascular mortality in older adults, but this burden is unevenly distributed. Demographic, socioeconomic, and healthcare inequalities shape regional vulnerability to extreme heat, yet composite indices integrating epidemiological risk and adaptive capacity for heat-related cardiovascular mortality remain limited at subnational scales in Latin America. Objectives: To estimate the association between heat waves and cardiovascular mortality in older adults across the 17 DRS of São Paulo and to construct a composite climate vulnerability index. Methods: This ecological time-series study was conducted across the 17 Regional Health Departments (DRS) of the state of São Paulo and included individuals aged 60 years or older. Data from 2010–2019 and 2023 were analyzed; 2020–2022 were excluded to reduce distortions associated with the COVID-19 pandemic. Heat waves were defined as periods of at least three consecutive days with mean daily temperature ≥3 °C above the seasonal climatology, based on ERA5 reanalysis data. The association with cardiovascular mortality (ICD-10: I00–I99) was estimated using Distributed Lag Non-Linear Models (DLNM), with lags from 0 to 15 days. The composite vulnerability index combined seven indicators: heat wave-related relative risk, cardiovascular bed rate per 10,000 older adults, proportion of older adults, per capita health funding, primary care coverage, Human Development Index, and water supply coverage. Indicators were normalized using the Min–Max method, with protective variables inverted, and aggregated by arithmetic mean. Results and Conclusions: Heat waves were associated with increased cardiovascular mortality in older adults across all 17 DRS, with marked spatial heterogeneity. Heat-related excess mortality was most pronounced in adults aged 74–79 years. The composite index ranged from 0.181 to 0.844, identifying the highest vulnerability in inland regions — Registro, Presidente Prudente, Bauru, Marília, São João da Boa Vista, and Araçatuba — where elevated heat-related risk coincided with lower adaptive capacity. Greater São Paulo and surrounding areas showed the lowest vulnerability, reflecting stronger healthcare and socioeconomic infrastructure. These findings indicate that extreme heat impact depends on territorial inequalities in aging, healthcare, and socioeconomic conditions. The proposed index offers a framework to identify priority areas for climate adaptation, strengthen surveillance, and support equitable public health planning.





Heart Failure / Transplantation / Ventricular Assist Devices / Cardiomyopathies



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20966

A NOVEL RISK SCORE TO PREDICT MORTALITY DURING THE VULNERABLE PERIOD AFTER ACUTE HEART FAILURE: THE BPC SCORE

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Introduction/Background: Acute heart failure (AHF) is a high-risk condition, with validated risk scores available to estimate in-hospital mortality. However, there are no specific tools for risk stratification during the vulnerable period—the post-discharge phase characterized by high mortality. Objectives: To develop and validate a risk score to predict mortality after hospitalization for AHF, named the BPC score, and compare its performance with the Acute Decompensated Heart Failure National Registry (ADHERE) and Get With The Guidelines–Heart Failure (GWTG-HF) scores, originally developed for in-hospital mortality prediction. Methods: This prospective cohort study included patients discharged after hospitalization for AHF from 20 public hospitals participating in the Brazilian Unified Health System (SUS) "Best Practices in Cardiology" program between 2016 and 2022. The outcome was all-cause mortality within 90 days after discharge. Patients were randomly divided into training (70%) and testing (30%) cohorts. Predictors were selected using multivariable Cox regression with forward stepwise selection, and weighted points proportional to β coefficients composed the BPC score. Discrimination was assessed using the area under the ROC curve (AUC) and calibration using the Hosmer–Lemeshow (H-L) test. Results and Conclusions: A total of 2,785 patients were included (age 60±15 years, 43% female, left ventricular ejection fraction 41±17%), of whom 176 died during the 90-day follow-up. Variables included in the new score were: age >75 years, Chagas etiology, discharge creatinine >2.5 mg/dL, reduced mobility during hospitalization, educational level , atrial fibrillation, discharge systolic blood pressure <90 mmHg, and prolonged hospitalization (Figure 1). Patients were stratified into risk categories according to BPC score tertiles: low risk (<4), intermediate risk (=4), and high risk (>4). Mortality risk doubled [hazard ratio (HR) 2.05; 95% CI 1.71–2.46; p<0.001] with each increase in BPC score risk category (Figure 1). In the testing cohort, the BPC score demonstrated superior discrimination (Figure 2) compared with ADHERE and GWTG-HF (AUC 0.73 vs 0.56 vs 0.64, respectively; p=0.01), with satisfactory calibration (H-L p>0.05) for all scores. In this national multicenter cohort of patients with AHF, the BPC score demonstrated good discrimination and satisfactory calibration for prediction of 90-day post-discharge mortality, outperforming traditional in-hospital risk scores during the vulnerable period.

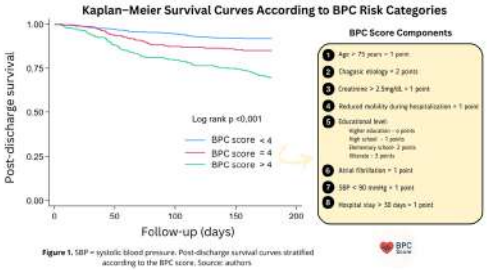


Figure 1. SBP = systolic blood pressure. Post-discharge survival curves stratified according to the BPC score. Source: authors

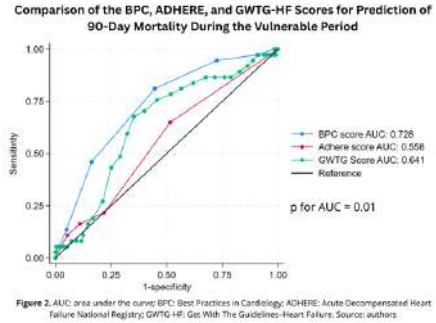


Figure 2. AUC: area under the curve; BPC: Best Practices in Cardiology; ADHERE: Acute Decompensated Heart Failure National Registry; GWTG-HF: Get With The Guidelines-Heart Failure. Source: authors

Hypertension / Renal Denervation



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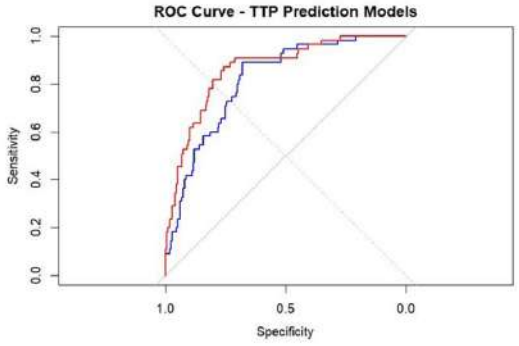
16571

BEYOND BLOOD PRESSURE: TIME TO PEAK REVEALS EARLY DAMAGE TO THE BRAIN AS A TARGET ORGAN IN HYPERTENSION

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Introduction/Background: Intracranial compliance has been proposed as an early marker of hypertension-mediated brain injury. However, the hemodynamic determinants of the time-to-peak (TTP) parameter remain unclear, particularly in the early stages of hypertension. Objectives: To investigate the hemodynamic determinants of TTP in individuals with untreated hypertension, evaluating the role of peripheral and central blood pressure, as well as parameters of pulsatility, arterial stiffness, and heart rate. Methods: This multicenter, cross-sectional study was conducted across six centers in Brazil and included 252 individuals with hypertension not receiving antihypertensive treatment. Measurements included office blood pressure, central blood pressure, and noninvasive intracranial pressure waveform analysis. TTP was analyzed in relation to peripheral and central hemodynamic variables, including systolic and diastolic blood pressure, pulse pressure (PP), augmentation index (AIx), pulse wave velocity (PWV), and heart rate (HR). Multivariable regression models were constructed, followed by discrimination analysis using receiver operating characteristic (ROC) curves and model comparison. Results and Conclusions: Central diastolic blood pressure (cDBP) showed an independent association with TTP ($p < 0.001$) and emerged as the main hemodynamic determinant. Age and sex also contributed significantly, with higher TTP values observed in females and a lower probability of elevated TTP in males. The inclusion of heart rate in the model significantly improved discriminative performance (AUC from 0.81 to 0.86; $p = 0.006$), whereas traditional peripheral and central blood pressure variables, as well as pulsatility and arterial stiffness parameters, did not enhance model performance. Collinearity analysis demonstrated low redundancy between cDBP and heart rate, indicating independent contributions of these variables. These findings suggest that TTP reflects a distinct hemodynamic domain, determined by the interplay between baseline pressure, cardiac cycle timing, and sex-related biological factors, capturing early cerebral alterations not detected by conventional hemodynamic measures and reinforcing its potential as a marker of target organ damage in hypertension.



Sleep Medicine



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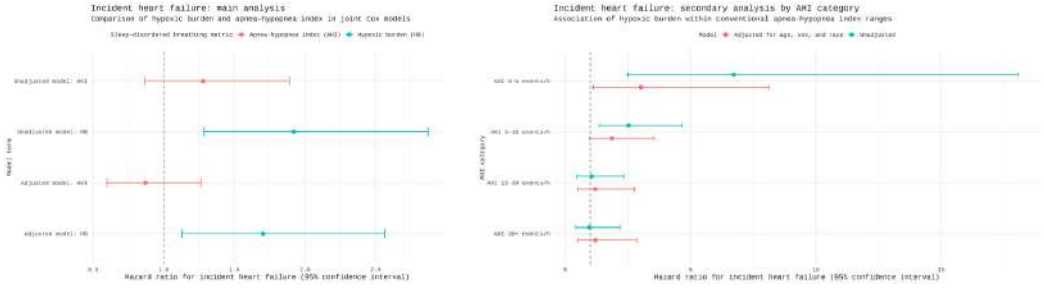
17153

HYPOXIC BURDEN AND RISK OF INCIDENT HEART FAILURE IN THE SLEEP HEART HEALTH STUDY

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Introduction/Background: The apnea-hypopnea index (AHI) is the standard metric used to quantify obstructive sleep apnea severity, but it may not fully capture the physiological burden of intermittent hypoxemia. Hypoxic burden (HB) integrates frequency, depth and duration of oxygen desaturations, may better reflect cumulative nocturnal hypoxic exposure and improve cardiovascular risk stratification. Objectives: To evaluate the association between HB and incident heart failure (HF) in the Sleep Heart Health Study (SHHS), compare its performance with AHI, and explore whether this association varies across AHI-defined severity ranges. Methods: An observational cohort analysis was conducted using SHHS data, including participants without HF at baseline. HB was automatically derived from overnight oxygen saturation (SpO_2) signals from the SHHS database using a validated algorithm. The outcome was incident HF. Cox proportional hazards models were fitted to assess the association of HB and AHI with incident HF, using continuous log-transformed variables. Models were examined in unadjusted and clinically adjusted analyses. In a secondary analysis, participants were stratified according to conventional AHI ranges (0-5, 5-15, 15-30, and ≥30 events/h). Results and Conclusions: The cohort included 4,613 participants and 518 incident HF events. In the primary analysis, HB was associated with incident HF in the unadjusted continuous model (HR 1.92, 95% CI 1.29-2.87, p=0.001), whereas AHI was not (HR 1.28, 95% CI 0.86-1.89, p=0.219). In models including both HB and AHI, adjusted for age, sex, and race, HB remained significantly associated with incident HF (HR 1.70, 95% CI 1.13-2.57, p=0.011), whereas AHI did not (HR 0.87, 95% CI 0.60-1.27, p=0.467). In the secondary analysis, the association between HB and incident HF was strongest in lower AHI ranges: for AHI 0-5 events/h, HR 6.47 (95% CI 2.34-17.85, p<0.001) in the unadjusted model and HR 3.02 (95% CI 1.12-8.12, p=0.029) after adjustment; for AHI 5-15 events/h, HB was associated with incident HF in the unadjusted model (HR 2.53, 95% CI 1.37-4.67, p=0.003), with attenuation after adjustment (HR 1.86, 95% CI 0.97-3.56, p=0.061). No significant association was observed in AHI 15-30 or ≥30 events/h. HB showed a stronger association with incident HF than AHI in the primary analysis and may better identify cardiovascular risk within conventional AHI-defined severity categories, particularly among patients with low-to-moderate AHI, a group often considered at lower cardiovascular risk.



BEST ORAL ABSTRACTS – SCIENTIFIC INITIATION



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22008

MINS NEARLY TRIPLES 30-DAY MORTALITY EVEN IN PATIENTS ALREADY AT HIGH RISK: AN AGE-STRATIFIED ANALYSIS OF 2,532 SURGICAL PATIENTS

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Introduction/Background: The impact of ageing on the incidence and prognosis of myocardial injury after non-cardiac surgery (MINS) in Brazil is unknown. Objectives: We aimed to characterise the incidence gradient, clinical severity, and short- and long-term outcomes of MINS across age groups in a Brazilian tertiary surgical intensive care unit (ICU). Methods: Historical cohort study of consecutive patients admitted to a surgical ICU following non-cardiac surgery (2011–2016), with a median follow-up of 6.7 years (maximum 10.2 years). MINS was defined as troponin elevation exceeding the 99th-percentile upper reference limit without a non-ischemic etiology. Patients were stratified into four age groups: <45, 45–64, 65–75, and >75 years. Primary outcome was long-term all-cause mortality. Secondary outcomes included 30-day and 1-year mortality. Odds ratios (ORs) with 95% confidence intervals (CIs) and Kruskal-Wallis tests were used as appropriate. Results and Conclusions: Results: Of 2,532 patients, MINS incidence followed a stepwise gradient: 3.7% (<45), 12.1% (45–64), 12.1% (65–75), and 18.3% (>75 years) (chi-square p<0.001). Patients >75 had 5.78-fold higher odds of MINS than those <45 (OR 5.78, 95%CI 3.28–10.20, p<0.001), and significantly higher incidence than the 65–75 group (OR 1.62, 95%CI 1.19–2.20, p=0.002). ICU severity increased progressively with age (SAPS3 median: 26, 33, 38, and 43 across groups; Kruskal-Wallis p<0.001). Despite lower mechanical ventilation rates in the >75 group (26.4% vs 52.0% in 45–64, p<0.001) — possibly reflecting ceiling-of-care decisions — outcomes were markedly worse: 30-day mortality 23.1%, 1-year mortality 43.3%, and long-term mortality 72.1%. Compared with the 45–64 group, patients >75 with MINS had 3-fold higher 30-day (OR 3.30, 95%CI 1.08–10.12, p=0.041) and 1-year mortality (OR 3.31, 95%CI 1.45–7.52, p=0.004), and nearly 5-fold higher long-term mortality (OR 4.72, 95%CI 2.27–9.79, p<0.001). Within the >75 group, MINS still conferred a 9.6-fold increase in 30-day mortality versus non-MINS peers (23.1% vs 3.0%, p<0.001). Conclusions: MINS incidence peaks at 18.3% in patients over 75, with long-term mortality exceeding 70%. Even in the context of high background mortality, MINS independently amplifies short-term risk nearly 10-fold in this group. These findings point toward systematic perioperative troponin surveillance as a priority in elderly surgical patients.

Cardiovascular Prevention / Atherosclerosis / Dyslipidemia / Cardiovascular Risk Factors / Immunotherapy and Vaccines



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21602

FACTOR XIA INHIBITORS FOR SECONDARY STROKE PREVENTION: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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Introduction/Background: Secondary prevention after non-cardioembolic ischemic stroke or transient ischemic attack (TIA) remains challenging because reducing thrombotic risk is often accompanied by increased bleeding complications. Factor XIa (FXIa) inhibitors have emerged as a promising strategy to reduce thrombotic events while potentially preserving hemostasis. Objectives: To evaluate the efficacy and safety of FXIa inhibitors for secondary prevention in patients with non-cardioembolic ischemic stroke or high-risk TIA. Methods: A systematic review and meta-analysis of randomized controlled trials (RCTs) was conducted in accordance with PRISMA guidelines. The study included adults with non-cardioembolic ischemic stroke or high-risk TIA treated with FXIa inhibitors (asundexian and milvexian) compared with placebo or standard antiplatelet therapy. Primary outcomes were ischemic stroke and major bleeding according to the International Society on Thrombosis and Haemostasis definition. Secondary outcomes included any stroke, clinically relevant non-major (CRNM) bleeding, combined CRNM or major bleeding, intracranial hemorrhage, and all-cause mortality. Risk ratios with 95% confidence intervals were pooled using Mantel–Haenszel fixed effects model. Risk of bias was assessed using the Cochrane RoB 2 tool, and certainty of evidence was evaluated using the GRADE approach. Results and Conclusions: Three RCTs comprising over 16000 participants were included. FXIa inhibitors significantly reduced the risk of ischemic stroke (RR 0.76; 95% CI 0.68–0.86; I²=0%) and any stroke (RR 0.76; 95% CI 0.68–0.85; I²=0%) compared with placebo. No statistically significant differences were found for major bleeding (RR 1.15; 95% CI 0.90–1.46), intracranial hemorrhage (RR 1.12; 95% CI 0.73–1.70), or all-cause mortality (RR 1.00; 95% CI 0.85–1.18). Although numerically higher rates of CRNM bleeding (RR 1.50; 95% CI 0.90–2.48) and combined CRNM or major bleeding (RR 1.45; 95% CI 0.93–2.25) were observed with FXIa inhibitors, these differences did not reach statistical significance. Overall, FXIa inhibitors demonstrated significant reductions in recurrent ischemic stroke and any stroke without significantly increasing major bleeding, intracranial hemorrhage, or mortality. These findings suggest that FXIa inhibition may represent a promising therapeutic strategy for secondary stroke prevention, although further large-scale trials are needed to better define long-term efficacy and safety.

Figure 1. Forest plots of the primary outcomes comparing factor XIa inhibitors with placebo.

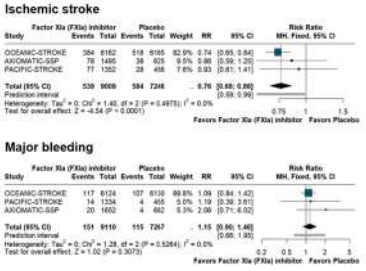
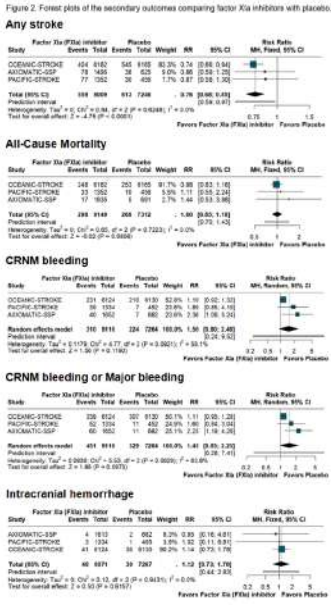


Figure 2. Forest plots of the secondary outcomes comparing factor XIa inhibitors with placebo.



Epidemiology and Health Policy / Global Health



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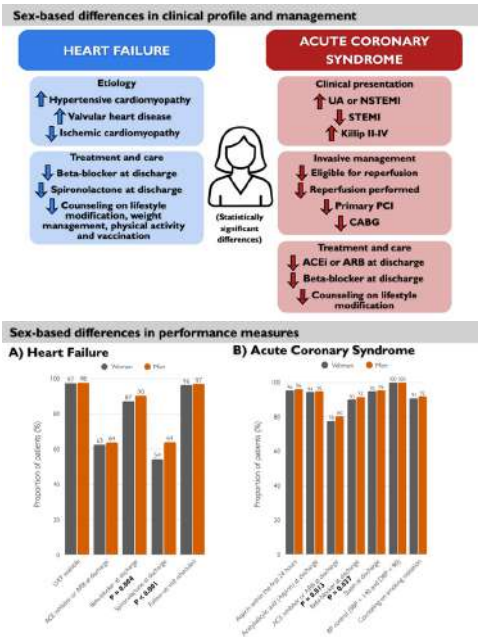
15912

SEX-BASED COMPARISON IN QUALITY OF CARE AMONG PATIENTS WITH HEART FAILURE AND ACUTE CORONARY SYNDROME: A MULTICENTER STUDY IN BRAZIL

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Introduction/Background: Sex-related disparities in cardiovascular care have been widely reported, but it remains unclear whether these differences persist within structured quality improvement programs. Evaluating patterns of care in real-world settings may help contextualize previously described inequities. Objectives: To assess sex-based differences in the quality of care among patients hospitalized with heart failure (HF) or acute coronary syndrome (ACS) in a nationwide quality improvement registry. Methods: This multicenter prospective cohort study included patients hospitalized with HF or ACS across 18 hospitals participating in the Brazilian Best Practice in Cardiology Program between 2016 and 2022. Baseline characteristics, in-hospital mortality, and guideline-recommended performance measures were compared between women and men. Multivariable logistic regression models were used to evaluate the association between sex and in-hospital mortality, as well as selected performance measures, including adjustment for time since hospital enrollment in the program. Results and Conclusions: A total of 10,338 patients were included, of whom 3,812 had HF and 6,526 had ACS. Women presented with distinct clinical profiles in both cohorts and were less likely to undergo invasive strategies in ACS, including lower rates of eligibility for reperfusion (51.8% vs 62.5%, p<0.001), reperfusion performed (82.3% vs 86.3%, p=0.001), primary percutaneous coronary intervention (41.7% vs 49.8%, p<0.001), and coronary artery bypass grafting (10.5% vs 12.6%, p=0.019). Differences in adherence to performance measures were generally modest; however, women were less likely to receive selected evidence-based therapies at discharge, including beta-blockers (87.1% vs 90.4%, p=0.004) and spironolactone (54.4% vs 64.0%, p<0.001) in HF, and angiotensin-converting enzyme inhibitors/angiotensin receptor blockers (77.7% vs 80.3%, p=0.013) and beta-blockers (90.0% vs 91.6%, p=0.037) in ACS. In-hospital mortality did not differ between sexes in HF. In ACS, mortality was higher among women in unadjusted analyses, but sex was not independently associated with mortality after adjustment. Temporal improvements in selected performance measures were observed in both cohorts, without significant interaction between sex and time. Quality improvement initiatives may attenuate, but do not fully eliminate, sex-based imbalances in the use of evidence-based therapies, suggesting that additional targeted strategies are needed to advance equity in cardiovascular care.



Heart Failure / Transplantation / Ventricular Assist Devices / Cardiomyopathies



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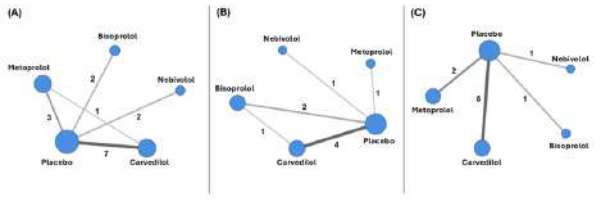
DO BETA-BLOCKERS REPRESENT A TRUE CLASS EFFECT IN HFREF? A NETWORK META-ANALYSIS OF RANDOMIZED TRIALS

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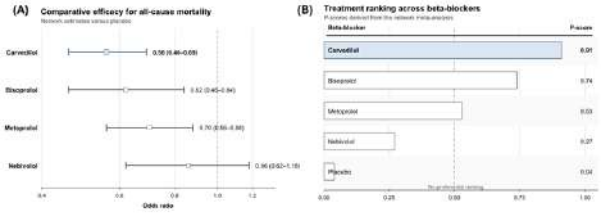
Introduction/Background: Beta-blockers are foundational in heart failure with reduced ejection fraction (HFrEF); however, whether their benefits reflect a true class effect or clinically meaningful differences between agents remains uncertain. Objectives: To assess whether beta-blockers exert a uniform class effect or display differential efficacy across clinically relevant outcomes in HFrEF. Methods: A systematic review of randomized controlled trials (RCTs) was conducted according to PRISMA, with a prospectively registered PROSPERO protocol. PubMed, Embase, and Cochrane Library were searched from inception to April 2026. RCTs comparing beta-blockers, including head-to-head and placebo-controlled trials in HFrEF, were included. Risk of bias was assessed using the RoB2 tool. The primary outcome was all-cause mortality (ACM); secondary outcomes were cardiovascular (CV) death and hospitalization for heart failure (HHF). A frequentist random-effects network meta-analysis was performed. Treatment effects were estimated as odds ratios (ORs) with 95% confidence intervals (CIs), and ranking probabilities were assessed using P-scores. Consistency was evaluated using node-splitting and transitivity based on key effect modifiers. Sensitivity analyses excluded metoprolol tartrate trials. Certainty of evidence was assessed using GRADE. Results and Conclusions: Sixteen RCTs (n = 16,892) were included. Compared with placebo, carvedilol (OR 0.56, 95% CI 0.46–0.69), bisoprolol (OR 0.62, 95% CI 0.46–0.84), and metoprolol (OR 0.70, 95% CI 0.56–0.88) reduced ACM, whereas nebivolol did not. Although most head-to-head comparisons were not statistically significant, a consistent directional pattern was observed, with carvedilol favoring lower ACM across the network, including a reduction versus nebivolol. Similar trends were observed for CV death. For HHF, only carvedilol showed benefit. Carvedilol ranked highest across outcomes according to P-scores. Low heterogeneity was observed across networks, with no evidence of inconsistency. These findings question the assumption of a uniform class effect among beta-blockers in HFrEF. Although most direct comparisons were not statistically significant, the consistency of effect estimates and ranking patterns across the network suggests that carvedilol may have a more favorable profile across key outcomes. Further head-to-head trials are needed to determine whether these differences reflect true pharmacologic superiority.

Figure 1. Network structure of randomized comparisons among beta-blockers and placebo across clinical outcomes: (A) all-cause mortality, (B) cardiovascular death, and (C) hospitalization for heart failure.[a]



[a]Node size is proportional to the number of participants, and edge thickness is proportional to the number of studies.

Figure 2. Comparative efficacy of beta-blockers in HFrEF.
(A) Network meta-analysis estimates for all-cause mortality versus placebo.
(B) Treatment ranking based on P-scores.
The consistent directional pattern across effect estimates and ranking supports potential differences between agents rather than a uniform class effect.



Neglected Cardiovascular Diseases



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SEX DIFFERENCES IN THE PHENOTYPIC PATTERN OF VALVULAR INVOLVEMENT IN RHEUMATIC HEART DISEASE

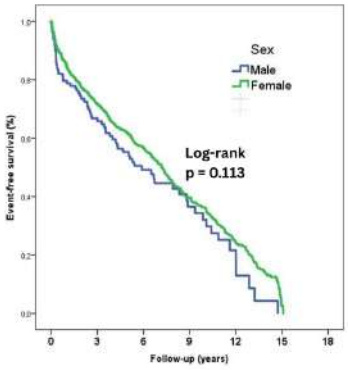
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Table 1. Pattern of valvular involvement in RHD according to sex

Variables*		Female (n=755)	Male (n=148)	P Value
Echocardiographic data				
LA volume index (mL/m²)		60.6 ± 25.8	69.7 ± 33.9	**0.002**
Mean gradient (mmHg)		9.8 ± 4.9	9.9 ± 4.5	0.821
Mitral valve area (cm²)		1.2 ± 0.45	1.2 ± 0.48	0.884
C_d(mL/mmHg)		4.96 ± 1.76	5.54 ± 1.92	**0.003**
RV function parameters				
Pulmonary artery pressure(mmHg)		43.4 ± 17.7	41.7 ± 17.3	0.295
MV	Leaflets mobility	2 (2-2)	2 (2-2)	**0.021**
morphology**	Leaflets thickening	2 (2-2)	2 (2-2)	**<0.001**
	Subvalvular thickening	2 (2-2)	2 (2-2)	0.725
	Calcification	2 (1-2)	2 (1-3)	**<0.001**
	Echo score	8 (6-8)	8 (7-9)	**<0.001**
Pattern of valvular involvement				
Isolated MV		417 (55)	57 (37)	**<0.001**
Mitral and Aortic		296 (39)	82 (55) 7	**<0.001**
Mitral, aortic and tricuspid		30 (4) 11	(5)	0.843
Mitral and tricuspid		(1) 78	1 (1)	0.702
Pure MS		(10) 677	30 (20)	**<0.001**
Combined MS and MR		(90) 67	118 (80)	
Moderate/severe MR		(9) 165	21 (14)	**0.046**
Combined AS and AR		(22) 32	36 (24)	0.324
Moderate/severe AR		(4) 21	10 (7)	0.301
Combined TS and TR		(3) 117	4 (3)	1.000
Moderate/severe TR		(15)	20 (14)	0.638

*Data are expressed as the mean value ± SD or absolute numbers (percentage)
**Data are expressed as median (Q1-Q3)



Introduction/Background: Rheumatic heart disease (RHD) is the leading acquired heart disease in young populations of developing countries. RHD has a marked female predominance that emerges early and intensifies in chronic stages. Thus, sex may influence disease progression and valvular remodeling, yet sex-specific phenotypes of RHD are underexplored. Objectives: To analyze sex-specific differences in phenotypic patterns, and long-term outcomes in chronic RHD, focusing on structural remodeling, valvular involvement, and clinical outcomes. Methods: A prospective cohort of chronic RHD patients was conducted from March 2011 to March 2026 at a tertiary center. Demographic, clinical, and echocardiographic data were collected at baseline, with follow-up every 6 months or based on symptoms. The outcome was a composite of atrial fibrillation (AF) onset, stroke, need for valve intervention (percutaneous or surgical), and cardiovascular mortality. The association between sex and outcomes was assessed using a Kaplan-Meier test and a Cox proportional hazards model adjusted for known prognostic factors, including symptoms and severity of valvular disease. Results and Conclusions: Overall, 903 patients were included, with a mean age of 48.4 ± 12.4 years, and 84% were women. At baseline, 329 patients were in NYHA class III/IV (36%) with mitral valve area of 1.2 ± 0.46 cm². Women more frequently had isolated mitral valve disease (55 vs 37%; p<0.001), while men had more multivalvular disease, particularly mitral and aortic (55 vs 39%; p<0.001). Moderate or severe mitral regurgitation associated with stenosis was more common in men (14 vs 9%; p=0.046). Over a median follow-up of 3.9 years (IQR 1.2–7.5), 462 patients (51%) experienced an adverse outcome, predominantly driven by valve interventions (116 percutaneous valvuloplasties and 233 valve replacements), along with 41 cardiovascular deaths. Women had higher rates of redo percutaneous intervention (13.6 vs 8.8%) and stroke (4 vs 2.7%), while men had higher rates of AF onset (5.4 vs 3%) and cardiovascular death (6.8 vs 4%). Mitral valve replacement rates were similar (26.4 vs 25.7%). In the Kaplan-Meier analysis, event-free survival rates were similar among sexes (p=0.113, Figure 1). Sex was not an independent predictor of outcomes in univariate and multivariate Cox models. Chronic RHD shows distinct sex-related phenotypic differences: men often have multivalvular disease, while women present isolated mitral valve involvement. Long-term outcomes and major interventions were similar between sexes.

BEST ORAL ABSTRACTS – EXPERIMENTAL CARDIOLOGY



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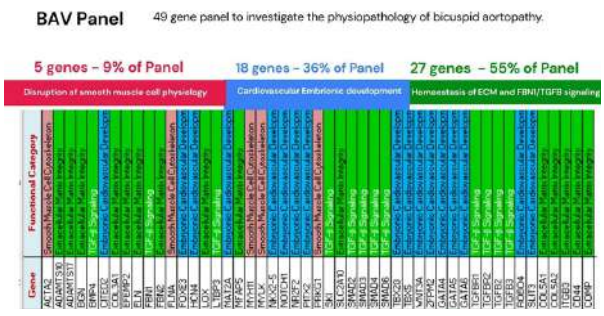
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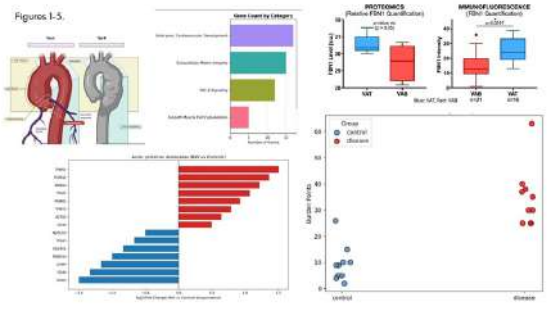
MULTI-OMICS FOR THE BIOMOLECULAR CHARACTERIZATION OF BICUSPID AORTOPATHY AND DEVELOPMENT OF A POLYGENIC RISK SCORE IN A BRAZILIAN COHORT

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Introduction/Background: Bicuspid aortic valve (BAV) represents the most prevalent congenital cardiac anomaly and serves as the primary risk factor for thoracic aortic aneurysms and dissections. The pathophysiology of BAV-associated aortopathy transcends simple hemodynamic alterations , suggesting a complex genetic architecture and proteomic profiles distinct from those of the tricuspid aortic valve (TAV). In highly admixed populations, such as in Brazil , significant genomic gaps limit effective risk stratification , which currently relies almost exclusively on aortic diameter measurements. Objectives: To investigate the biomolecular profile of aortopathy in Brazilian patients with Bicuspid Aortic Valve (BAV) using a multi-omics approach to extracellular matrix (ECM) genes, FBN1/TGF-B axis genes and smooth muscle cell (SMC) related genes, and to evaluate the efficacy of a novel functional genetic risk score and compare the phenotypes under the molecular and clinical perspective in our brazilian population for the first time. Methods: A prospective multicenter study was conducted involving patients undergoing proximal aortic surgery. The research integrated Whole Exome Sequencing (WES) and tissue proteomics (Liquid Chromatography-Mass Spectrometry) to compare Bicuspid Aortic Valve (BAV) and Tricuspid Aortic Valve (TAV) cohorts. We developed the Polygenic Functional Burden Score (PFBS) to quantify the cumulative impact of rare functional variants (Allele Frequency < 1%) within a panel of 49 candidate genes. These genes are specifically linked to extracellular matrix (ECM) homeostasis, cardiogenesis, and vascular function. Results and Conclusions: Proteomic analysis of aneurysmal ascending aortas identified 223 proteins exclusive to the BAV group. We observed a significant upregulation of fibrotic pathways in BAV tissue—a non-canonical finding in genetic aortopathies—characterized by the exclusive presence of TGFB1, LTBP3, and COMP. Genomic analysis revealed that the BAV group harbored a higher burden of rare variants in key genes, including NOTCH1, MYH11, TGFBR2, and SMAD3. The Polygenic Functional Burden Score (PFBS) was 3.6 times higher in the BAV group compared to controls (mean 34.8 vs. 9.5; p < 0.0001), with some patients exceeding 60 points. Bicuspid aortopathy possesses a distinct molecular signature defined by a chronic pro-fibrotic state and aberrant TGF-B signaling.





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THE METABOLIC POINT OF NO RETURN: ¹H-NMR SPECTROSCOPY BASED METABOLIC SIGNATURE REVEALS PRE-STRUCTURAL CONCENTRIC LEFT VENTRICLE HYPERTROPHY.

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Introduction/Background: Left ventricle hypertrophy (LVH) is a structurally silent entity till echocardiography detects myocardial remodeling. This diagnostic latency may result in irreversible hypertrophic progression and diastolic dysfunction of the heart. Pre-structural metabolic fingerprints via serum metabolomic profiling may often enable early detection in this era of precision medicine. Objectives: To map the pre-structural metabolomic trajectory of LVH via ¹H-NMR and validate it against histopathology, echocardiography, and ELISA, identifying an early reversible intervention window. Methods: A total of 296 human subjects (ages male 52.6±14.1 yr, female 49.3±13.1 yr) were stratified into three groups: mitral stenosis as a disease control (DC, n=34); HTN with pressure overload and without hypertrophy (PO, n=141); and severe aortic stenosis with established LVH (n=121). All patients underwent echocardiography to assess cardiac parameters, including left ventricle mass (LVM), relative wall thickness (RWT), posterior wall thickness in diastole (LVPWd), IVSd, FS%, and EF%. Fasting serum samples were analyzed using 1D ¹H-NMR experiments at 800 MHz with TSP as a reference. Processed spectra were analyzed using MetaboAnalyst6.0. Histopathology and ELISA quantification were performed, including NT-proBNP, IL-6, TNF-α, hs-CRP, and TGF-β. Diagnostic performance was assessed using various statistical analyses with a receiver operating curve (ROC). Results and Conclusions: Chemometric analysis reveals that different combinations of betaine, 3-hydroxybutyric acid, phosphocholine, glycine, and creatinine metabolites with S-plots (VIP ≥ 1.5) are able to make clear class separation and play a significant role in distinguishing LVH cohorts from DC and PO (AUC = 0.945), LVH from DC (AUC = 0.92), PO from DC (AUC = 1.0), and LVH from PO (AUC = 0.989). Regression showed significant negative correlations between 3-hydroxybutyric acid and PW (p < 0.04) as well as LVM (p < 0.02). Phosphocholine demonstrated significant negative correlations with CO (p<0.017), IVS (p<0.002), PW (p<0.003), RWT (p<0.03), and LVM (p<0.005). Betaine showed significant negative correlations with IVS (p<0.008), PW, LVEF, RWT, and LV mass (all p<0.01). In contrast, creatinine showed significant positive correlations with CO (p < 0.016), IVS, PW, SV, RWT, and LVM (all p < 0.001). Glycine positively correlates with IVS, PW, and LVM (all p < 0.001) and RWT (p < 0.002).This study reveals that serum-based metabolic profiling offers a promising liquid biopsy-inspired early warning approach.

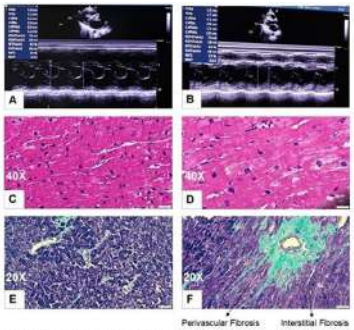


Figure 1: Echocardiographic and histopathological validation of DC vs concentric LVH. (A-B) shows M-mode echocardiographic of structural changes of LV DC vs. Concentric LVH. (C-D) H&E (40X) staining shows cardiomyocyte enlargement DC vs Concentric LVH and (E-F) represent masson trichrome staining (20x) shows increased fibrosis DC vs concentric LVH fibrosis.

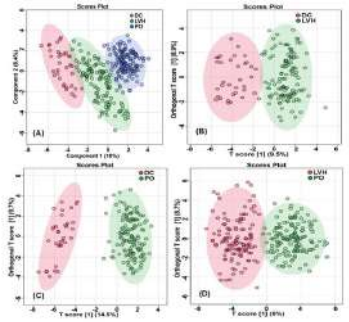


Figure 2: Chemometric analysis (A) PLS-DA score plot among DC, LVH, and PO. OPLS-DA score plot between (B) DC vs LVH, (C) DC vs PO, and (D) LVH vs PO.

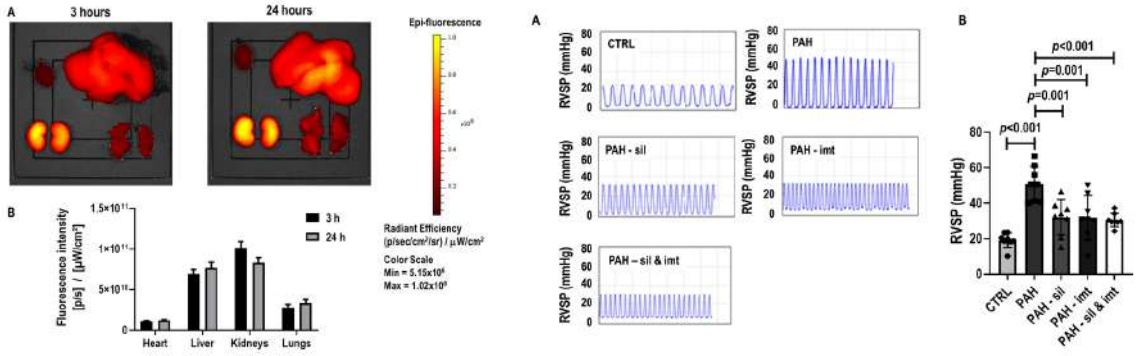
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MITOCHONDRIAL TRANSPLANTATION FROM BONE MARROW MESENCHYMAL STROMAL CELLS COMBINED WITH SILDENAFIL ATTENUATED VASCULAR REMODELING AND IMPROVED RIGHT VENTRICULAR DYSFUNCTION IN EXPERIMENTAL PULMONARY ARTERIAL HYPERTENSION

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Introduction/Background: Pulmonary arterial hypertension (PAH) is characterized by progressive vascular remodeling and right ventricular (RV) dysfunction, processes that are increasingly associated with disturbances in cellular metabolism. Objectives: We investigated whether transplantation of exogenous mitochondria derived from bone marrow mesenchymal stromal cells, alone or combined with sildenafil, could improve mitochondrial homeostasis and attenuate cardiopulmonary remodeling in monocrotaline-induced PAH. Methods: Male Wistar rats were assigned to control (CTRL, n=8) or PAH (n=32) groups. Fourteen days after induction of PAH, animals were randomized to receive saline, sildenafil (20 mg/kg/day for 14 days), intravenous mitochondrial transplantation (100 µg, days 14 and 21), or combined therapy. On day 28, echocardiography, invasive measurement of RV systolic pressure (RVSP), pulmonary vascular histology, gene expression analyses (vimentin, VE-cadherin, and mitochondrial metabolism–related genes), and high-resolution respirometry were performed. Results and Conclusions: All treatments significantly reduced RVSP compared with untreated PAH. Mitochondrial therapy, alone or combined with sildenafil, decreased arteriolar α-smooth muscle actin content, whereas endothelial–mesenchymal transition was attenuated only with combined treatment. Mitochondrial transplantation and sildenafil increased Complex I–dependent respiration, whereas Complex IV activity improved exclusively with mitochondrial therapy. Combined treatment reduced plasma IL-6 and IL-1β levels compared with PAH. Thus, mitochondrial transplantation, particularly when combined with sildenafil, improved RV function, limited pulmonary vascular remodeling, reduced plasma inflammatory markers and changed key mitochondrial pathways in experimental PAH.



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22033

BIDIRECTIONAL ASSOCIATION BETWEEN BLOOD TRANSFUSION AND MINS IN NON-CARDIAC SURGERY: A FOUR-GROUP MORTALITY ANALYSIS

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Introduction/Background: Blood transfusion and myocardial injury after non-cardiac surgery (MINS) may be bidirectionally related: anaemia and haemorrhage can reduce myocardial oxygen delivery and precipitate MINS, while MINS-related haemodynamic instability may necessitate transfusion. Objectives: We aimed to characterise this relationship and its prognostic impact in a Brazilian surgical intensive care unit (ICU). Methods: Historical cohort of patients admitted to a surgical ICU following non-cardiac surgery (2011–2016), with median follow-up of 6.7 years. MINS was defined as troponin elevation above the 99th-percentile upper reference limit without a non-ischemic etiology. Patients were stratified into four groups: neither MINS nor transfusion; transfusion only; MINS only; and MINS+transfusion. Bidirectionality was assessed by comparing MINS rates in transfused vs non-transfused patients (Direction 1), and transfusion rates in vasopressor-requiring vs haemodynamically stable MINS patients (Direction 2). Odds ratios (ORs) with 95% confidence intervals (CIs) were calculated. Results and Conclusions: Results: Of 2,532 patients, 525 (20.7%) received transfusion. MINS patients were transfused at more than twice the rate of non-MINS patients (38.2% vs 18.2%, OR 2.77, 95%CI 2.15–3.56, p<0.001), with elevated rates of FFP (12.6% vs 1.5%, OR 9.26), platelets (10.7% vs 1.4%, OR 8.20), and cryoprecipitate (3.2% vs 0.2%, OR 18.00) (all p<0.001). Supporting Direction 1, MINS rates were higher in transfused vs non-transfused patients (20.9% vs 7.9% elective; 29.0% vs 18.8% emergency surgery). Supporting Direction 2, transfusion was required in 58.7% of vasopressor-dependent MINS patients vs 31.8% of haemodynamically stable MINS patients (p<0.001). A stepwise mortality gradient was observed: 30-day mortality 1.1% (neither), 4.1% (transfusion only), 8.7% (MINS only), and 26.7% (MINS+transfusion). MINS+transfusion conferred OR 32.81 (95%CI 16.44–65.49) for 30-day and OR 12.65 (95%CI 7.67–20.87) for 1-year mortality vs neither (both p<0.001); transfusion further worsened prognosis among MINS patients alone (30-day OR 3.83, p=0.001). Conclusions: Transfusion and MINS are bidirectionally related: haemorrhage and anaemia appear to precipitate MINS, while MINS-related haemodynamic compromise amplifies transfusion requirements. Their co-occurrence identifies an extreme-risk phenotype with 30-day mortality exceeding 26%, pointing toward integrated haemostatic and cardiac monitoring in high-risk surgical patients.

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EXTERNAL MULTICENTER VALIDATION AND REFINEMENT OF A MACHINE LEARNING–BASED SCORING MODEL FOR ICU OUTCOMES IN PATIENTS WITH ISCHEMIC HEART DISEASE: EICU-CRD AND MIMIC-IV CLIF COHORTS

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Introduction/Background: Ischemic heart disease (IHD) accounts for ~9 million deaths annually, with a substantial proportion requiring ICU care. Established scores (TIMI, GRACE, HEART) were not validated for the heterogeneous ICU-admitted IHD spectrum. Objectives: To derive and externally validate a multicenter machine learning–based scoring model for high-acuity ICU course and short-term mortality. Methods: Retrospective multicenter cohort. Derivation: eICU-CRD (~200 U.S. hospitals, 2014–2015). External validation: MIMIC-IV in CLIF format (2008–2019). Adults (≥18y) admitted to ICU with IHD (ICD-9 410–414, ICD-10 I20–I25) and ICU stay ≥4h were eligible. Twenty-nine variables from the first 24h fitted L2-regularized logistic regression (primary), random forest, and an AutoScore-style 10-feature score. Primary outcome: high-acuity composite (vasopressor >24h, ventilation ≥48h, dialysis, or in-hospital death). Performance: AUC (95% CI), calibration, decision curve analysis (DCA), leave-one-hospital-out cross-validation, intercept-slope recalibration. Results and Conclusions: Of 13,226 IHD patients (190 hospitals; median age 67y; 35.5% female), 4,344 (32.8%) experienced the primary outcome. Internal AUCs: 0.77 (0.75–0.80) for the composite, 0.86 (0.83–0.89) for 30-day mortality. External AUCs (MIMIC-IV CLIF, n=26,360): 0.72 (0.72–0.73) and 0.78 (0.77–0.79) (Figure 1). The 10-feature parsimonious score retained AUC within 0.02 of the full 29-variable model. External calibration showed overprediction, fully corrected by intercept-slope recalibration. Leave-one-hospital-out cross-validation: median AUC 0.83 (IQR 0.74–0.87; range 0.46–0.96). DCA showed positive net benefit between thresholds 10–40%. A multicenter-derived parsimonious ML model for ICU outcomes in IHD is transportable, outperforms a previously published single-center model for short-term mortality (AUC 0.86 vs 0.74), and is amenable to local recalibration. Substantial inter-hospital heterogeneity supports site-specific recalibration before deployment.

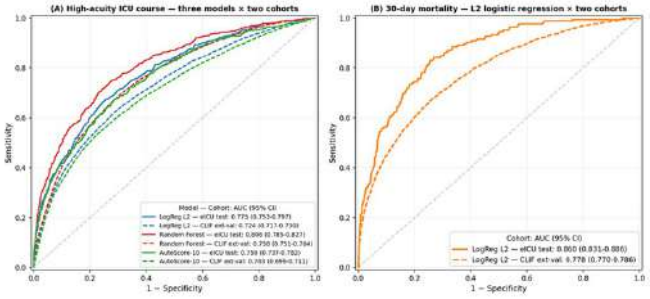


Figure 1. Receiver operating characteristic (ROC) curves. (A) High-acuity composite outcome — three models on the internal eICU-CRD test cohort and the external MIMIC-IV CLIF cohort. (B) 30-day mortality — L2 logistic regression on both cohorts. AUCs with 95% bootstrap confidence intervals.

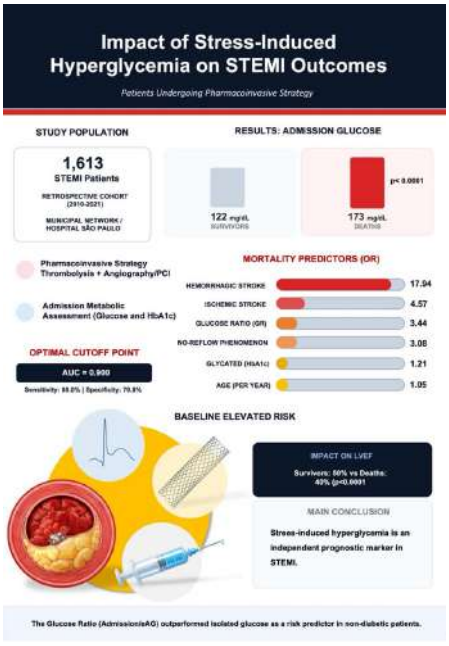
21074

STRESS-INDUCED HYPERGLYCEMIA AS A PREDICTOR OF IN-HOSPITAL MORTALITY IN ACUTE MYOCARDIAL INFARCTION

KAIO VINICIUS CAMPOS MARQUES1; MARIANA CRISTINA CORREIA1; BRENO VINICIUS DOS SANTOS PINTO1; JOÃO PEDRO BENEVIDES DE OLIVEIRA1; RODRIGO SILVA FORTES1; FRANCISCO A H FONSECA1; HENRIQUE T BIANCO1; BERNARDO F GARCIA1; PEDRO IVO MORAES1; MARIA CRISTINA DE OLIVEIRA IZAR1; ADRIANO CAIXETA1; ATTILIO GALHARDO1;

(1) UNIFESP - UNIVERSIDADE FEDERAL DE SAO PAULO - SÃO PAULO - SP - BRASIL;

Introduction/Background: Stress-induced hyperglycemia (SIH) is frequently observed during acute myocardial infarction (AMI) and is associated with transient elevations of catecholamines, cortisol, and pro-inflammatory cytokines. Defined as the ratio between admission plasma glucose and estimated average glucose (eAG), it may predict mortality and adverse cardiovascular outcomes. However, it is not incorporated into widely used risk stratification scores and has been poorly investigated in AMI patients undergoing a pharmacoinvasive strategy. Objectives: The objective of this study was to evaluate the association between SIH and in-hospital mortality in patients with ST elevation myocardial infarction (STEMI), with and without diabetes mellitus, undergoing a pharmacoinvasive strategy Methods: This retrospective cohort study included 1,613 patients with STEMI treated within a municipal healthcare network. The study was approved by the local Ethics Committee. Estimated average glucose (eAG) at admission was calculated from HbA1c values [eAG (mg/dL) = (28.7 × HbA1c) - 46.7] and SIH was estimated by the ratio between admission glucose and eAG. Demographic and laboratory data, risk factors, and angiographic parameters were collected using the Research Electronic Data Capture platform. Independent predictors of in-hospital mortality were identified through multivariate logistic regression analysis. Model discrimination and calibration were assessed using the area under the curve (AUC) and the Hosmer-Lemeshow test. Results and Conclusions: Patients who died during hospitalization had higher glucose levels at admission than survivors (median 173+/-150 vs. 122+/-59 mg/ dL; p < 0,001). SIH was strongly associated with in-hospital mortality, particularly among patients without a prior diagnosis of diabetes (p < 0.001). In multivariate analysis, SIH remained an independent predictor of mortality. The final model demonstrated excellent discrimination (AUC = 0.90), with a sensitivity of 88.0% and specificity of 79.8%. Predictors of in-hospital mortality (p < 0.05) were (OR, 95% CI): ischemic stroke (4.57, 1.4-14.98), hemorrhagic stroke (17.94, 4.5- 71.46), SIH (3.44, 1.79-6.6), no-reflow (3.08, 1.67-5.68), HbA1c (1.21, 1.07– 1.37), and age (1.05, 1.03-1.08). In conclusion, stress-induced hyperglycemia is an independent predictor of in- hospital mortality in STEMI patients undergoing a pharmacoinvasive strategy and may help identify high-risk individuals for more personalized therapeutic decisions.



Cardiac Arrhythmias / Electrophysiology / Electrocardiography / Cardiac Pacing



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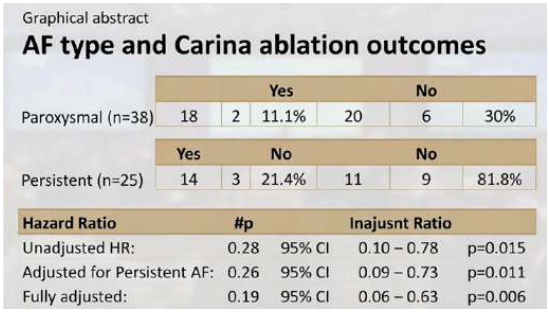
18492

CLINICAL ASSESSMENT OF THE ROLE OF CARINA ABLATION AFTER FIRST-PASS PULMONARY VEIN ISOLATION: FIRST RESULTS OF THE CARINA STUDY

GUILHERME MOREIRA PIZETTA1; HENRIQUE TEIXEIRA GIESTAS SERPA1; THAIS COUTINHO NICOLA1; EDUARDO SERPA1; LUISA CARVALHO BENEDITO1; CHRISTIANO LEMOS DA CUNHA1; CARLOS ALEXANDRE VOLPONI LOVATTO1; ALOYR SIMOES JR.1; FABRICIO SARMENTO VASSALLO1; LUIZ FERNANDO MACHADO BARBOSA2;

(1) HOSPITAL SANTA CASA DE MISERICORDIA DE VITORIA - VITÓRIA - ES - BRASIL; (2) ESCOLA SUPERIOR DE CIENCIAS DA SANTA CASA DE MISERICORDIA DE VITORIA - VITÓRIA - ES - BRASIL;

Introduction/Background: Background: Several predictors of recurrence after atrial fibrillation (AF) ablation have been described. Clinical and technical factors influence outcomes regardless of energy source or technique. Cryoablation and pulsed-field ablation show better long-term results, possibly due to closer contact with the carina region. Objectives: Objective: To evaluate whether, in patients achieving first-pass pulmonary vein isolation (FPI), additional carina ablation reduces recurrence. Methods: Methods: Prospective, randomized study from December 2023 to May 2025 with 63 patients undergoing first-time AF ablation in whom FPI was achieved. All patients perform antral pulmonary vein isolation and in patients randomized to carina ablation this approach was performed. Follow-up was for 10 ± 4.8 months. High-power short-duration protocol was performed using 50 W (TactiCath catheter) /6–12 s (30 ml/min flow) in 34 patients and 60W (Tactiflex catheter) for 6/9 s (20 ml/min flow) in 29 patients. Contact force was 10–20 g on the anterior wall and 5–10 g on the posterior wall of the left atrium. Intracardiac echocardiogram was used ant the descrition of the operator. Results and Conclusions: Results: Male were 49 (77,8%) with baseline characteristics similar between success and recurrence groups except for a higher CHA2DS2VA score (3.1 ± 1.6 vs 1.9 ± 1.7, p=0.008) in the carina group. The total recurrence rate was 31,7% (20 of 63). Recurrence occurred in 5/31 (16.1%) patients with carina ablation versus 15/32 (46.9%) without (p=0.014; OR 0.22, 95% CI 0.07–0.71). After multivariable adjustment for persistent AF, sex, BMI, CHA2DS2VA, left atrial diameter, and LVEF, carina ablation remained strongly protective (adjusted OR 0.07, 95% CI 0.01–0.41; p=0.003) with a NNT of 3.2. Follow-up period was 11.6±4.8 months. One pericardial effusion occurred 20 days post-ablation in the success group (with 60W). One patient died 13 months after ablation in complication of a stroke (recurrence group). Conclusion: In patients with FPI, additional carina ablation is associated with an 81% relative reduction in atrial tachyarrhythmia recurrence, supporting its use as a simple and effective adjunctive strategy during AF ablation.



Cardio-Oncology

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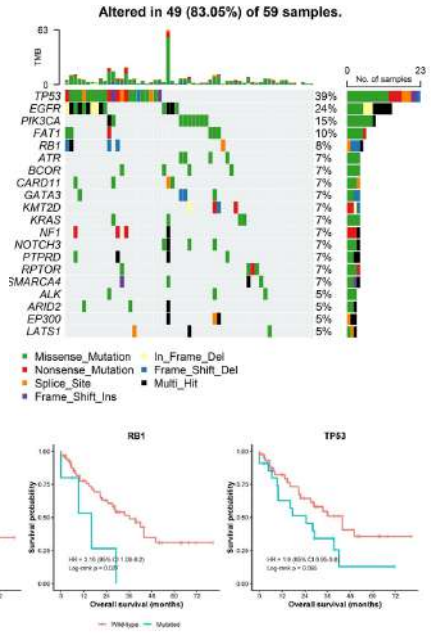
21598

GENOMIC LANDSCAPE AND CLINICAL OUTCOMES OF TUMORS INVOLVING THE HEART AND PERICARDIUM

VALBERT OLIVEIRA COSTA FILHO FILHO1; SILVESTE COELHO DOS SANTOS COSTA1; CARLOS CARLOS ALBERTO BARBOSA NETO1; FABRÍCIA CARDOSO MARQUES1; MARIANA LOPES1; MARIA EDUARDA MEDEIROS1; BÁRBARA CASTRO CARNEIRO1; MARIA EDUARDA CAVALCANTE1; REBECA OLIVEIRA1; MARIA EDUARDA AVELINO1; EDUARDA SEVERO1; MARKUS ANDRET CAVALCANTE GIFONI1;

(1) UFC - FORTALEZA - CE - Brasil;

Introduction/Background: Although tumors involving the heart and pericardium are clinically relevant because of their association with poor prognosis, their molecular features remain poorly defined. Objectives: To characterize the clinicogenomic landscape of tumors involving cardiac and pericardial sites, identify prognostic genomic alterations, and explore survival outcomes according to site of involvement. Methods: We conducted a retrospective analysis of a large U.S tumor sequencing cohort to identify tumors involving cardiac or pericardial sites. Survival was evaluated using Kaplan-Meier curves and hazard ratios (HR) were calculated using Cox proportional hazards models. Results and Conclusions: Of 54,331 tumors in our cohort, only 71 (0.13%) involved cardiac or pericardial sites. Patients were predominantly female (60%), with a median age of 51.5 years (IQR, 43.0-63.0). Cases comprised 17 primary cardiac soft tissue sarcomas, 13 cardiac metastases, 40 pericardial metastases, and one primary pericardial neuroblastoma. Lung adenocarcinoma was the dominant source of pericardial metastases (65%). Across the overall cohort, the most frequently altered genes were TP53 (39%), EGFR (24%), PIK3CA (15%), FAT1 (10%), RB1 (8%), and ATR (7%). All tumors were microsatellite stable. Site-specific analyses showed distinct molecular patterns. Among primary cardiac tumors, the most frequently altered genes were RPTOR (23%), ARID1B (15%), and ATR (15%), with a median OS of 16.3 months (IQR, 6.7-39.7). Among cardiac metastases, the most frequent alterations were TP53 (33%), followed by EGFR, NF1, and PIK3CA (22% each), with a median OS of 20.8 months (IQR, 8.4-29.3). Among pericardial metastases, the most frequently altered genes were TP53 (56%), EGFR (33%), and PIK3CA (19%), with a median OS of 23.7 months (IQR, 6.0-39.7). EGFR and RB1 alterations were associated with worse survival, with EGFR-mutant tumors showing an HR of 2.84 (95% CI, 1.28-6.31; p = 0.007) and RB1-mutant tumors showing an HR of 3.15 (95% CI, 1.08-9.20). Therefore, our findings show that tumors involving the heart and pericardium were rare and showed distinct site-specific genomic profiles. Recurrent alterations in potentially targetable genes, including EGFR, PIK3CA, and ATR, may reveal therapeutic vulnerabilities, while EGFR and RB1 alterations were associated with worse survival. These findings support genomic profiling as a tool for prognostic stratification and therapeutic hypothesis generation in this uncommon tumor population.



16772

PAZOPANIB CAUSES ARTERIAL HYPERTENSION IN PATIENTS WITH CLEAR CELL RENAL CELL CARCINOMA: TRANSLATIONAL EVIDENCE FOR ETAR-MEDIATED MECHANISMS

BRUNA EMY ONO1; ARTUR OLIVEIRA SALES1; THAIS SILVA RODRIGUES1; JOÃO EDUARDO IZAIAS1; JOSE MAURICIO SEGUNDO CORREA MOTA2; HELENA NALY MIGUENS ROCHA3; ANTÔNIO CLAUDIO LUCAS NOBREGA3; NATALIA GALITO ROCHA3; FERNANDA MARCIANO CONSOLIM-COLOMBO4; MARIA CLAUDIA IRIGOYEN5; RENATA JUNQUEIRA MOLL BERNARDES1; ALLAN ROBSON KLUSER SALES1;

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Introduction/Background: Patients with advanced clear cell renal cell carcinoma (ccRCC) treated with pazopanib, a vascular endothelial growth factor receptor tyrosine kinase inhibitor associated with improved survival, frequently develop arterial hypertension (AH). The mechanisms underlying these cardiotoxic effects remain unclear, although activation of the endothelin-1 (ET-1) system has been implicated. Objectives: We hypothesized that pazopanib induces endothelial dysfunction through activation of the endothelin-1/ETA receptor axis, contributing to develop of AH. Methods: To test this hypothesis, a translational study was conducted. Fourteen ccRCC patients (age:62±6 yrs and BMI:28±2 Kg/m2) undergoing treatment with pazopanib 800 mg/day and 7 ccRCC patients (age:60±6yrs and BMI:27±3 Kg/m2) in active surveillance were studied. Twenty four-hour systolic and diastolic arterial pressure (SAP and DAP), carotid intima-media thickness (IMTCA) and brachial artery flow-mediated dilation (FMDBA), reactive hyperemia index (RHI) and carotid-femoral pulse wave velocity (PWVcf) were evaluated at baseline and after 4 weeks of pazopanib and surveillance. Additionally, fifty-six male Wistar rats were treated for 21 days with sham, pazopanib, ETA antagonist ambrisentan, or both (n=14/group). SAP, DAP, baroreflex sensitivity, and mesenteric vascular reactivity were assessed Results and Conclusions: In patients, pazopanib increased the SAP, DAP, IMTC, and PWVcf, and decreased FMDBA and RHI, with no changes in active surveillance. In rats, pazopanib reproduced this phenotype, increasing SAP and DAP, an effect completely prevented by ambrisentan. Furthermore, ambrisentan attenuated the pazopanib-induced impairment of baroreflex sensitivity and the decrease in endothelium-dependent relaxation in mesenteric arteries. Our findings indicate that pazopanib induces systemic vascular dysfunction through ET-1/ETAR signaling. ETA receptor antagonism may be explored as a potential strategy to mitigate these effects.

Cardiovascular Imaging – Nuclear Medicine



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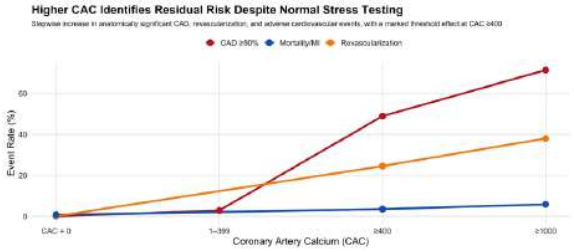
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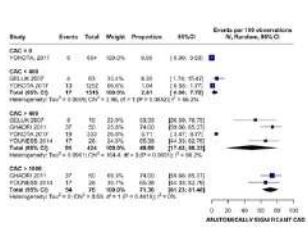
CORONARY ARTERY CALCIUM IDENTIFIES RESIDUAL RISK IN PATIENTS WITH NORMAL FUNCTIONAL TESTING: A SYSTEMATIC REVIEW AND META-ANALYSIS

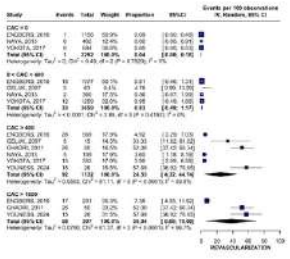
MARIA ANTONIA COSTA CRUZ AKABANE1; ISABELLA CRIVELARO FONSECA DIANA2; MARCELA VASCONCELOS MONTENEGRO3; LÍVIAN DE SOUSA GONÇALVES4; FERNANDO HENRIQUE PEREIRA SOARES DE OLIVEIRA5; RAFAELLA SANTANA6; ANA PAULA DELUCA7; ENZO MARIA CARVALHO ROSA8; DOUGLAS NUNES CAVALCANTE9; RHANDERSON CARDOSO10; SIMONE CRISTINA SOARES BRANDAO11; MARCELO F DI CARLI11;

(1) UFJF - JUIZ DE FORA - MG - BRASIL; (2) UNIVERSIDADE DE BUENOS AIRES - ARGENTINA; (3) UPE - RECIFE - PE - BRASIL; (4) UNIVERSIDADE NOVE DE JULHO - SÃO PAULO - SP - BRASIL; (5) UNIVERSIDADE VILA VELHA - VILA VELHA - ES - BRASIL; (6) UNIVERSIDADE FEDERAL DE SANTA MARIA - SANTA MARIA - RS - BRASIL; (7) CENTRO UNIVERSITARIO PARA O DESENVOLVIMENTO DO ALTO VALE DO ITAJAI - RIO DO SUL - SC - BRASIL; (8) UFC - FORTALEZA - MG - BRASIL; (9) HOSPITAL SÃO LUIS - REDE D'OR - SAO PAULO - SP - BRASIL; (10) BRIGHAM AND WOMEN'S HOSPITAL/HARVARD MEDICAL SCHOOL - UNITED KINGDOM; (11) BRIGHAM AND WOMEN'S HOSPITAL/HARVARD MEDICAL SCHOOL - UNITED STATES;

Introduction/Background: Background: Functional stress testing identifies inducible ischemia but does not exclude underlying atherosclerosis or future risk. Coronary artery calcium (CAC) quantifies atherosclerotic burden and may provide incremental prognostic value. Its role in symptomatic patients with negative stress tests remains uncertain. We evaluated the prognostic value of CAC in this setting. Objectives: Objective: To evaluate the prognostic value of coronary artery calcium (CAC) in symptomatic adults with negative functional stress tests, and to determine its association with residual cardiovascular risk and adverse clinical outcomes. Methods: Methods: Systematic review and single-arm meta-analysis including adults (≥18 years) with negative stress tests (SPECT, stress echocardiography, PET, or CMR). Random-effects models were used to estimate pooled proportions with 95% confidence intervals (CIs). Heterogeneity was assessed using Cochran's Q and I². Results and Conclusions: Results: Six studies (N = 7,269; mean age 61.3 years; 43% male) were included. Despite negative stress tests, increasing CAC burden was consistently associated with worse cardiovascular outcomes. The prevalence of anatomically significant coronary artery disease (≥50% stenosis) increased from 0% (CAC=0) to 2.8% for CAC 1–399, 48.9% (~1 in 2) for CAC ≥400, and 71.4% (~3 in 4) for CAC ≥1000. Coronary revascularization increased from 0.04% for CAC=0 to 24.5% (~1 in 4) for CAC ≥400 and 38.0% (~1 in 3) for CAC ≥1000. Myocardial infarction increased from 0.77% for CAC=0 to 3.46% for CAC ≥400. All-cause mortality also increased with CAC burden, reaching 5.77% for CAC ≥400, Figure. Conclusion: In symptomatic patients with negative stress tests, CAC reveals a marked gradient of residual risk not captured by ischemia assessment. These findings support its complementary role in risk stratification and potential to guide further evaluation and preventive strategies.







Cardiovascular Pharmacology



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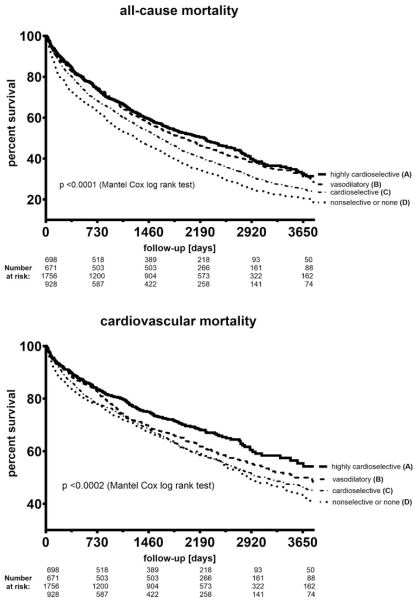
17296

THE PROGNOSTIC IMPACT OF CARDIOSELECTIVITY OF BETA-BLOCKERS PRESCRIBED DURING HOSPITALIZATION FOR DECOMPENSATED HEART FAILURE.

OTTO MAYER1; JOSEF JIRÁK2; JAN FILIPOVSKY1;

(1) 2ND DEPARTMENT OF INTERNAL MEDICINE, MEDICAL FACULTY OF CHARLES UNIVERSITY AND UNIVERSITY HOSPITAL, PILSEN - CZECH REPUBLIC; (2) DEPARTMENT OF INFORMATICS, UNIVERSITY HOSPITAL, PILSEN - CZECH REPUBLIC;

Introduction/Background: Beta-blockers show considerable variation in cardioselectivity (i.e., the relative affinity to the β1 receptor), even among those with evidence of benefit in the treatment of chronic heart failure (HF). Objectives: We aimed to evaluate whether the cardioselectivity of BBs prescribed during hospitalization for decompensated HF would affect the long-term prognosis of patients. Methods: In the prospective study, we followed 4053 patients hospitalized for decompensated HF. The entire cohort was divided into subgroups based on the cardioselectivity of the recommended beta-blocker (as stated in the discharge summary) Results and Conclusions: BBs with high cardioselectivity were associated with apparently better survival than moderately cardioselective or nonselective BBs (Figure 1). After complex adjustment, patients treated with a highly selective beta-blocker (bisoprolol) showed significantly lower five-year cardiovascular mortality than those with a lesser degree of cardioselectivity (mainly metoprolol) [HR 0.69 (95%CIs:0.52-0.92), p=0.011]. This difference remained in patients with HF with reduced ejection fraction (HFrEF) [HR 0.58 (95%CIs:0.37-0.89), p=0.013], but was not yet significant in HF with preserved ejection fraction [HR 0.66 (95%CIs:0.43-1.02), p=0.063]. In HFrEF patients only, highly cardioselective beta-blockers also showed a lower risk of cardiovascular mortality than BBs with vasodilatory properties (mainly carvedilol) [HR 0.55 (95%CIs:0.33-0.93, p=0.025]. In conclusion, the choice of a beta-blocker based on its degree of cardioselectivity may have prognostic implications in patients with chronic HF



20690

DO GLP-1 RECEPTOR AGONISTS REDUCE ALCOHOL USE? A BAYESIAN META-ANALYSIS OF RANDOMIZED CLINICAL TRIALS

GIULIA CALDEIRA GAELZER1; PEDRO GOMES BATISTA2; MARCELA VASCONCELOS MONTENEGRO3; RAILLA RAQUEL ALBINO DOS SANTOS SILVA4; MUSHRIN MALIK5; CAROLINE FISCHER BACCA6; JULIANA GIORGI7; GUSTAVO LENCI MARQUES1;

(1) PONTIFICIA UNIVERSIDADE CATOLICA PUC - CURITIBA - PR - BRASIL; (2) UNIVERSIDADE FEDERAL DA PARAIBA - JOÃO PESSOA - PB - BRASIL; (3) UNIVERSIDADE DE PERNAMBUCO - RECIFE - PE - BRASIL; (4) UNIVERSIDADE FEDERAL DO CEARA - FORTALEZA - CE - BRASIL; (5) BETH ISRAEL DEACONESS MEDICAL CENTER, UNITED STATES OF AMERICA - UNITED STATES; (6) CENTRO UNIVERSITARIO PARA O DESENVOLVIMENTO DO ALTO VALE DO ITAJAI - RIO DO SUL - SC - BRASIL; (7) HOSPITAL SIRIO-LIBANES - SÃO PAULO - SP - BRASIL;

Introduction/Background: Background: Alcohol use disorder (AUD) remains associated with substantial morbidity and mortality, with limited pharmacologic options. Glucagon-like peptide-1 receptor agonists (GLP-1RAs), widely used in the treatment of metabolic disease, have shown potential neuromodulatory effects on reward pathways, suggesting a role in reducing alcohol consumption. Objectives: Objectives: To evaluate the effects of GLP-1RAs on alcohol-related outcomes using a Bayesian meta-analytic framework. Methods: Methods: A systematic review identified randomized controlled trials evaluating GLP-1RAs in adults with AUD. Bayesian random-effects models were applied using weakly informative priors. Outcomes included heavy drinking days, alcohol craving, and total alcohol consumption. Results were reported as mean differences (MD) with 95% credible intervals (CrIs) and 95% prediction intervals (PIs). Results and Conclusions: Results: Three randomized trials were included, encompassing heterogeneous populations (treatment-seeking and non–treatment-seeking individuals, varying BMI profiles). On heavy-drinking days, the pooled effect suggested a numerical reduction (MD = −2.19 days; 95% CrI = −10.99 to 6.67), with wide uncertainty and a broad prediction interval (−13.69 to 9.53). Craving showed a similarly imprecise estimate (MD = −0.82; 95% CrI = −3.90 to 2.24; PI = −6.74 to 5.09). Total alcohol consumption demonstrated a larger numerical reduction (MD −261.0 g; 95% CrI −548.13 to 46.91), though with substantial heterogeneity and uncertainty (PI −778.56 to 300.07). Across outcomes, posterior distributions were compatible with both a clinically meaningful benefit and no effect. Conclusions: GLP-1RAs demonstrate encouraging but highly uncertain signals for reducing alcohol consumption and related outcomes in AUD. The wide credible and prediction intervals reflect substantial between-study heterogeneity and limited sample size. These findings should be interpreted as hypothesis-generating, supporting the need for larger, adequately powered trials to define clinical efficacy and identify responsive phenotypes.

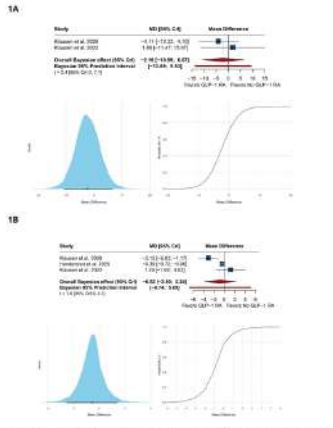


Figure 1. Bayesian forest plots illustrating the mean differences (MDs) between GLP-1 receptor agonists and no treatment, along with posterior density distributions for (A) heavy-drinking days and (B) craving.

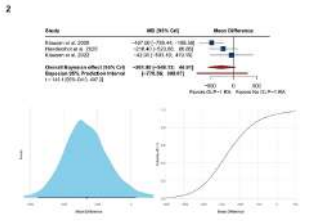


Figure 2. Bayesian forest plots illustrating the mean difference (MD) between GLP-1 receptor agonists and no treatment, along with posterior density distributions for alcohol consumption.

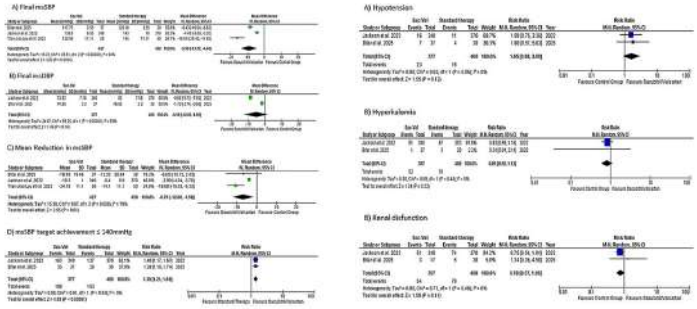
19126

SACUBITRIL/VALSARTAN IN RESISTANT HYPERTENSION: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introduction/Background: Resistant hypertension (RH) affects approximately 10–15% of hypertensive patients and is associated with increased cardiovascular risk. Sacubitril/valsartan (Sac/Val), an angiotensin receptor–neprilysin inhibitor (ARNI), has demonstrated blood pressure–lowering effects; however, its role in RH requires systematic evaluation. Objectives: To evaluate the efficacy and safety of Sac/Val compared with conventional renin–angiotensin–aldosterone system (RAAS)-based therapies in patients with RH through a systematic review and meta-analysis of randomized controlled trials (RCT). Methods: We conducted a systematic review and meta-analysis of RCTs comparing sacubitril/valsartan with standard RAAS-based therapies in adult patients with RH. We searched multiple databases through January 2026 following Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines. Risk of bias was assessed using the revised Cochrane risk-of-bias tool for randomized trials (RoB 2), and certainty of evidence was evaluated using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) methodology. Primary outcomes included mean sitting systolic and diastolic blood pressure (msSBP/msDBP), change from baseline, and blood pressure control rate. Random-effects meta-analyses were performed using Review Manager version 5.4.1. PROSPERO Registration: CRD420251056456. Results and Conclusions: Three RCTs including 890 participants were analyzed. Sac/Val significantly reduced final msSBP (mean difference [MD] −9.10 mmHg, 95% confidence interval [CI] −13.77 to −4.44; I²=94%; low certainty) and increased the proportion of patients achieving BP control ≤140 mmHg (risk ratio [RR] 1.39, 95% CI 1.21–1.60; I²=0%; moderate certainty). No significant effect was observed for msDBP (MD −5.2 mmHg, 95% CI −12.03 to 1.7; very low certainty). There were no significant differences in adverse events, including symptomatic hypotension, hyperkalemia, or renal dysfunction (moderate certainty). Substantial heterogeneity was observed for BP outcomes. In conclusion, Sac/Val was associated with greater reductions in systolic blood pressure and improved BP control compared with conventional RAAS-based therapies in patients with RH, with a similar safety profile. However, the certainty of evidence ranges from low to moderate, and substantial heterogeneity limits the robustness of these findings, highlighting the need for larger, well-designed RCTs.



18042

GLP-1 RECEPTOR AGONISTS AND CARDIOVASCULAR OUTCOMES IN PATIENTS WITH TYPE 2 DIABETES ACROSS MYOCARDIAL INFARCTION-DEFINED POPULATIONS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introduction/Background: Patients with type 2 diabetes mellitus (T2DM) who survive myocardial infarction (MI) remain at high risk for recurrent cardiovascular events and heart failure (HF). Although glucagon-like peptide-1 receptor agonists (GLP-1 RAs) reduce cardiovascular events in stable atherosclerotic disease, their impact among patients with established MI has not been comprehensively synthesized. Objectives: To evaluate the association between GLP-1 RA therapy and cardiovascular outcomes in patients with T2DM across MI-defined cohorts. Methods: We searched MEDLINE, Embase, and Cochrane Central Register of Controlled Trials. Hazard ratios (HRs) with 95% confidence intervals (CIs) were pooled using random-effects models. Heterogeneity was evaluated using the I² statistic, and 95% prediction intervals (PIs) were calculated to estimate the expected range of true effects in future clinical settings. Outcomes included all-cause mortality, cardiovascular death, study-defined major adverse cardiovascular events (MACE), MI, stroke, and HF or hospitalization for HF. Statistical analysis was performed using R software version 4.5.0. Results and Conclusions: Seven studies, including 37,393 patients with T2DM and MI-defined populations (9556 receiving GLP-1 RAs), were analyzed. GLP-1 RA therapy was associated with lower all-cause mortality (HR, 0.67; 95% CI, 0.49-0.90; I² = 87.3%; PI, 0.27-1.63; P = 0.0085), reduced MACE (HR, 0.69; 95% CI, 0.56-0.84; I² = 55.6%; PI, 0.44-1.06; P = 0.0002), and fewer HF or HF hospitalizations (HR, 0.78; 95% CI, 0.62-0.98; I² = 77.6%; PI, 0.42-1.45; P = 0.0306). No significant associations were observed for cardiovascular death (HR, 0.85; 95% CI, 0.67-1.06; I² = 0%; PI, 0.42-1.69; P = 0.15), recurrent MI (HR, 0.82; 95% CI, 0.62-1.09; I² = 63%; PI, 0.41-1.63; P = 0.1753), or stroke (HR, 0.91; 95% CI, 0.68-1.22; I² = 61.2%; PI, 0.40-2.05; P = 0.5237). In patients with T2DM across MI-defined populations, GLP-1 RA therapy was associated with lower mortality, study-defined MACE, and HF-related events. Given the substantial heterogeneity, wide PIs for key outcomes, and predominance of observational data, these findings should be interpreted as hypothesis-generating and support the need for dedicated randomized trials.

Congenital and Pediatric Cardiology



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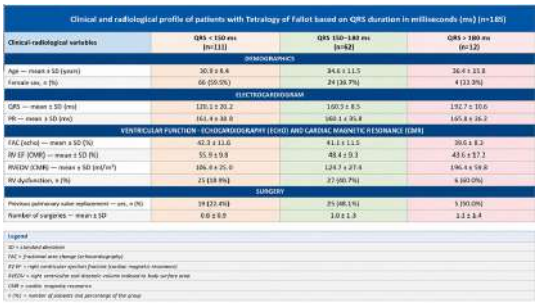
21537

CLINICAL AND RADIOLOGICAL PROFILE OF PATIENTS WITH TETRALOGY OF FALLOT AND PROLONGED QRS DURATION

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Introduction/Background: Tetralogy of Fallot is the most common cyanotic congenital heart disease. Its prevalence has increased due to advances in clinical and surgical management. However, these patients often require multiple reinterventions, especially related to pulmonary valve replacement, placing them at higher risk for arrhythmogenic events. A QRS duration greater than 180 ms is known to be one of the factors associated with increased risk of ventricular arrhythmias and sudden cardiac death, making systematic follow-up essential. Objectives: To analyze the clinical and radiological profile of patients with Tetralogy of Fallot and prolonged QRS duration. Methods: This was a retrospective longitudinal cohort study based on electronic medical record review at a tertiary referral center for congenital heart disease. Patients with Tetralogy of Fallot were included, and QRS duration on electrocardiogram (ECG), fractional area change (FAC) on echocardiography, and right ventricular ejection fraction and volume on cardiac magnetic resonance imaging were analyzed. Results and Conclusions: Data from 185 patients were analyzed and divided into three groups: QRS <150 ms (n=111), QRS 150–180 ms (n=62), and QRS ≥180 ms (n=12). ECG analysis comparing patients with QRS ≥180 ms versus QRS <150 ms showed that the first group had lower right ventricular ejection fraction (43% vs. 55%) and higher right ventricular end-diastolic volume (196 mL/m² vs. 106 mL/m²). Worse FAC (39.6% vs. 42.3%) and a higher prevalence of right ventricular dysfunction (40% vs. 19%) were also observed. These findings suggest right ventricular remodeling and progressive functional deterioration associated with QRS prolongation. Therefore, ECG assessment at every outpatient visit in patients with Tetralogy of Fallot may contribute to clinical decision-making regarding complementary exams and earlier follow-up. The findings of this study demonstrate an association between QRS prolongation and structural and functional right ventricular abnormalities in patients with repaired Tetralogy of Fallot. This reinforces the importance of electrocardiographic and imaging follow-up in this population.



Clinical and radiological profile of patients with Tetralogy of Fallot based on QRS duration in milliseconds (ms) (n=185)

Clinical-radiological variables	QRS < 150 ms (n=111)	QRS 150–180 ms (n=62)	QRS > 180 ms (n=12)
DEMOGRAPHICS			
Age — mean ± SD (years)	30.8 ± 8.4	34.6 ± 11.5	36.4 ± 11.8
Female sex, n (%)	66 (59.5%)	24 (38.7%)	4 (33.3%)
ELECTROCARDIOGRAM			
QRS — mean ± SD (ms)	120.1 ± 20.2	160.3 ± 8.5	192.7 ± 10.6
PR — mean ± SD (ms)	161.4 ± 38.8	160.1 ± 35.8	165.8 ± 26.2
VENTRICULAR FUNCTION - ECHOCARDIOGRAPHY (ECHO) AND CARDIAC MAGNETIC RESONANCE (CMR)			
FAC (echo) — mean ± SD (%)	42.3 ± 11.6	41.1 ± 11.5	39.6 ± 8.2
RV EF (CMR) — mean ± SD (%)	55.9 ± 9.8	48.4 ± 9.3	43.6 ± 17.2
RVEDV (CMR) — mean ± SD (ml/m²)	106.8 ± 25.0	124.7 ± 27.4	196.4 ± 59.8
RV dysfunction, n (%)	21 (18.9%)	37 (60.7%)	5 (40.0%)
SURGERY			
Previous pulmonary valve replacement — yes, n (%)	19 (22.4%)	25 (48.1%)	3 (30.0%)
Number of surgeries — mean ± SD	0.6 ± 0.9	1.0 ± 1.3	1.1 ± 1.4

Legend
SD = standard deviation
FAC = fractional area change (on transthoracic echocardiography)
RV EF = right ventricular ejection fraction (cardiac magnetic resonance)
RVEDV = right ventricular end-diastolic volume indexed to body surface area
CMR = cardiac magnetic resonance
n (%) = number of patients and percentage of the group

Insuficiência Cardíaca / Transplante / Dispositivos de Assistência Ventricular / Cardiomiopatias



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15926

TRANSESOPHAGEAL ECHOCARDIOGRAPHY–GUIDED RADIOFREQUENCY SEPTAL ABLATION IN OBSTRUCTIVE HYPERTROPHIC CARDIOMYOPATHY: 1-YEAR FOLLOW-UP

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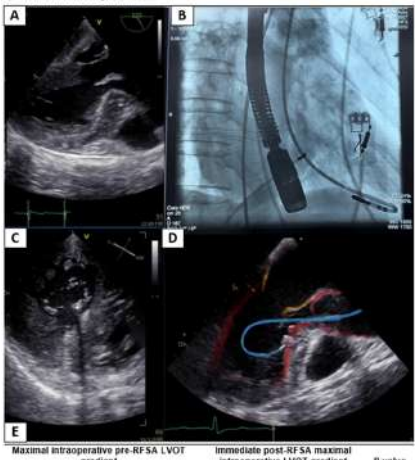
Introduction/Background: The management of patients with symptomatic obstructive hypertrophic cardiomyopathy (HOCM) remains challenging. Radiofrequency septal ablation (RFSA) may represent a safe and effective strategy, with outcomes comparable to other septal reduction therapies, and may serve as a viable alternative for patients with refractory HOCM who are at high surgical risk for myectomy. Objectives: To evaluate the safety and efficacy of RFSA in patients with refractory HOCM who are at high surgical risk for septal myectomy. Methods: This was a single-center, retrospective, observational study including patients with HOCM and a LVOT gradient ≥50 mmHg (at rest/provoked), who were refractory to medical therapy and had contraindications to surgical myectomy, and who underwent RFSA between January 2018-October 2024 at a tertiary referral center (52-week follow-up). Comparisons were performed using parametric or nonparametric tests, according to data distribution, and associations between categorical variables were assessed using Fisher's exact test (p<0.05). Results and Conclusions: A total of 86 patients were included, with a mean age of 56.7±14.9 years; 77.9% were female, and 97.5% were in NYHA functional class III/IV. The mean maximal LVOT gradient (rest/provoked) was 97.5±37.1 mmHg. At 52 weeks following RFSA, resting LVOT gradients decreased from 78.6±39.9 mmHg to 29.9±29.4 mmHg (P<0.001), and maximal provoked gradients decreased from 97.5±37.1 mmHg to 41.7±35.8 mmHg, with 66% of patients achieving gradients ≤50 mmHg (P<0.001), with a significant reduction already observed intraoperatively (Figure 1). In addition, the prevalence of systolic anterior motion (SAM) of the mitral valve decreased from 80% to 40% (Table 1). These hemodynamic improvements translated into clinical benefit, with only 21% of patients remaining in NYHA class III/IV at 52 weeks (1.3% in class IV). RFSA was associated with a low complication rate, with no observed cases of stroke, ventricular septal defect, or pericardial effusion, and only one pacemaker implantation. There was one post-procedural myocardial infarction and one vascular complication, both successfully managed. Despite the high-risk profile of the cohort (contraindicated for myectomy), overall mortality remained low (2.3%), lower than that reported for septal myectomy in low- and intermediate-volume centers (5.6% and 2.9%, respectively). Overall, RFSA in refractory HOCM was feasible, effective, and safe, and may represent a viable alternative in experienced centers.

Table 1. Pre- and postprocedural clinical and echocardiographic characteristics of the study sample with statistical significance analysis

Characteristics	Pre-RFSA	Post-RFSA	P-value
NYHA class (%)			
I	0	48.7	
II	2.4	30.3	
III	77.4	19.7	
IV	20.2	1.3	
IV septal thickness (mm)	18.3±3.4	17.2±3.8	0.001
LVEF (%)	67±4.6	65.8±4.6	0.019
LVOT gradient (rest)	78.6±39.9	29.9±29.4	<0.001
LVOT gradient (valsalva)	95.8±40.8	35.8±34.9	<0.001
LVOT gradient (maximal)*	97.5±37.1	41.7±35.8	<0.001
LVEDD (mm)	44.2±6.5	45.2±6.1	0.517
LAVI (ml/m²)	53.3±19.8	53.1±16.9	0.432
PASP (mmHg)	37.7±16.6	32.7±13.9	0.002
SAM of the mitral valve (%)	80	40	<0.001

LAVI: left atrial volume index; LVEDD: left ventricular end-diastolic diameter; LVOT: left ventricular outflow tract; NYHA: New York Heart Association; PASP: pulmonary artery systolic pressure; RFSA: radiofrequency septal ablation; SAM: systolic anterior motion SRT: Septal reduction therapy. *Maximal resting or provoked LVOT gradient*Maximal resting or provoked LVOT gradient. P-value from the Wilcoxon signed-rank test

Figure 1. Echocardiography-guided radiofrequency septal ablation with immediate reduction in left ventricular outflow tract gradient.



Maximal intraoperative pre-RFSA LVOT gradient	Immediate post-RFSA maximal intraoperative LVOT gradient	P value
86.9±34.7 mmHg	47.0±26.3 mmHg	<0.001

A: Identification of the flow acceleration site prior to ablation and gradient measurement. **B:** Fluoroscopic view of septal mapping. *C*: Catheter position in two projections, in contact with the septum. **D:** Schematic illustration of optimal catheter positioning, protecting the anterior mitral leaflet from radiofrequency delivery. **E:** Immediate and significant intraoperative reduction in left ventricular outflow tract (LVOT) gradient. RFSA: radiofrequency septal ablation; LVOT: left ventricular outflow tract.

Medicina do Sono



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IMPACT OF OBSTRUCTIVE SLEEP APNEA (OSA), INSOMNIA AND THE COMBINATION (COMISA) ON THE HYPERTENSION INCIDENCE: THE ELSA-BRASIL STUDY

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Introduction/Background: Sleep disorders are increasingly common in our society. Previous evidence suggests that both obstructive sleep apnea (OSA) and insomnia are associated with hypertension (HTN). Data on how the comorbid of OSA and insomnia (COMISA) is related to higher HTN risk (compared to either insomnia or OSA) are poorly explored. Objectives: To examine whether COMISA is associated with a higher incidence rate of HTN in the ELSA-Brasil cohort. Methods: The cohort included normotensive participants at the baseline, who underwent sleep study (type III) and sleep questionnaires. OSA was defined by an apnea-hypopnea index ≥15 events/h. Insomnia was defined using the CIS-R questionnaire. New cases of HTN were defined by blood pressure (BP) ≥140 and/or 90 mmHg during the follow-up period. The sample was divided into four groups: control (no OSA/no insomnia), insomnia, OSA and COMISA. ANOVA or Kruskal-Wallis test were used to compare variables. Poisson regression model was used to calculate the incidence risk rate (IRR). We adjusted the model considering the following confounders: age, sex, race, body mass index, baseline BP, diabetes and family history of HTN. The statistical significance was set at <0.05. Results and Conclusions: We evaluated 1,596 participants (61% women; mean age: 48 years; 64% white). There were 396 (24,8%) new cases of HTN (median follow-up of 8 years and 3,334 persons-year). The incidence of HTN was higher in participants with OSA and COMISA as compared to individuals with insomnia or the control group (no OSA/no insomnia). Difference in HTN incidence was significant only between the OSA group and the control or insomnia groups (p<0.001 and p=0.015), respectively. After adjustments, the presence of OSA and COMISA were associated with a higher IRR for new cases of HTN over the follow-up period. Both OSA and COMISA were associated with a higher incidence of HTN as compared to insomnia or control groups.

Neglected Cardiovascular Diseases



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19653

LEFT ATRIOVENTRICULAR AND LEFT ATRIAL VOLUMETRIC/MECHANICAL COUPLING INDEXES ARE INDEPENDENT PREDICTORS OF ALL-CAUSE MORTALITY IN PATIENTS WITH CHRONIC CHAGAS DISEASE

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Introduction/Background: Chronic Chagas disease (CD) affects 8 million people worldwide and its cardiac form has a high mortality. Thus, new mortality predictors are still a matter of research. The predictive value of the new left atrioventricular (LACI) and left atrial (LA) volumetric/mechanical (LAVI/A') coupling indexes are yet to be determined in CD. Objectives: To investigate LACI and LAVI/A' all-cause mortality predictive value in chronic CD. Methods: Patients with chronic CD were included consecutively in this single-center longitudinal observational study. Patients with atrial fibrillation or suboptimal imaging were excluded. LACI was the ratio of LA over left ventricular (LV) end-diastolic volumes. LAVI/A' was the ratio of maximum LA volume over late diastolic mitral annulus velocity. LA volumes were obtained by 3D echocardiography. The endpoint was a composite of all-cause mortality or heart transplant. The associations with the endpoint independent from clinical, ECG, and 2D echocardiographic parameters (model I) or from model I adjusting variables plus LV and LA strain parameters (model II) were tested by multivariate Cox-proportional-hazards regression. Receiver operating characteristic curves were generated to define optimal cutoff values for endpoint prediction and their areas (AUC) were compared by pairwise comparison. Cumulative survival curves constructed using Kaplan–Meier method were compared by log–rank test. P values <.05 were considered significant. Results and Conclusions: A total of 382 patients (58.6% female; 53 ± 11 years) were followed for 6.6±2.7 years. Endpoint occurred in 82 patients (80 deaths/2 heart transplants; 32.5 events/1,000 person-years). The causes of death were heart failure (46%), sudden death (28%), stroke (4%), unrelated to CD (10%), and unknown (12%). LACI was associated with the endpoint in models I (HR 1.03, 95% CI 1.01-1.05, P=.01) and II (HR 1.03, 95% CI 1.01-1.05, P=.0008). LAVI/A' was also associated with the endpoint in models I (HR 1.08, 95% CI 1.05-1.12, P<.0001) and II (HR 1.09, 95% CI 1.05-1.12, P<.0001). Optimal cutoff for LACI was 21.2% (AUC 0.65, sensitivity 71.7%, specificity 53.7%, P<.0001) and for LAVI/A' was 3.3 mL×sec/cm−1per m2 (AUC 0.87, sensitivity 81.7%, specificity 83.7%, P<.0001). AUC for LAVI/A' was larger than the one for LACI (P<.0001). Those with LAVI/A'≥3.3 at baseline had a 19-fold higher risk for all-cause mortality. LAVI/A' is a new LA function index with promising all-cause mortality predictive value in CD.

Nutrition



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16122

GRAIN INTAKE PATTERNS AND METABOLIC SCORE FOR INSULIN RESISTANCE IN RELATION TO THE RISK AND SEVERITY OF PREMATURE CORONARY ARTERY DISEASE: THE MULTI ETHNIC STUDY IN LOW-MIDDLE INCOME COUNTRY

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Introduction/Background: Recent evaluations revealed that the age of CAD has gradually declined in middle-East countries. Both dietary habits and metabolic disturbances may contribute to its early onset. Due to global burden of disease data, low whole grain intake is the leading cause of coronary artery disease (CAD) burden. Moreover, the metabolic score for insulin resistance (METS IR) offers a practical, non insulin based surrogate for evaluating insulin resistance. Despite their conceptual connection, little is known about how these two factors, grain consumption pattern and metabolic status, relate to both the presence and severity of PCAD within a diverse ethnicities' population. Objectives: To assess the intake of whole and refined grain and METS IR relation to the risk and severity of PCAD. Methods: This was a multi-centric case-control study among Iranian eight ethnicities within the framework of the Iran premature coronary artery disease (IPAD) project. The data were collected from hospitals with catheterization laboratories. Cases were 2099 patients with a stenosis ≥75 % in at least one vessel or ≥50 % in the left main artery. Control group were 1168 individuals with normal angiography test. Grains intake was assessed using a validated semi-quantitative food frequency questionnaire. METS IR was calculated using fasting glucose, triglycerides, BMI, and HDL cholesterol. Multivariable logistic regression models estimated odds ratios (ORs) for the presence and severity of PCAD across intake categories and METS IR quartiles. Results and Conclusions: Participants with higher whole grain intake showed notably lower odds of both having PCAD (OR= 0.54, 95% CI: 0.40- 0.72; P<0.001) and also inverse association with its severity after full adjustment. However, a significant direct link was found between higher refined grains consumption and the risk of PCAD (OR= 1.43, 95% CI: 0.91-1.84; P= 0.013) but not its severity. METS IR demonstrated that individuals in the highest quartile had substantially higher odds of PCAD (OR= 3.15, 95% CI: 2.03–4.89; P< 0.001) and of severe PCAD (OR= 2.25; 95% CI: 1.37–3.68; P< 0.001). The magnitude of these associations differed across ethnic groups, with the clearest patterns observed in Fars, Gilak, and Kurd participants. Both dietary grain patterns and METS IR were independently associated with the risk and severity of PCAD in this large multi ethnic study. These findings highlight the importance of considering both nutritional quality and metabolic status when assessing susceptibility to premature coronary atherosclerosis in Middle Eastern populations.

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ACCURACY OF BODY ADIPOSITY INDEX (BAI) FOR THE ASSESSMENT OF BODY FAT PERCENTAGE COMPARED TO DUAL-ENERGY X-RAY ABSORPTIOMETRY (DXA) IN PATIENTS WITH HEART FAILURE.

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Introduction/Background: The impact of obesity on clinical outcomes in individuals with heart failure (HF) has been widely investigated obtaining yielding controversial results, probably due to the use of parameters with low accuracy to assess body adiposity. Although largely used, the body mass index (BMI) has limitations, as it does not distinguish between body composition compartments. Conversely, dual-energy X-ray absorptiometry (DXA), considered the gold standard for assessing body fat percentage (%BF), has a higher cost and limited accessibility in clinical practice. In this context, it is essential to identify more accurate and cost-effective methods to estimate body adiposity. The body adiposity index (BAI) estimates %BF and is easily obtained; nevertheless, its accuracy in patients with HF has not yet been established. Objectives: To evaluate the accuracy of the BAI in estimating %BF compared to DXA in individuals with HF. Methods: A cross-sectional study including outpatients with HF, of both genders. Body fat percentage was estimated by BAI (%BF-BAI), calculated using the formula proposed by Bergman et al. (2011): hip circumference (cm) / height (m)^1.5 − 18, and by DXA (%BF-DXA), considered the reference method. The accuracy of BAI in estimating %BF was determined using Lin's concordance correlation coefficient (CCC) and Bland–Altman analysis. The strength of agreement (CCC) was classified according to the criteria proposed by Landis and Koch (1977). Results and Conclusions: A total of 157 patients were evaluated: 32% (n=50) women and 68% (n=107) men, with a mean age of 60.1±12.4 years, BMI of 29.2±6.0 kg/m², and waist circumference of 102.7±13.9 cm. The %BF estimated using BAI and DXA was, respectively, 28.5±4.5% and 32.6±7.6% in men, and 36.6±6.9% and 43.5±7.6% in women. According to the Pearson analysis, %BF-DXA showed a strong association with %BF-BAI (r=0.81; p<0.001). The CCC indicated moderate agreement between %BF-DXA and %BF-BAI (r_c=0.642; 95% CI=0.57–0.71; p<0.0001). Bland–Altman analysis revealed a bias (mean difference) of -5.0% for %BF-DXA compared with %BF-BAI, with 95% limits of agreement ranging from -15.56 to 5.51%. In individuals with HF, %BF-BAI demonstrates a strong association and moderate accuracy compared to %BF-DXA, slightly underestimating values. Considering the importance of assessing body adiposity in patients with HF, BAI may represent a practical and accessible tool for use in routine clinical practice.

BEST ABSTRACTS – CASE REPORT



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Cardiac Arrhythmias / Electrophysiology / Electrocardiography / Cardiac Pacing



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17084

CASE REPORT: CHALLENGES IN THE DIAGNOSIS AND MANAGEMENT OF MAST CELL ACTIVATION SYNDROME (MCAS) IN A PATIENT WITH HYPERMOBILITY SPECTRUM DISORDER, SEVERE DYSAUTONOMIA, AND SUSPECTED ASIA SYNDROME

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Introduction: Female, 35-year-old, previously active, living in a high-temperature region, developed progressive severe autonomic dysfunction beginning in January 2024, characterized by disabling fatigue, marked orthostatic intolerance, and major functional impairment requiring frequent supine positioning. Case Description: Her history included immune-triggering events, including COVID-19 (2021), followed by dengue and systemic inflammatory response syndrome in 2024, after which marked deterioration of autonomic stability occurred. She developed recurrent severe hypotension (70–80 mmHg) associated with presyncope, lipothymia, dyspnea on minimal exertion, and generalized weakness, requiring repeated hospitalizations for intravenous volume replacement. Orthostatic heart rate increased from approximately 80 bpm supine to 135 bpm standing, and tilt-table testing confirmed orthostatic intolerance. She also presented unintentional 12 kg weight loss over 1 year and significant gastrointestinal symptoms, including severe constipation (7–10 days without bowel movements), intermittent diarrhea, and prior erosive pangastritis. Physical examination demonstrated generalized joint hypermobility (Beighton score 8/9), temporomandibular instability, and connective tissue features consistent with Hypermobility Spectrum Disorder. Multisystem manifestations—including heat-induced pruritus, hypersensitivity to hymenoptera stings, chronic rhinorrhea, gastrointestinal involvement, and perimenstrual worsening—supported suspected MCAS. The presence of silicone breast implants (2016) raised suspicion for Autoimmune/Inflammatory Syndrome Induced by Adjuvants. The clinical course was refractory to fludrocortisone, desmopressin, and high-dose midodrine; pyridostigmine was discontinued due to alopecia. A multimodal strategy including vitamin C, venlafaxine, ivabradine, electrolyte supplementation, desmopressin as needed, glutamine, antihistamines, montelukast, ketotifen, famotidine, and a low-histamine diet resulted in blood pressure stabilization, improvement of gastrointestinal and respiratory symptoms, discontinuation of midodrine, and gradual functional recovery. Conclusions: This case highlights the complexity of overlapping dysautonomia, connective tissue disorders, and mast cell-related diseases, reinforcing the need for individualized multidisciplinary management and integrated autonomic and immune modulation for clinical stabilization.

Cardio-Oncology

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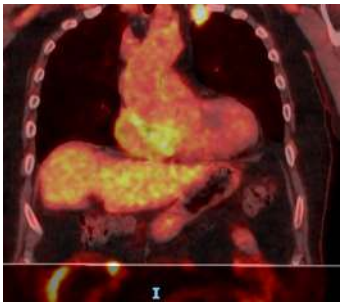
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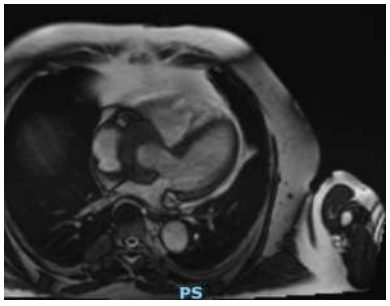
CARDIAC INVOLVEMENT IN ROSAI-DORFMAN DISEASE: A CASE REPORT

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Introduction: Rosai-Dorfman disease (RDD) is a rare, benign condition that involves an overgrowth of histiocytes and rarely affects the heart. We describe below the case of a patient with this clinical condition. Case Description: A 56-year-old male, farmer, with no past medical history, recently developed hypertension, asymptomatic at the time of diagnose. Physical examination was normal. He underwent a transthoracic echocardiogram to evaluate target organ damage secondary to systemic arterial hypertension, which identified a lesion in the right atrium. Laboratory exams only revealed a slightly altered kidney function, with other tests normal. For further investigation, cardiac MRI was performed and showed a mass in the right atrium, extending through the inter-atrium septum to the left atrium, of rounded surface and regular edges of 40mm x 50mm. A Chest CT scan showed two elongated subpleural formations with attenuation of soft tissues, one located below the posterior segment of the 6th right costal arch, measuring approximately 40mm x 15mm. The second next to the anterior segment of the 1st left costal arch, measuring approximately 20 x 20mm. A FDG-PET/CT was then performed with an uptake in the interatrial lesion (SUV 5.7), and both thoracic lesions with a SUV of 5.1 and 5.6. Also, two new bone lesions were evidenced, one in the right humerus and the other in the sternal manubrium with SUVs of 6.1 and 6.9, respectively. To clear the diagnose, he was submitted to a biopsy of the right pleural lesion, which resulted in fibrosis with lymphoplasmacytic and histiocytic inflammatory infiltrate, without atypia. Due to the inconclusive result, an endomyocardial biopsy was done and was also inconclusive, showing only fragments of myocardium with signs of hypertrophy. The patient underwent surgical removal of the cardiac tumor. Due to the extensive involvement, including inaccessible structures, a cytoreductive strategy was performed, removing a large part of the mass and clearing the right ventricular inflow tract and right atrial chamber. The biopsy revealed Rosai-Dorfman disease, with HSL500 Panel showing KRAS A146P mutation. Conclusions: Rosai-Dorfman disease (RDD) usually presents with cervical lymphadenopathy, associated with fever and weight loss. Cardiac manifestation is considered rare, requiring differential diagnosis with lymphoma and sarcoma. Treatments include surgery, corticosteroids and targeted therapy.





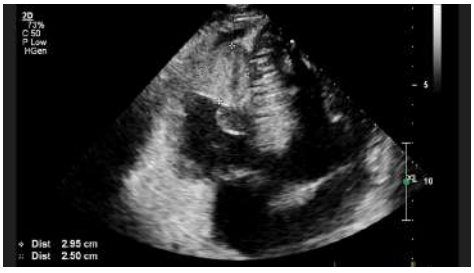
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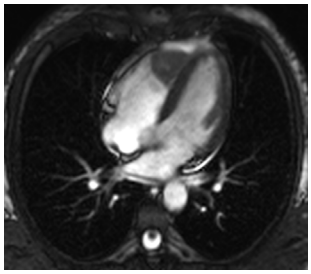
CARDIAC MATURE MYOCYTE HAMARTOMA IN A PATIENT WITH METASTATIC SQUAMOUS CELL CARCINOMA: DIAGNOSTIC CHALLENGE OF A RIGHT VENTRICULAR MASS

THIAGO LEANDRO PEREIRA JACYNTHO1; JOÃO PEDRO SENFF1; SARA DE CAMARGO GUEIBER1; MARIANA MAINARDES SILVA1; SARAH FAGUNDES GROBE1; BRUNA OLANDOSKI ERBANO1; PEDRO FELIPE GOMES NICZ1; LARISSA DE OLIVEIRA RENGEL DOS SANTOS1; AMANDA DE NADAI COSTA1; LUCIA DE NORONHA1; GUSTAVO GAVAZZONI BLUME1; LIDIA ANA ZYTYNSKI MOURA1;

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Introduction: Cardiac mature myocyte hamartomas (MMH) are extremely rare benign primary tumors, with approximately 34 cases reported up to 2023. They differ from rhabdomyomas and fibromas, which are more prevalent in children, by occurring predominantly in adults and being located in the ventricles. They are composed of disorganized mature myocytes and exhibit slow growth, with a variable clinical spectrum ranging from asymptomatic cases to arrhythmias and sudden death. Definitive diagnosis is histopathological, as imaging modalities such as echocardiography and cardiac magnetic resonance provide nonspecific findings and may mimic benign or malignant neoplasms. Case Description: A 40-year-old man with a history of tongue squamous cell carcinoma (SCC), treated with surgery, chemotherapy, and radiotherapy in 2024, was admitted in September 2025 after syncope. Initial evaluation revealed a left frontal expansive lesion, whose resection confirmed poorly differentiated SCC with meningeal involvement, consistent with metastasis. In the subsequent cardiological evaluation, transthoracic echocardiography (October 2025) revealed a heterogeneous mass in the right ventricle (2.95 × 2.50 cm), with cystic areas and mobile components, associated with segmental hypokinesia. Cardiac magnetic resonance imaging suggested a secondary neoplastic etiology, without excluding an infectious cause. A percutaneous endomyocardial biopsy via right heart catheterization was performed under echocardiographic guidance, identifying MMH in one of seven samples. Cowden syndrome was considered; however, the absence of clinical criteria and family history made this hypothesis unlikely. In the absence of significant ventricular dysfunction, cardiovascular symptoms, or pericardial effusion, and considering the unfavorable oncological prognosis, as well as the immunosuppressed state and recurrent infections, a conservative management strategy was adopted. During follow-up, a reduction in the mass was observed after chemotherapy, without cardiovascular events. Conclusions: We report a rare case of MMH diagnosed by biopsy in a patient with metastatic SCC. Despite its benign nature, the clinical course was atypical, with lesion reduction after chemotherapy, suggesting possible coexistence with metastatic disease. Cardiac metastases from tongue SCC are rare and associated with poor prognosis. This case highlights the diagnostic complexity of cardiac masses and the need for an individualized approach.





19065

MALIGNANT OF THE PERIPHERAL NERVE SHEATH TUMOR (MPNST) WITH CARDIAC INVOLVEMENT: A RARE CASE REPORT OF PRIMARY SARCOMA OF THE HEART

ANA CAROLINA GARCIA PEDROSO DE OLIVEIRA SOUZA1; ANNE LOUREIRO XAVIER KISUKURI2; CAROLINA CAETANO DE SOUZA2; GABRIEL HENRIQUE EFFIO SOLIS2; ANDRÉ LUIZ POLO2; LARA GARCIA FERNANDES PEREIRA2; INGRID VICTORIA SANCHEZ MADRID2; ITALO CARNEIRO DE LIMA2; FERNANDO FOCACCIA PÓVOA2; RAMON MOTTA DA SILVA BRITTO2; JOÃO VICTOR SCARDINI MOREIRA2;

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Introduction: Primary heart tumors are rare, representing less than 0.03% of autopsy findings. Among malignant tumors, sarcomas are the most common, with angiosarcoma being the most frequent. MPNST is an aggressive sarcoma that rarely affects the heart. It can occur sporadically or associated with neurofibromatosis type 1, and is characterized by rapid growth and a guarded prognosis. The clinical presentation is usually insidious and nonspecific, which delays diagnosis and complicates initial management. Brain MRI may be considered at the time of diagnosis due to the propensity for brain metastases. In selected cases, heart transplantation may be an option. Case Description: A 45-year-old woman with Hashimoto's thyroiditis, uterine fibroids, childhood glomerulonephritis. In 2024, she began experiencing a dry cough and dyspnea on exertion, which progressively worsened. She sought medical attention in 2025, when a chest CT angiography revealed pulmonary venous thrombosis, and full anticoagulation was initiated. Despite the therapy, she continued to experience dyspnea, cyanosis of the extremities, and functional impairment, prompting a new consultation. Chest CT scan revealed thrombosis in the right pulmonary vein and left atrium, as well as mediastinal lymphadenopathy. Echocardiography showed mitral valve thickening, an image adhered to its atrial surface, moderate mitral regurgitation, significant tricuspid regurgitation, and a pulmonary artery systolic pressure (PASP) of 79 mmHg. Hematological investigation was negative. With clinical worsening, signs of low cardiac output, and elevated PASP to 103 mmHg, cardiac surgery with mitral valve replacement was indicated. A tumor mass was identified in the right pulmonary vein and left atrium, without thrombi. The material was sent for histopathology, which revealed a high-grade spindle cell sarcoma, compatible with MPNST. After tumor excision, the patient experienced symptomatic improvement and a reduction in PASP. Conclusions: This report describes a rare case of cardiac MPNST with an atypical clinical presentation, initially mistaken for pulmonary thromboembolism. The refractory evolution to conventional treatment and the presence of significant pulmonary hypertension were essential for the diagnostic suspicion. The case highlights the relevance of considering malignant cardiac tumors in the differential diagnosis of intracardiac masses and progressive symptoms, especially when there is no response to the instituted treatment.

20597

PRIMARY CARDIAC NULL PHENOTYPE CALLA-POSITIVE LYMPHOBLASTIC LYMPHOMA: A CASE REPORT OF FULMINANT PRESENTATION

MARCOS GABRIEL ALVES DA SILVA1; FAISAL VEIGA EL AOUAR1; BEATRIZ RIHS MATOS TAVARES1; AURELIO AUGUSTO GUEDES1;

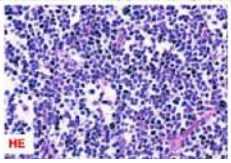
(1) HOSPITAL SANTA ROSÁLIA - TEÓFILO OTONI - MG - BRASIL;

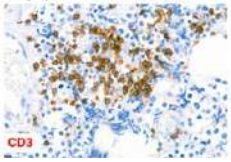
Introduction: Primary cardiac lymphomas are extremely rare neoplasms, accounting for a small proportion of cardiac tumors and extranodal lymphomas. They present with nonspecific clinical manifestations, frequently mimicking other cardiovascular diseases, which contributes to delayed diagnosis. Cases of primary cardiac lymphoblastic lymphoma with Null immunophenotype remain exceptionally rare in the literature and require extensive immunohistochemical characterization for accurate determination of cellular lineage. Case Description: An 85-year-old male patient initially presented with nonspecific symptoms characterized by hyporexia and unquantified weight loss, progressing to worsening dyspnea, precordial chest pain, and marked asthenia. Initial evaluation demonstrated mild lymphopenia, normocytic normochromic anemia, and a large pericardial effusion on echocardiography. After approximately 60 days and three hospital admissions for recurrent pericardiocentesis and bilateral pleural drainage, a repeat echocardiogram revealed an infiltrative intracardiac mass involving the right ventricle, measuring 60 × 26 mm, with extension into the right atrium and imaging features suggestive of neoplasia, as shown in the transthoracic echocardiography image. The patient underwent thoracotomy for pericardial drainage, pleural drainage, and biopsy of the lesion. He subsequently developed hemodynamic instability and died on the first postoperative day. Histopathological examination revealed diffuse high-grade neoplastic lymphoid proliferation infiltrating adipose tissue. Immunohistochemistry demonstrated an immature phenotype, with diffuse positivity for TdT, negativity for CD20 and CD3, positivity for CD10, MYC expression greater than 50%, and negativity for BCL-2 and EBV. These findings were consistent with CALLA-positive Null phenotype lymphoblastic lymphoma as evidenced em table 1. Conclusions: This case highlights the marked biological aggressiveness of immature phenotype lymphoblastic lymphomas with primary cardiac involvement, emphasizing the diagnostic challenge posed by nonspecific cardiovascular manifestations and rapid clinical deterioration. Although rare, these neoplasms should be considered in the differential diagnosis of infiltrative cardiac masses associated with recurrent pericardial effusion.

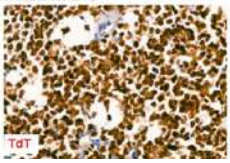
Painel de Anticorpos	Clone	Resultado	Obs. / Bloco
- Ki-67 - Antígeno de proliferação celular	MIB1	Positivo	80% (B-21973/25 3)
- CD20 - antígeno de linfócitos B	L26	Negativo	(B-21973/25 3)
- CD3 - receptor de linfócitos T (cadeia epsilon)	RBT-CD3	Negativo	(B-21973/25 3)
- CD10 - antígeno comum da leucemia linfoide aguda (CALLA)	DAK-CD10	Positivo	(B-21973/25 3)
- Proteína antiapoptótica BCL-2	124	Negativo	(B-21973/25 3)
• Desoxinucleotidil-transferase (TdT)	EP266	Positivo	(B-21973/25 3)
• MYC, produto do oncogene	EP121	Positivo	>50% (B-21973/25 3)
• Transcrito EBER-I do vírus de Epstein-Barr (EBV)	-	Negativo	(B-21973/25 3)

Bibliografia:

WHO Classification of Haematolymphoid Tumours. Lyon (France): International Agency for Research on Cancer; 2022 (WHO classification of tumours series, 5th ed.; vol. 11).









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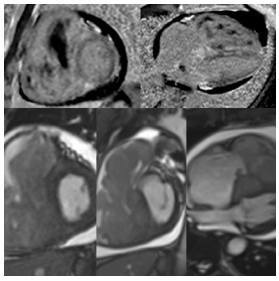
INTRACARDIAC SPINDLE-CELL SYNOVIAL SARCOMA CAUSING RIGHT VENTRICULAR OUTFLOW OBSTRUCTION: A MULTIMODALITY IMAGING AND CARDIO-ONCOLOGY CHALLENGE

JUSSARA GUIMARÃES DA ROCHA LIMA1; STEPHANIE CAROLINE DA COSTA FERREIRA2; VANESSA REIS DE ABREU CAVALCANTI3; LETÍCIA MARIA SANTIAGO SILVÉRIO2; ROBERTA RODRIGUES NOLASCO CARDOSO1; LUANA ALMEIDA DE ALENCAR LIMA1; JOANA SANTOS CESAR DE CARVALHO1; REINALDO DOS SANTOS MOURA1; CRISTIANE MONTEIRO DA CRUZ1; JOSÉ EDILSON DE FARIAS FILHO1; LARISSA LEITE DE SOUZA LEÃO1; ANTÔNIO EVERALDO VITORIANO DE ARAÚJO FILHO1;

(1) CENTRO UNIVERSITARIO DE MACEIO - UNIMA / AFYA - MACEIO - AL - BRASIL; (2) CENTRO UNIVERSITARIO CESMAC - MACEIO - AL - BRASIL; (3) HOSPITAL SANTA CASA DE MISERICÓRDIA DE MACEIÓ - MACEIÓ - AL - BRASIL;

Introduction: Primary cardiac sarcomas are rare and highly aggressive neoplasms, often presenting with nonspecific symptoms and delayed diagnosis. Within this spectrum, synovial sarcoma is exceptionally uncommon. This scenario underscores the growing role of cardio-oncology in integrating advanced imaging, hemodynamic assessment, and oncologic management. Case Description: A 34-year-old male presented with progressive dyspnea and chest pain. Electrocardiogram showed nonspecific abnormalities. Transthoracic echocardiography revealed a large intracavitary mass in the right ventricle (80.9 × 38.6 mm), causing dynamic right ventricular outflow tract obstruction, right chamber dilation, diastolic dysfunction, and moderate-to-severe tricuspid regurgitation. Chest computed tomography demonstrated an extensive filling defect extending from the right ventricle to the pulmonary trunk and its branches. Cardiac magnetic resonance imaging further characterized a heterogeneous mass attached to the tricuspid annulus and interventricular septum, extending through the right ventricular outflow tract into the pulmonary artery, associated with moderate right ventricular systolic dysfunction, strongly suggestive of primary malignant cardiac neoplasm. Partial surgical resection was performed. Histopathological and immunohistochemical analyses confirmed intracardiac spindle-cell synovial sarcoma. Despite intervention, the patient experienced rapid disease progression, with a decline in left ventricular ejection fraction (58% to 48%) and development of multiple pulmonary nodules consistent with metastatic dissemination. Palliative chemotherapy was initiated, requiring close cardiovascular monitoring in a specialized cardio-oncology setting due to the risk of further functional deterioration. Conclusions: This case highlights the diagnostic and therapeutic complexity of intracardiac synovial sarcoma, emphasizing the pivotal role of multimodality imaging and the need for integrated cardio-oncology care. Early recognition and continuous cardiovascular surveillance are essential, particularly in advanced disease, where therapeutic options are limited and prognosis remains poor.





Cardiovascular Imaging – MRI and CT



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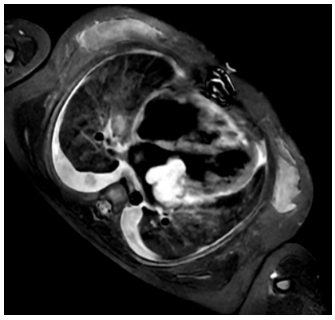
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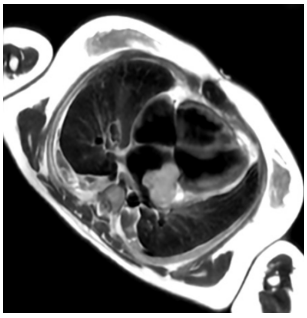
LEFT ATRIAL INTIMAL SARCOMA MIMICKING MYXOMA: IMPORTANCE OF CARDIAC MAGNETIC RESONANCE IMAGING IN THE DIFFERENTIAL DIAGNOSIS OF INTRACAVITARY MASSES

CAMILLA FIDENCIO REIMBERG1; TIAGO SENRA GARCIA DOS SANTOS1; GUSTAVO REBEQUE MODOLO1; ANTONIO TITO PALADINO FILHO1; ARTHUR FELIPE GIAMBONA RENTE2; PEDRO CASAGRANDE2;

(1) INSTITUTO DANTE PAZZANESE DE CARDIOLOGIA - SAO PAULO - SP - BRASIL; (2) REDE DOR - RIO DE JANEIRO - RJ - BRASIL;

Introduction: Primary cardiac tumors are rare, and most are benign, with myxomas being the predominant type. Sarcomas represent the main primary malignant neoplasms of the heart and are associated with aggressive behavior and poor prognosis. Intimal sarcoma, although more common in large vessels, may involve cardiac chambers and often mimics benign lesions. Imaging differentiation is crucial for diagnosis and therapeutic planning. Case Description: A previously healthy 29-year-old woman presented with progressive dyspnea, orthopnea, and dry cough. Physical examination revealed signs of systemic congestion and a significant holosystolic mitral murmur. Echocardiography revealed a mass measuring approximately 40 mm in the left atrium, associated with severe mitral regurgitation and compression of the pulmonary veins. Cardiac magnetic resonance imaging demonstrated a heterogeneous lesion with marked late gadolinium enhancement and an infiltrative pattern involving the interventricular septum and mitral apparatus, suggesting malignant neoplasm. Due to clinical deterioration, the patient underwent emergency surgery due to obstruction of the left ventricular inflow tract. Partial resection of the mass was performed. Histopathological examination confirmed intimal sarcoma. The patient was referred for oncologic treatment. Differentiating benign from malignant cardiac masses remains a clinical challenge. Myxomas are generally pedunculated and attached to the interatrial septum, with more homogeneous characteristics. In contrast, malignant tumors tend to be infiltrative, heterogeneous, and associated with significant late enhancement. Cardiac magnetic resonance imaging stands out for its ability to provide tissue characterization, allowing identification of necrosis, vascularization, and local invasion. In the present case, these findings were fundamental in excluding benign hypotheses and guiding early surgical intervention. The prognosis of cardiac sarcomas remains poor, and early diagnosis is one of the main potentially modifiable prognostic factors. Conclusions: Left atrial masses with atypical characteristics should raise suspicion for malignancy. Cardiac magnetic resonance imaging plays a central role in diagnostic differentiation and therapeutic planning and may directly impact patient survival.





Cardiovascular Prevention / Atherosclerosis / Dyslipidemia / Cardiovascular Risk Factors / Immunotherapy and Vaccines



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17603

BEYOND IDIOPATHIC: STEROID-DEPENDENT RECURRENT PERICARDITIS REVEALING NOD2- ASSOCIATED AUTOINFLAMMATORY DISEASE

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Introduction: Refractory recurrent pericarditis remains a clinical challenge and is often labeled as idiopathic. However, autoinflammatory mechanisms are increasingly being recognized, with relevant therapeutic implications. Case Description: A 36-year-old woman, previously healthy, presented with severe low back pain and progressive weakness, which progressed to recurrent episodes of pericarditis. The episodes occurred monthly, often related to the menstrual period and painful ovulation. Initial treatment with colchicine and nonsteroidal anti-inflammatory drugs for six months, followed by azathioprine and prednisone (30 mg/day), did not prevent recurrences, which occurred during corticosteroid tapering and presented with chest pain and ventilation-dependent pain. The findings indicated a multisystemic nature, including peritonitis, appendicitis, bronchitis, pleural effusion, and parotid edema. PET-CT revealed hypermetabolic cervical and thoracic lymphadenopathy, as well as focal hypermetabolism at the antragastric/pancreatic interface. Cardiac magnetic resonance imaging (MRI) confirmed moderate pericardial effusion and mild pericardial late enhancement, with preserved systolic function. The patient developed neurological manifestations (severe headache, syncope, and epileptiform activity on electroencephalogram [EEG]), leading to a diagnosis of idiopathic intracranial hypertension with a cerebrospinal fluid opening pressure of 40 cmH□O and normal cerebrospinal fluid analysis. Investigations for infectious, neoplastic, and autoantibody causes were negative. Genetic testing (Exome NGS) identified a variant of uncertain significance (VUS) in homozygosity in the NOD2 gene, which is associated with Yao and Blau syndromes. Given the refractory nature of the condition, the clinical presentation, and the suspicion of an autoinflammatory syndrome, therapy with Anakinra [an interleukin-1 (IL-1) antagonist] was initiated at a daily dose of 100 mg. To date, the patient has shown clinical improvement and is being monitored with cardiac MRI, with remission of areas of late enhancement that indicated disease activity. Conclusions: Autoinflammatory diseases should be considered in cases of corticosteroid-dependent recurrent pericarditis. Recognition of this etiology allows for appropriate therapies targeted therapies, such as IL-1 blockade, with significant clinical impact. This case underscores the need to reevaluate the concept of “idiopathic” in refractory settings.

Cardiovascular Surgery



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SURGICAL TREATMENT OF GIANT ATRIAL SEPTAL LIPOMA WITHOUT RESECTION OF THE INTERATRIAL SEPTUM BY EXTERNAL CARDIAC APPROACH THROUGH THE SONDERGAARD'S GROOVE.

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Introduction: Cardiac atrial septal lipoma is a rare cardiac benign neoplasm of mature adipocytes arising in the interatrial septum with an overall cardiac tumor incidence of 0.17–0.19% at autopsies. The surgical treatment of this condition generally involves the resection of the atrial septum with reconstruction of the septum with bovine pericardium. This approach may cause residual atrial septal defects, arrhythmias and conduction disturbances. We describe a new approach that involves complete removal of the tumor without resection of the atrial septum. Case Description: A 55-year-old woman presented with vertigo. Transesophageal echocardiogram showed a hyperechogenic mass with oval aspect involving the atrial septum near the atrial roof, measuring 21 x 48 mm, without pedicle and suggestive of a lipoma. Cardiac magnetic resonance demonstrated a mass in the right superior region of the atrial septum, adhered to the atrial roof, measuring 24 x 25 x 44 mm, compatible with a lipoma. The patient was submitted to surgery through median sternotomy with cardiopulmonary bypass and cardioplegia. The mass was completely dissected through Sondergaard's groove between the atria without opening the atria and the heart. The tumor, resembling an encapsulated lipoma, was totally excised. The aorta was released and the heart acquired sinus rhythm. An intraoperative transesophageal echocardiogram indicated the complete excision of the tumor and no residual atrial septal defect. Histopathological examination described a neoplasm of mature adipose tissue arranged in lobules without cytologic atypia, measuring 55 x 45 x 28 mm, compatible with a lipoma. Conclusions: The complete excision of an atrial septal lipoma without resection of the atrial septum was feasible and safe. This new technique may prevent complications related with the atrial septal resection.



Neglected Cardiovascular Diseases



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SYNERGISTIC MYOCARDIAL FIBROSIS AND ARRHYTHMOGENIC RISK: A RARE OVERLAP OF DYSFERLINOPATHY (LGMD R2) AND CHAGASIC CARDIOMYOPATHY

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Introduction: Dysferlinopathies (LGMD R2) are autosomal recessive muscular dystrophies caused by DYSF mutations, which impair calcium-dependent sarcolemmal repair. While primarily a skeletal muscle pathology, dysferlin is a critical component of the cardiac transverse tubule system, regulating vesicle trafficking and myocardial membrane integrity. In endemic regions, the clinical complexity is significantly amplified by the overlap with Chagas Disease, which possesses an aggressive tropism for the cardiac conduction system. This report aims to analyze a rare case of mixed-etiology cardiomyopathy involving a compound heterozygous patient, highlighting the synergistic burden of dystrophic fibrofatty replacement and chagasic inflammatory aggression on lethal arrhythmia risk. Case Description: An adult male patient with LGMD R2, confirmed via Next-Generation Sequencing (NGS) as a compound heterozygote, presented with progressive proximal weakness and total wheelchair dependence. Longitudinal follow-up (2023–2026) through serial 12-lead ECGs revealed a bifascicular block (Right Bundle Branch Block + Left Anterior Fascicular Block)—a hallmark of Chagasic damage—superimposed on an underlying dystrophic myocardial fragility. Complementary imaging suggested incipient diastolic dysfunction and reduced global longitudinal strain. Cardiac Magnetic Resonance (CMR) is planned to quantify the myocardial scar burden via late gadolinium enhancement (LGE), as the subendocardial and transmural fibrosis profiles are essential to distinguish degenerative from infectious damage. The clinical course was severely aggravated by a major depressive episode and a suicide attempt in 2025, resulting in a severe Traumatic Brain Injury (TBI) and permanent cognitive impairment. Current pharmacological management focuses on heart failure prevention using low-dose ACE inhibitors and beta-blockers, though titration remains limited by autonomic instability and the high risk of progression to total atrioventricular block. Conclusions: The synergy between genetic dystrophic fibrosis and Chagasic inflammatory damage imposes a severe arrhythmogenic burden, demonstrating that in advanced muscular dystrophies, invasive cardiological surveillance and rhythmic risk stratification are the primary determinants of survival.The cumulative myocardial fibrosis and electrical instability justify early consideration of an Implantable Cardioverter-Defibrillator for primary prevention of sudden cardiac death,even within complex neuro-palliative contexts.

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17747

NOVEL PTPN11 VARIANT IN NOONAN SYNDROME: NEONATAL PULMONARY STENOSIS AND MULTISYSTEMIC CHALLENGES

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Introduction: Noonan Syndrome (NS) is a rare autosomal dominant RAS disorder that presents with cardiovascular involvement in up to 80% of cases, classically associated with pulmonary valve stenosis (PVS) and hypertrophic right ventricular (RV) cardiomyopathy. Severe neonatal forms are associated with lymphatic anomalies and myeloproliferative disorders that mimic Juvenile Monocytic Myeloid Leukemia. The objective of this report is to describe a case of NS caused by a undescribed pathogenic variant presenting with an extreme phenotype, focusing on the genotype-phenotype correlation and neonatal hemodynamic management. Case Description: A 38-year-old pregnant woman presented with increased nuchal translucency (5.3 mm), polyhydramnios, and fetal hydrops, suggesting a genetic syndrome. Fetal echocardiography (31 weeks and 3 days) revealed thickened atrioventricular valves with elongated leaflets, severe PVS (velocity 1.8 mm/s), and RV hypertrophy. A preterm male infant (2,195g; 42.5cm) was delivered via cesarean section at 32 weeks and 2 days. He required intubation in the delivery room, presenting signs of respiratory failure, cryptorchidism, and facial dysmorphisms (flat face, low-set ears). Neonatal echocardiography confirmed PVS (gradient 27 mmHg), right ventricular hypertrophy, patent foramen ovale, and patent ductus arteriosus. Treatment was initiated with oral beta-blocker and sildenafil. During follow-up was detected lymphatic dysplasia, evidenced by chylothorax (pleural triglycerides: 377 mg/dL), thrombocytopenia, and leukocytosis with peripheral blasts (1%), suggestive of a transient myeloproliferative disorder. The genetic panel confirmed the pathogenic variant in the PTPN11 gene [c.1505C>T:p.(Ser502Leu)]. The clinical course was aggravated by gastrointestinal dysmotility requiring exploratory laparotomy, multidrug-resistant pneumonia, and multiple organ failure, leading to death within 44 days. Conclusions: The extreme neonatal presentation of NS requires high clinical suspicion and a multidisciplinary approach. Management of right RV hypertrophy should be prioritized with beta-blockers to optimize diastole, and the use of positive inotropes is contraindicated as they exacerbate the obstruction. It is noteworthy that this report demonstrates a previously undescribed pathogenic variant in the PTPN11 gene, which resulted in severe phenotypic manifestations (right heart obstruction, lymphatic dysplasia, and hematological instability), limiting the patient's survival.



RESULTADO

Foi identificada uma variante patogênica, em heterozigose, no gene *PTPN11*.

ACHADOS COMPLEMENTARES

Não foram encontradas variantes de significado clínico indeterminado (VUS).

RESULTADO E INTERPRETAÇÃO

- SNV

Condição Clínica	Herança	Gene	Posição cromossômica	Variante	Zigosidade	Classificação
Síndrome de Noonan, tipo 1 [OMIM: 163950]	autossômica dominante	*PTPN11*	chr12: 112.926.885	NM_002834.5: c.1505C>T: p.(Ser502Leu)	heterozigose (60,66%)	patogênica

Comentários
depositada no dbSNP (rs397507544)
ausente no banco de controles populacionais (gnomAD)
reportada no ClinVar (Variation ID: 40557)
preditores in silico: deletério
foi descrita na literatura científica (PubMed: 17020470, 15385933, 26916529, 28991257, 29907601, 30287924, 32164556, 32368696, 31941532, 33318624, 34132406, 35441720, 37291213)
evidências ACMG: PM2,PM5,PM6,PP2,PP3,PS4

Heart Failure / Transplantation / Ventricular Assist Devices / Cardiomyopathies



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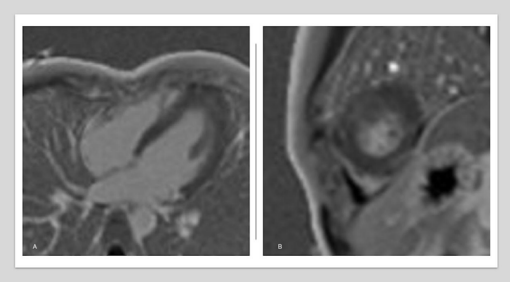
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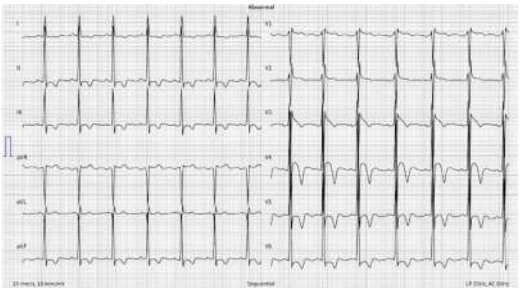
MYOCARDIAL FRAGILITY IN GYG1-RELATED METABOLIC CARDIOMYOPATHY: A CASE WITH BRUGADA PHENOCOPY AND DELAYED DEVICE-RELATED RUPTURE

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Introduction: Glycogen storage disease type XV (GSD-XV), caused by biallelic pathogenic variants in the GYG1 gene, is an ultra-rare metabolic disorder primarily associated with late-onset skeletal myopathy. Limited reports describe hypertrophic cardiac phenotypes and myocardial fibrosis, with variable manifestations including arrhythmias and heart failure. However, myocardial mechanical integrity in GYG1-related disease and its implications for device-related outcomes remain poorly defined. This case highlights a potential susceptibility to delayed, life-threatening mechanical complications following intracardiac device implantation. Case Description: A 31-year-old male presented with chest pain, fatigue, and exertional dyspnoea. Electrocardiography revealed a spontaneous type-1 Brugada pattern with complete right bundle branch block. Transthoracic echocardiography showed non-obstructive left ventricular hypertrophy with preserved ejection fraction, while speckle-tracking showed reduced global longitudinal strain with heterogeneous distribution and no apical sparing. Cardiac magnetic resonance imaging showed mid-to-apical hypertrophy and patchy non-ischaemic late gadolinium enhancement consistent with myocardial fibrosis. Metabolic and systemic evaluations were unremarkable, supporting a cardiac phenotype. Genetic testing identified a homozygous pathogenic GYG1 variant (p.Asp102His), with no variants in genes associated with primary Brugada syndrome, supporting a substrate-related Brugada phenocopy. An implantable cardioverter-defibrillator was implanted due to high-risk features. Early follow-up was unremarkable at 1 and 3 months. At 6 months, evaluation revealed pericardial effusion progressing to tamponade. Device extraction confirmed lead-related myocardial rupture requiring surgical repair. The delayed asymptomatic presentation without procedural complications, device-related issues, or trauma suggests progressive myocardial vulnerability rather than acute perforation. Conclusions: This case demonstrates a cardiac-dominant phenotype of GYG1-related disease. Delayed lead-related myocardial rupture, unlike typical early perforation, supports intrinsic myocardial fragility, despite the absence of conventional risk factors. This may reflect structural weakening due to abnormal glycogen metabolism and fibrotic remodeling. Recognition of this vulnerability has implications for device strategies and follow-up. Multimodality imaging and genetic evaluation are essential for diagnosis and risk stratification.





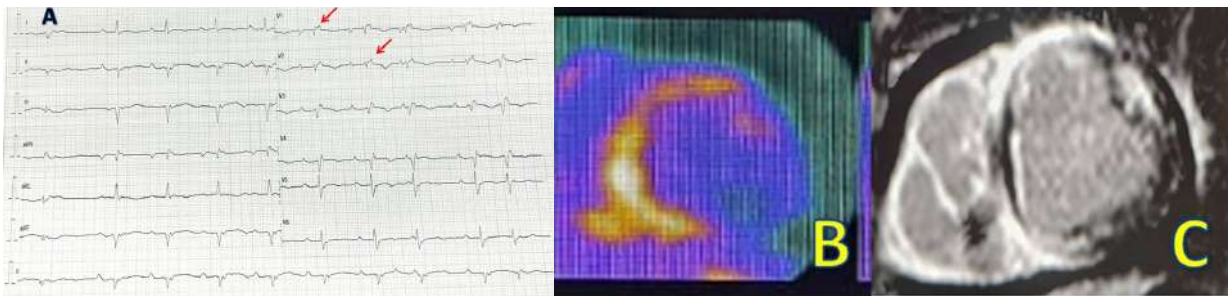
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CARDIAC SARCOIDOSIS ASSOCIATED WITH EPSILON WAVE AND VENTRICULAR TACHYCARDIA: A CASE REPORT

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Introduction: Sarcoidosis is a systemic inflammatory disease characterized by non-caseating granulomas in multiple tissues. Cardiac involvement occurs in about 5% of cases, mainly affecting the ventricular myocardium, as well as the pericardium, conduction system, and valves. It may present with heart failure (HF), palpitations, syncope, and sudden death (SD), often associated with ventricular arrhythmias. Case Description: A 41-year-old man with a history of anabolic steroid use presented with exertional dyspnea and fatigue for 3 months, along with a syncopal episode. On admission, he showed signs of systemic and pulmonary congestion, consistent with HF. Electrocardiogram revealed sinus rhythm, first-degree AV block, right bundle branch block, T-wave inversion in V1–V4, and a terminal positive deflection in V1 and V2 suggestive of an epsilon wave (Fig. A). Echocardiography showed biventricular dysfunction with an ejection fraction of 21%, diffuse hypokinesia, septal trabeculations, and tricuspid regurgitation. During hospitalization, he developed unstable ventricular tachycardia treated with electrical cardioversion, and a cardioverter-defibrillator was subsequently implanted. Multigene panel testing was negative. Cardiac PET/CT revealed heterogeneous hypermetabolism in the left ventricle (Fig. B), as well as uptake in thoracic and abdominal lymph nodes. Cardiac MRI showed extensive multifocal biventricular mesoepicardial late gadolinium enhancement suggestive of cardiac sarcoidosis (Fig. C). Axillary lymph node biopsy confirmed the diagnosis, showing non-caseating granulomatous lymphadenitis with giant cells and asteroid bodies. Immunosuppressive therapy was initiated, with joint follow-up by rheumatology. Conclusions: Cardiac sarcoidosis is an important differential diagnosis of cardiomyopathies in young patients and may initially present with ventricular arrhythmias. Although the epsilon wave is classically associated with arrhythmogenic right ventricular dysplasia, it may also occur in sarcoidosis. Other genetic cardiomyopathies should be also considered, especially according to imaging findings. Histopathological confirmation should always be pursued. Treatment includes immunosuppression, HF management, and possibly secondary prevention of SD with an ICD.



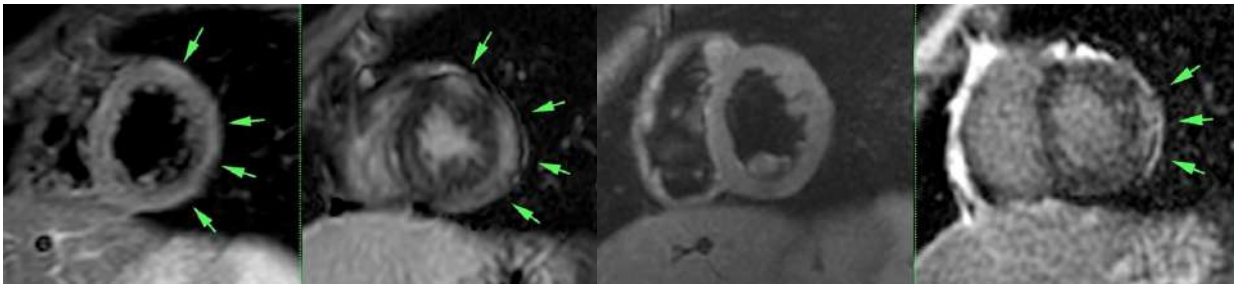
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RECURRENT INFLAMMATORY MYOCARDITIS IN A PATIENT WITH LIMB-GIRDLE MUSCULAR DYSTROPHY TYPE 2F: CORTICOSTEROID DEPENDENCE AND RESPONSE TO AZATHIOPRINE

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Introduction: Limb-girdle muscular dystrophies (LGMD) are hereditary diseases with progressive proximal muscle weakness. LGMD 2F (SGCD gene mutation) may involve cardiac manifestations, with dilated cardiomyopathy being the most frequent. Recurrent myocarditis in this context is rare and poorly described. Case Description: A 12-year-old male patient with LGMD 2F (mutation in exon 8 of the SGCD gene; peak CPK 7,700 U/L), presenting with loss of ambulation, upper limb weakness, neurogenic bladder, and gastroesophageal reflux disease. Annual cardiology follow-up had previously shown no abnormalities. The patient presented with multiple episodes of intense precordial pain radiating to the left upper limb, triggered by physical or emotional stress, accompanied by elevated troponin I (peak 7.93 ng/mL) and ST-segment elevation in V2–V5 on ECG, initially raising suspicion of anterolateral myocardial infarction and prompting two hospitalizations. Ischemic etiology and coronary anomalies were excluded by aortic and coronary computed tomography angiography. Subsequent ECGs revealed early repolarization disturbance. Cardiac magnetic resonance imaging (CMR) during the acute phase showed non-ischemic late gadolinium enhancement associated with hyperintensity on triple inversion recovery sequences, confirming acute myocarditis. Prednisone 2 mg/kg/day was initiated with immediate clinical response, normalization of troponin, and resolution of myocardial edema on follow-up CMR. However, the patient developed corticosteroid dependence, with symptomatic recurrences and rising biomarkers at every tapering attempt. Repeat CMR confirmed fibrosis in previously affected segments along with new foci of edema and hyperemia in previously unaffected segments. Methotrexate (titrated up to 17.5 mg/week) was introduced as a corticosteroid-sparing agent but was discontinued due to severe gastrointestinal intolerance. Azathioprine 50 mg/day was then started in combination with ondansetron, with good tolerability, allowing gradual reduction of prednisone to a physiological dose (5 mg/day), with no new myocarditis episodes since initiating this combination. Conclusions: This case highlights recurrent myocarditis as a rare cardiac manifestation of LGMD 2F and suggests that recurrent inflammatory episodes may potentially contribute to the development of dilated cardiomyopathy observed in these patients. Azathioprine proved effective as a corticosteroid-sparing immunosuppressant in the setting of corticosteroid dependence.



Interventional Cardiology



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19687

WAIST-TO–CORONARY SINUS DIAMETER RATIO AS A POTENTIAL PREDICTOR OF RESPONSE TO NOVEL CORONARY SINUS REDUCER THERAPY IN REFRACTORY ANGINA: A PILOT CASE SERIES

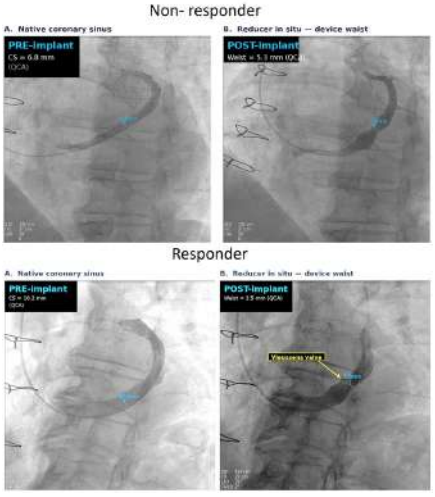
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Introduction: Coronary sinus reducer (CSR) implantation is a novel therapeutic option for patients with refractory angina not amenable to revascularisation. However, response to therapy is heterogeneous and predictors of clinical and perfusion improvement remain insufficiently defined. In this case series we hypothesised that anatomical and device-related parameters, including the waist-to–coronary sinus (CS) diameter ratio as a surrogate of effective constriction, may be associated with therapeutic response following CSR implantation. Case Description: Four patients (3 male/1 female; age 61–86 years) with refractory angina (CCS III–IV), LVEF 44–56%, and baseline ischaemic burden of 10–26% underwent CSR implantation on optimal medical therapy. CS diameter and device waist were assessed by quantitative coronary angiography (QCA) at implantation. Follow-up SPECT at 4 months was performed using an identical pharmacological stress protocol on the same gamma camera and interpreted by a single blinded reader. CS diameter ranged 5.5–10.2 mm (mean 7.45 mm), waist 3.3–5.3 mm, and waist-to–CS ratio 0.34–0.78. Three patients demonstrated improved perfusion with a reduction in ischaemic burden of 5–10 percentage points, associated with CCS class improvement (1–3 grades) and 6MWT increase (10–47%). The greatest benefit was observed in the patient with the largest CS diameter and lowest ratio (0.34), whereas the non-responder showed the highest ratio (0.78), suggesting inadequate narrowing and insufficient pressure gradient as a potential mechanism of failure. Conclusions: In this preliminary case series, a higher degree of relative coronary sinus constriction, expressed as a lower waist-to–coronary sinus diameter ratio, was associated with greater improvement in myocardial perfusion, symptoms, and functional capacity after CSR implantation. Conversely, limited device-induced narrowing may be linked to absent or attenuated response, suggesting a potential mechanistic role of pressure gradient generation in treatment efficacy. These findings are hypothesis-generating and warrant validation in larger prospective studies.

Table 1. Patient characteristics and outcomes.

Pt	Age/Sex	CCS pre	SPECT% pre	CS diam. (mm)	Waist (mm)	SPECT% post	ΔSPECT (pp)	CCS post	6MWT Δ (%)
1	70 / M	IV	28%	6.8	5.3	29%	+3	III (−1)	+13.5%
2	86 / M	IV	15%	10.2	3.5	5%	−10	I (−3)	+47.0%
3	76 / F	III	10%	5.5	3.3	3%	−7	II (−1)	+10.2%
4	61 / M	III	10%	7.3	3.8	5%	−5	I (−2)	+20.0%



RESEARCHER POSTER – ORIGINAL RESEARCH



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18402

ANTI-INFLAMMATORY THERAPY IN CORONARY ARTERY DISEASE: A SYSTEMATIC REVIEW OF THE ROLE OF TIMING AND RESIDUAL INFLAMMATORY RISK

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(1) UNIVERSIDADE DO ESTADO DO PARA (UEPA) - BELÉM - PA - BRASIL;

Introduction/Background: Inflammation is a key driver of atherosclerosis, yet clinical trials of anti-inflammatory therapies in coronary artery disease (CAD) have yielded inconsistent results. Whether treatment efficacy is influenced by the timing of intervention and residual inflammatory risk remains uncertain. Objectives: To evaluate the impact of anti-inflammatory therapies on cardiovascular outcomes in CAD, with emphasis on disease phase (acute vs chronic) and inflammatory status. Methods: A systematic review was conducted following PRISMA 2020 guidelines. PubMed, Embase, and Cochrane CENTRAL were searched, identifying 648 records; 460 were screened after duplicate removal, and four randomized controlled trials (COLCOT, CANTOS, CIRT, and LoDoCo2) were included. Studies evaluated systemic anti-inflammatory therapies versus placebo in adult patients with CAD and were classified as acute (≤30 days post–myocardial infarction) or chronic disease. Risk of bias was assessed using the Cochrane RoB 2.0 tool. Resultados e Conclusions: Four trials (>25,000 patients) were analyzed. In the acute phase, COLCOT demonstrated that colchicine significantly reduced major adverse cardiovascular events (MACE) (HR 0.77; 95% CI 0.61–0.96). In chronic CAD, treatment effects were heterogeneous: in CANTOS, canakinumab reduced events in patients with elevated inflammatory markers (HR 0.85; 95% CI 0.74–0.98), whereas in CIRT, methotrexate showed no benefit (HR 0.96; 95% CI 0.79–1.16) and did not reduce inflammatory biomarkers. In LoDoCo2, colchicine demonstrated consistent benefit in stable disease (HR 0.69; 95% CI 0.57–0.83). Overall risk of bias was low, with minor concerns related to selective reporting and specific design features. Collectively, these findings indicate that anti-inflammatory therapy in CAD is not uniformly effective and is modulated by both timing of intervention and residual inflammatory risk. Early initiation after myocardial infarction and targeted use in patients with persistent inflammation appear to confer the greatest benefit, supporting a precision-based approach to inflammation modulation in atherosclerotic disease. Limitations include intertrial heterogeneity, differences in study populations and endpoints, and the absence of quantitative meta-analysis.

16882

CORONARY ATHEROSCLEROSIS ON CCTA IN PATIENTS WITH ZERO CALCIUM SCORE: ASSOCIATION WITH MORTALITY OUTCOMES

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Introduction/Background: Coronary computed tomography angiography (CCTA) has become an important tool for assessing cardiovascular risk. While coronary artery calcium (CAC) scoring is widely employed as a risk stratification method, it does not capture all cardiovascular risks, especially in patients with a CAC score of zero. Notably, some individuals with a CAC score of zero exhibit signs of coronary atherosclerosis on CCTA, indicating a potential residual risk that is not fully understood. This raises important questions about the prognostic implications of coronary atherosclerosis in this specific population. Objectives: To evaluate the association between coronary atherosclerosis detected by CCTA and all-cause and cardiovascular mortality in patients with CAC score of zero. Methods: Observational study including patients who were submitted to CCTA and with a zero CAC. Exposure was presence of coronary atherosclerosis (negative vs. positive CCTA). Outcomes were all-cause and cardiovascular mortality. Participants were followed for approximately 6 years. Analyses included Kaplan–Meier curves with log-rank testing and Cox regression models (crude and adjusted for age, sex, and diabetes). Sensitivity analysis used Firth's penalized Cox regression. Proportional hazards assumptions were verified. Resultados e Conclusions: Results: Of 1,204 patients with CAC 0, 159 (13.2%) had any evidence of atherosclerosis (positive CCTA). These patients were older, more often male, and had more diabetes (all p<0.05) in comparison to those with a negative CCTA. During follow-up, 57 deaths (4.7%) occurred, with higher all-cause mortality in the positive group (8.8% vs. 4.1%). Survival was lower in the positive group (log-rank p=0.019). In unadjusted analysis, positive CCTA was associated with increased all-cause mortality (HR=2.03; 95% CI 1.11–3.72), but not after adjustment (HR=0.88; 95% CI 0.46–1.71). Age and male sex remained independent predictors. Similar findings were observed for cardiovascular mortality. Penalized models confirmed these results. Age was the main confounder. Conclusion: In patients with CAC score of zero, coronary atherosclerosis on CCTA was associated with higher mortality only in unadjusted analyses. After adjustment, no independent association was observed, suggesting that CCTA identifies higher baseline risk largely driven by age rather than independent prognostic value.

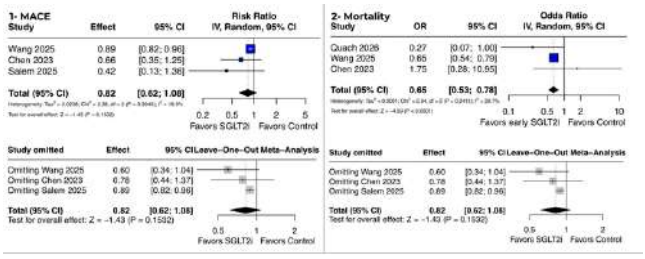
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EARLY INITIATION OF SGLT2 INHIBITORS IN ACUTE CARDIOVASCULAR SETTINGS: A SYSTEMATIC REVIEW AND META-ANALYSIS OF CLINICAL OUTCOMES

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Introduction/Background: The optimal timing for initiating sodium–glucose cotransporter-2 inhibitors (SGLT2i) in acute cardiovascular conditions remains uncertain. While these agents have established benefits in chronic heart failure and cardiometabolic disease, their early use during acute myocardial infarction (AMI) or acute coronary syndrome (ACS) has not been fully elucidated. Objectives: To evaluate the impact of early in-hospital initiation of SGLT2 inhibitors in patients with acute cardiovascular events, assessing their effects on major adverse cardiovascular events (MACE) and mortality through a pooled analysis of randomized and observational studies. Methods: We conducted a systematic review and meta-analysis in accordance with PRISMA guidelines, including studies evaluating early in-hospital initiation of SGLT2i in patients with acute cardiovascular events. The primary outcome was major adverse cardiovascular events (MACE), and secondary outcomes included all-cause or cardiovascular mortality. Random-effects models (REML) were applied using inverse-variance weighting. Effect estimates were pooled as relative measures (hazard ratios and odds ratios). Leave-one-out sensitivity analyses were performed to assess robustness. Resultados e Conclusions: A total of 36,929 patients across 4 studies were included in this analysis . Early initiation of SGLT2 inhibitors in acute cardiovascular settings was not associated with a significant reduction in MACE (pooled effect 0.82, 95% CI 0.62–1.08; p=0.15; I²=16%). However, mortality was significantly reduced (pooled effect 0.65, 95% CI 0.53–0.78; p<0.001; I²=29.7%). Leave-one-out analyses supported the robustness of these findings, with no single study fully driving the mortality benefit, although the neutral MACE result appeared sensitive to exclusion of the largest study. The largest cohort, Wang 2025, showed significant reductions in cardiovascular composite outcomes and cardiovascular mortality with early SGLT2i initiation after acute myocardial infarction, whereas smaller studies mainly suggested benefit in heart failure-related outcomes or ventricular remodeling despite neutral composite endpoints . Overall, early in-hospital initiation of SGLT2 inhibitors appears to confer a survival benefit despite a neutral pooled effect on composite cardiovascular events, supporting their potential role in acute cardiovascular care and underscoring the need for further randomized evidence focused on hard clinical endpoints



19737

ELEVATED APOLIPOPROTEIN(A) AS AN INDEPENDENT RISK FACTOR FOR ACUTE MYOCARDIAL INFARCTION IN YOUNG PATIENTS

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Introduction/Background: The occurrence of acute myocardial infarction (AMI) in young patients has a major clinical, functional, and socioeconomic impact, in addition to a distinct etiopathogenic profile compared with that observed in older age groups. In this context, lipoprotein(a) [Lp(a)], a particle composed of low-density lipoprotein bound to apolipoprotein(a), has been recognized as a genetic marker of cardiovascular risk, with atherogenic, pro-inflammatory, and pro-thrombotic properties. Its role appears to be particularly relevant in premature coronary artery disease, especially in individuals without a substantial burden of traditional risk factors Objectives: To analyze the association between elevated Lp(a)/apolipoprotein(a) levels and the risk of AMI or acute coronary syndrome in young patients, with emphasis on its independence from conventional cardiovascular risk factors. Methods: Observational studies, a systematic review, and a meta-analysis investigating Lp(a) in patients with AMI, acute coronary syndrome, and premature coronary artery disease were analyzed, with attention to the magnitude of the association, early coronary outcomes, and adjustment for concomitant clinical variables Resultados e Conclusions: Elevated Lp(a) was consistently associated with a higher risk of premature coronary artery disease and acute myocardial infarction in young patients, independent of traditional cardiovascular risk factors. A systematic review showed an approximately threefold increase in risk in some subgroups, while a meta-analysis of 51 studies (100,540 participants) found significant associations with premature atherosclerotic cardiovascular disease (OR 2.15; 95% CI 1.53–3.02) and premature coronary artery disease (OR 2.44; 95% CI 2.06–2.90). Clinical studies further confirmed that elevated Lp(a) is frequent in young patients with acute coronary manifestations and remains an independent predictor even after adjustment for other variables. In patients under 50 years with AMI, Lp(a) ≥30 mg/dL was associated with a 3.22-fold higher risk of premature infarction. Overall, these findings suggest that Lp(a) contributes independently to coronary vulnerability in young individuals, even when conventional lipid parameters are not markedly abnormal. Elevated Lp(a)/apo(a) is an independent risk factor for premature MI and CAD in young patients, especially when traditional risk factors are absent or insufficient. Measuring Lp(a) may improve risk assessment in ACS, AMI, or a family history of early atherosclerosi

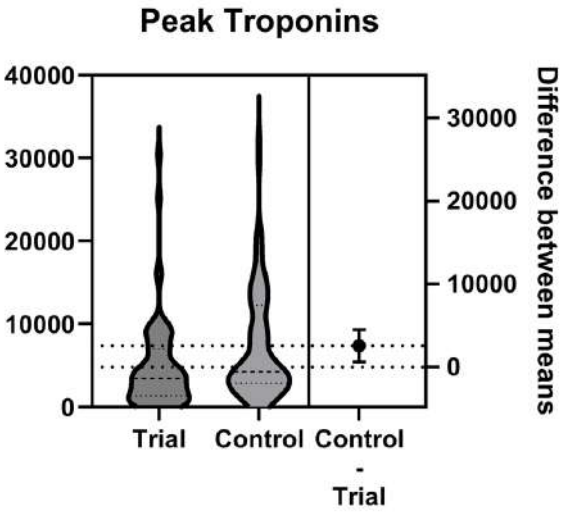
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PREVENTION OF REPERFUSION INJURY IN MYOCARDIAL INFARCTION - PRIME, DOES PARACETAMOL REDUCE REPERFUSION INJURY IN PATIENTS PRESENTING WITH ST-ELEVATION MYOCARDIAL INFARCTION? A SINGLE SITE, HISTORICAL CONTROL, OPEN-LABEL, CLINICAL TRIAL

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Introduction/Background: ST-segment Elevation Myocardial Infarction (STEMI) remains a major cause of morbidity, mortality, and cost, including in New Zealand where outcomes are inequitable for Māori and Pacific peoples. Infarct size is a key determinant of prognosis. Although urgent reperfusion with percutaneous coronary intervention (PCI) or thrombolysis salvages threatened myocardium, reperfusion injury may substantially contribute to final infarct size. Pre-clinical data suggest paracetamol may reduce ischaemia–reperfusion injury via antioxidant effects and via its metabolite AM404, which may influence anandamide signaling associated with CB2 receptor activation. Given its low cost, even modest benefit could have meaningful clinical and financial impact. Objectives: To assess whether oral paracetamol given prior to PCI reduces biomarkers of infarct size in patients presenting with acute STEMI, and to evaluate feasibility and safety of this approach in routine acute care. Methods: Single-centre proof-of-concept study at Waikato Hospital. Patients with acute STEMI requiring primary or rescue PCI received oral paracetamol 1.5 g at recruitment alongside standard STEMI therapy, then 1 g four times daily for up to 4 days or until discharge. A historic control cohort was derived from the ANZACS-QI registry with chart review and matching by PCI type. Primary outcome: peak troponin 6–24 hours post-PCI (and delta troponin where available). Secondary outcomes: post-PCI ventricular arrhythmias, echocardiographic left ventricular ejection fraction (LVEF) within 4 days, and 30-day mortality. Recruitment occurred Aug 2024–Dec 2025. Resultados e Conclusions: Ninety-five patients were recruited; 13 were excluded and 7 lacked peak troponins, leaving 75 for the primary analysis (53 primary PCI; 22 rescue PCI). Compared with controls, mean peak troponin was lower by 2541 (34.5%) (4830 vs 7371; p=0.005); median peak troponin was 3456 vs 4250 (difference 1597; p=0.003). Delta troponin was also lower (2634 vs 4014; difference 2034; p=0.0002). Ventricular arrhythmias occurred in 11/82 (13.4%) trial patients vs 14/75 (18.7%) controls, LVEF impairment favoured paracetamol on AUC analysis, and 30-day mortality was 2/82 (2.4%) vs 4/75 (5.3%). Conclusions Paracetamol administration before PCI was feasible and safe in acute STEMI, including after cardiac arrest, with results consistent with reduced reperfusion injury and an estimated 20–25% reduction in infarct size. A randomised controlled trial is planned.



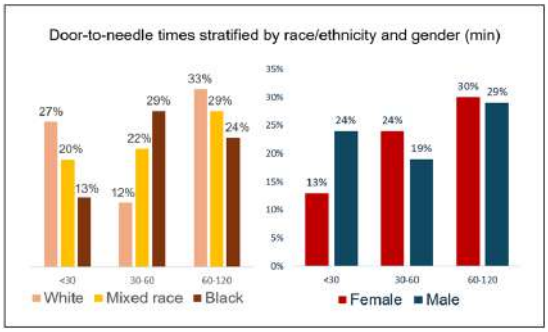
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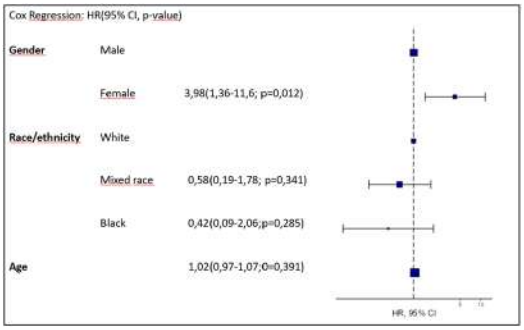
RACIAL/ETHNIC AND GENDER INEQUITIES IN DOOR-TO-NEEDLE TIME AMONG PATIENTS WITH STEMI: RESULTS FROM THE EQUITY-MI COHORT.

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Introduction/Background: Limitations persist in the literature regarding disparities in the management of patients with ST-segment elevation myocardial infarction (STEMI), particularly when comparisons are made according to race/ethnicity and gender. Objectives: To compare clinical characteristics and to assess door-to-needle time (DNT) within 30 minutes and evaluate 180-day survival according to race/ethnicity (White, Brown [mixed race], and Black) and gender. Methods: EQUITY-MI is a single-centre, prospective cohort study of patients diagnosed with STEMI in the state of Rio de Janeiro, Brazil, who were referred to a single reperfusion centre.Continuous and categorical variables were analysed using Kruskal–Wallis and chi-squared tests. To estimate the effect of DNT within 30 minutes, logistic regression models were applied and odds ratios (ORs) were calculated. Survival analysis was performed using the Kaplan–Meier method with comparisons by the log-rank test. Cox proportional hazards models were used to estimate crude and adjusted hazard ratios (HRs) for 180-day mortality, adjusting for age, race/ethnicity, education level and household income. A significance level of 0.05 was adopted. Resultados e Conclusions: Among 504 patients, 27.2% were women and 67.8% self-identified as Black or Brown. DNT within 30 minutes occurred in 27.2% of White patients versus 12.5% of Black patients (p = 0.07). Black patients having 2.86-fold lower odds of achieving DNT within 30 minutes compared with White patients (OR = 0.349, p = 0.023), and women had lower odds than men (OR = 0.416; p = 0.015). In the interaction analysis, Black women had 5.49-fold lower odds of DNT within 30 minutes (OR = 0.182, p = 0.028).Kaplan–Meier analysis showed lower cumulative survival among women than men (log-rank p = 0.001), with no significant differences across racial/ethnic groups (p = 0.304). In Cox regression, female gender was independently associated with higher 180-day mortality in both unadjusted (HR 4.63; 95% CI 1.68–12.75; p = 0.003) and adjusted models (HR 3.98; 95% CI 1.36–11.66; p = 0.012). EQUITY-MI identified inequities in STEMI care and outcomes by gender and race/ethnicity. DNT often exceeded the recommended 30-minute target. Black patients and women had lower odds of timely thrombolysis, and female gender was independently associated with higher 180-day mortality. The interaction between race/ethnicity and gender revealed a pattern of intersectionality, with Black women experiencing the most unfavourable scenario compared with White men.





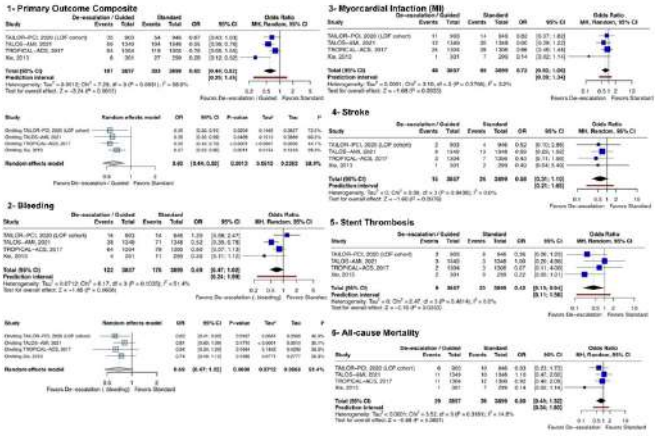
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REDEFINING RISK BALANCE AFTER PCI: A SYSTEMATIC REVIEW AND META-ANALYSIS OF DE-ESCALATION AND PRECISION-GUIDED ANTIPLATELET STRATEGIES

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Introduction/Background: The optimal antiplatelet strategy after percutaneous coronary intervention (PCI) remains a critical clinical challenge, particularly in balancing ischemic protection against bleeding risk. De-escalation strategies, including guided and unguided approaches, have emerged as potential alternatives to standard dual antiplatelet therapy (DAPT), yet their overall impact remains incompletely defined. Objectives: To evaluate the safety and efficacy of de-escalation and precision-guided antiplatelet strategies following percutaneous coronary intervention (PCI), with a focus on balancing ischemic and bleeding risks. Methods: A systematic review and meta-analysis of randomized controlled trials was conducted according to PRISMA guidelines. Trials comparing de-escalation or guided antiplatelet strategies versus standard therapy after PCI were included. The primary outcome was a composite clinical endpoint, with secondary outcomes including clinically relevant bleeding, myocardial infarction (MI), stent thrombosis, stroke, and all-cause mortality. Random-effects models (REML) were used to calculate pooled odds ratios (ORs) with 95% confidence intervals (CIs). Resultados e Conclusions: Across four randomized trials including 7,756 patients undergoing PCI, de-escalation and precision-guided antiplatelet strategies were associated with a significant reduction in the primary composite outcome (OR 0.60; 95% CI 0.44–0.82; P=0.0012; I²=58.9%). This benefit was primarily driven by a reduction in clinically relevant bleeding (OR 0.69; 95% CI 0.47–1.02; P=0.0608; I²=51.4%). Importantly, there were no significant differences in ischemic outcomes, including myocardial infarction (OR 0.72; 95% CI 0.50–1.06; P=0.0933; I²=3.2%), all-cause mortality (OR 0.80; 95% CI 0.49–1.32; P=0.38; I²=14.8%), or stroke (OR 0.58; 95% CI 0.31–1.10; P=0.0978; I²=0%) . Notably, de-escalation strategies were associated with a significant reduction in stent thrombosis (OR 0.42; 95% CI 0.19–0.94; P=0.035; I²=0%), reinforcing the absence of a safety trade-off. Overall, these findings demonstrate that de-escalation strategies effectively reduce bleeding risk while preserving ischemic protection, resulting in a favorable net clinical benefit. This supports a paradigm shift toward individualized, risk-based antiplatelet therapy following PCI.



Acute Cardiovascular Care / Cardiovascular Emergencies



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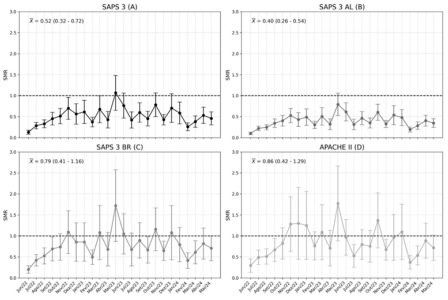
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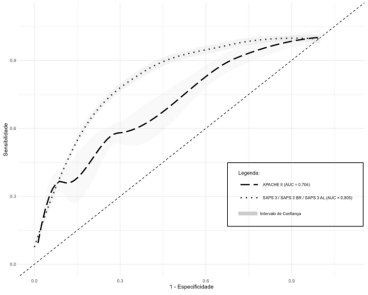
APPLICABILITY OF SAPS 3 AND APACHE II SCORES IN A CARDIAC INTENSIVE CARE UNIT: A PROSPECTIVE STUDY

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Introduction/Background: Prognostic scores such as the Simplified Acute Physiology Score (SAPS) and the Acute Physiology and Chronic Health Evaluation (APACHE) are essential for assessing performance and predicting mortality in Intensive Care Units (ICUs). Objectives: To assess the performance of SAPS 3, including its Latin America (LA) and Brazil (BR) versions, and APACHE II in predicting in-hospital mortality in a cardiac intensive care unit (CICU). Methods: Prospective cohort of patients admitted between June 2022 and May 2024, followed until discharge or death. Data were extracted from electronic medical records. Calibration was assessed by comparing observed and predicted mortality using the Standardized Mortality Ratio (SMR), and discrimination was evaluated using the area under the receiver operating characteristic curve (AUC). Resultados e Conclusions: A total of 573 patients were included; 288 (50%) had three or more comorbidities, the median age was 63 years (IQR, 53-72), and 344 (60%) were male. Cardiovascular diseases accounted for 76% of admissions, the median SAPS 3 score was 55 points (49-63) and overall mortality was 15%. All models showed an SMR below 1, indicating that observed mortality was lower than predicted and suggesting good quality of care in the unit. Mean SMR values were 0.52 (95% CI, 0.32-0.72) for SAPS 3, 0.40 (95% CI, 0.26-0.54) for SAPS 3 LA, 0.79 (95% CI, 0.41-1.16) for SAPS 3 BR, and 0.86 (95% CI, 0.42-1.29) for APACHE II. Among the evaluated models, SAPS 3 BR showed the best calibration, with the SMR closest to 1, indicating better alignment with local clinical reality. Discrimination was also superior for SAPS 3 and its regional adaptations, with an AUC of 0.805, compared with 0.704 for APACHE II, a statistically significant difference (p = 0.00149). FIGURE 1 - SMR for different prognostic scores in the CICU FIGURE 2 - ROC curve for each prognostic score Overall, SAPS 3, particularly the Brazilian version, outperformed APACHE II and appears to be the most appropriate prognostic model for routine use in high-complexity cardiac ICUs in Brazil. Although overall mortality was higher than the national average, the lower-than-predicted mortality reinforces the adequacy of care delivered in this unit.





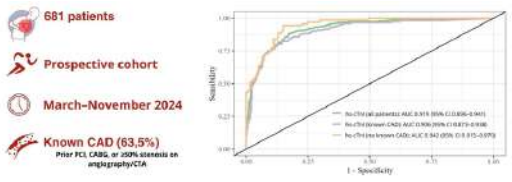
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CORONARY ARTERY DISEASE REDUCES THE SAFETY OF THE ESC 0/1-HOUR RULE-OUT STRATEGY IN ACUTE CHEST PAIN WITH SUSPECTED ACUTE CORONARY SYNDROME: A REAL-WORLD COHORT

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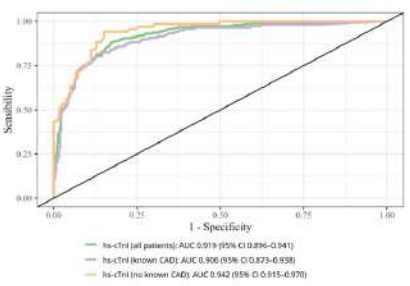
(1) INSTITUTO DANTE PAZZANESE DE CARDIOLOGIA - SAO PAULO - SP - BRASIL;

Introduction/Background: The ESC 0/1-hour algorithm is recommended for rapid rule-out of acute coronary syndromes in patients presenting with acute chest pain, demonstrating high safety in prior validation studies. However, these studies were predominantly conducted in populations with a low prevalence of coronary artery disease (CAD), potentially limiting generalisability to higher-risk settings. Objectives: To evaluate the real-world diagnostic performance and safety of the ESC 0/1-hour algorithm in a population with acute chest pain and high prevalence of CAD. Methods: Prospective cohort including consecutive patients presenting with suspected acute coronary syndrome at a tertiary cardiology centre between March and November 2024. High-sensitivity cardiac troponin I (hs-cTnI) was measured at presentation and after 1 hour. The ESC 0/1-hour algorithm was retrospectively applied for classification. The primary endpoint was myocardial infarction or all-cause death at 30 days. Diagnostic performance of hs-cTnI was assessed using receiver operating characteristic (ROC) curve analysis, with subgroup analyses according to prior CAD status. Resultados e Conclusions: A total of 681 patients were included (mean age 64.2 ± 11 years; 63% male), of whom 63.5% had known CAD. At 30 days, myocardial infarction occurred in 27% and mortality in 1.8%. Admission hs-cTnI demonstrated excellent discrimination for myocardial infarction or death (AUC 0.919; 95% CI 0.896–0.941), but performance was attenuated in patients with known CAD compared with those without CAD (AUC 0.906 vs. 0.942). The ESC 0/1-hour algorithm showed sensitivity of 85%, specificity of 91%, positive predictive value of 78%, and negative predictive value of 94%. However, rule-out safety was reduced in patients with known CAD, reflected by lower negative predictive values. Conclusion: In a population with a high prevalence of CAD the ESC 0/1-hour algorithm maintains good overall performance but reduced safety for rule-out in patients with known CAD, with negative predictive values below the 99% threshold recommended for safe discharge. These findings support a more individualized interpretation of accelerated diagnostic pathways incorporating coronary history.



Performance of the ESC 0/1-hour algorithm for 30-day death or myocardial infarction

30-day outcomes	Sensibility (CI 95%)	Specificity (CI 95%)	PPV (CI 95%)	NPV (CI 95%)
Death or MI	0.85(0.80-0.90)	0.91(0.88-0.93)	0.78(0.72-0.83)	0.94(0.92-0.96)
MACE	0.58(0.52-0.63)	0.94(0.91-0.96)	0.90(0.85-0.94)	0.71(0.67-0.75)



19708

FACTORS ASSOCIATED WITH HOSPITAL READMISSION OF PATIENTS WITHIN ONE YEAR AFTER ACUTE MYOCARDIAL INFARCTION: THE ROLE OF A NURSE-LED MYOCARDIAL INFARCTION PROGRAM

FERNANDA FERNANDA LIMA1; LILIA DE SOUZA NOGUEIRA2; CAROLINE RUSSO FERREIRA1; BRUNA DANIELLA DE SOUSA DE LIMA2;

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Introduction/Background: Cardiovascular diseases remain the principal cause of death worldwide. In this context, the Acute Myocardial Infarction (AMI) stands out due to its high morbidity, mortality, frequent hospital readmissions, and substantial healthcare costs. Despite advances in in-hospital care, post-discharge follow-up remains challenging. Nurse-led telephone monitoring may be an accessible strategy to improve continuity of care and prevent hospital readmissions. This study evaluated the contribution of a nurse-led telephone follow-up program for patients after AMI in a Brazilian setting. Objectives: To identify factors associated with hospital readmission within one year after AMI among patients enrolled in a nurse-led myocardial infarction follow-up program Methods: Retrospective cohort study conducted in a private hospital in São Paulo, Brazil. The sample included patients admitted with AMI and enrolled in the institution's Myocardial Infarction Program between 2017 and 2023. The dependent variable was cardiovascular hospital readmission within one year after discharge. Independent variables included age, sex, AMI type, lifestyle habits, medication adherence, reported symptoms, and successful nurse-led telephone contacts performed at six scheduled time points (7, 30, 90, 180, 240, and 365 days post-discharge). Generalized mixed-effects modeling was applied (5% significance level). Resultados e Conclusions: Among 683 patients analyzed (80.53% men; mean age 67.19 years; 66.62% non-ST-segment elevation AMI), successful telephone contact rates ranged from 96.34% at 7 days to 54.31% at 365 days post-discharge. A total of 74 cardiovascular readmissions were identified, most occurring within the first 30 days post-discharge (n=42). The number of successful nurse-led telephone contacts was the only independent predictor of the outcome. Each successful follow-up contact reduced the odds of hospital readmission by 25.3% within one year after AMI (OR 0.747; 95%CI 0.611–0.913; p=0.004). Conclusion: Structured nurse-led telephone follow-up after AMI was associated with a significant reduction in hospital readmissions of patients. These findings highlight the importance of nurse-led remote monitoring as a feasible strategy to ensure continuity of care, support long-term recovery, and improve cardiovascular outcomes after discharge.

22005

FACTORS INFLUENCING THE OUTCOMES OF PATIENTS TRANSFERRED FOR ANGIOPLASTY: ANALYSIS OF THE ACUTE MYOCARDIAL INFARCTION CARE NETWORK IN SALVADOR AND THE METROPOLITAN REGION, BAHIA

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Introduction/Background: Acute Myocardial Infarction (AMI) presents high morbidity and mortality, and percutaneous transluminal coronary angioplasty (PTCA) is essential for reducing complications and deaths, which are directly influenced by clinical and temporal factors. Objectives: This study aimed to analyze factors associated with the outcomes of patients transferred for PTCA within the public healthcare network of Salvador and its Metropolitan Region. Methods: Cross-sectional study using a regional STEMI care database (January 2017–April 2026). Patients with STEMI admitted to public healthcare units in Salvador, Bahia, and its metropolitan region transferred for PTCA were included. Suspected STEMI cases are reported to a multidisciplinary STEMI response team for ECG review, cardiology supervision, and reperfusion guidance. The variables analyzed included age, sex, GRACE score, affected myocardial wall, assistance times (door-to-ECG, door-to-needle, and door-to-balloon) in minutes, total ischemia time, mortality, total length of hospital stay in days, and complications. Categorical variables were described using absolute and relative frequencies, while numerical variables were expressed as median and interquartile range [IQR]. Pearson and point-biserial correlation tests were applied, expressed with p-values and 95% Confidence Intervals (95%CI), adopting a significance level of 5% (p<0.05). Resultados e Conclusions: A total of 1918 patients were included, predominantly male (1197;62.4%), with a median age of 62 years (IQR:15), most frequently classified as yellow risk category (762;52.67%), and with the inferior wall as the main electrocardiographic territory affected (878;48.03%). Primary PTCA was the main reperfusion strategy adopted (1245;64.91%). Regarding assistance times, the median total ischemia time was 330 minutes (IQR:307), door-to-ECG time was 19 minutes (IQR:33), and door-to-balloon time was 214 minutes (IQR 156). Significant correlations were identified between door-to-ECG time (0.04–0.13; p < 0.001), GRACE score (0.22–0.31;p<0.001), and length of hospital stay (0.002–0.09;p=0.041) with mortality. Furthermore, door-to-ECG time (0.03–0.12;p<0.001) and GRACE score (0.28–0.37;p<0.001) were correlated with the incidence of complications. Regarding length of hospital stay, significant correlations were identified with total ischemia time (0.03–0.14; p<0.001) and GRACE score (0.14–0.24;p<0.001). Longer delays and higher risk scores were linked to death, complications, and longer AMI hospitalization.

Table 1. Baseline characteristics, care-time intervals, and mortality-related correlations

Variable	Value / estimate	p-value
Total patients, n	1,918	—
Male sex, n (%)	1,197 (62.4)	—
Age, years, median (IQR)	62 (15)	—
Yellow risk category, n (%)	762 (52.67)	—
Inferior wall territory, n (%)	878 (48.03)	—
Primary PTCA, n (%)	1,245 (64.91)	—
Total ischemia time, min, median (IQR)	330 (307)	—
Door-to-ECG time, min, median (IQR)	19 (33)	—
Door-to-balloon time, min, median (IQR)	214 (156)	—
Door-to-ECG time correlation with mortality	0.04–0.13	<0.001
GRACE score correlation with mortality	0.22–0.31	<0.001
Length of hospital stay correlation with mortality	0.002–0.09	0.041

Note: Descriptive variables are reported as n (%) or median (IQR). ECG, electrocardiogram; GRACE, Global Registry of Acute Coronary Events; IQR, interquartile range; PTCA, percutaneous transluminal coronary angioplasty.

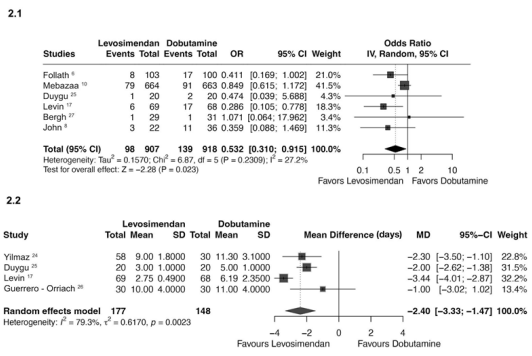
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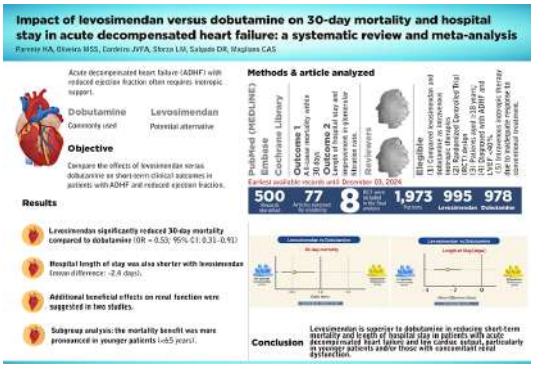
IMPACT OF LEVOSIMENDAN VERSUS DOBUTAMINE ON 30-DAY MORTALITY AND HOSPITAL STAY IN ACUTE DECOMPENSATED HEART FAILURE: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introduction/Background: Acute decompensated heart failure (ADHF) with reduced ejection fraction frequently requires inotropic support. Dobutamine is widely used, but its impact on survival remains uncertain. Levosimendan, a calcium sensitiser with vasodilatory properties, may offer haemodynamic and clinical advantages over catecholaminergic inotropes. Objectives: To compare the effects of levosimendan versus dobutamine on short-term clinical outcomes in adults with ADHF and low cardiac output. Methods: We systematically searched MEDLINE, Embase and Cochrane Library from inception to 3 December 2024 for randomised controlled trials enrolling adults with ADHF or postoperative low cardiac output syndrome and left ventricular ejection fraction <40% requiring intravenous inotropes. Trials comparing levosimendan with dobutamine and reporting at least one outcome of interest were included. The primary outcome was 30-day all-cause mortality; secondary outcomes were length of hospital stay and renal function. Random-effects meta-analyses were performed, and risk of bias was assessed with RoB 2. Certainty of evidence was graded with GRADE. Resultados e Conclusions: Eight trials including 1973 patients (995 levosimendan, 978 dobutamine) met the criteria. Levosimendan significantly reduced 30-day mortality compared with dobutamine (OR 0.53, 95% CI 0.31–0.91; I²=27%). In four trials (n=325), levosimendan shortened hospital stay by a mean of 2.4 days (95% CI −3.33 to −1.47; I²=79%). Two studies reported renal outcomes, showing greater improvements in estimated glomerular filtration rate and reductions in serum creatinine with levosimendan. Certainty of evidence was moderate for mortality and very low for hospital stay. In adults with ADHF and low cardiac output, levosimendan was associated with lower short-term mortality and shorter hospital stay compared with dobutamine, with signals of renal benefit. Larger contemporary trials are needed to confirm these findings and to define the optimal use of levosimendan in this high-risk population.





14989

LIDOCAINE IMPROVES RETURN OF SPONTANEOUS CIRCULATION COMPARED WITH AMIODARONE IN SHOCK-RESISTANT CARDIAC ARREST

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Introduction/Background: Cardiac arrest (CA) remains a leading cause of morbidity and mortality worldwide. Approximately 20% of cases present with shockable rhythms (ventricular fibrillation or pulseless ventricular tachycardia), yet up to half of these patients fail to achieve sustained return of spontaneous circulation (ROSC), and only about 29% survive to hospital discharge. Current guidelines recommend the use of antiarrhythmic drugs, such as amiodarone or lidocaine, in cases of defibrillation-resistant CA. However, recent trials have shown inconsistent results, and the optimal choice between these agents remains uncertain. Objectives: To perform a systematic review and meta-analysis comparing the efficacy of lidocaine versus amiodarone in patients with CA. Methods: A systematic search of PubMed, Cochrane Library, and Embase databases was conducted to identify studies comparing lidocaine and amiodarone in CA. Pooled odds ratios (ORs) with 95% confidence intervals (CIs) were calculated using a random-effects model. Statistical heterogeneity was assessed using the I² statistic. A two-sided p-value <0.05 was considered statistically significant. Analyses were performed using RevMan software. Resultados e Conclusions: A total of 13 studies comprising 39,037 patients (71.5% male; mean age 64.5 ± 14.5 years) were included. Lidocaine was associated with a significantly higher likelihood of achieving ROSC compared with amiodarone (OR 0.87; 95% CI 0.74–0.94; p=0.0009 - Figure 1A). However, no significant differences were observed in survival to hospital discharge (OR 0.92; 95% CI 0.79–1.06; p=0.24 - Figure 1B) or unfavorable neurological outcomes (OR 1.12; 95% CI 0.88–1.44; p=0.36 - Figure 1C). Conclusions: In this meta-analysis, lidocaine was associated with a higher likelihood of achieving ROSC compared with amiodarone. However, this benefit did not translate into improved survival to hospital discharge or unfavorable neurological outcomes. These findings support a potential role for lidocaine in the early phase of CA, although further randomized evidence is needed to determine its impact on long-term outcomes.

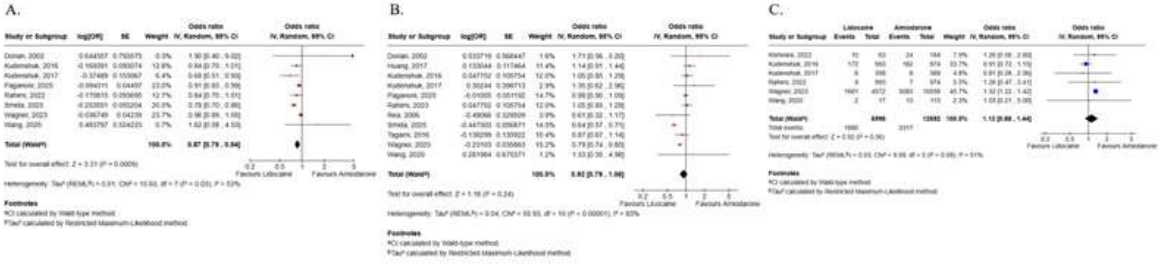


Figure 1. Forest plots comparing the effects of lidocaine and amiodarone between two groups. A. Return of spontaneous circulation. B. Survival to hospital discharge. C. Neurologic outcomes.

18192

METHYLENE BLUE FOR PREVENTION OF VASOPLEGIC SYNDROME AFTER CARDIAC SURGERY WITH CARDIOPULMONARY BYPASS: A RANDOMIZED PILOT TRIAL IN A HIGH-RISK SETTING

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Introduction/Background: Background: Vasoplegic syndrome (VS) is a relevant complication after cardiac surgery with cardiopulmonary bypass (CPB). It usually presents as persistent hypotension with low vascular resistance despite preserved cardiac output, often requiring high vasopressor doses and longer postoperative support. Although methylene blue (MB) is frequently considered in refractory cases, data on its prophylactic use are still scarce. Only a few small randomized trials tested different timing and dosing strategies. Objectives: Objective: To evaluate whether MB given immediately after CPB could reduce postoperative VS and related complications. Methods: Methods: We conducted a single-center randomized pilot trial including adult patients undergoing elective, urgent, or emergency cardiac surgery with CPB. Patients were assigned in a 1:1 ratio by an independent physician to receive MB or equivalent dosing of saline solution, only after separation from CPB. Because of the characteristic coloration, full blinding of the treating team was not feasible. MB was given at 2 mg/kg over 30 minutes, followed by 0.5 mg/kg/h for 6 hours. VS was defined by prespecified hemodynamic criteria within the first 48 postoperative hours. Secondary outcomes included vasopressor use, atrial fibrillation, acute kidney injury, transfusion, ICU and hospital length of stay, and 30-day mortality. Resultados e Conclusions: Results: Fifty-one patients were analyzed (26 in the control group and 25 in the MB group). Baseline and surgical characteristics were similar between groups, and most procedures were classified as urgent or emergency operations (88%). In this higher-risk setting with an incidence of VS slightly higher than reported in the literature, we found similar rates of VS in both groups (15% vs. 16%). After adjustments, MB was not associated with lower VS occurrence (OR 1.09; 95% CI 0.22–5.51; p>0.90). No relevant differences were observed in atrial fibrillation, acute kidney injury, transfusion, ICU stay, total hospital stay, or 30-day mortality. Conclusions: In this pilot randomized study, prophylactic MB started immediately after CPB did not reduce postoperative VS or improve clinical outcomes. Our findings do not support routine use of MB in unselected patients after cardiac surgery for prevention of VS and reinforce the need for larger studies evaluating better timing, dosing strategies, and more appropriate risk-based case selection.

19789

NOVEL TEMPORAL PREDICTORS OF IN-HOSPITAL MORTALITY FOLLOWING PRIMARY PPCI USING AI BASED MACHINE LEARNING : “3D RISK” STRATIFICATION IS THE WAY AHEAD!!

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Introduction/Background: In-Hospital mortality determiation for primary PCI patients is stilla moving target especially for third world countries where easily determinable bedside parameters may be moireuseful than costly ones Objectives: Background and Aim: Mortality prediction following primary PCI suffers from adynamicity mainly due to entry variables only being studied as Outcome predictors. Our study aimed to establish a dynamic 3D Risk nomogram “moving” with patient status to predict in-hospital mortality following primary PCI. Methods: Materials and methods: We studied the incremental role of Lactate: Albumin ratio and Systemic Inflammatory Response Index (SIRI) (latter calculated as Peripheral blood (N x M) / L) during hospital course as predictors. The Risk model generated by stepwise logistic regression and Machine Learning was then forward validated for real-world accuracy. Resultados e Conclusions: Results: Seven predictors generated by Regression and two ML models (KNN,SVM) were selected to build the weighted Risk score (using SHAPley analysis): ICU Serum Lactate/ Albumin > 2.2 anytime in hospital course (WF: 3.5), AW- STEMI with LBBB o rLVEF < 30%(WF: 3.0), Post PCI Myocardial blush grade < 2(WF: 3), In-hospital Vasotrope-Inotrope Index > 40(WF: 3.0), Insulin-requiring DM(WF: 2.5), SIRI> 1.5(WS: 2.5)and Admission MAPSE < 7 mm by ECHO (WF: 2.5). AUROC was 0.893 (95% CI: 0.61–0.96). On generating tertiles (T1 to T3) of the score of T1< 9.5,9.5-15 > 15 of total 20 points, Low, Intermediate and High risk cohorts yielded likelihood of mortality being linearly correlated at 4.5%, 19.5% and 33.7% respectively. In a forward Validation cohort of 249 patients from 2019, the score had an excellent predictive accuracy of 88% agreement (goodness-of-fit) and outperformed both the current best models-PAMI risk score and CADILLAC score- mainly due to its dynamic nature to reflect ongoing patient status.

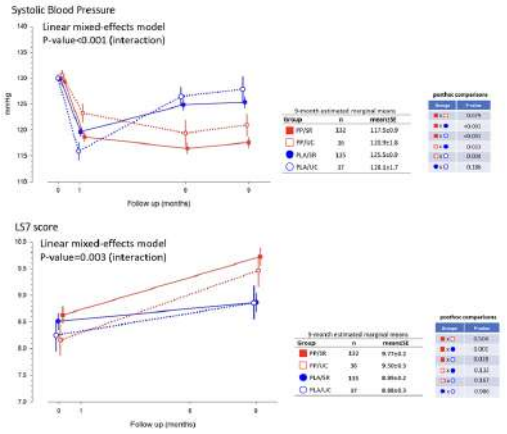
20808

Polypill and Mobile App for Stroke and Cardiovascular Primary Prevention

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Introduction/Background: Cardiovascular diseases (CVD) and stroke remain leading causes of death and disability worldwide, particularly in low- and middle-income countries, where implementation of effective primary prevention strategies remains suboptimal. Simplified pharmacological strategies combined with digital health interventions may improve cardiovascular risk control and promote healthier lifestyles at the population level. Objectives: To evaluate the safety and effectiveness of a fixed-dose polypill, with and without the Stroke Riskometer app (SRA), in adults with low-to-moderate cardiovascular risk. Methods: In this pragmatic, multicenter, 2-by-2 factorial, randomized, placebo-controlled trial, adults 50-75 years of age without established CVD and with systolic blood pressure (SBP) of 121-139 mmHg were assigned to receive a polypill (valsartan 80 mg, amlodipine 5 mg, and rosuvastatin 10 mg) or matching placebo, with or without use of the SRA. The two co–primary outcomes were the change from baseline to 9 months in SBP and cardiovascular health assessed by the Life's Simple 7 (LS7) score. Resultados e Conclusions: Results: A total of 371 participants underwent randomization; 94% completed 9-month follow-up. The mean estimated 10-year CVD-risk in the overall trial population was 6.5%, and the mean baseline SBP was 130 mmHg. At 9 months, SBP was lower in the polypill plus SRA group than in the placebo plus usual care group (mean [±SE], 117.5±0.9 vs. 128.1±1.7 mmHg; P=0.002). The LS7 score increased by 1.14 points in the polypill plus SRA group and by 0.64 points in the placebo plus usual care group (mean [±SE], 9.8±0.2 vs. 8.9±0.3; P=0.039). No serious adverse events were attributed to the polypill. Conclusions: The combination of a fixed-dose polypill and a mobile health application significantly improved blood pressure control and cardiovascular health metrics in individuals at increased cardiovascular risk, with a favorable safety profile. These findings support integrated pharmacological and digital health strategies as scalable approaches for stroke and cardiovascular primary prevention, particularly in resource-constrained settings.



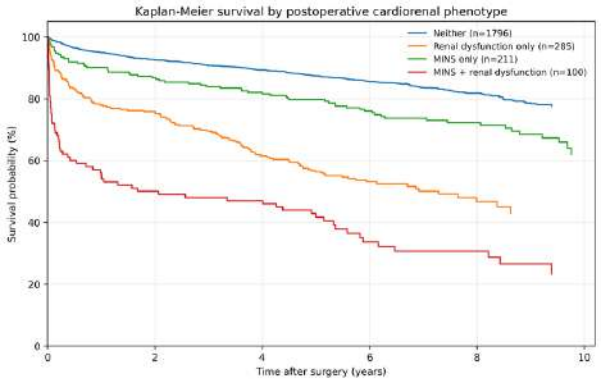
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POSTOPERATIVE MYOCARDIAL INJURY AND RENAL DYSFUNCTION DEFINE A HIGH-RISK CARDIORENAL PHENOTYPE AFTER NONCARDIAC SURGERY

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Introduction/Background: Postoperative myocardial injury and renal dysfunction after noncardiac surgery may reflect cardiorenal vulnerability. Whether their coexistence identifies a phenotype with sustained mortality risk remains uncertain. Objectives: To evaluate whether postoperative myocardial injury combined with renal dysfunction defines a high-risk cardiorenal phenotype after noncardiac surgery. Methods: We performed a retrospective cohort study of adults admitted to a surgical ICU after noncardiac surgery with postoperative troponin surveillance. Myocardial injury after noncardiac surgery (MINS) was defined as troponin elevation above the assay upper reference limit. Estimated creatinine clearance was calculated by Cockcroft-Gault using age, sex, body weight, and creatinine on the day of peak troponin. Renal dysfunction was defined as creatinine clearance <60 mL/min and/or renal replacement therapy during ICU stay. Patients were classified as neither condition, renal dysfunction only, MINS only, or MINS plus renal dysfunction. Outcomes were 30-day, 1-year, and long-term all-cause mortality. Associations were estimated using SAPS 3-adjusted modified Poisson regression. Long-term survival was assessed using Kaplan-Meier curves and SAPS 3-adjusted Cox regression. Resultados e Conclusions: Among 2,392 patients, 1,796 had neither condition, 285 renal dysfunction only, 211 MINS only, and 100 MINS plus renal dysfunction. Mean age was 60.2±15.9, 76.8±10.9, 65.2±12.9, and 76.8±11.9 years, respectively. Median creatinine clearance was 125.1, 45.8, 116.0, and 42.6 mL/min, and renal replacement therapy was required in 0.0%, 15.8%, 0.0%, and 37.0%. Thirty-day mortality was 1.0%, 7.0%, 3.3%, and 25.0%; 1-year mortality was 5.1%, 22.1%, 10.0%, and 44.0%; and long-term mortality was 17.5%, 49.1%, 30.3%, and 69.0%. After SAPS 3 adjustment, MINS plus renal dysfunction was associated with higher 30-day mortality (aRR 8.93, 95% CI 3.93-20.26) and 1-year mortality (aRR 3.59, 95% CI 2.37-5.42). Kaplan-Meier curves showed long-term survival separation, and the combined phenotype remained associated with long-term mortality in Cox analysis (aHR 2.83, 95% CI 2.09-3.82). Conclusions: Postoperative myocardial injury and renal dysfunction define a high-risk cardiorenal phenotype after noncardiac surgery. Coexistence of MINS with reduced creatinine clearance and/or renal replacement therapy identified older patients with higher early, 1-year, and long-term mortality independent of global illness severity.



20136

RETURN OF SPONTANEOUS CIRCULATION IN VICTIMS OF OUT-OF-HOSPITAL CARDIAC ARREST ATTENDED BY THE MOBILE EMERGENCY MEDICAL SERVICE OF SÃO PAULO (SAMU-SP)

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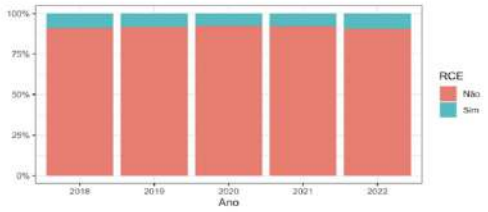
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Introduction/Background: Early recognition of out-of-hospital cardiac arrest (OHCA) and timely initiation of cardiopulmonary resuscitation (CPR) are associated with increased rates of return of spontaneous circulation (ROSC) and patient survival. However, evidence regarding care provided to these victims by the Mobile Emergency Medical Service of the city of São Paulo (SAMU-SP) remains limited. Objectives: To describe OHCA occurrences attended by SAMU-SP and to comparatively analyze victims with and without ROSC according to demographic characteristics and event-related variables. Methods: This was a retrospective study with a quantitative approach, analyzing occurrences attended by SAMU-SP. The study population consisted of OHCA victims assisted between 2018 and 2022, with records available in the Medical Priority Dispatch System™ (MPDS™). The variable of interest was ROSC, categorized as “yes” (respiratory rate >0 and/or Glasgow Coma Scale score >3) or “no” (respiratory rate =0 and Glasgow Coma Scale score =3) at scene or hospital admission. Demographic variables and event-related characteristics were analyzed. Descriptive statistics were performed, including absolute and relative frequencies, as well as median and quartiles. The study was approved by the Research Ethics Committees of the School of Nursing, University of São Paulo (CAAE No. 76111823.8.0000.5392) and the Municipal Health Department (CAAE No. 76111823.8.3001.0086). Resultados e Conclusions: A total of 34,863 OHCA occurrences attended by SAMU-SP were analyzed, of which 51% (17,864) were managed by Basic Life Support (BLS), 15.7% (5,428) by Intermediate Life Support (ILS), and 33.3% (11,571) by Advanced Life Support (ALS). Among these, 2,871 (8.24%) achieved ROSC, with a slight increase observed over the study period. ILS (9.86%) and ALS (8.01%) showed slightly higher proportions of ROSC compared to BLS (7.89%). Victims who achieved ROSC had a lower median age (53 versus 71 anos) and response time (23 versus 24 minites) than those without ROSC. The median scene (21 minutes), transport (10 minutes), and total (58 minutes) times were longer in the group with ROSC compared to the group without ROSC: 14, 6, and 30 minutes, respectively. OHCA victims who achieved ROSC were younger, had shorter response time, and were more frequently attended by ILS or ALS teams. In addition, these victims presented longer scene, transport, and total times compared to those who did not achieve ROSC.

Tabela 1. Vítimas de PCREH atendidas pelo SAMU-SP segundo RCE e características das ocorrências.

Variáveis	N	RCE	
		Sim	Não
Modalidade de suporte empenhado - N (%)			
SBV	17.864	1.409 (7,89)	16.455 (92,11)
SIV	5.428	535 (9,86)	4.893 (90,14)
SAV	11.571	927 (8,01)	10.644 (91,99)
Região da ocorrência – N (%)			
Centro-Oeste	5.664	472 (8,33)	5.192 (91,67)
Leste	6.237	562 (9,01)	5.675 (90,99)
Norte	7.625	605 (7,93)	7.020 (92,07)
Sudeste	8.202	665 (8,11)	7.537 (91,89)
Sul	7.135	567 (7,95)	6.568 (92,05)

Figura 1. Porcentagem de RCE das vítimas de PCREH atendidas pelo SAMU-SP no período de 2018 a 2022.



17291

STRUCTURAL ATRIAL CARDIOPATHY AND COGNITIVE DECLINE BEFORE STROKE: INSIGHTS FROM A COHORT STUDY AT A BRAZILIAN REFERRAL CENTER

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Introduction/Background: Pre-stroke cognitive impairment is common in ischemic stroke patients and affects clinical outcomes. Atrial fibrillation (AF) is a known risk factor for stroke and dementia, but recent evidence suggests that structural changes in the left atrium may also contribute to thromboembolic events and cognitive decline, even without AF. The Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE) is a validated tool to assess cognitive decline. Despite its importance, the relationship between structural atrial heart disease and pre-stroke cognitive decline is not well understood Objectives: To investigate the association between structural atrial cardiopathy and pre-stroke cognitive decline assessed by the IQCODE in ischemic stroke patients. Methods: This cohort included patients admitted to a referral hospital in Bahia, Brazil, with acute ischemic stroke between July 2023 and November 2026. Clinical and demographic data were collected via interviews, and echocardiographic measurements were obtained from records. Atrial heart disease was defined as left atrial diameter >38 mm in women and >40 mm in men. Pre-stroke cognitive decline was assessed using the IQCODE, administered to informants by trained researchers. Logistic regression, adjusting for age, sex, education, hypertension, diabetes, and AF, analyzed the association Resultados e Conclusions: A total of 496 patients were included. Of these, 86 (17.3%) had pre-stroke dementia according to the IQCODE. Atrial cardiopathy was identified in 157 patients (31.6%), while AF was present in 65 (13.1%). In crude analysis, atrial cardiopathy was not associated with pre-stroke cognitive decline (OR 0.98, 95% CI 0.86–1.11, p=0.76). Excluding AF patients, the association remained absent (OR=1.38, 95% CI=0.76–2.47, p=0.29). In multivariable regression, atrial cardiopathy was not associated with dementia (OR=0.95, 95% CI 0.56–1.59, p=0.78). Age (OR=1.03, p=0.015) and low education level (OR=1.78, p=0.040) were independently associated with dementia. In ischemic stroke patients, structural atrial heart disease was not associated with pre-stroke cognitive decline as assessed by the IQCODE. Advanced age and low education level were independent predictors of cognitive decline. These findings suggest that structural atrial heart disease alone may not be a significant factor in prior cognitive impairment. However, further studies are needed to explore its role in cognitive risk stratification.

13234

SYSTEMATIC REVIEW OF COST-COMPARISON AND COST-EFFECTIVENESS STUDIES OF LEVOSIMENDAN VERSUS DOBUTAMINE IN ACUTE HEART FAILURE

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Introduction/Background: Levosimendan and dobutamine are commonly used in acute heart failure (AHF), but economic evidence comparing these therapies remains limited. This study evaluated the economic outcomes of levosimendan versus dobutamine in adults with AHF. Objectives: To synthesise available evidence on the cost-effectiveness and cost analysis of levosimendan compared with dobutamine in adults with AHF or postoperative low-output states. Methods: A systematic search of MEDLINE, EMBASE, and the Cochrane Library was conducted through June 3, 2025, in accordance with PRISMA guidelines. An updated search was conducted in February 2026 in specialized economic evaluation databases, including EconLit, the NHS Economic Evaluation Database, and the Health Technology Assessment database. Studies comparing levosimendan and dobutamine in adults with AHF reporting cost-effectiveness outcomes or total hospital costs were included. Data extraction and quality assessment were performed using the CHEERS 2022 checklist. Resultados e Conclusions: Six studies (11,523 patients) were included. Three evaluated cost-effectiveness and three total costs. Levosimendan showed improved survival and shorter hospital stay with neutral or favorable incremental costs. ICERs ranged from €3,205 per life-year saved (Cleland) to overall cost savings of €4,787 per patient (Mardiguian). Total-cost analyses demonstrated cost neutrality (R$14,117 vs R$14,142 in Oliveira Jr.; €5,396 vs €5,275 in Lissovoy), whereas a Mexican budget impact analysis reported cost savings with levosimendan compared with dobutamine (MXN$108,673 vs MXN$117,782 per patient; approximately MXN$9,100 savings per patient). One-way sensitivity analyses confirmed result stability, while no probabilistic analyses were performed. Levosimendan was generally associated with cost neutrality or potential cost savings compared with dobutamine, mainly related to reduced hospitalization and resource utilization. Overall, the available evidence suggests a favorable economic profile, although further contemporary cost-effectiveness analyses are needed.

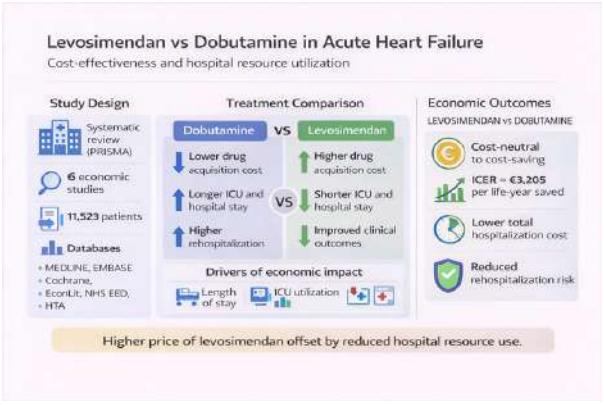


Table 1. Basic Characteristics of Included Studies

Author	Country	Perspective	Model	Population	Age	N	Cost	Time Horizon	Discount (%)	Outcomes	Sensitivity
Cleland 2003	EUR1	Healthcare	Parametric survival	AHF/CHF/POCS	59	199	Direct (drug + hosp.)	3 yrs	3	LYS	1-way
Oliveira Jr 2005	Brazil	Hospital	Cost-consequence	CHF NYHA IV AHF	58.5	18	Direct (all hospital)	Index	N/A	Total cost	None
Lissovoy 2008	FR/DE/UK	3rd payer	DRG econometric	AHF LVEF≤30%	66.5	1327	Direct (drug+hosp+proc)	180 d	N/A	LYS	1-way
Mayen-Herrera 2011	Mexico	Healthcare	Budget impact	AHF inotropes	-	1000*	Direct (ward+ICU+drug)	5 yrs	5	Total cost	None
Fedele 2011	Italy	Hospital	Deterministic incr.	AHF LVEF<40%	67	292	Direct (drug+hosp)	1 yr	N/A	Total cost	None
Mardiguian 2016	Germany	Healthcare	Markov	POCS	-	8687	Direct (all)	1 yr	3	LYS + Total	1-way

18126

TERRITORIAL INEQUALITY IN THE SUPPLY OF EMERGENCY CORONARY ANGIOPLASTY IN THE SUS: A SPATIAL ANALYSIS OF RIO DE JANEIRO STATE

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Introduction/Background: Acute Myocardial Infarction (AMI) is a time-dependent condition that requires rapid intervention, with primary coronary angioplasty established as the gold-standard treatment for reperfusion. However, in Brazil, the supply of high-complexity services is unevenly distributed, reflecting severe structural asymmetries in the organization of the public health network. Objectives: To analyze the spatial distribution of AMI hospitalizations and the supply of emergency coronary angioplasty through the SUS across the 18 microregions of Rio de Janeiro state, aiming to identify territorial inequalities, care gaps, and hubs of technological concentration. Methods: An ecological and spatial study using data from SIH/DATASUS and IBGE for the period from January to December 2024. AMI hospitalizations by microregion of residence were cross-referenced with emergency Hospital Admission Authorizations (AIH) for primary angioplasty by location of procedure. To reduce billing bias, a three-month subsequent extraction margin was applied. AMI incidence rates, supply density, and the attraction index (angioplasties performed / local hospitalizations × 100) were calculated, analyzing the demand-supply relationship across the 18 microregions of the state. Resultados e Conclusions: Half of the state's microregions showed a total absence of angioplasty supply. Populous areas such as Campos dos Goytacazes, Baía da Ilha Grande, and Bacia de São João recorded 266, 259, and 248 AMI hospitalizations, respectively, without local procedure availability. The Vale do Paraíba Fluminense, the second most populous microregion (589 AMI cases), presented an attraction index of only 1.7% (10 procedures). In contrast, centralizing hubs absorbed significant external demand: Itaperuna recorded an index of 146.46% and Nova Friburgo 100.86%, while the Rio de Janeiro microregion concentrated the highest absolute volumes (28.96% attraction). These findings highlight severe territorial inequalities in the cardiovascular emergency network. While the Serrana and Northwest regions show higher installed capacity, Northern Rio de Janeiro and the Green Coast face critical care gaps. Excessive centralization and the persistence of underserved areas result in healthcare evasion and care fragmentation. In conclusion, there is an urgent need to review regionalization policies and high-complexity service contracting within the SUS to mitigate these disparities and ensure timely, equitable access to gold-standard reperfusion therapy across all regions of the state.

21781

TROPONIN-TO-UPPER REFERENCE LIMIT RATIO AS A DOSE-RESPONSE PREDICTOR OF MORTALITY AFTER NONCARDIAC SURGERY

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Introduction/Background: Postoperative troponin elevation is associated with adverse outcomes after noncardiac surgery, but whether the magnitude of elevation relative to the assay upper reference limit identifies graded mortality risk remains uncertain. Objectives: To evaluate the troponin-to-upper reference limit ratio as a dose-response predictor of mortality after noncardiac surgery. Methods: We performed a retrospective cohort study of adult patients admitted to a surgical intensive care unit after noncardiac surgery with postoperative troponin surveillance. Peak postoperative troponin was divided by the assay-specific upper reference limit and categorized as ≤1x, >1–<5x, or ≥5x. Outcomes were 30-day and 1-year all-cause mortality. Associations were assessed using modified Poisson regression with robust variance, adjusted for age, sex, Revised Cardiac Risk Index, urgent surgery, high-risk surgery, and SAPS 3. Resultados e Conclusions: Among 2,228 patients, mean age was 63.9±16.2 years and 44.4% were male. Overall 30-day and 1-year mortality were 2.9% and 9.6%. Mortality increased stepwise across troponin-ratio categories: 30-day mortality was 1.7%, 8.0%, and 27.8% for ≤1x, >1–<5x, and ≥5x; corresponding 1-year mortality was 7.4%, 21.2%, and 48.6%. After adjustment, compared with ≤1x, >1–<5x was associated with higher 1-year mortality (adjusted risk ratio [aRR] 1.65, 95% CI 1.15–2.37), while ≥5x identified a markedly higher risk (aRR 2.69, 95% CI 1.82–3.97; p for trend <0.001). For 30-day mortality, adjusted risk increased from >1–<5x (aRR 2.56, 95% CI 1.27–5.14) to ≥5x (aRR 7.05, 95% CI 3.78–13.13; p for trend <0.001). As a continuous variable, each doubling of 1+troponin ratio was associated with higher 30-day (aRR 1.41, 95% CI 1.24–1.60) and 1-year mortality (aRR 1.22, 95% CI 1.12–1.33). Adding troponin-ratio categories to the clinical model improved 1-year mortality discrimination (C-statistic 0.792 to 0.811; likelihood-ratio p<0.001). Conclusions: The postoperative troponin-to-upper reference limit ratio showed a clear dose-response association with mortality after noncardiac surgery. Values ≥5x identified a particularly high-risk phenotype and may support early postoperative risk stratification beyond traditional clinical variables.

Cardiac Arrhythmias / Electrophysiology / Electrocardiography / Cardiac Pacing



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16775

ASSOCIATION BETWEEN INTERATRIAL BLOCK AND CARDIOVASCULAR OUTCOMES IN AFRICAN AMERICANS: EVIDENCE FROM THE JACKSON HEART STUDY

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Introduction/Background: Interatrial block (IAB), also recognized as Bayés Syndrome, is classified as partial (P-wave duration ≥ 120 ms with normal axis) or advanced (P-wave duration ≥ 120 ms with biphasic morphology in inferior leads). Both forms are associated with worse cardiovascular outcomes. However, African American populations remain significantly underrepresented in studies examining these associations. Objectives: To evaluate the prognostic value of partial and advanced IAB on cardiovascular and thromboembolic outcomes in an exclusively African American cohort using data from the Jackson Heart Study. Methods: We analyzed the prospectively collected data from the Jackson Heart Study, a community-based cohort of Black American adults aged 21–94 years. IAB was classified as partial (P-wave duration ≥120 ms; axis 0°–90°) or advanced (P-wave duration ≥120 ms; axis <0° with biphasic morphology in inferior leads). Participants with P-wave duration <120 ms served as the reference group (No IAB). Individuals with non-sinus rhythm, pacemaker use, unreadable or missing ECG data, or prevalent heart failure (HF) were excluded. Group comparisons used Kruskal–Wallis and chi-square tests. Kaplan–Meier and multivariable Cox models adjusted for major cardiovascular risk factors were used to evaluate coronary heart disease (CHD), HF, stroke, major adverse cardiovascular events (MACE), and all-cause mortality. Resultados e Conclusions: After exclusions, 3,646 participants were included: 1,974 (54.1%) without IAB, 1,639 (44.9%) with partial IAB, and 33 (0.9%) with advanced IAB. Baseline characteristics are summarized in Table 1. Over a median follow-up of approximately 11 years, advanced IAB was independently associated with MACE (HR 2.93; 95% CI 1.30–6.62). Partial IAB was independently associated with incident CHD (HR 1.46; 95% CI 1.03–2.07). No significant associations were observed between either IAB subtype and HF, stroke, or all-cause mortality. In this large African American cohort, advanced IAB was associated with increased risks of MACE, while partial IAB predicted incident CHD. These findings support the prognostic relevance of routine ECG identification of IAB in African American adults. However, the small number of advanced IAB cases resulted in wide confidence intervals, warranting cautious interpretation and confirmation in larger cohorts.

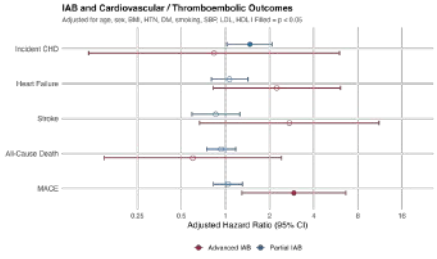


Table 1. Baseline Characteristics and Outcomes by Interatrial Block Status

Characteristic	Overall N = 3,476	No IAB N = 1,973	Partial IAB N = 1,639	Adv. IAB N = 34	*P*
Demographics					
Age, years	55 (13)	53 (13)	57 (12)	55 (14)	<0.001
Female sex	2,287 (63%)	1,369 (69%)	898 (55%)	20 (59%)	<0.001
BMI, kg/m² (Obese ≥30)	32 (7) / 54%	31 (7) / 49%	33 (7) / 60%	34 (7) / 67%	<0.001
Waist circumference, cm	101 (16)	98 (16)	104 (16)	106 (19)	<0.001
Cardiovascular Risk Factors					
Hypertension	2,051 (56%)	952 (49%)	1,067 (65%)	22 (65%)	<0.001
Diabetes mellitus	817 (23%)	409 (21%)	402 (25%)	6 (18%)	0.021
Systolic BP, mmHg	127 (17)	126 (16)	129 (17)	125 (13)	<0.001
eGFR, mL/min/1.73m²	95 (22)	97 (22)	91 (22)	95 (25)	<0.001
Statin use	477 (13%)	220 (11%)	255 (16%)	2 (5.9%)	<0.001
Current smoker	476 (13%)	276 (14%)	199 (12%)	1 (2.9%)	0.050
ECG Parameters					
P-wave duration, ms	118 (13)	109 (7)	129 (9)	132 (11)	<0.001
PR interval (lead II), ms	173 (28)	163 (24)	185 (27)	187 (38)	<0.001
QRS duration, ms	94 (14)	91 (13)	98 (15)	95 (11)	<0.001
QTc, ms	426 (27)	426 (27)	427 (28)	420 (24)	0.2
Echocardiographic Parameters					
LA diameter 2D, mm	35.0 (4.4)	34.3 (4.2)	35.9 (4.6)	36.2 (3.8)	<0.001
LA dilation — Mild	511 (15%)	205 (11%)	298 (19%)	8 (24%)	<0.001
LVEF, %	62 (7)	62 (7)	62 (8)	62 (8)	0.048
LV mass index, g/m²	75 (21)	72 (20)	77 (23)	73 (16)	<0.001
MR ≥ mild	720 (20%)	367 (19%)	343 (21%)	10 (29%)	0.079
Clinical Outcomes					
Prevalent CVD	358 (9.8%)	159 (8.1%)	196 (12%)	3 (8.8%)	<0.001
Follow-up, years	11.1 (2.7)	11.3 (2.5)	10.9 (2.9)	11.2 (2.9)	0.030
Incident CHD	169 (5.1%)	67 (3.6%)	100 (6.8%)	2 (6.5%)	<0.001
Incident HF	235 (7.3%)	105 (6.0%)	126 (8.7%)	4 (15%)	0.003
Incident stroke	141 (4.1%)	71 (3.8%)	68 (4.5%)	2 (6.9%)	0.5
All-cause death	373 (10%)	187 (9.5%)	182 (11%)	4 (12%)	0.3
MACE	447 (15%)	208 (12%)	232 (17%)	7 (27%)	<0.001
Incident cancer, n (%)	245 (7.0%)	129 (6.7%)	113 (7.2%)	3 (9.1%)	—
Adj. HR (Partial/ Advanced)	—	Ref.	0.83 (0.63–1.10)	0.91 (0.23–3.69)	0.19/0.90
Any hospitalization, n (%)	2,131 (58.7%)	1,104 (56.2%)	1,006 (61.8%)	21 (63.6%)	—
Adj. HR (Partial/ Advanced)	—	Ref.	0.99 (0.90–1.08)	1.08 (0.68–1.72)	0.77/0.74
Functional decline, n (%)	1,106 (33.6%)	567 (31.4%)	527 (36.2%)	12 (37.5%)	—
Adj. HR (Partial/ Advanced)	—	Ref.	0.96 (0.85–1.10)	1.20 (0.64–2.24)	0.57/0.57
Kidney Function					
eGFR baseline / follow-up	—	99.0 / 88.4	92.9 / 82.3	99.4 / 94.2	—
Rapid decline ≥25%, n (%)	423/2628 (16.1%)	204/1411 (14.5%)	217/1197 (18.1%)	2/20 (10.0%)	—
Adj. OR (any IAB vs No IAB)	1.01 (0.81–1.27)	Ref.	—	—	0.90

Data as mean (SD) or n (%). Adj. HR/OR: Cox/logistic models adjusted for age, sex, BMI, hypertension, diabetes, smoking, SBP, LDL, HDL.
IAB = interatrial block; eGFR = estimated glomerular filtration rate; MACE = major adverse cardiovascular events; HF = heart failure; MR = mitral regurgitation; LV = left ventricular.

21705

CLINICAL CHARACTERISTICS, HIGH-RISK CRITERIA, AND OUTCOMES OF ACCESSORY PATHWAY ABLATION IN CHILDREN: A COMBINED PROSPECTIVE-RETROSPECTIVE STUDY

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Introduction/Background: Ventricular pre-excitation is a primary cause of supraventricular tachycardia (SVT) in children. While many patients are asymptomatic, rapid anterograde conduction through the accessory pathway (AP) carries a risk of life-threatening arrhythmic events. Effective risk stratification remains a clinical priority, necessitating a multifaceted approach combining non-invasive and invasive evaluations to prevent sudden cardiac death. Objectives: To describe the clinical and electrocardiographic profile of pediatric patients with ventricular pre-excitation, evaluate acute and long-term transcatheter ablation outcomes, and identify specific factors associated with tachyarrhythmia recurrence. Methods: This longitudinal study included pediatric patients with ventricular pre-excitation and/or AP-mediated SVT evaluated between 2020 and 2025 at a tertiary pediatric cardiology center. Diagnostic workup involved clinical evaluation, 12-lead ECG, 24-hour Holter monitoring, and exercise stress testing. In patients referred for intervention, conventional electrophysiological study (EPS) was performed with multipolar intracavitary catheter placement and analysis of conduction intervals. High-risk EPS criteria were: shortest pre-excited R-R interval (SPERRI) during induced atrial fibrillation or rapid atrial pacing ≤250 ms, AP anterograde effective refractory period (APERP) ≤240 ms, multiple accessory pathways, or septal/parahissian location. 3D electroanatomical mapping was reserved for high anatomical complexity or re-ablation. Recurrence predictors were analyzed using logistic regression (OR; 95% CI). Resultados e Conclusions: We evaluated 78 patients (mean age 10.3 ± 3.6 years). Symptoms occurred in 67%, primarily palpitations, documented SVT, and syncope. High-risk EPS criteria were identified in 35 patients (45%). Ablation was indicated in 69 patients (88%), with an acute success rate of 92% (n=63; 95% CI: 83–96%). Over a mean follow-up of 24 months, recurrence occurred in 9 patients (12%; 95% CI: 6–21%). Multivariate analysis identified septal AP location (OR 3.1; 95% CI: 1.2–8.3; p=0.02) and the presence of multiple APs (OR 2.8; 95% CI: 1.1–7.2; p=0.03) as independent predictors of recurrence. No permanent major complications, including high-degree AV block, were observed. In septal/parahissian cases, the ablation strategy was individualized to prioritize the safety of the atrioventricular conduction system.

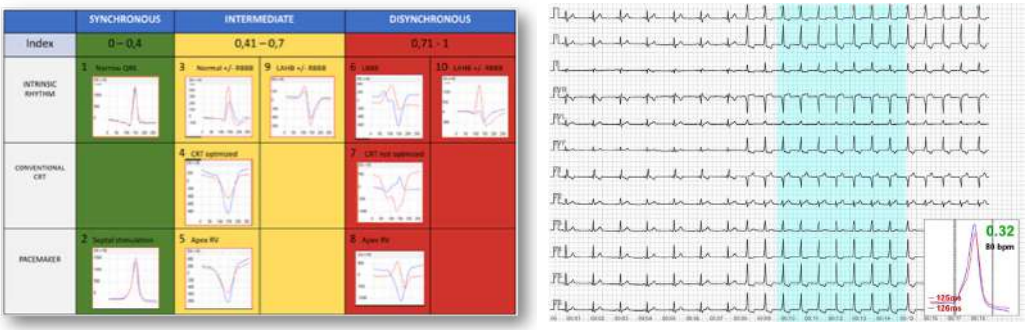
15673

ELECTRICAL SYNCHRONY-GUIDED CARDIAC PACING FOR PREVENTION OF PACING-INDUCED CARDIOMYOPATHY

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Introduction/Background: The paradigm of cardiac pacing has shifted from traditional high ventricular apex (RVA) stimulation, which causes left bundle branch block (LBBB) and cardiomyopathy in 30% of cases, toward more physiological approaches. While His-bundle pacing faced technical hurdles, left bundle branch area pacing (LBBAP) has emerged as a preferred alternative. With 15 years of expertise, our group achieves high clinical success using conventional leads guided by electrical synchrony to prevent ventricular dysfunction and the subsequent need for CRT upgrades. Objectives: To evaluate the impact of electrical synchrony-guided physiological pacing on ventricular function, assessed via Doppler echocardiography, as a strategy to prevent myocardial dysfunction. Methods: This prospective multicenter study included patients 18 years of age or older with indications for permanent cardiac pacing. Implantation was performed using physiological pacing guided by electrical synchrony (Synchromax method). Clinical, electrical, and echocardiographic parameters were evaluated at baseline and during follow-up (minimum 2 months post-implant). Physiological pacing was defined by the achievement of a Synchromax Type 2 curve according to standardized charts. Resultados e Conclusions: Results: A total of 135 patients from centers in Argentina were enrolled (mean age 74 years; 68% male). Comorbidities included hypertension (82.4%), dyslipidemia (38%), and diabetes (14.6%). The primary indication was sick sinus syndrome (38%). During a mean follow-up of 9 months, the Type 2 pacing curve was achieved in 93% of patients and remained stable in all cases. Baseline Left Ventricular Ejection Fraction (LVEF) was 56.2%, significantly increasing to 59.4% during follow-up (p=0.018). In patients with baseline dyssynchrony (28% of the cohort; Curves #6 and #10), LVEF improved from a subnormal mean of 52.8% to 59.4% post-implantation (p=0.019). No significant changes were observed in lead thresholds, impedance, or sensing. The mean pacing burden was 76%. There were no reported complications, no CRT upgrades or heart failure-related hospitalizations. Conclusions: Electrical synchrony-guided physiological pacing significantly improves LVEF, particularly in patients with baseline ventricular impairment, and maintains stable electrical parameters over time. This technique represents a robust strategy to prevent pacing-induced ventricular dysfunction and reduce the long-term need for CRT upgrades.



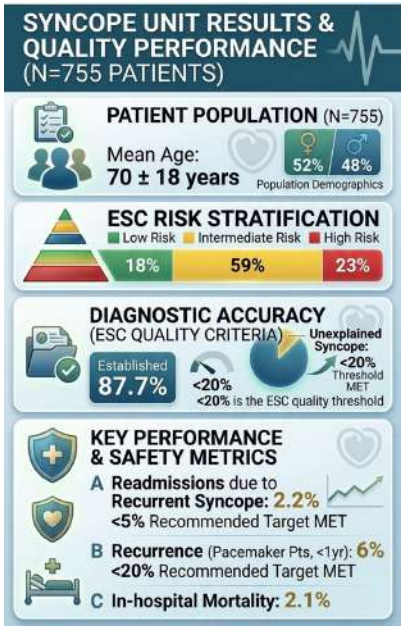
14035

FIVE-YEAR PERFORMANCE OF A STRUCTURED SYNCOPE UNIT IN BRAZIL: DIAGNOSTIC YIELD, READMISSIONS, AND SAFETY OUTCOMES IN 755 CONSECUTIVE PATIENTS

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Introduction/Background: Background: Syncope Units structured according to the European Society of Cardiology (ESC) recommendations and the 2015 ESC Syncope Unit Position Paper aim to improve diagnostic accuracy, optimize resource utilization, and enhance patient safety through standardized care pathways and quality indicators. However, long-term real-world data from Latin America remain limited. Objectives: Objective: To evaluate the performance of a structured Syncope Unit in a Brazilian tertiary hospital over five consecutive years (2020–2025), using ESC Syncope Unit quality indicators. Methods: Methods: We conducted a prospective registry including all consecutive patients evaluated by the hospital Syncope Unit between January 2020 and December 2025. Clinical characteristics, ESC guideline-based risk stratification, diagnostic tests, final diagnosis, interventions, and quality indicators were systematically recorded. Service performance was assessed according to ESC Syncope Unit quality criteria described in the 2015 ESC Syncope Unit Position Paper. Primary outcomes included diagnostic yield, proportion of unexplained syncope, readmissions due to recurrent syncope, recurrence after pacemaker implantation (<1 year), and in-hospital mortality. Resultados e Conclusions: Results: A total of 755 patients were included (mean age 70±18 years; 52% female). According to ESC syncope risk criteria, 18% were low risk, 59% intermediate, and 23% high risk. An established diagnosis was achieved in 87.7% of patients; unexplained syncope accounted for 12.3%, which remained consistently below the ESC quality threshold of <20%. Readmissions due to recurrent syncope occurred in 2.2%, below the recommended <5%. Among patients with pacemakers, recurrence within 1 year was 6%, well under the recommended <20%. In-hospital mortality was 2.1%. These quality indicators remained stable and within ESC-recommended targets across all five years. Conclusion: This five-year real-world Brazilian cohort demonstrates that a structured Syncope Unit operating in accordance with ESC Syncope Unit quality criteria can achieve a high diagnostic yield, low rates of unexplained syncope, and excellent safety outcomes. These findings support the feasibility and effectiveness of implementing ESC Syncope Unit standards in Latin American tertiary hospitals.



15950

MASKED BUNDLE BRANCH BLOCK VS. BIFASCICULAR BLOCK: A PROGNOSTIC ANALYSIS THROUGH ELECTROPHYSIOLOGICAL STUDY

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Introduction/Background: Masked bundle branch block (MBBB) is a form of standard bifascicular bundle branch block (BBB) that combines features of left bundle branch block (LBBB) and right bundle branch block (RBBB), and may indicate a worse prognosis and greater clinical severity. Objectives: To compare MBBB with standard BBB regarding clinical outcomes and functional or structural impairment. Methods: This was a comparative observational study with a cross-sectional baseline analysis and 24-month follow-up, approved by the local ethics committee under protocol number 1.378.059. Seventy adult patients were conveniently selected, of whom 45 underwent echocardiography, 24-hour Holter monitoring, electrophysiological study (EPS), laboratory testing, and serologic testing for Chagas disease or coronary angiography when indicated for etiologic assessment; 25 patients was not included for clinical reasons or refusal after inclusion. Patients with hemodynamic instability, age <18 years, and pregnancy were excluded. Participants were classified into two groups according to the electrocardiographic pattern, as assessed by two independent electrophysiologists: MBBB (G1, n=27) and standard BB (G2, n=18). A significance level of 5% (p<0.05) was adopted. Resultados e Conclusions: Mean age was 68.0 ± 11.7 years in G1 and 68.1 ± 11.3 years in G2. The most frequent etiology in both groups was chronic Chagas cardiomyopathy (66.7% vs. 54.5%), followed by coronary artery disease (16.7% vs. 22.7%). Palpitations were less frequent in G1 (15.9% vs. 50.0%; p=0.003). Patients with MBBB had larger left ventricular diameters (53.0 ± 11.6 mm vs. 43.0 ± 12.7 mm; p=0.002) and lower Teichholz ejection fraction (37.2% ± 13.9 vs. 51.0% ± 14.6; p<0.001). Persistent atrial fibrillation was more frequent in G1 (39.5% vs. 12.0%; p=0.018). Mean HV interval was longer in G1 (66.3 ± 18.3 ms vs. 52.9 ± 8.1 ms; p=0.006), with no significant difference in AH interval. During follow-up, 13 patients in G1 required pacemaker implantation, whereas no patient in G2 reached this endpoint (29.5% vs. 0%; p=0.001). There was also a trend toward higher mortality in G1 compared with G2 (25.0% vs. 7.4%; p=0.054). In this analysis, patients with MBBB showed greater structural and functional left ventricular impairment, higher prevalence of atrial fibrillation, and more pronounced infra-hissian conduction delay, with a higher frequency of progression to pacemaker implantation and/or death during follow-up, suggesting greater clinical severity compared with standard bifascicular block.

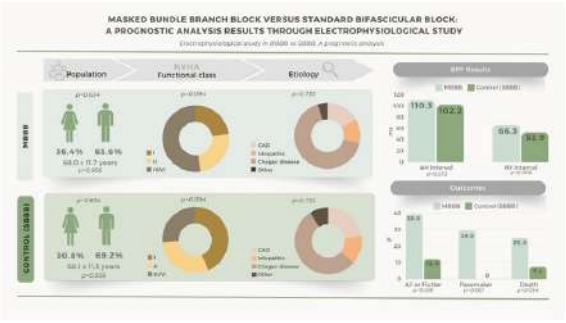


Table. Distribution of the composite outcome (death or need for pacemaker implantation) between the MBBB and Control groups.

	Group		
	MBBB	Control	P*
	N (%)	N (%)	
Composite outcome			**0.007**
Yes	28 (68.3)	9 (34.6)	
No	13 (31.7)	17 (65.4)	

* Pearson's chi-square test.

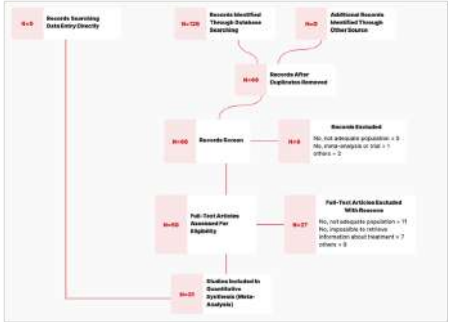
13988

PAINFUL LEFT BUNDLE BRANCH BLOCK SYNDROME: A SYSTEMATIC REVIEW OF TREATMENT STRATEGIES IN CASE REPORTS

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Introduction/Background: The phenomenon of Painful Left Bundle Branch Block (PLBBB) was first brought into medical discourse by Vieweg in 1976, it presents a unique clinical challenge. Researchers reported a case of left bundle branch block (LBBB) and angina occurring during exercise without detectable coronary angiography abnormalities. This laid the foundation for the current understanding of “Painful LBBB Syndrome.” The underlying causes of this condition are yet to be understood. Sudden onset and resolution of pain in this syndrome do not typically align with coronary lesions or spasms causing myocardial ischemia. This systematic review aims to synthesize available case reports, focusing on treatment choices and patient outcomes, to better understand this rare but impactful cardiac phenomenon. Objectives: To enhance the clarity of PLBBB Syndrome management, deepening overall awareness of its clinical significance and therapeutic approaches. Methods: Databases including PubMed, Scopus, Web of Science, and Scielo were searched without restrictions on language or publication date. Following PRISMA guidelines, 128 articles were identified, with 31 meeting inclusion criteria. Data were extracted on patient demographics, clinical presentation, treatment regimens, and outcomes, using Microsoft Excel and assessed for bias with the Joanna Briggs Institute's tool. Resultados e Conclusions: The analysis included 45 patients with a mean age of 55.46 ± 12.23. Predominantly, LBBB episodes occurred during exercise (73.3%). Initial treatments comprised beta-blockers/calcium channel blockers (55.56%), pacemaker implantation (13.3%), antianginal medications (13.3%), and other modalities (17.7%). Refractoriness to initial treatment was observed in 66.7% of patients, with subsequent pacemaker implantation resolving symptoms in most cases. An overall satisfactory response was seen in 73.3% of patients post-treatment adjustments. The diverse approaches in treatment highlight the necessity for tailored therapeutic strategies. While pacemakers have demonstrated efficacy in controlling symptoms in several reported cases, it is essential to recognize the complex nature of this intervention. Pacemaker implantation, being a surgical procedure, carries long-lasting implications for patients. Hence, the continuation of pharmacological treatments might still be preferable until more definitive research is available. This review emphasizes the urgent need for further research to establish evidence-based guidelines to optimize outcomes for PLBBB.



Summarized Initial and Sequential Treatment Options

First Treatment (n)	Refractoriness	Second Treatment (n)
Beta blockers and Calcium Channel Blockers (25)	22	• Pacemaker (9) • Dual chamber (2) • His pacing (3) • BIV (3) • LBBAP (1) • Theophylline (1) • Increase in betablocker dose (2)
Antianginal (6)	5	• Pacemaker (2) • LBBAP (2) • Increase in Calcium Channel Blocker dose (1)
Pacemaker (6)	1	• Device programming adjustments (1)
Other (8)	3	• Pacemaker BIV (1) • Exercise prescription (1)

Abbreviations: BIV: Biventricular pacing (cardiac resynchronization therapy); LBBAP: Left bundle branch area pacing.

16769

PATHOGENIC VARIANTS IN MOLECULAR TESTING AND SUDDEN CARDIAC DEATH: PREVALENCE, SENSITIVITY AND SPECIFICITY IN A PROSPECTIVE COHORT STUDY

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Introduction/Background: Pathogenic variants (PV) identified in whole exome sequencing (WES) of genetic testing have been reported in association with inherited cardiac diseases (channelopathies and arrhythmogenic cardiomyopathies) and sudden cardiac death (SCD). Objectives: To investigate the prevalence, sensitivity and specificity of PV in the diagnosis of patients with a SCD history in a cohort of a reference hospital. Methods: Prospective, cohort study, from 2022 to 2026, including 253 patients with a personal and/or family history of SCD and suspected inherited cardiac disease, referred for WES. PV were identified in 174/253 patients: 111/253 associated with SCD (channelopathies and arrhythmogenic cardiomyopathies) and 63/253 with other PV. Age: 3 months to 91 yo (mean= 43 yo), Sex: female in 138/253 patients. Variables analyzed: PV, history of SCD, phenotypic manifestation, electrocardiogram, echocardiogram and cardiac magnetic resonance imaging. PV results were expressed as prevalence and the remaining outcomes were expressed as incidence over the study period. Resultados e Conclusions: The prevalence of PV associated with SCD was 44% (111/253): TTR (cardiac amyloidosis) in 17% (42/253); SCN5A (Brugada and long QT syndrome) in 5% (12/253); KCNH2 (long QT syndrome) in 3% (7/253); FLNC (dilated cardiomyopathy) in 5% (12/253); LMNA (cardiomyopathy) in 1% (3/253); MYH7 (hypertrophic cardiomyopathy) in 4% (10/253); MYBPC3 (hypertrophic cardiomyopathy) in 4% (10/253); PKP2 (arrhythmogenic cardiomyopathy) in 1% (3/253); other cardiomyopathies TTN in 1% (2/253); ALPK3 in 1% (2/253); PRKAG2 in 1% (2/253); and TNNI3K in 0,4% (1/253). (Figure 1). The incidence of SCD death among patients with PV associated with channelopathies and/or arrhythmogenic cardiomyopathies was 59% (65/111): 56% (62/111) in family members and 7% (8/111) in probands. Sensitivity and specificity of PV for the diagnosis of SCD were 68% (65/96) and 51% (48/94), respectively. (Table I). Conclusions: In this cohort of a reference hospital, a high prevalence (44%) of PV associated with SCD was observed, as well as a high incidence of SCD in this group (59%). The sensitivity and specificity of the PV for the diagnosis of SCD were significant, 68% and 51%, respectively. The main PV associated with SCD were found in TTR (17%), SCN5A (5%), FLNC (5%), MYH7 (4%), and MYBPC3 (4%) genes. These findings highlight the importance of precision medicine in the evaluation of patients with suspected inherited cardiac diseases and SCD.

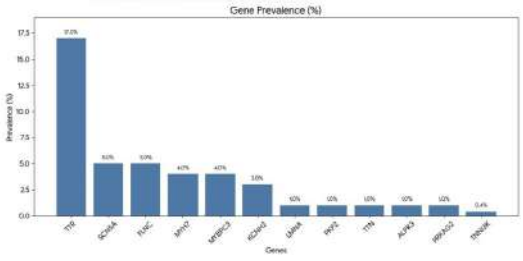


Figure 1

Pathogenic Variant n= 253	SCD (family) n= 92	SCD (personal) n= 9	SCD (family or personal) n= 96	Pathogenic Variant (SCD)	Pathogenic Variant (other)	Se	Sp
Positive Test n= 174	62	8	65	111	63	68% (65/96)	-
Negative Test n= 79	30	1	31	-	-	-	51% (48/94)

SCD: sudden cardiac death; Se: sensitivity; Sp: specificity

Table I

Cardio-Oncology

81º CONGRESSO BRASILEIRO DE CARDIOLOGIA together with WORLD CONGRESS OF CARDIOLOGY

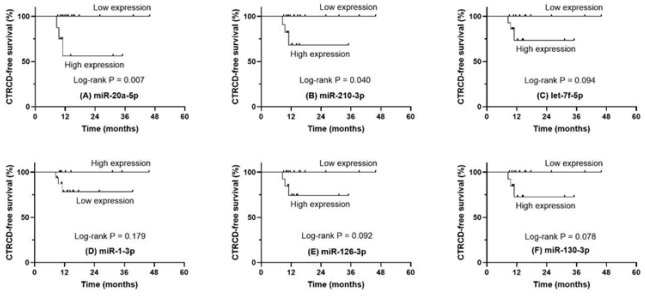
16603

MIR-20A-5P AND MIR-210-3P AS PREDICTIVE BIOMARKERS OF TRASTUZUMAB-RELATED CARDIOTOXICITY IN ANTHRACYCLINE-FREE HER2-POSITIVE BREAST CANCER: A PROSPECTIVE PILOT STUDY

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Introduction/Background: Cancer therapy-related cardiac dysfunction (CTRCD) is a clinically significant complication in HER2-positive breast cancer patients treated with trastuzumab (TTZ). Traditional biomarkers such as troponin and natriuretic peptides show limited predictive accuracy for early risk stratification. Circulating microRNAs (miRNAs) have emerged as promising non-invasive biomarkers; however, evidence in anthracycline-free, TTZ-treated populations remains scarce. Objectives: To evaluate the predictive capacity of six circulating serum miRNAs for CTRCD development in patients with early-stage HER2-positive breast cancer undergoing TTZ therapy without prior anthracycline exposure. Methods: Prospective cohort study of consecutive women aged ≥18 years with early-stage HER2-positive breast cancer treated at a breast oncology outpatient clinic (March 2019–March 2022), approved by the local ethics committee (protocol No. 2019-0010). Patients with prior anthracycline-based regimens were excluded. CTRCD was defined as LVEF reduction >10 percentage points to below 53%. Blood samples were collected before TTZ initiation. miRNA expression was quantified by RT-PCR. Participants were stratified into low- and high-expression groups for six prespecified miRNAs (let-7f-5p, miR-1-3p, miR-20a-5p, miR-126-3p, miR-130-3p, miR-210-3p) using optimal cut-offs by the Youden index. Time-to-event analyses used Kaplan-Meier curves and log-rank tests. Resultados e Conclusions: Twenty-five patients (mean age 55.7±12.4 years) were followed for a median of 12.4 months (IQR 10.7–16.6; 34.4 patient-years). CTRCD occurred in 3 patients (12.0%). High baseline expression of miR-20a-5p and miR-210-3p was significantly associated with lower CTRCD-free survival (log-rank p=0.007 and p=0.040, respectively; Figure 1A–B). Elevated baseline levels of miR-20a-5p and miR-210-3p demonstrated 100% sensitivity and specificities of 77.3% and 63.6%, respectively, for predicting CTRCD development. Conclusion. In this hypothesis-generating pilot study, elevated pre-treatment levels of miR-20a-5p and miR-210-3p predicted CTRCD development in early HER2-positive breast cancer patients receiving TTZ without prior anthracyclines. These findings warrant validation in larger prospective cohorts before clinical application.



16727

PREHABILITATIVE EXERCISE IMPROVES CARDIORESPIRATORY FUNCTION IN ADULTS WITH LUNG CANCER ELECTED FOR SURGERY: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introduction/Background: Patients with cancer awaiting surgery often have reduced functional reserve, which can negatively affect perioperative outcomes. Exercise-based prehabilitation has gained attention as a way to improve cardiorespiratory fitness and better prepare patients for surgical stress. From a cardiovascular perspective, major surgery can be viewed as a stress test of physiologic reserve, making preoperative optimization particularly relevant. Objectives: To assess whether prehabilitative exercise improves cardiorespiratory function in adults with lung cancer elected for surgery. Additionally, we assessed whether this effect varies according to demographic, methodological and exercise modality characteristics. Methods: We searched seven databases from inception to June 2026 (CRD420251072796). Studies examining the effects of exercise-based prehabilitation in adults with lung cancer elected for surgery were included. A three-level mixed-effects meta-analysis was used, and results were expressed as standardized mean difference (SMD) with 95% confidence intervals. Subgroup and meta-regression analyses were performed based on demographic, methodological and exercise modality characteristics. Resultados e Conclusions: Ten studies were included. Patients with lung cancer (n= 805, 52.6% males) had a median age of 64 (IQR: 63.6, 66.9) years and BMI of 24.4 (IQR: 24.0, 24.7) kg.m-2. A total of 38.8% were elected for open surgery. Prehabilitative exercise modalities comprised aerobic (AE) or combined aerobic and resistance exercise (COMB). Prehabilitative exercise resulted in a significant improvement of 0.31 SMD (95% CI: 0.04–0.59; p=0.030; I2=28%) in overall cardiorespiratory function. In regard to subgroup analysis, benefits were evident in preoperative assessments, whereas cardiorespiratory function was preserved postoperatively. AE showed more consistent benefits than COMB. Cardiac and respiratory outcomes did not reach statistical significance when individually analysed. Benefits were irrespective of age or sex. Overall, our findings indicate that prehabilitative aerobic-based exercise programmes may improve preoperative cardiorespiratory function. Considering the limited available evidence, further investigation is warranted.

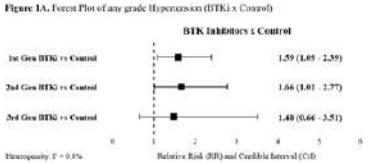
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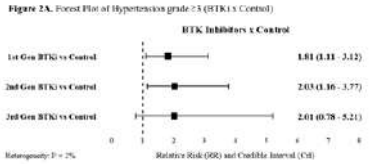
RISK OF HYPERTENSION IN PATIENTS TREATED WITH BRUTON'S TYROSINE KINASE INHIBITORS FOR ONCOHEMATOLOGICAL MALIGNANCIES: AN UPDATED BAYESIAN SYSTEMATIC REVIEW AND NETWORK META-ANALYSIS OF RANDOMIZED CLINICAL TRIALS

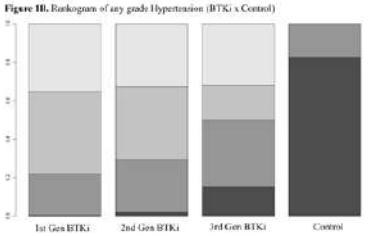
FELIPE GILDO VILELA MIRANDA SANTOS1; CAUÃ ARAUJO DE CARVALHO1; PEDRO VITOR DE BRITO FERREIRA1; DAVI CHAVES ROCHA DE SOUZA1; JOÃO VITOR BENJAMIM PIRES1; JOÃO VICTOR TEIXEIRA COSTA1; EDVAN DE QUEIROZ CRUSOÉ1;

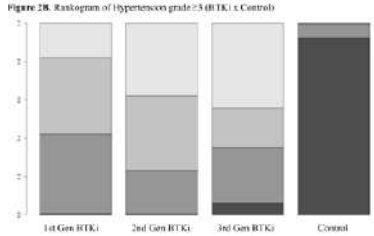
(1) UNIVERSIDADE FEDERAL DA BAHIA - SALVADOR - BA - BRASIL;

Introduction/Background: Introduction: Bruton's tyrosine kinase inhibitors (BTKi) transformed the treatment of linked B-cell malignancies and chronic lymphocytic leukemia (CLL). However, this therapy has been associated with cardiovascular adverse effects – frequently hypertension (HTN) – and new generations of BTKi's were developed to reduce these risks. Nonetheless, it lacks an accurate comparison between each generation's HTN risk. Consequently, an exhaustive review of HTN incidence with each generation of BTKi is necessary to provide information on how to manage these patients. Objectives: Objective: To compare the risk of HTN between patients treated with different generations of BTKi for oncohematological malignancies. Methods: Methods: We strictly applied the PRISMA guidelines for network meta-analyses systematically searching PubMed, Cochrane and Embase on April 1st, 2026, for randomized clinical trials reporting HTN in patients with oncohematological malignancies enrolled for BTKi treatment. The primary outcome was any grade HTN and secondary outcome was HTN grade3. Data were extracted for statistical analysis using Excel and Rayyan software. Statistical bayesian network analysis was performed using RStudio (version 2024.12.1) and heterogeneity was assessed with I² statistics. Risk of bias was assessed with Cochrane RoB 2 tool and findings were summarized with GRADE assessment. Resultados e Conclusions: From 4,830 reports, 24 studies met the selection criteria and were analyzed, resulting in 11,013 patients. Primary outcome analysis (I²=0.8%) showed an increased risk of any grade HTN in 1st generation (ibrutinib) (RR 1.59; CrI 95% 1.09-2.39; SUCRA 0.29) and 2nd generation BTKi (acalabrutinib, zanubrutinib) (RR 1.66; CrI 95% 1.01-2.77; SUCRA 0.33), with inconclusive increase in 3rd generation BTKi (pirtobrutinib) (RR 1.48; CrI 95% 0.66-3.51; SUCRA 0.44), compared to control (SUCRA 0.93). Secondary outcome analysis (I²=2%) showed increased risk of grade 3 HTN in 1st generation (RR 1.81; CrI 95% 1.11-3.12; SUCRA 0.42), 2nd generation (RR 2.03; CrI 95% 1.16-3.77; SUCRA 0.29), with inconclusive increase in 3rd generation BTKi (RR 2.01; CrI 95% 0.78-5.21; SUCRA 0.32), compared to control (SUCRA 0.97). These findings indicate that early BTKi generations are associated to hypertension and the 1st generation appears to be less harmful in grade 3 hypertension. Therefore, patients being treated with 1st or 2nd BTKi generations potentially benefit from attentive control of treatment-developed hypertension.









20135

SEX-SPECIFIC LEFT VENTRICULAR SYSTOLIC FUNCTION RESPONSE TO AEROBIC EXERCISE DURING ANTHRACYCLINE CHEMOTHERAPY: AEROHEMONCO SECONDARY ANALYSIS

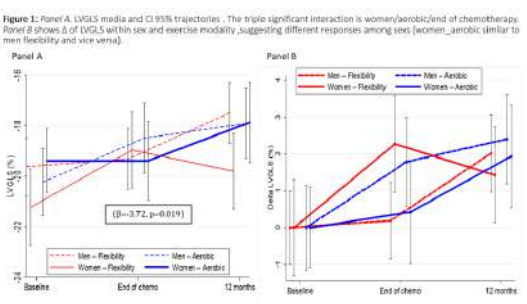
LUCIA FLORIO1; SANTIAGO RIVOIR1; SOLEDAD MURGUIA1; MATILDE BOADA1; VICTOR DAYAN1;

(1) HOSPITAL DE CLINICAS - URUGUAY;

Introduction/Background: Aerobic exercise is recommended to mitigate cancer therapy-related toxicity, and left ventricular global longitudinal strain (LVGLS) is sensitive to early systolic changes. The AEROHEMONCO randomized trial did not demonstrate an overall benefit of aerobic exercise in preventing systolic deterioration in lymphoma patients receiving anthracycline-based chemotherapy. Whether responses differ by sex remains uncertain. Objectives: To evaluate sex-by-intervention differences in systolic function at the end of anthracycline chemotherapy and at 12 months. Methods: AEROHEMONCO randomized patients with lymphoma to a supervised 12-week aerobic (active) or flexibility (control) exercise program during chemotherapy (19 subjects in each group). Echocardiography was performed at baseline, at the end of chemotherapy, and 12 months. LVGLS (primary outcome) and left ventricular ejection fraction (LVEF) were analyzed using mixed-effects models with random intercepts for participants and fixed effects for period, group, sex, and their interactions. A nonparametric sensitivity analysis compared within-subject LVGLS changes (Δ) using Mann–Whitney tests. Resultados e Conclusions: Basal characteristics by sex and group are shown in Table 1. In the LVGLS mixed model (n=102 measures, 38 participants), the Period×Group×Sex interaction was significant (p=0.032). The three-way interaction term (women_aerobic_the end of chemotherapy) was significant (β = −3.72, p=0.019), whereas the corresponding term at 12 months was not (p=0.946). Model-predicted LVGLS at the end of chemotherapy was -19.38% in women-aerobic vs -18.96% in women-flexibility, while men showed the opposite pattern (-18.48% aerobic vs -19.31% flexibility) (Figure 1). In the LVEF mixed model (n=103), LVEF declined over time (end of chemotherapy β=-2.84%, p=0.008; 12 months β=-4.66%, p<0.001) with no significant interactions. In the nonparametric sensitivity analysis, within the flexibility group, women showed greater LVGLS deterioration during chemotherapy than men (Δbaseline→end chemotherapy: median 2.20 vs -0.40; p=0.0001), while men worsened more from the end of chemotherapy to 12 months (Δend chemotherapy→12 months: median 1.80 vs -0.60; p=0.0006). In the aerobic group, men deteriorated during chemotherapy (median 1.80 vs -0.30; p=0.039). LVGLS trajectories were consistent with a sex-dependent intervention pattern at the end of chemotherapy (significant PeriodxGroupxSex interaction). These findings are hypothesis-generating and support confirmation in larger studies.

Variable	Flex – Men (n=12)	Flex – Women (n=7)	p	Aerob – Men (n=9)	Aerob – Women (n=10)	p
Age, years Median, IQR	54 [42-62.5]	36 [26-60]	0.35	45 [41-61]	48.5 [45-67]	0.62
Weight, kg	70.03 ± 9.54	69.28 ± 20.68	0.94	73.74 ± 15.10	69.52 ± 16.73	0.57
Muscle mass, %	28[26-36]	24.4 [21.3-25.8.1]	0.07	27.3 [24.8-30.2]	21.85 [19-24.1]	0.02
6-minute walk test, m	459[432-549]	420[360-459]	0.19	480[435-531]	480[430.5-514.5]	0.43
ANT dose received, mg/m²	300[300-350]	300[300-300]	0.48	300[300-300]	300[300-300]	1
LVEF, %	61.17 ± 4.00	62.43 ± 2.51	0.41	60.89 ± 4.31	62.10 ± 3.31	0.51
Troponin	3.4[0.04-4.8]	1.2[0.04-5.6]	0.71	1.75[0.04-5.3]	1 [0.04-2]	0.73
NT-proBNP	54[30-226]	50[30-80]	0.31	133.5[97.5-168.5]	59[50-104]	0.04
LVGLS, %	-19.62 ± 1.63	-21.23 ± 2.57	0.17	-20.23 ± 1.96	-19.38 ± 1.96	0.36
LAVi, mL/m²	25.42 ± 9.83	29.60 ± 12.28	0.46	29.63 ± 7.83	26.95 ± 8.84	0.49
LA strain, %	38.5[35-48]	36[14.5-48.8]	0.50	25.75[22.3-44]	41 [23-42.5]	0.67
E/e'	6.65 ± 2.05	8.09 ± 1.86	0.15	8.28 ± 2.91	8.03 ± 2.61	0.85

Variable	Flex – Men (n=12)	Flex – Women (n=7)	p	Aerob – Men (n=9)	Aerob – Women (n=10)	p
Diabetes	2 (16.67)	2 (28.57)	0.60	1 (11.11)	2 (20.00)	1.00
Current smoking	5 (41.67)	3 (42.86)	1.00	5 (55.56)	5 (50.00)	1.00
HIV	1 (8.33)	0 (0.00)	1.00	3 (33.33)	1 (10.00)	0.30
Dyslipidemia	0 (0.00)	1 (14.29)	0.37	0 (0.00)	0 (0.00)	--
Alcohol use	1 (8.33)	0 (0.00)	1.00	0 (0.00)	0 (0.00)	--
Chronic kidney disease	1 (8.33)	0 (0.00)	1.00	0 (0.00)	0 (0.00)	--
Obesity	0 (0.00)	1 (14.29)	0.37	1 (11.11)	3 (30.00)	0.58
Marihuana/ Cocaine base paste	1 (8.33)	0 (0.00)	1.00	3 (33.33)	1 (10.00)	0.30
Prior chemotherapy	1 (8.33)	0 (0.00)	1.00	0 (0.00)	0 (0.00)	--
Lymphoma (Non-Hodgkin)	9 (75.00)	3 (42.86)	0.33	7 (77.78)	7 (70.00)	1.00
Planned regimen (Hodgkin-type vs CHOP-family) n (%)	3 vs 9	4 vs 7	0.35	2 vs 7	3 vs 7	0.16



16048

SYMPATHETIC-CARDIOVASCULAR REACTIVITY TO MENTAL STRESS IN BREAST CANCER PATIENTS TREATED WITH DOXORUBICIN-BASED CHEMOTHERAPY.

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Introduction/Background: Data from our group indicates that breast cancer (BC) patients and disease survivors exhibit increased sympathetic neural activity and heart rate (HR) at rest. However, little is known about the sympathetic-cardiovascular responses during acute mental stress. Objectives: To test whether patients with BC, compared to controls, exhibit greater muscle sympathetic nerve activity (MSNA), lower brachial artery blood flow (BABF), and increased heart rate (HR) and blood pressure (BP) during a mental stress test. Methods: To test this hypothesis, we evaluated neurovascular and hemodynamic responses during acute mental stress in seven patients with BC (age: 47±9 years, BMI: 30±1 kg/m2) and ten control subjects (age: 48±8 years, BMI: 33±2 kg/m2). MSNA (Microneurography), brachial artery blood flow and vascular conductance (BABF and CV, Ultrasound), HR (Electrocardiogram), and systolic, diastolic, and mean arterial pressure (SAP, DAP, and MAP, Finometer) were assessed at rest and during a mental stress test. The mental stress protocol (Stroop Color Word) consisted of 3 minutes of rest, 3 minutes of mental stress, and 3 minutes of recovery. Resultados e Conclusions: At rest, patients with BC exhibit higher MSNA than control subjects ($p<0.05$) and a tendency to have higher HR ($p=0.06$). However, no difference was observed for SAP, DAP, MAP, BABF and CV ($p>0.05$ for all). During the mental stress challenge, a greater increase in MSNA and HR was observed in patients with BC compared to controls ($p=0.04$ for both) with no difference between the groups for SAP, DAP, MAP, BABF and CV ($p>0.05$ for all). Collectively, our data indicates that patients with BC exhibit greater sympathetic neural and HR reactivity during mental stress, indicating that these patients are at increased cardiovascular risk.

Cardiovascular Genetics



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17813

CLINICAL, EPIDEMIOLOGIC AND GENETIC FEATURES OF BRAZILIAN LAMINOPATHY: A SINGLE CENTER COHORT REGISTRY.

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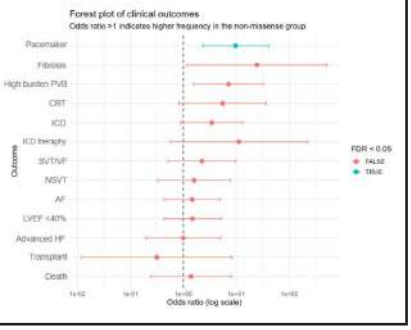
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Table 1. Demographic features.

Characteristics	Total (N=40)
Age — yr	49±11
Female sex — no.(%)	20 (50)
Family history of Sudden Death	6 (15)
Follow-up duration — months	45±5
Symptoms at first presentation — no.(%)	
Heart Failure symptoms	19 (47)
Arrthmic symptoms†	27(67)
Age at first symptoms — yr	39±11
Background Heart Failure therapy — no.(%)	
Beta-blocker	34 (85)
ACEI/ARB/IRNA	31 (77)
MRA	24 (60)
iSGLT2	16 (40)
Presence of CIED — no.(%)	25 (62)
Imaging Findings	
Left Ventricular Disfunction — no.(%)	25 (62)
Left Ventricle Ejection Fraction — Median	44±14
Presence of myocardial LGE — no.(%)	20 (50)
Nonmissense variants — no.(%)	23 (57)
Pathogenic / Likely Pathogenic variants	25 (62)
Eletrocardiogaphic Findings	
AVB — no.(%)	20 (50)
NSVT — no.(%)	27 (67)
Atrial Fibrilation — no.(%)	18 (45)
High PVC burden — no.(%) ‡	21 (52)

ACEI: Angiotensin-Converting Enzyme Inhibitors; MRA: Mineralocorticoid Receptor Antagonist; IRNA: Angiotensin Receptor-Neprilysin Inhibitor; CIED: Cardiac implantable Eletronic Device; iSGLT2: Sodium-Glucose Co-Transporter 2 Inhibitors; LGE: Late Gadolinium enhancement; AVB: Atrioventricular Block; NSVT: Non-sustained Ventricular Tachycardia. PVC: Premature Ventricular Beats
†Arrithmic symptoms were defined as palpitations, syncope, bradycardia or sudden death
‡ Defined as more than 500 PVC
* Plus-minus values are means ±SD

Introduction/Background: Cardiomyopathy due to laminopathy may present as overlapping phenotype spectrums including progressive heart failure, malignant arrhythmias, and early conduction system disease. A comprehensive understanding of LMNA variants presentation is therefore of critical importance. Objectives: To describe the clinical, epidemiological, and genetic characteristics of Brazilian patients with laminopathy followed at a quaternary cardiology center. Methods: A retrospective cohort study was conducted including patients harboring variants in the LMNA gene, followed from 2010 to 2026 at quaternary cardiology center. Demographic data, phenotypic characteristics, complementary test findings, and relevant clinical outcomes were collected. Additional analyses comparing missense versus non-missense variants were performed using the chi-square test or Fisher's exact test, as appropriate. For each outcome, odds ratios (OR) with 95% confidence intervals (95% CI) were estimated. To account for multiple comparisons across the evaluated outcomes, p-values were adjusted using the Benjamini–Hochberg false discovery rate (FDR) method. Statistical significance was defined as an adjusted p-value < 0.05. Resultados e Conclusions: A total of 40 patients were evaluated, 20 (50%) were female, median age was 49±11 years, with first symptoms presenting at 39±11 years old. Median follow-up was 45±5 months. The percentage for CIED and ventricular dysfunction were both 25 (62%). 25 were submitted to Cardiac Magnetic resonance evaluation with 20 (80%) presenting myocardial fibrosis. 23 (57%) patients had a nonmissense variants identified on genetic analyses, and 62% of variants were classified as pathogenic or likely pathogenic. Half of patients (50%) presented AVB, and 27 (67%) at least one episode of nonsustained ventricular tachycardia (NSVT) during follow-up (Tabela 1). When compared to missense variants, nonmissense mutations were marked by more need of pacemaker implantation (75% vs. 21%, FDR-adjusted p = 0.015). Higher PVC burden (83,3% vs 37.5%) and myocardial fibrosis (100% vs 54.6%) were also observed in the non-missense group, although these did not retain statistical significance. (Figura 1) This cohort reinforces the malignant cardiac phenotype of LMNA cardiomyopathy, with a high risk of conduction system abnormalities, and high burden of ventricular arrhythmias. Nonmissense variants had a worse prognosis confirming genotype–phenotype correlation.



20337

DEVELOPMENT OF AN INTERACTIVE DATABASE OF LDLR, APOB, PCSK9, AND LDLRAP1 VARIANTS AND GENOTYPES OBSERVED IN HOMOZYGOUS FAMILIAL HYPERCHOLESTEROLEMIA (HOFH)

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Introduction/Background: Background: HoFH is characterized by extremely elevated LDL-C from birth leading to premature atherosclerotic cardiovascular disease and is caused by biallelic pathogenic variants in the LDLR, APOB, PCSK9 and LDLRAP1 genes. Genetic test interpretation is complicated by significant genetic heterogeneity, variants of uncertain significance (VUS), and complex inheritance patterns. Objectives: Objective: Provide a publicly available gene variant database for clinicians and scientists interpreting variants in LDLR, APOB, PCSK9 and LDLRAP1, and characterize HoFH genotypes. Methods: Methods: Variants were sourced from a comprehensive literature review (through 02/2025) and a sponsored testing program. Patients meeting biochemical (LDL-C ≥400 mg/dL) or genetic criteria (2 pathogenic [P] or likely pathogenic [LP] variants not in cis) for HoFH were included for further analysis. Data were assembled and stored in a MongoDB database and curated into a publicly available website (https://www.rarediseasegenes.com). Resultados e Conclusions: Results: The database reports 2,696 unique P/LP/VUS variants (LDLR: 2413 [~89%], APOB: 171 [6%], PCSK9: 104 [4%], and LDLRAP1: 44 [2%]) from 51,674 individuals, 5% of whom (n=2,564) met HoFH genetic (n=1,968) and/or biochemical (n=1,149) criteria. Most individuals meeting genetic criteria had biallelic variants in LDLR, PCSK9 or APOB (n=1,079 [55%]) whereas 107 [%5] had biallelic variants in LDLRAP1. Thirty-two percent of variants were classified as VUS (n=836), leading to 302 patients with biallelic variants with ≥1VUS. In these cases, 49/135 (36%) with LDL-C values reported met HoFH biochemical criteria. Biochemical presentation (mean LDL-C [mg/dL]) among individuals with biallelic P/LP variants ranged from 284-597 for individuals with PCSK9 or LDLR genotypes, respectively (Table). Notably, biochemical presentation among biallelic VUS-containing genotypes ranged from 192-544 for individuals with PCSK9 or LDLRAP1, respectively. Conclusions: Significant genetic and biochemical heterogeneity are observed among individuals who meet HoFH diagnostic criteria. Additionally, a high VUS rate contributes to challenges in diagnosis. Databases providing access to biochemical and molecular data may aid timely diagnosis and intervention.

Table. HoFH genotypes and LDL-C levels

Gene	HoFH positive genotype [a]	N (% of patients)	N (%) with LDL-C reported	Mean LDL-C (mg/dl) [b] ± SD (mg/dl)	Median LDL-C (mg/dl) [b] ± IQR (mg/dl)
LDLR	Biallelic identical variants	1063 (54%)	560 (53%)	597 ± 200	588 ± 231
	Biallelic different variants	664 (34%)	298 (45%)	566 ± 224	555 ± 282
APOB	Biallelic identical variants	10 (0.5 %)	7 (70%)	311 ± 55	306 ± 62
	Biallelic different variants	0	0	N/A	N/A
PCSK9	Biallelic identical variants	6 (0.3%)	6 (100%)	284 ± 48	283 ± 81
	Biallelic different variants	2 (0.1 %)	2 (100%)	234	234
LDLRAP1	Biallelic identical variants	107 (5%)	67 (63%)	519 ± 172	503 ± 184
	Biallelic different variants	17 (0.9%)	11 (65%)	533 ± 47	530 ± 75
All except *LDLRAP1*	Biallelic digenic	98 (5%)	63 (64%)	334 ± 162	308 ± 197
All	Biallelic identical variants	1186 (60%)	640 (54%)	583 ±201	573 ± 255
All	Biallelic different variants	684 (35%)	312 (46%)	561 ± 223	551 ± 265

[a]P/LP variants not in cis. [b] LDL-C values as reported in literature, may be treated or untreated.

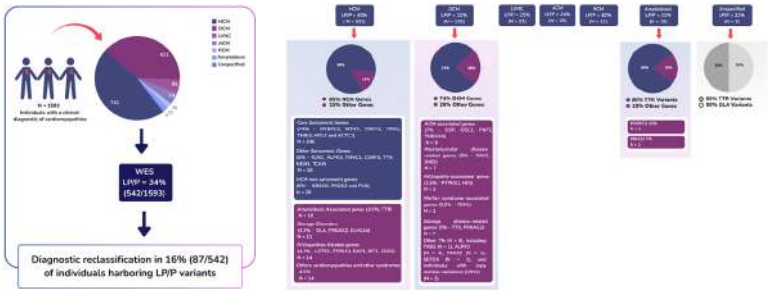
21025

FROM DIAGNOSIS TO GENETIC RECLASSIFICATION: THE ROLE OF WHOLE EXOME SEQUENCING IN CARDIOMYOPATHIES

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Introduction/Background: Cardiomyopathies are a heterogeneous group of myocardial disorders characterized by structural and/or functional abnormalities and may arise from both genetic and acquired etiologies. Genetic testing plays a critical role in diagnosis, risk stratification, and clinical management, while precision medicine approaches further enhance diagnostic accuracy and enable differentiation from genocopies. Objectives: To determine the prevalence of genocopies in patients with a presumed diagnosis of cardiomyopathies from the MAPA Genoma Brazil cohort of cardiac genetic diseases. Methods: We conducted a retrospective cohort study of 1,593 Brazilian individuals with clinically diagnosed cardiomyopathies to assess the diagnostic impact of whole exome sequencing. Genetic variants were classified according to ACMG criteria. Only individuals with pathogenic (P) or likely pathogenic (LP) variants in ClinGen-curated genes were included. Molecular results were compared with the initial clinical diagnoses. Resultados e Conclusions: Participants were classified as hypertrophic (46.6%), dilated (39.0%), left ventricular noncompaction (5.3%), arrhythmogenic (4.6%), restrictive (1.9%), amyloidosis (2.0%), and unspecified (0.6%). P/LP variants were detected in 34% (n=542) of individuals, with a yield of 45% in hypertrophic and 21% in dilated cardiomyopathies. Among P/LP carriers, 16% (n=87) showed discordance between molecular and initial clinical diagnoses. (Fig. 1) Genetic reclassification occurred in 25% (n=35) of dilated cases, including 9 in arrhythmogenic-related genes, 8 neuromuscular disorders, 7 storage diseases (PRKAG2, TTR), 4 in ALPK3, 2 RASopathies, 1 Marfan syndrome, and 4 other syndromes. 15% (n=50) of hypertrophic cardiomyopathies were also reclassified including 21 storage diseases (GLA, TTR, PRKAG2, KLHL24), 14 RASopathies, 4 dilated-related, 3 arrhythmogenic-related, and 8 other syndromes, such as McArdle, Carnitine Deficiency, and Char. (Fig. 2) 22 individuals harbored multiple P/LP variants and exhibited more severe or blended phenotypes. These findings underscore the critical role of genetic testing in refining cardiomyopathy diagnoses, as 16% of patients with a presumed diagnosis were reclassified as genocopies. Accurate genetic diagnosis enables personalized management, appropriate genetic counseling, and family screening, and may modify therapeutic strategies, ultimately reducing the risk of adverse outcomes such as sudden cardiac death in both probands and their relatives.



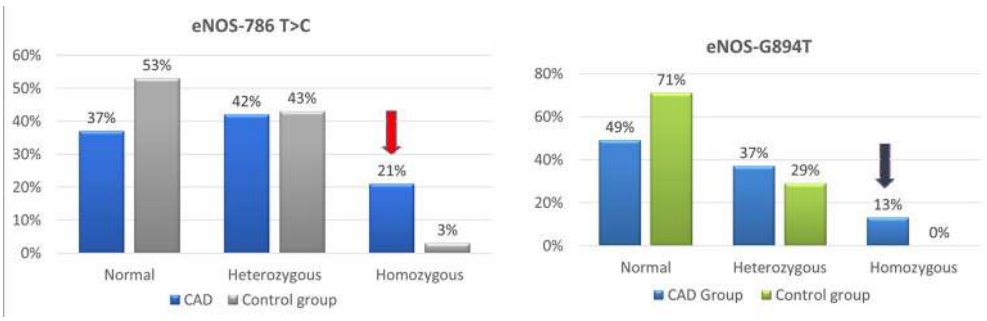
16705

GENETIC AND ENVIRONMENTAL INTERPLAY IN CORONARY ARTERY DISEASE: THE ROLE OF ENOS POLYMORPHISMS AND SMOKING

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Introduction/Background: Endothelial nitric oxide synthase (eNOS) gene polymorphisms, particularly eNOS-786 T>C and eNOS G894T, are associated with impaired endothelial function through reduced nitric oxide bioavailability and may contribute to the development of coronary artery disease (CAD). Objectives: To investigate the association of eNOS-786 T>C and eNOS G894T polymorphisms with CAD and to evaluate the interaction between these genetic variants and cigarette smoking. Methods: This case–control study included 89 patients aged 18–50 years with angiographically confirmed CAD (acute coronary syndrome and angina pectoris) and 90 age-matched healthy controls. Genotyping for eNOS polymorphisms was performed using reverse hybridization, and statistical analysis was conducted using chi-square and logistic regression models. Resultados e Conclusions: Results: The homozygous eNOS-786 T>C variant was significantly more frequent in CAD patients compared to controls (p=0.0001), confirming its strong association with disease presence. For the eNOS G894T polymorphism, genotype distribution showed that the homozygous variant was detected exclusively in CAD patients (13%) and absent in controls, while the heterozygous variant demonstrated a borderline, non-significant association with CAD (p=0.059). Analysis of gene–environment interaction demonstrated that cigarette smoking significantly increased the risk of coronary artery disease among carriers of the homozygous eNOS-786 T>C genotype (OR=17.0; p=0.048) and the carriers of the heterozygous eNOS-G894T genotype (OR=17.2; p=0.0001). Conclusions: The homozygous eNOS-786 T>C polymorphism is significantly associated with CAD in young patients, while the homozygous eNOS G894T was present only in the patients with CAD. The homozygous eNOS-786 T>C genotype and heterozygous eNOS G894T variant may further contribute to disease susceptibility, especially in the presence of cigarette smoking. These findings highlight the importance of gene–environment interplay in CAD and support the potential role of eNOS polymorphisms as biomarkers for risk stratification.



17699

GENOTYPE–PHENOTYPE CORRELATION IN HEREDITARY ATTR: REAL-WORLD DATA FROM A RARE DISEASE REGISTRY IN RECIFE, BRAZIL

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Introduction/Background: Transthyretin amyloidosis (ATTR) is a rare disorder caused by extracellular deposition of misfolded transthyretin, leading to progressive organ dysfunction. Hereditary ATTR (ATTRv) presents marked clinical heterogeneity, with different mutations associated with cardiac, neurological, or mixed phenotypes. Objectives: To evaluate the regional epidemiology of ATTRv and analyze genotype–phenotype correlations, focusing on cardiac involvement. Methods: Retrospective observational study based on a rare disease registry (RARUS), including 282 patients diagnosed with ATTRv through TTR gene sequencing. Descriptive and comparative analyses were performed to assess associations between variants and clinical presentation. Resultados e Conclusions: The most prevalent variants were Val142Ile (64.9%) and Val50Met (32.3%). Val50Met was not associated with isolated cardiac onset, presenting mainly with neurological or mixed manifestations. Val142Ile showed a heterogeneous profile, with 36.7% neurological onset and 15.5% cardiac onset. Asymptomatic individuals identified through family screening accounted for a relevant proportion (46.6% vs. 31.4%). Cardiac involvement was more frequent in Val142Ile, with higher prevalence of abnormalities on echocardiography and technetium-labeled pyrophosphate scintigraphy. TTR mutations are associated with distinct phenotypes in ATTRv. Val142Ile is more strongly associated with cardiac involvement, while Val50Met predominantly presents with neurological manifestations. These findings support genotype-based risk stratification and early screening strategies.

Cardiovascular Imaging – Echocardiography



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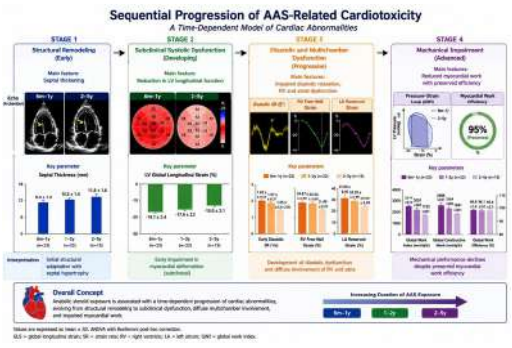
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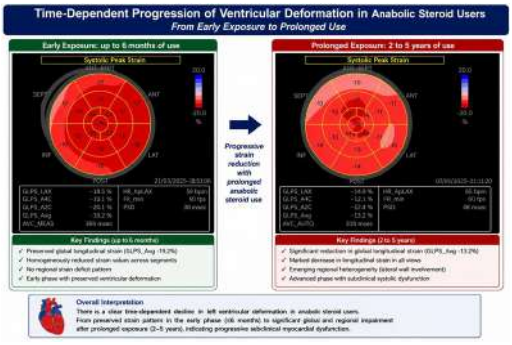
A TIME-DEPENDENT MODEL OF CARDIOTOXICITY IN ANABOLIC STEROID USERS: FROM SUBCLINICAL DYSFUNCTION TO MECHANICAL IMPAIRMENT

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Introduction/Background: The progression of anabolic-androgenic steroid (AAS)-related cardiotoxicity remains incompletely characterized. We aimed to investigate whether increasing duration of AAS exposure is associated with a sequential pattern of structural, functional, and mechanical cardiac abnormalities assessed by advanced echocardiography. Objectives: To investigate the time-dependent progression of structural, functional, and mechanical cardiac abnormalities associated with anabolic-androgenic steroid exposure. Methods: This observational cross-sectional study included AAS users stratified according to exposure duration: 6 months–1 year (n=23), 1–2 years (n=22), and 2–5 years (n=13). Comprehensive transthoracic echocardiography with speckle tracking and myocardial work analysis was performed. Structural, systolic, diastolic, right ventricular, atrial, and myocardial work parameters were compared among groups using ANOVA with Bonferroni correction. Resultados e Conclusions: RESULTS Increasing AAS exposure was associated with progressive multilevel cardiac impairment. Early structural remodeling was characterized by progressive interventricular septal thickening. Functional abnormalities included reduction in left ventricular ejection fraction, worsening global longitudinal strain, impaired early diastolic strain rate, and reduction in right ventricular and atrial strain parameters. Mechanical abnormalities were identified by progressive reduction in global work index and global constructive work despite preserved myocardial work efficiency. These findings suggest a sequential pattern of cardiotoxicity progressing from structural remodeling to subclinical myocardial dysfunction and ultimately mechanical impairment. CONCLUSIONS Longer anabolic steroid exposure is associated with a time-dependent progression of cardiac abnormalities involving structural remodeling, subclinical dysfunction, diffuse multichamber involvement, and impaired myocardial work. This model may represent a comprehensive mechanistic framework for AAS-related cardiotoxicity detected by advanced echocardiography.[23]





19872

DEEP LEARNING–ASSISTED ECHOCARDIOGRAPHIC DETECTION OF SUBCLINICAL LEFT VENTRICULAR DYSFUNCTION

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Introduction/Background: Subclinical left ventricular (LV) dysfunction frequently precedes overt heart failure and is associated with adverse cardiovascular outcomes. Conventional echocardiographic assessment based on left ventricular ejection fraction (LVEF) lacks sensitivity for early myocardial impairment. Although global longitudinal strain (GLS) improves detection, its use remains limited in routine practice. Objectives: We aimed to develop and validate a deep learning–based model for automated detection of subclinical LV dysfunction from standard echocardiographic data. Methods: In this retrospective multicenter study, 15,248 transthoracic echocardiograms from three tertiary care centers were analyzed. Sample size was considered adequate to ensure stable model training and performance estimation, exceeding commonly recommended thresholds for deep learning applications in medical imaging. Subclinical LV dysfunction was defined as impaired GLS (>−18%) with preserved LVEF (≥50%). Data were randomly split into training (70%), validation (15%), and internal test (15%) cohorts. Model performance was evaluated using area under the receiver operating characteristic curve (AUC), sensitivity, and specificity, and compared with expert cardiologist visual assessment. An independent external validation cohort (n=2,134) from a separate institution was used to assess generalizability. Resultados e Conclusions: The deep learning model demonstrated excellent discrimination, achieving an AUC of 0.91 (95% CI 0.89–0.93) in the internal test set. At the optimal threshold, sensitivity and specificity were 90% and 87%, respectively. Compared with expert visual assessment (AUC 0.78, 95% CI 0.75–0.81), the model showed significantly improved performance (ΔAUC = 0.13, 95% CI 0.10–0.16; p<0.001), with higher sensitivity (90% vs 72%) and comparable specificity (87% vs 89%). Among patients with preserved LVEF, the model identified previously unrecognized subclinical dysfunction in 19% of cases. In the external validation cohort, model performance remained robust (AUC 0.89), supporting generalizability across different patient populations and imaging settings. Conclusion: Deep learning–assisted echocardiography enables accurate and scalable detection of subclinical LV dysfunction beyond conventional LVEF-based assessment. These findings support the integration of AI-driven tools into routine echocardiographic workflows to enhance early diagnosis and risk stratification in patients at risk for heart failure.

Title: Model Performance Compared with Standard Assessment

Metric	AI Model	Cardiologist Visual Assessment
AUC	0.91	0.78
Sensitivity	90%	72%
Specificity	87%	89%

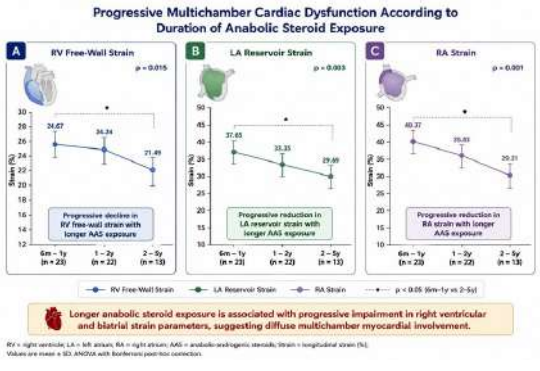
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DIFFUSE CARDIAC INVOLVEMENT IN ANABOLIC STEROID USERS: BIVENTRICULAR AND ATRIAL DYSFUNCTION BY ADVANCED ECHOCARDIOGRAPHY

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Introduction/Background: Anabolic-androgenic steroid (AAS) use may affect cardiac function beyond the left ventricle, but biventricular and atrial involvement remain underrecognized. We aimed to evaluate whether longer AAS exposure is associated with diffuse cardiac dysfunction assessed by advanced echocardiographic strain analysis. Objectives: To assess the impact of cumulative anabolic-androgenic steroid exposure on biventricular and atrial myocardial function using advanced echocardiographic analysis. Methods: This observational cross-sectional study included AAS users stratified by exposure duration: 6 months–1 year (n=23), 1–2 years (n=22), and 2–5 years (n=13). Comprehensive transthoracic echocardiography with speckle tracking analysis was performed. Left ventricular, right ventricular, and atrial strain parameters were compared among groups using ANOVA with Bonferroni correction. Resultados e Conclusions: RESULTS Baseline clinical characteristics were similar among groups. Longer AAS exposure was associated with progressive impairment of cardiac deformation across multiple chambers. Right ventricular global longitudinal strain decreased significantly across groups (20.86±2.75% vs 20.67±2.68% vs 18.48±1.99%; p=0.027), as did right ventricular free-wall strain (24.67±2.98% vs 24.24±3.69% vs 21.49±2.57%; p=0.0155). TAPSE also decreased with longer exposure (21.38±1.99 vs 19.37±2.41 vs 18.31±2.59 mm; p=0.001). Atrial function was similarly affected, with reductions in left atrial reservoir strain (37.65±6.40% vs 33.35±6.99% vs 29.69±5.95%; p=0.003), left atrial conduit strain (23.33±5.37% vs 20.11±5.44% vs 17.31±3.88%; p=0.0052), and right atrial strain (40.37±7.82% vs 35.83±8.20% vs 29.31±6.99%; p=0.0012). CONCLUSIONS Longer exposure to anabolic steroids is associated with diffuse cardiac involvement, including right ventricular dysfunction and impaired biatrial strain. These findings suggest that AAS-related cardiotoxicity is not limited to the left ventricle, but may represent a progressive multichamber myocardial disease.



21682

EARLY DIASTOLIC DYSFUNCTION IN ANABOLIC STEROID USERS DETECTED BY STRAIN RATE IMAGING

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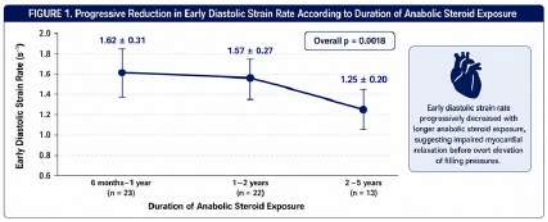
(1) UNIG - NOVA IGUAÇU - RJ - BRASIL; (2) IPANEMA HEALTH CLUB - RIO DE JANEIRO - RJ - BRASIL; (3) UNIVERSIDADE UNIGRANRIO AFYA - RIO DE JANEIRO - RJ - BRASIL;

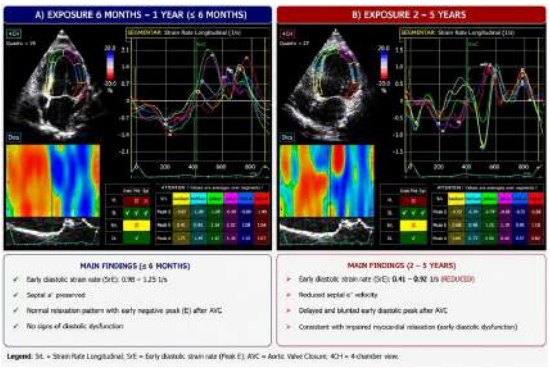
Introduction/Background: Anabolic-androgenic steroid (AAS) use may induce early myocardial dysfunction before overt changes in conventional diastolic parameters. We aimed to evaluate whether diastolic strain rate imaging can detect early left ventricular relaxation impairment according to duration of AAS exposure. Objectives: To investigate the association between cumulative anabolic-androgenic steroid exposure and early diastolic dysfunction assessed by strain rate imaging. Methods: This observational cross-sectional study included AAS users stratified by exposure duration: 6 months–1 year (n=23), 1–2 years (n=22), and 2–5 years (n=13). Comprehensive transthoracic echocardiography with speckle tracking analysis was performed. Early diastolic strain rate, tissue Doppler indices, and conventional diastolic parameters were compared among groups using ANOVA with Bonferroni correction. Resultados e Conclusions: RESULTS Baseline clinical characteristics, including body size, heart rate, and resting blood pressure, were similar among groups. Early diastolic strain rate showed a significant progressive reduction with longer AAS exposure (1.62±0.31 vs 1.57±0.27 vs 1.25±0.20; p=0.0018). Post-hoc analysis confirmed significantly lower early diastolic strain rate in the 2–5-year group compared with both the 6-month–1-year group (p=0.003) and the 1–2-year group (p=0.008). Septal e' velocity was also reduced with longer exposure (9.7±1.6 vs 9.1±1.6 vs 8.15±1.28 cm/s; p=0.022), while E/e' remained unchanged, suggesting early relaxation impairment without increased filling pressures. CONCLUSIONS Longer duration of anabolic steroid exposure is associated with early diastolic dysfunction detected by strain rate imaging. The reduction in early diastolic strain rate despite preserved E/e' suggests subclinical impairment of myocardial relaxation before overt elevation of filling pressures.

TABLE 1. Diastolic Functional Parameters According to Duration of Anabolic Steroid Exposure

Parameter	6 months–1 year (n = 23)	1–2 years (n = 22)	2–5 years (n = 13)	p value
Early diastolic strain rate (s⁻¹)	1.62 ± 0.31	1.57 ± 0.27	1.25 ± 0.20	0.0018
Septal e' (cm/s)	9.7 ± 1.6	9.1 ± 1.6	8.15 ± 1.28	0.022
E/e' ratio	6.39 ± 1.31	6.14 ± 1.52	6.02 ± 1.83	0.766

Values are expressed as mean ± SD. ANOVA with Bonferroni post-hoc correction.





18698

GLOBAL LONGITUDINAL STRAIN AND IDENTIFICATION OF MYOCARDIAL FIBROSIS IN STAGE B1 CHRONIC CHAGAS CARDIOMYOPATHY

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Introduction/Background: Chronic Chagas cardiomyopathy (CCC) is an inflammatory and fibrotic disease in which cardiac magnetic resonance (CMR) enables noninvasive detection of myocardial fibrosis through late gadolinium enhancement (LGE). Global longitudinal strain (GLS) has been shown to detect subclinical myocardial dysfunction and predict adverse cardiovascular outcomes. Objectives: To evaluate the association between GLS and the presence of myocardial fibrosis in patients with stage B1 chronic Chagas cardiomyopathy. Methods: Cross-sectional study conducted at a tertiary referral center including 116 patients with stage B1 CCC. GLS was obtained by two-dimensional speckle-tracking echocardiography, according to American Society of Echocardiography recommendations. Myocardial fibrosis was assessed by LGE-CMR. The independent association between GLS and myocardial fibrosis was evaluated using multivariable logistic regression, adjusted for age, sex, left ventricular ejection fraction, and NT-proBNP, followed by backward stepwise selection. Resultados e Conclusions: Results: Baseline characteristics related to age and sex were similar between patients with and without fibrosis. Myocardial fibrosis was present in 56 patients (48.3%). Mean GLS was −18.5 ± 2.6%, with worse deformation in the fibrosis group (−17.9 ± 2.8% vs −19.0 ± 2.4%; p = 0.029). On multivariable analysis, GLS remained independently associated with the presence of myocardial fibrosis (OR 1.18; 95% CI 1.01–1.37; p = 0.033). In a sensitivity analysis restricted to patients with CMR-derived LVEF ≥ 60%, the magnitude of the association was maintained. Conclusion: In patients with stage B1 CCC, GLS was independently associated with myocardial fibrosis detected by CMR. These findings corroborate previous evidence and expand its applicability to this early disease stage, reinforcing the potential role of GLS as a complementary echocardiographic marker for identifying subclinical myocardial remodeling and for early risk stratification in this population.

Table 1. Baseline characteristics of patients with and without myocardial fibrosis.

Variable	Total (N=116)	Fibrosis (N=56)	No Fibrosis (N=60)	p Value
Age, y	59.5 ± 10.1	59.9 ± 9.2	59.0 ± 11.0	0.644
Female sex, n (%)	79 (68.1)	34 (60.7)	45 (75.0)	0.099
CMR-derived LVEF, %	65.5 ± 9.6	60.1 ± 10.4	70.6 ± 6.7	<0.001
GLS, %	−18.5 ± 2.6	−17.9 ± 2.8	−19.0 ± 2.4	0.029

Table legend: Baseline clinical, echocardiographic, and cardiac magnetic resonance characteristics of patients with chronic Chagas cardiomyopathy without ventricular dysfunction, stratified by the presence of myocardial fibrosis detected by late gadolinium enhancement. Data are presented as mean ± standard deviation or n (%). CMR = cardiac magnetic resonance; GLS = global longitudinal strain; LVEF = left ventricular ejection fraction.

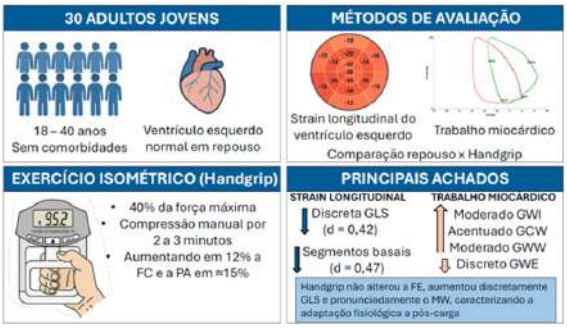
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LEFT VENTRICULAR MECHANICAL RESPONSE TO ISOMETRIC EXERCISE ASSESSED BY LONGITUDINAL STRAIN AND MYOCARDIAL WORK IN HEALTHY ADULTS

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Introduction/Background: Background Left ventricular (LV) ejection fraction is limited by load dependency and may fail to identify subtle mechanical adaptations. Global longitudinal strain (GLS) and myocardial work (MW) integrate deformation and afterload, providing a more comprehensive assessment of LV mechanics. Isometric handgrip exercise represents a simple and reproducible model of acute pressure overload. Objectives: Purpose To characterise LV mechanical responses to isometric handgrip exercise using GLS and myocardial work indices in healthy adults. Methods: Methods Thirty healthy individuals (mean age 29.3 ± 6.1 years; 50% male) underwent transthoracic echocardiography at rest and during sustained handgrip at 30–40% of maximal voluntary contraction. Blood pressure and heart rate were recorded. GLS, global myocardial work index (GWI), global constructive work (GCW), global wasted work (GWW) and global work efficiency (GWE) were derived from non-invasive pressure–strain loops. Paired comparisons and effect sizes were calculated. Resultados e Conclusions: Results Handgrip elicited a significant haemodynamic response, with systolic blood pressure increasing from 115 ± 16 to 133 ± 18 mmHg and heart rate from 72 ± 12 to 82 ± 10 bpm (both p<0.0001). LV ejection fraction remained unchanged (64.8% vs 64.4%; p=0.62). GLS showed a mild reduction (20.4 ± 2.6% vs 19.6 ± 2.5%; p=0.028; Cohen's d = 0.42), mainly in basal segments. In contrast, MW indices increased substantially: GWI rose from 1810 ± 322 to 2054 ± 403 mmHg% (p=0.0002; d = 0.77), GCW from 2172 ± 371 to 2486 ± 453 mmHg% (p<0.0001; d = 1.05), and GWW from 108 ± 44 to 160 ± 76 mmHg% (p=0.0008; d = 0.68). GWE showed a small reduction (94.8 ± 1.8% vs 93.6 ± 2.5%; p=0.022; d = 0.44), remaining within physiological limits. Segmental analysis demonstrated greater MW increases in basal and mid-ventricular segments, with no significant apical changes. Conclusion(s) In healthy adults, isometric handgrip induces preserved ejection fraction, mild load-related GLS reduction and marked increases in myocardial work. MW indices, particularly GWI and GCW, are more sensitive than GLS or ejection fraction for detecting acute LV contractile adaptation to pressure overload. Handgrip combined with myocardial work analysis is a robust approach for assessing LV mechanical reserve



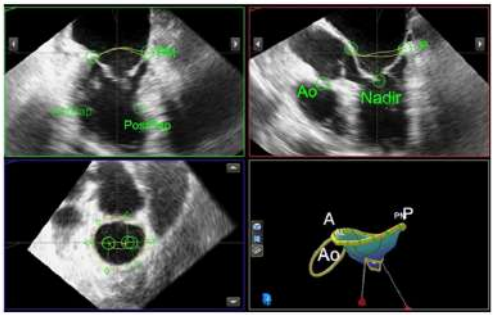
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MITRAL VALVE NAVIGATION: A FEASIBLE TECHNIQUE FOR ACCURATE ASSESSMENT OF MITRAL VALVE AREA

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Introduction/Background: Precise measurement of mitral valve area is central to define rheumatic mitral stenosis severity, but conventional echocardiographic methods have important anatomical and hemodynamic limitations. The Mitral Valve Navigation (MVN) method, derived from three dimensional transesophageal echocardiography, takes into account commissures and also the different depths between the tips of the cusps (more distal) and the commissural points (more proximal) in relation to the valve annulus. Furthermore, the irregularities of the leaflet edges are traced in different planes. The MVN method is, therefore, not based on geometric assumptions derived from direct two-dimensional (2D) and three-dimensional (3D) planimetry, but on the true valve anatomy. Objectives: To compare mitral valve area obtained by the MVN method with 2D planimetry, 3D planimetry and pressure half-time (PHT) in patients with rheumatic mitral stenosis. Methods: Observational study including 186 patients who underwent comprehensive echocardiographic assessment and off-line MVN analysis. Correlations were tested with Spearman coefficients, paired comparisons with Wilcoxon tests, agreement with Bland-Altman analysis, reclassification with McNemar tests, and intraobserver variability with the intraclass correlation coefficient. In addition to the cutoff of ≤1.5 cm2, the threshold of ≤1.0 cm2 was also evaluated. Resultados e Conclusions: MVN correlated significantly with all methods, with the strongest correlation observed for 3D planimetry (rho=0.529; p=0.001), followed by 2D planimetry (rho=0.465; p<0.001) and PHT (rho=0.367; p<0.001). MVN values were lower than those obtained by 2D planimetry (0.947±0.349 vs 1.013±0.275 cm2; p=0.004) and PHT (0.947±0.349 vs 1.032±0.263 cm2; p<0.001), with no significant difference in relation to 3D planimetry (p=0.420). There was no significant reclassification at either ≤1.5 cm2 or ≤1.0 cm2. The method showed excellent intraobserver reproducibility (ICC=0.834; p<0.001). MVN is feasible, reproducible, and more closely aligned with 3D planimetry, and may complement the quantification of rheumatic mitral stenosis severity, especially in discordant cases.



MVN vs 3D	rho=0,529; p=0,001
MVN vs 2D	rho=0,465; p<0,001 Wilcoxon p=0,004
MVN vs PHT	rho=0,367; p<0,001 Wilcoxon p<0,001
McNemar <=1,5	2D: 0,238 | PHT: 0,648 | 3D: 1,000
McNemar <=1,0	2D: 0,052 | PHT: 0,450 | 3D: 0,727
ICC intraobs.	0,834; p<0,001

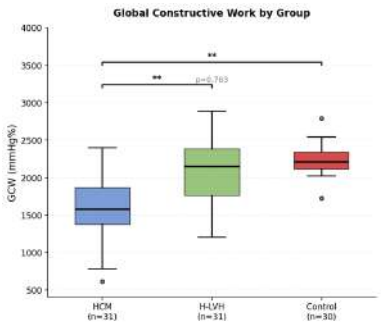
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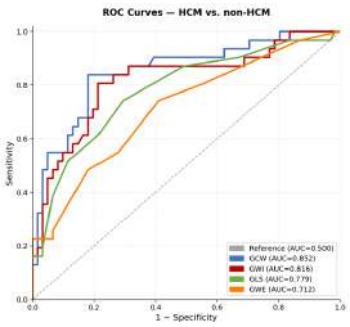
MYOCARDIAL WORK INDICES IN NON-OBSTRUCTIVE HYPERTROPHIC CARDIOMYOPATHY, HYPERTENSIVE LEFT VENTRICULAR HYPERTROPHY, AND CONTROLS: COMPARISON AND DIAGNOSTIC ACCURACY

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Introduction/Background: Hypertrophic cardiomyopathy (HCM) and hypertensive left ventricular hypertrophy (H-LVH) share morphological features but differ in pathophysiology, prognosis, and management. Conventional parameters such as EF and GLS have limited ability to distinguish these conditions. Myocardial work (MW), derived from pressure-strain loops, provides load-independent assessment of ventricular mechanics. Objectives: Primary: To compare MW indices (GWI, GCW, GWW, GWE) among patients with non-obstructive HCM, H-LVH, and controls. Secondary: To assess diagnostic accuracy of MW for differentiating HCM from H-LVH, evaluate correlations with structural/functional variables, and test incremental value of combined models. Methods: Cross-sectional study, 92 subjects: HCM (n=31, diagnosed per current guidelines, maximum wall thickness 15mm or greater not explained by pressure overload, non-obstructive gradient below 30 mmHg), H-LVH (n=31, SBP 140 mmHg or higher and/or antihypertensive therapy, elevated LVMI greater than 115/95 g/m2 or relative wall thickness greater than 0.42), controls (n=30). EF 50% or greater, sinus rhythm. EchoPAC software (GE Vivid E95). ANOVA or Kruskal-Wallis with Bonferroni correction. Spearman correlations. Multivariate linear regression with dummy coding. ROC curves with DeLong test, including MWT/PW ratio, MW indices, and combined logistic model. ICC and Bland-Altman for reproducibility (n=21). Resultados e Conclusions: GWI and GCW were significantly lower in HCM vs H-LVH and controls (p<0.001), with no difference between H-LVH and controls (p=0.142; p=0.763). GCW showed highest diagnostic accuracy (AUC=0.852; sensitivity 83.9%; specificity 82.0%; cut-off 1983 mmHg%). Combined model (MWT/PW + GCW) achieved 96.8% sensitivity and 100% specificity, correctly reclassifying 3 false positives from MWT/PW alone. HCM (beta=-0.615) and H-LVH (beta=-0.361) were independent negative predictors of GWI after adjusting for SBP (R2adj=0.427). GWE showed strongest correlation with LV mass (rho=-0.650). GCW reproducibility: ICC=0.931. MW indices characterize distinct mechanical phenotypes in HCM and H-LVH. GCW provides incremental diagnostic value over morphological assessment, achieving 100% specificity in borderline cases.





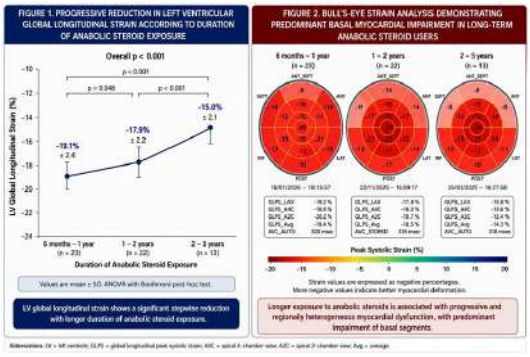
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PROGRESSIVE SUBCLINICAL LEFT VENTRICULAR DYSFUNCTION IN ANABOLIC STEROID USERS: A SPECKLE TRACKING ANALYSIS

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Introduction/Background: Anabolic-androgenic steroid (AAS) use has been associated with myocardial dysfunction and early cardiotoxicity, even in individuals without overt cardiovascular disease. We aimed to evaluate the impact of cumulative AAS exposure on subclinical left ventricular systolic function using speckle tracking echocardiography. Objectives: To evaluate the association between cumulative anabolic-androgenic steroid exposure and subclinical left ventricular systolic dysfunction using two-dimensional speckle tracking echocardiography. Methods: This observational cross-sectional study included AAS users stratified according to duration of exposure: 6 months–1 year (n=23), 1–2 years (n=22), and 2–5 years (n=13). Comprehensive transthoracic echocardiography with two-dimensional speckle tracking analysis was performed. Left ventricular global longitudinal strain (LV-GLS), regional strain, and conventional echocardiographic parameters were compared among groups using ANOVA with Bonferroni correction. Resultados e Conclusions: RESULTS Baseline clinical characteristics, including body size, heart rate, and resting blood pressure, were similar among groups. Progressive impairment in left ventricular systolic performance was observed with increasing duration of AAS exposure. LV-GLS demonstrated a significant stepwise reduction across exposure groups (19.1±2.4% vs 17.9±2.2% vs 15.0±2.1%; p<0.001). Post-hoc analysis confirmed significantly lower LV-GLS in individuals with 2–5 years of exposure compared with both shorter-duration groups. Regional strain analysis demonstrated predominant basal segment impairment, suggesting a nonphysiological remodeling pattern associated with chronic AAS exposure. Conventional systolic parameters also worsened with longer exposure, including increased left ventricular end-systolic volume and reduced ejection fraction. CONCLUSIONS Longer duration of anabolic steroid exposure is associated with progressive subclinical left ventricular dysfunction detected by speckle tracking echocardiography. Basal myocardial segments appear disproportionately affected, suggesting an early and regionally heterogeneous pattern of AAS-related cardiotoxicity.



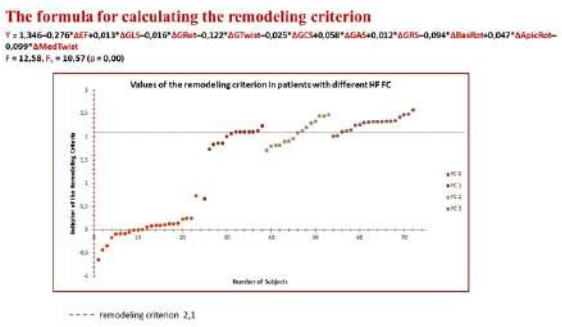
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THE ESTIMATION OF LEFT VENTRICULAR REMODELING BY FOUR-DIMENSIONAL SPECKLE-TRACKING ECHOCARDIOGRAPHY DURING STRESS-ECHOCARDIOGRAPHY IN PATIENTS WITH CORONARY ARTERY DISEASE WITH PRESERVED EJECTION FRACTION.

EKATERINA KRENEVA1; NIKOLAI NELASOV2; ROMAN SIDOROV2; EVGENII RODIONOV1; SERGEY LEBEDEV1; VSEVOLOD LYHIN1; IRINA DJERIEVA2; ALEXEI POMORTSEV3; ANATOLY MALYSHEV1; MAXIM MORGUNOV2;

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Introduction/Background: A type of left ventricular remodeling in patients with coronary artery disease (CAD) is linked to the loss of contractility of the myocardium and leads to changes in function notwithstanding the preserved ejection fraction (Luisi G.A. et al., 2022, Lazar MA. et al., 2023). Nowadays, strain parameters, attained by speckle-tracking echocardiography (STE), especially by stress-echocardiography (SE) with vasodilators, are applied as additional predictors of remodeling along with ejection fraction (EF), end-systolic volume (ESV), and wall motion score index (WMSI) (Dell'Angela L. et al., 2024, El-Naggar H.M. et.al., 2023). Objectives: 71 patients underwent four-dimensional (4D) stress – echocardiography (SE) with Adenosine Triphosphate (ATP) at ultrasound department of Rostov State Medical University during 2018-2024. 1 group: 48 patients hospitalized with diagnosis of CAD, the mean age is 58 y. (95%CI: 55,27-60,72); and 2 group: 23 healthy adults, the mean age is 40,2 y. (95%CI: 26,53-55,12). 2 groups were similar by EF: 61,7 % ((95%CI: 59,63 – 63,04) vs 64,7 % (95%CI: 61,52 – 67,38) and by ESV: 46,52 ml (95%CI: 36,92 – 56,11) vs 42,87 ml (95%CI: 36,74 – 49,00). Methods: Global longitudinal strain (GLS), radial (GRS), circumferential (GCS), area (GAS), rotation (GRot) and twisting (GTwist) were reported by US scanner Vivid E95 GE with 4VC transducer at rest and at the peak of vasodilation during SE with ATP. According to our protocol (the patent for the invention of the RF № 2688441 (21.05.2019 y.)). ATP administered intravenously at a rate of 140 to 175 and 210 μg/kg/min. Resultados e Conclusions: Spearman's rank correlation coefficient showed strong correlation between GLS (r=0,74 (p=0,01)), and moderate correlation between GAS (r=0,6 (p=0,01)), apical Rotation (r=0,42 (p=0,00) and increasing of ESV during the SE. Multiple regression analyses detected the group influence of strain indicators the increase in ESV (marker of remodeling), F =12,58 (p=0,00). Formula for the calculation of remodeling criteria which consisted of 10 dynamic strain parameters at the peak of vasodilation with the cut off the point of 2,1 showed the high level of prediction in the class of heart failure: AUC 0,98 (se. 82,8%, sp. 95,2%, ac. 90,1%) (the patent for the invention of the RF № 2828733C1 (17.10.2024 y.)).



Cardiovascular Imaging – MRI and CT



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CLINICAL INDICATIONS, MAIN FINDINGS AND SAFETY OF CARDIAC MAGNET-IC RESONANCE FROM A PRIVATY OUTPATIENT FACILITY IN BRAZIL

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Introduction/Background: In recent years, cardiovascular magnetic resonance (CMR) is gaining prominence among diagnostic imaging modalities due to its versatility in the evaluation of a wide range of congenital and acquired diseases. Despite its solid clinical indications present in the main clinical guidelines worldwide, CMR is still un-derused. However, in Brazil, CMR has compulsory reimbursement from private health insurance companies and has increasing availability all over the country. Objectives: We aim to evaluate the main clinical indications, the demographic profile, the most frequent exam findings and adverse reactions in a real world setting. Methods: Consecutive patients submitted to routine CMR exam in a private diagnostic center in Goiania-Brazil were included. They were categorized by their clinical indication and the acquisition protocol used. We analyzed the main findings and classified them as major [moderate to severe ventricular dilation, hypertrophy, pericardial effusion, valve dysfunction and any grade of myocardial ischemia or late gadolinium enhancement (LGE), masses or congenital heart disease] or minor findings (mild alterations) and classified the adverse reactions as mild or moderate/severe. All patients underwent to cardiac exam in a 1.5 T scanner (GE Medical Systems, Milwaukee, WI, EUA) and all the exams were analyzed by trained cardiologists. Resultados e Conclusions: A total of 108 patients were enrolled from September 1st to September 30th 2025 (mean age of 58.2 ± 16 years; 39.8% female). The most common indication of CMR was related to ischemic heart disease (IHD), with (69.4%; n=75) or without suspicion of non-ischemic cardiomyopathy (65.7%; n=71). The other indications were cardiomyopathies (24.1%; n=26), myocarditis (4.6%; n=5), cardiac masses (3.7%; n=4), hemochromatosis (1.8%; n=2) and valve disease (n=1). Stress perfusion imaging were done in 70.4% of the cases. A normal CMR result was obtained in 35.2% of cases (n=38), minor findings in 13% (n=14) and major findings in 51.8% (n=56). The exam was extremely safe, with only 3 moderate and no severe adverse reactions. CONCLUSION: In a high-volume imaging center, investigation of IHD is the most frequent indication of CMR, followed by cardiomyopathies, with no severe adverse reactions observed. In most of the cases, major cardiovascular findings were detected, suggesting that CMR is most commonly used to evaluate more complex patients and also that the exam has a high diagnostic capability to detect a wide variety of alterations.

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CLINICAL PREDICTORS OF HIGH CORONARY ATHEROSCLEROTIC BURDEN IN PATIENTS WITH ACUTE CHEST PAIN UNDERGOING CORONARY CTA

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Introduction/Background: Coronary computed tomography angiography (CTA) allows not only the detection of coronary stenosis but also the quantification of the extent of coronary atherosclerosis. The Segment Involvement Score (SIS) reflects the anatomic burden of disease and may provide incremental information for risk stratification in patients with chest pain. Characterizing the clinical profile and atherosclerotic burden of patients presenting to the emergency department with acute chest pain may improve our understanding of the role of this method in this clinical setting. Objectives: To evaluate the association between clinical characteristics and high coronary atherosclerotic burden, defined as a SIS ≥5, in patients presenting with acute chest pain who underwent coronary CTA. Methods: This observational study included 562 patients presenting to the emergency department with chest pain who underwent coronary CTA after exclusion of individuals with prior coronary artery disease. Demographic data, cardiovascular risk factors, coronary lesion characteristics, and calcium scores were assessed. Associations with a high atherosclerotic burden were estimated using prevalence ratios in crude and adjusted analyses. Resultados e Conclusions: The median age was 49 years (IQR, 42–60), and 47.7% of the patients were women. On coronary CTA, 61.8% of patients had no coronary lesions; among the remainder, 710 lesions were identified, predominantly minimal or mild lesions (83.5%). The prevalence of a high atherosclerotic burden increased with age, including in patients aged 50–69 years (PR, 2.10; 95% CI, 1.16–3.80) and those older than 70 years (PR, 3.11; 95% CI, 1.47–6.59), and was higher in men (PR, 3.14; 95% CI, 1.75–5.62). Among the cardiovascular risk factors, hypertension (PR, 2.37; 95% CI, 1.34–4.20) and diabetes (PR, 1.75; 95% CI, 1.04–2.93) were independently associated with SIS ≥5. Among patients presenting with chest pain who underwent coronary CTA, older age, male sex, hypertension, and diabetes were independently associated with a high atherosclerotic burden. These findings reinforce the consistent association between routinely obtained clinical variables and a greater anatomic coronary disease burden in this clinical setting. These results support the use of coronary CTA as a complementary tool for characterizing the atherosclerotic burden in this population.

Table 1: Demographic characteristics and medical history of patients presenting to the emergency department with chest pain who underwent coronary CTA (n = 562).

Demographic characteristics	
Age (years), median (interquartile range)	49 (42 – 60)
Age group (years), n (%)	
18 – 39	90 (16,0)
40 – 49	201 (35,8)
50 – 59	125 (22,2)
60 – 69	102 (18,2)
≥ 70	44 (7,8)
Female sex, n (%)	268 (47,7)
Medical history	
BMI (Kg/m²), n (%) (n=535)	
≤ 24,9	179 (33,5)
25 – 29,9	200 (37,4)
≥ 30	156 (29,1)
Smoking, n (%)	67 (11,9)
Hypertension, n (%)	226 (40,2)
Diabetes, n (%)	64 (11,4)
Creatinine (mg/dL), median (interquartile range) (n=547)	0,90 (0,77 – 1,06)

BMI, body mass index.

Table 2: Prevalence of high atherosclerotic burden on coronary CTA according to the Segment Involvement Score (n = 562)

Characteristics	Prevalence	Crude Analysis		Adjusted Analysis	
		PR ($IC_{95\%}$)	p Value	PR ($IC_{95\%}$)	p Value
Age (years)					
18 – 49	5,2%	1,0	< 0,001†	1,0	0,002†
50 – 69	14,5%	2,82 (1,57 – 5,06)		2,10 (1,16 – 3,80)	
≥ 70	20,5%	3,97 (1,85 – 8,51)		3,11 (1,47 – 6,59)	
Sex					
Female	4,9%	1,0	< 0,001‡	1,0	< 0,001‡
Male	15,0%	3,09 (1,70 – 5,60)		3,14 (1,75 – 5,62)	
Smoking					
No	9,7%	1,0	0,34‡	-	
Yes	13,4%	1,39 (0,71 – 2,69)			
Hypertension					
No	5,1%	1,0	< 0,001‡	1,0	0,003‡
Yes	17,7%	3,49 (2,03 – 6,01)		2,37 (1,34 – 4,20)	
Diabetes					
No	7,8%	1,0	< 0,001‡	1,0	0,03‡
Yes	28,1%	3,59 (2,19 – 5,89)		1,75 (1,04 – 2,93)	

† Test for linear trend
‡ Test for heterogeneity
PR: Prevalence Ratio
$IC_{95\%}$: Confidence Interval

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CLINICAL PROFILE, CORONARY CTA FINDINGS, AND IN-HOSPITAL OUTCOMES OF PATIENTS PRESENTING WITH ACUTE CHEST PAIN IN A PRIVATE HEALTHCARE HOSPITAL

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Introduction/Background: Chest pain is one of the most common reasons for emergency department visits. In patients with a low probability of acute coronary syndrome, coronary computed tomography angiography (CTA) is the imaging test of choice for excluding obstructive coronary artery disease. In addition to its diagnostic role, real-world characterization of the clinical profile, anatomic findings, and outcomes of these patients may help define the value of this strategy in optimizing care pathways and hospital resource utilization in the private healthcare setting. Objectives: To describe the clinical characteristics, coronary CTA findings, and in-hospital outcomes of patients presenting with chest pain to a tertiary private healthcare hospital. Methods: This descriptive observational study included patients who underwent coronary CTA for the evaluation of acute chest pain. Demographic characteristics, cardiovascular risk factors, coronary artery calcium scores, and the presence, distribution, and severity of coronary stenosis were assessed, along with short-term in-hospital outcomes. Resultados e Conclusions: A total of 579 patients presenting with acute chest pain who underwent coronary CTA were included in the study. The mean age was 51.5 years, and 47.5% were women. The prevalence of hypertension, diabetes, smoking, and prior coronary artery disease was 41.5 %, 11.3%, 12.1%, and 2.8 %, respectively. A calcium score of 0 was observed in 64.7% of the patients. On coronary CTA, 60.3% of patients had no coronary stenosis, whereas 39.7% had at least one lesion. Among the 789 identified lesions, 82.1% were minimal or mild, 9.4% were moderate, and 8.5% were severe or occlusive, with a predominance in the left anterior descending artery territory (46.9%). Hospital admissions occurred in 19.7% of cases. Invasive coronary angiography was performed in 53 patients, and 40 underwent coronary revascularization, including 38 percutaneous coronary interventions and two coronary artery bypass grafting procedures. The use of coronary CTA in low-risk patients presenting with acute chest pain was associated with a high diagnostic yield and low rate of invasive coronary procedures. This strategy should be reinforced to support the more efficient use of hospital resources. These findings are consistent with those of prior randomized trials showing the safety of early CCTA-based evaluation in the emergency setting.

Table 1: Demographic characteristics, medical history, and clinical presentation of patients presenting to the emergency department with chest pain who underwent coronary CTA (n = 579).

Demographic Characteristics	
Age (years), mean (standard deviation)	51,5 (12,6)
Age groups (years), n (%)	
18 – 39	91 (15,7)
40 – 49	203 (35,1)
50 – 59	130 (22,5)
60 – 69	105 (18,1)
≥ 70	50 (8,6)
Female Sex, n (%)	275 (47,5)
Medical History	
BMI (Kg/m²), n (%) (n=552)	
≤ 24,9	185 (33,5)
25 – 29,9	209 (37,9)
≥ 30	158 (28,6)
Smoking, n (%) (n=576)	70 (12,1)
Hypertension, n (%) (n=576)	239 (41,5)
Diabetes, n (%) (n=577)	65 (11,3)
Dyslipidemia, n (%) (n=577)	96 (16,6)
Coronary artery disease, n (%) (n=576)	16 (2,8%)
Outcomes	
Hospital admission, n (%)	114 (19,7)
Invasive coronary angiography, n (%)	53 (9,1)
Coronary revascularization, n (%)	40 (6,9)
PCI, n (%)	38 (6,5)
CABG, n (%)	2 (0,3)

BMI, body mass index.
PCI, percutaneous coronary intervention.
CABG, coronary artery bypass graft surgery.

Tabela 2: Coronary CTA lesion characteristics

Patients (n=579)	
Calcium score, n (%) (n=571)	
0	369 (64,7)
1 – 99	128 (22,4)
100 – 299	39 (6,8)
≥ 300	35 (6,1)
Number of lesions per patient	
No lesions, n (%)	349 (60,3)
Any lesions, n (%)	230 (39,7)
1 lesion	74 (32,2)
2 lesions	44 (19,1)
3 lesions	25 (10,9)
4 lesions	23 (10,0)
≥ 5 lesions	64 (27,8)
Lesions (n=789)	
Location, n (%)	
Left main coronary artery	54 (6,8)
Left anterior descending artery territory	369 (46,9)
Right coronary artery territory	211 (26,7)
Left circumflex artery territory	146 (18,5)
Intermediate branch	9 (1,1)
Stenosis severity, n (%)	
Minimal / Mild	684 (82,1)
Moderate	74 (9,4)
Severe / Occluded	67 (8,5)

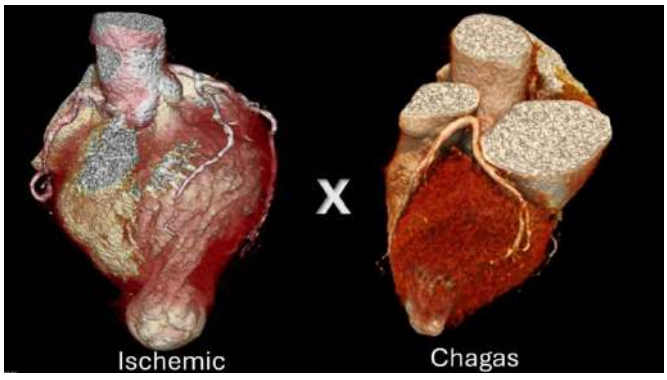
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DIFFERENT STROKES FOR DIFFERENT FOLKS: CARDIOVASCULAR COMPUTED TOMOGRAPHY FEATURES DISTINGUISHING CHAGASIC AND ISCHEMIC LEFT VENTRICULAR APICAL ANEURYSMS

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Introduction/Background: Background Apical aneurysm is a hallmark of chronic Chagas cardiomyopathy and reflects regional myocardial injury distinct from post– myocardial infarction ischemic aneurysms. While echocardiography has historically described these differences, a direct morphological comparison using cardiovascular computed tomography (CCT) has not been previously reported. Objectives: To provide the first CCT-based morphological comparison between ischemic and Chagasic left ventricular apical aneurysms, highlighting imaging features that may assist in etiological differentiation Methods: We retrospectively analyzed cardiovascular computed tomography studies performed at a single center between January and December 2025. Among 1,256 examinations, 4 cases of left ventricular apical aneurysm were identified: two associated with chronic Chagas disease and two with post–myocardial infarction ischemic cardiomyopathy. Coronary anatomy and aneurysm morphology were systematically evaluated. Resultados e Conclusions: Results Chagasic aneurysms demonstrated a characteristic small, focal, mammillary morphology with a narrow neck, confined to the apical segment and without associated coronary artery disease. In contrast, the ischemic aneurysm was larger, broad-based, and accompanied by severe obstructive disease of the left anterior descending coronary artery. These distinct CCT features allowed clear differentiation between etiologies. Conclusion This study provides the first CCT-based morphological characterization distinguishing Chagasic from ischemic left ventricular apical aneurysms. Cardiovascular computed tomography enables simultaneous assessment of ventricular morphology and coronary anatomy, offering a valuable non-invasive tool for etiological diagnosis in patients with apical aneurysms.



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EXTENSIVE RIGHT VENTRICULAR UPTAKE ON 99MTC-PYROPHOSPHATE SCINTIGRAPHY AS A MARKER OF POOR PROGNOSIS IN TRANSTHYRETIN AMYLOID CARDIOMYOPATHY: EXPERIENCE OF A TERTIARY UNIVERSITY HOSPITAL

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Introduction/Background: Scintigraphy with bone seeking tracers has revolutionized the non-invasive diagnosis of transthyretin amyloid cardiomyopathy (ATTR-CM). Recent evidence from large multicenter cohorts has identified right ventricular (RV) uptake as an emerging prognostic marker. However, the specific impact of the extent of RV tracer uptake on clinical outcomes requires further characterization, particularly in cohorts enriched for hereditary ATTR. Objectives: This study aimed to evaluate the prevalence and extent of RV uptake evidenced on 99mTc-pyrophosphate scintigraphy in patients with non-invasive diagnosis of ATTR-CM and its relationship with clinical outcomes. Methods: Patients with clinical suspicion based on symptoms of heart failure (HF) and characteristic findings on echocardiography or cardiac magnetic resonance were prospectively enrolled. Non-invasive diagnosis was established by visual myocardial uptake grade 2 or 3 on SPECT/CT and absence of monoclonal gammopathy . Genetic test was further performed. Extensive RV uptake on SPECT/CT was defined as tracer uptake encompassing the apical, mid-ventricular and basal segments while partial uptake was defined as involvement of basal or mid-ventricular segments, only. The primary composite endpoint included cardiovascular death, hospitalization for HF, and clinically significant arrhythmias. Resultados e Conclusions: Results: Thirty-eight patients were enrolled (mean age 76.1 ± 7.3, 78.9% male, 55.3 % African descent). A total of 54.5% were in NAC ATTR stage II or III, and 86.9% were in NYHA functional class II or III. Hereditary ATTR was present in 70.3% of patients, with Val122Ile as the most prevalent mutation (88.5%). Visual score of 3 for left ventricular uptake was observed in all SPECT/CT, with a predominantly homogeneous uptake pattern (94.7%). RV uptake was identified in 81.6% of scans. Extensive RV uptake was present in 60.5% of the studies, while partial RV uptake in only 21,1%. The occurrence of composite endpoint events was significantly higher in the group with extensive versus partial or absent RV uptake (52.12% vs. 20.0%, p=0.047). The group with extensive RV uptake had significantly shorter event-free survival (log-rank p=0.048) and extensive RV uptake was an independent predictor of outcomes in multivariate analysis (HR 3,69, p=0.047). Conclusion: In this cohort,the prevalence of RV involvement on scintigraphy was high and extensive RV uptake was most prevalent. Extensive RV uptake was independently associated with a greater risk of adverse outcomes.

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QUANTIFICATION OF RIGHT VENTRICULAR AMYLOID BURDEN WITH 18F-FLORBETABEN PET/CT AND ITS CORRELATION WITH 99MTC-PYROPHOSPHATE SCINTIGRAPHY, ECHOCARDIOGRAPHY AND CARDIAC MAGNETIC RESONANCE IN TRANSTHYRETIN CARDIAC AMYLOIDOSIS: A PILOT STUDY

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Introduction/Background: Right ventricular (RV) uptake on bone seeking tracer scintigraphy has emerged as a prognostic marker in transthyretin cardiac amyloidosis (ATTR-CA). However, how to estimate right ventricular (RV) amyloid burden using 18F-Florbetaben PET/CT in ATTR-CA remains understudied. Objectives: This pilot study aimed to quantify RV amyloid burden on 18F-Florbetaben PET/CT and assess its correlation with 99mTc-phyrophosphate scintigraphy, echocardiographic, cardiac magnetic resonance (CMR) imaging parameters, and biomarkers. Methods: Non-invasive diagnosis was established by visual myocardial uptake grade 2 or 3 on SPECT/CT in the absence of monoclonal gammopathy. Extensive RV uptake on SPECT/CT was defined as tracer uptake encompassing the apical, mid-ventricular and basal segments while partial uptake was defined as involvement of basal or mid-ventricular segments. ATTR-CA patients and 9 healthy volunteers further underwent a dynamic cardiac 18F-Florbetaben PET/CT scan performed for up to 40 minutes. Whole-heart static images were retrospectively reconstructed from the dynamic list-mode acquisition between 6 -11 min (Static 1), 15 -20 min (Static 2) and 25-30 min (Static 3). PMOD software was used to calculate left ventricle (LV) and right ventricle (RV) SUV averaged, SUV SD and blood pool in each of these intervals. VOIs were manually drawn contouring LV and RV walls, and blood pool activity (10 mm radius sphere in the left atrium). A cardiac time-activity curve (TAC) for LV, RV and blood pool was also acquired. Resultados e Conclusions: Fifteen patients were enrolled (mean age 77.9 ± 5.4, 86.7% male, 55.3 % African descent). Hereditary ATTR was most prevalent (Val122Ile 60.0%). A visual score of 3 for LV uptake was observed in all SPECT/CT.RV uptake was identified in 80.0% of scans. Extensive and partial RV uptake was present in 66.7% and 13.4%, respectively. RV uptake was detected in all PET/CT scans. Importantly, amyloid burden in those with partial or no RV uptake on scintigraphy was similar to those with extensive RV uptake on PET/CT. RV amyloid burden on PET/CT strongly correlated with NT-pro-BNP, LV and RV strain, RV and LV EF, TAPSE and ECV (each p< 0.05). PET/CT values of the nine controls were statistically significantly lower than ATTR-CA patients validating the methodology used to define RV amyloid burden. Conclusion: RV amyloid burden on PET/CT could be a novel marker of poor prognosis in ATTR-CA. Larger studies with longitudinal outcome data are needed to establish its independent prognostic value.

Cardiovascular Pharmacology

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ANTIRETROVIRAL THERAPIES AND CARDIOVASCULAR RISK FACTORS IN PEOPLE LIVING WITH HIV AGED 50 OR OLDER: FINDINGS FROM STUDIES IN BRAZIL AND THE USA

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Introduction/Background: Progress in antiretroviral therapy has allowed an increase in the life expectancy of people living with HIV (PLWH). However, this population remains at increased risk of non-AIDS-related comorbidities, including cardiovascular diseases (CVD). Furthermore, some antiretroviral therapy (ART) drugs have adverse effects associated with increased cardiovascular risk. Objectives: This study evaluated the relationship between different ART regimens and cardiovascular risk factors in PLWH aged ≥50 years, using data from studies conducted in the USA and Brazil. Methods: Data were derived from two sources: a cross-sectional study including 163 PLWH from a tertiary hospital in the USA (2016–2019) and a cohort study including 107 PLWH from a tertiary hospital in Brazil (2023). ART regimens included integrase inhibitors (I group: USA=79; Brazil=41), protease inhibitors (P group: USA=27; Brazil=31), combined integrase and protease inhibitors (IP group: USA=21; Brazil=35), and nucleoside/non-nucleoside reverse transcriptase inhibitor combinations (O group: USA=36; Brazil=0). Interferon gamma (IFN), interleukin-6 (IL-6), tumor necrosis factor (TNF), and cell-free mitochondrial DNA (cf-mtDNA) were available only in the US study. Quantile regression (τ=0.5) was used to compare clinical, biochemical, and immunological variables across groups, adjusting for age, sex, race, duration of HIV infection, BMI, smoking, diabetes, antihypertensive therapy, and statin use. Analyses were performed in R. Resultados e Conclusions: The results are summarized in Table 1. The Brazilian IP group exhibited higher total cholesterol (TC) and creatinine levels (Cr), corresponding to a lower estimated glomerular filtration rate (eGFR). Notably, the American IP group showed elevated levels of inflammatory markers (IFN, IL-6, TNF) and cf-mtDNA, whereas the respective P group had lower CD4 counts and reduced CD4/CD8 ratios. No differences were observed in BMI, waist circumference (WC), systolic blood pressure (SBP), diastolic blood pressure (DBP), HDL, LDL, fasting glucose (Glu), high-sensitivity C-reactive protein (CRP), and viral load. Taken together, this data suggests that combined integrase and protease inhibitor regimens may be associated with less favorable profiles of several cardiovascular risk factors, including dyslipidemia, impaired renal function, and elevated inflammatory markers. Longitudinal studies are needed to corroborate these findings.

Table 1: Group variables comparison by quantile regression

Variable	BRAZILIAN STUDY (N=107)					AMERICAN STUDY (N=163)				
	Group Comparison	Estimate	SE	t.ratio	p-value	Group Comparison	Estimate	SE	t.ratio	p-value
BMI	-	-	-	-	-	-	-	-	-	-
WC	-	-	-	-	-	-	-	-	-	-
SBP	-	-	-	-	-	-	-	-	-	-
DBP	-	-	-	-	-	-	-	-	-	-
TC	IP / I	26.90	9.90	2.72	0.02	-	-	-	-	-
HDL	-	-	-	-	-	-	-	-	-	-
LDL	-	-	-	-	-	-	-	-	-	-
Glu	-	-	-	-	-	-	-	-	-	-
CRP	-	-	-	-	-	-	-	-	-	-
IFN	-	-	-	-	-	IP / O	2.67	0.65	4.14	0.0004
IL-6	-	-	-	-	-	IP / O	0.29	0.11	2.66	0.04
TNF	-	-	-	-	-	IP / O	0.88	0.25	3.56	0.003
CD4	-	-	-	-	-	IP / I	0.65	0.23	2.83	0.03
CD4/CD8	-	-	-	-	-	O / P	268.50	64.0	4.19	0.0003
Viral Load	-	-	-	-	-	O / P	0.34	0.12	2.79	0.03
Cr	IP / P	0.13	39	3.27	0.005	-	-	-	-	-
e-GFR (CKD-EPI)	P / IP	12.45	3.09	4.03	0.0004	-	-	-	-	-
cf-mtDNA	-	-	-	-	-	IP / I	130.50	35.30	3.69	0.002
	-	-	-	-	-	IP / O	118.70	38.70	3.07	0.01

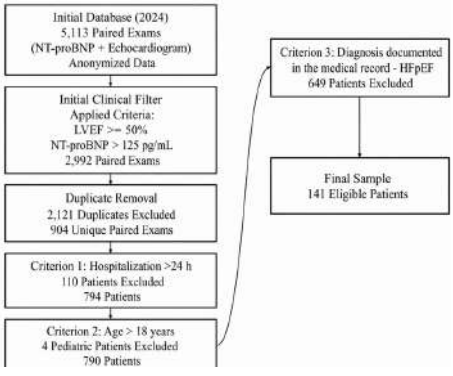
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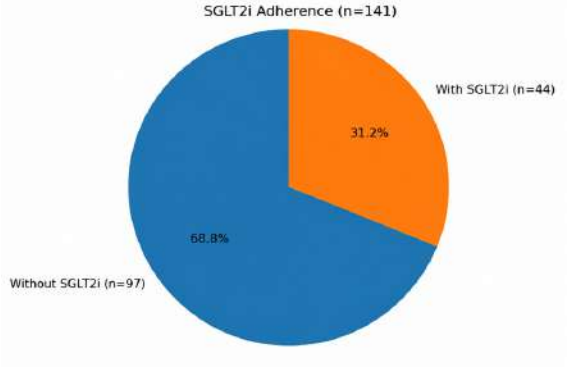
ASSESSMENT OF MEDICAL PRESCRIBING ADHERENCE TO DAPAGLIFLOZIN AND EMPAGLIFLOZIN IN HOSPITALIZED PATIENTS WITH HEART FAILURE WITH PRESERVED EJECTION FRACTION (HFPEF)

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Introduction/Background: Heart failure with preserved ejection fraction (HFpEF) is a frequent, heterogeneous syndrome associated with multiple comorbidities, high healthcare burden, and recurrent hospitalizations. In this context, SGLT2 inhibitors (SGLT2i) play an important therapeutic role, although their incorporation into hospital practice remains variable. Objectives: To evaluate adherence to the medical prescription of dapagliflozin and empagliflozin in hospitalized patients with HFpEF, identify factors associated with their use, and describe clinical outcomes during the study period. Methods: This was a retrospective observational study based on an institutional 2024 database linking echocardiography and NT-proBNP. Hospitalized patients with left ventricular ejection fraction ≥50% and a diagnosis consistent with HFpEF were included, totaling 141 patients. Resultados e Conclusions: The sample was predominantly female (60.3%), with a median age of 86 years, and 51.8% of admissions were classified as cardiovascular. SGLT2i were prescribed in 31.2% of patients, with dapagliflozin in 22.7% and empagliflozin in 8.5%. Their use was more frequent in cardiovascular admissions (42.5% versus 19.1%). Patients receiving SGLT2i were younger and had lower NT-proBNP levels. In the multivariable analysis, cardiovascular admission was associated with a higher likelihood of prescription (OR 3.25), whereas NT-proBNP was associated with a lower likelihood of use (OR 0.54). All-cause mortality was 27.7%, with a predominance of non-cardiovascular deaths (24.1%) over cardiovascular deaths (3.5%). NT-proBNP and recurrent urinary tract infection were associated with mortality, whereas SGLT2i use did not remain significant after adjustment. Adherence to SGLT2i prescription in hospitalized patients with HFpEF was partial and influenced by clinical characteristics and the context of hospitalization, highlighting the need for institutional strategies to optimize therapy and expand the incorporation of evidence into clinical practice.





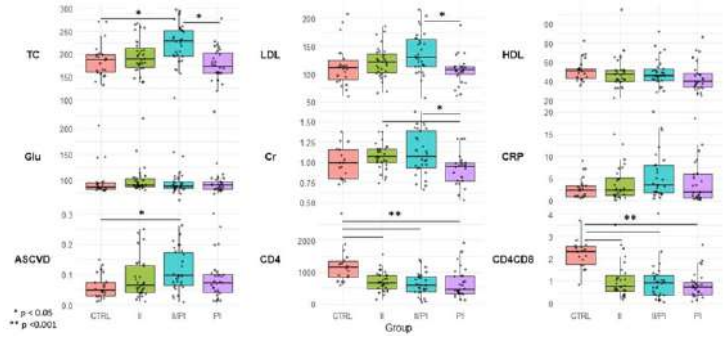
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CARDIOVASCULAR RISK IN PEOPLE LIVING WITH HIV AGED 50 OR OLDER USING DIFFERENT ANTIRETROVIRAL THERAPIES

FELIPE COSTA DE SOUZA1; NATHAN CORRÊA ASSIS1; CHRISTIANNE BRETAS VIEIRA SCARAMELLO1;

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Introduction/Background: Advances in antiretroviral therapy (ART) have significantly increased the life expectancy of people living with HIV (PLWH). Nevertheless, this population remains at higher risk for non-AIDS-related comorbidities, particularly cardiovascular diseases (CVD). In addition, certain ART regimens may contribute to metabolic and cardiovascular risk. Objectives: This study aimed to evaluate cardiovascular risk in PLWH aged 50 or older according to the ART regimen. Methods: This cross-sectional study, approved by the institutional ethics committee, was conducted at a tertiary care hospital. A total of 111 participants were included, of whom 22 were HIV-negative, comprising the control group. PLWH (n=89) were divided into three groups according to ART (Integrase Inhibitors – II, n=31; Protease Inhibitors - PI, n=28; combined Integrase Inhibitors/Protease Inhibitors – II/PI, n=30). Groups were matched by age, sex, race, and years living with HIV. Individuals with prior CVD were excluded. Data collection occurred between July and December 2023 during outpatient visits that included clinical evaluation, anthropometric measurements, and blood sampling for laboratory analysis. ASCVD risk score was calculated. Normality was assessed using the Shapiro-Wilk test. Data are presented as median (IQR). Comparisons were performed using the Kruskal-Wallis test with Dunn's post hoc test and Bonferroni correction. Analyses were conducted in RStudio; p<0.05 was considered significant. Resultados e Conclusions: The results are summarized in Figure 1. The II/PI group presented a worse metabolic profile, with greater total cholesterol (TC) than the control and PI groups. In addition, higher LDL and creatinine (Cr) levels were observed in the II/PI group than in the PI group, and the ASCVD score was higher than in the control group. These data together suggest an elevated overall cardiovascular risk in the II/PI group. All three ART groups demonstrated a less favorable immunological profile than the control group, as evidenced by lower CD4 counts and reduced CD4/CD8 ratios. However, no differences were observed in HDL cholesterol, fasting glucose (Glu), or high-sensitivity C-reactive protein (CRP) compared to HIV-negative individuals. These findings indicate that ART regimens, especially if combined, may negatively impact cardiometabolic risk, highlighting the importance of individualized cardiovascular assessment and careful therapeutic selection in older PLWH.



17994

CLINICAL, BLOOD PRESSURE, AND PHARMACOTHERAPEUTIC CHARACTERIZATION OF A COHORT OF HYPERTENSIVE PATIENTS IN A TERTIARY CARDIOLOGY CENTER

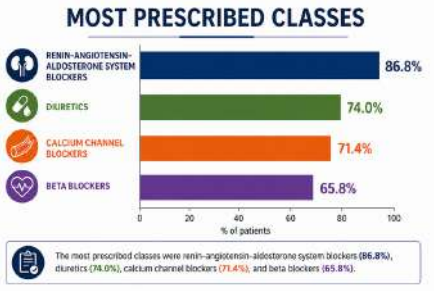
ROSANA LIMA GARCIA1; LUIZ APARECIDO BORTOLOTTO1; LUCIANO FERREIRA DRAGER1; HENO FERREIRA LOPES1; JOÃO VICENTE DA SILVEIRA1; FERNANDA CONSOLIM COLOMBO1;

(1) INCOR - INSTITUTO DO CORACAO DA UNIVERSIDADE DE SAO PAULO - SAO PAULO - SP - BRASIL;

Introduction/Background: Hypertension in tertiary care settings presents clinical complexity often associated with multimorbidity, polypharmacy, and difficult blood pressure control. Given its high prevalence in the public healthcare system, it is essential to characterize not only the epidemiological profile but also blood pressure control records and pharmacotherapeutic patterns, in order to support healthcare planning based on frequently updated data. Objectives: To describe the clinical, blood pressure, and pharmacotherapeutic profile of hypertensive patients treated in the Brazilian Public Health System (SUS) and followed at a tertiary cardiology center in the city of São Paulo. Methods: This is an observational, retrospective study including patients registered between January 2024 and December 2026, identified through the Medical and Hospital Information Unit database. Demographic, laboratory, and clinical variables were analyzed, including office blood pressure measurements and ambulatory blood pressure monitoring (ABPM), as well as prescription profiles and number of medications. Among patients with ABPM, the number of antihypertensive drug classes was evaluated according to blood pressure control, defined as systolic blood pressure ≤135 mmHg and diastolic blood pressure ≤85 mmHg during wakefulness. Resultados e Conclusions: In the hypertension outpatient clinic of a tertiary hospital, 3,745 patients were analyzed, with a predominance of females (61.1%) and individuals aged ≥60 years (69.0%). A high burden of comorbidities was observed, with 45.0% presenting an estimated glomerular filtration rate ≤60 mL/min/1.73 m². Mean office blood pressure was 139.9±24.7/83.8±11.7 mmHg, and 24-hour ABPM was 134.4±19.1/77.2±13.5 mmHg. Regarding pharmacotherapy, the mean number of tablets was 10.4±4.0, highlighting the relevance of polypharmacy. The most prescribed drug classes were renin–angiotensin–aldosterone system blockers (86.8%), diuretics (74.0%), calcium channel blockers (71.4%), and beta-blockers (65.8%). Among patients with ABPM (n=1,455), 50.8% achieved blood pressure control. A higher frequency of ≥5 antihypertensive classes was observed among uncontrolled patients (58.4% vs. 33.7%), suggesting greater therapeutic complexity associated with treatment resistance. These findings characterize a high-risk population with substantial polypharmacy and suboptimal blood pressure control. They highlight the need for structured management and better clinical data to support decisions and health policy in tertiary cardiology care.

Distribution of the number of tablets per patient among hypertensive patients treated in the SUS at a tertiary cardiology center

Variable	Result
Number of patients (n)	3745
Mean ± standard deviation	10.4 ± 4.0
Median	10
Minimum - maximum	3 - 35



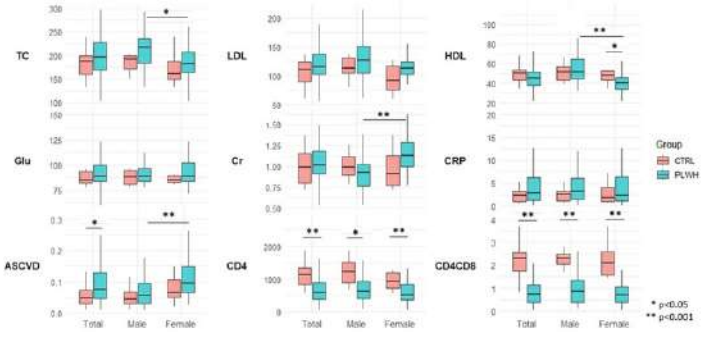
17717

EVALUATION OF SEX-RELATED CARDIOVASCULAR RISK IN PEOPLE LIVING WITH HIV AGED 50 OR OLDER

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(1) PROGRAMA DE POS GRADUACAO EM CIENCIAS CARDIOVASCULARES - UFF - NITERÓI - RJ - BRASIL;

Introduction/Background: People living with HIV (PLWH) are at higher risk for cardiovascular disease (CVD) than HIV-negative individuals. Although sex differences in cardiovascular risk are well-established in the general population, their influence in PLWH remains poorly understood. Elucidating these differences is crucial for guiding sex-specific clinical monitoring and preventive strategies. Objectives: This study aimed to evaluate sex-specific cardiovascular risk in PLWH aged 50 or older using antiretroviral therapy. Methods: This cross-sectional study, approved by the institutional ethics committee, was conducted at a tertiary care hospital. A total of 136 participants, 49% women and 51% men, aged 50 or older and without prior CVD, were included, being 107 PLWH and 29 controls (CTRL). Data were collected from July to December 2023 during clinic visits, followed by blood sampling. Anthropometric and laboratory parameters were assessed. ASCVD cardiovascular risk score was calculated. Normality was assessed using the Shapiro–Wilk test. Data are presented as median (IQR), and group comparisons were performed using the Wilcoxon test in R Studio. Resultados e Conclusions: The results are summarized in Figure 1. Compared with controls, women living with HIV had lower HDL cholesterol levels (40.4 [12.2] vs 47.7 [9.1]; p = 0.03). Overall, individuals living with HIV exhibited a higher ASCVD risk than controls (0.075 [0.082] vs 0.049 [0.044]; p = 0.03). Within the PLWH group, men had higher total cholesterol (TC) (217.0 [53.0] vs 182.0 [70.0]; p = 0.01) and HDL cholesterol (51.3 [20.2] vs 40.4 [12.2] ; p < 0.001) than women. In contrast, women showed higher creatinine levels (Cr) and ASCVD score than men (1.13 [0.29] vs 0.92 [0.26]; p < 0.001; and 0.096 [0.082] vs 0.055 [0.066]; p < 0.001, respectively). These findings indicate sex-dependent outcomes, with a potentially greater burden of renal impairment and overall cardiovascular risk among women living with HIV. Additionally, PLWH had lower CD4 counts (598 [500] vs 1140 [506] ; p < 0.001) and reduced CD4/CD8 ratios (0.74 [0.75] vs 2.30 [0.79]; p < 0.001), suggesting that increased cardiovascular risk may be partly related to persistent immune dysfunction. No differences were observed in LDL cholesterol, fasting glucose (Glu), or high-sensitivity C-reactive protein (CRP). More studies are needed to better understand sex differences in PLWH and to set strategies to improve their immune, metabolic, and cardiovascular health.



17811

WORKSHOPS ON THROMBOLYTIC MANAGEMENT IN THE ACUTE MYOCARDIAL INFARCTION CARE PATHWAY: INTEGRATION OF CLINICAL PHARMACY AND OPTIMIZATION OF CARE PROCESSES IN THE PUBLIC HEALTH NETWORK

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Introduction/Background: ST-segment elevation myocardial infarction (STEMI) is a leading cause of cardiovascular mortality in Brazil. As a time-dependent condition, reducing door-to-ECG and door-to-needle times is critical to improving outcomes. Public healthcare systems face persistent challenges in implementing STEMI care pathways, particularly in settings where tenecteplase is used without immediate access to percutaneous coronary intervention. Logistical factors, including drug storage and dispensing, as well as the integration of clinical pharmacy services, may significantly impact door-to-needle times. Educational workshops were developed to address these gaps. Objectives: To report the implementation of workshops on thrombolytic management in STEMI, focusing on clinical pharmacy integration and standardization of care processes. Methods: Institutional descriptive experience report conducted in accordance with CNS Resolution No. 510/2016. Seven in-person workshops (November 2024–October 2025), each lasting four hours, were delivered to multidisciplinary professionals from emergency care networks. Participating units designated representatives from medicine, nursing, management, and pharmacy. Activities included interactive lectures, case-based discussions, performance indicator analysis, sharing of best practices, and identification of critical issues in thrombolytic storage and dispensing processes. The final session incorporated simulation-based training of the care pathway. Resultados e Conclusions: Approximately 500 professionals from 72 thrombolysis-capable units participated. Heterogeneity in storage and dispensing processes and gaps in integration between care teams and pharmacy services were identified, potentially impacting door-to-needle times. Key outcomes included standardization of STEMI kits, establishment of structured communication workflows, and increased involvement of clinical pharmacy in real-time assessment of thrombolysis indications and contraindications. The workshops proved to be an effective continuing education strategy, contributing to process standardization, strengthening clinical pharmacy practice, and potentially reducing treatment delays.





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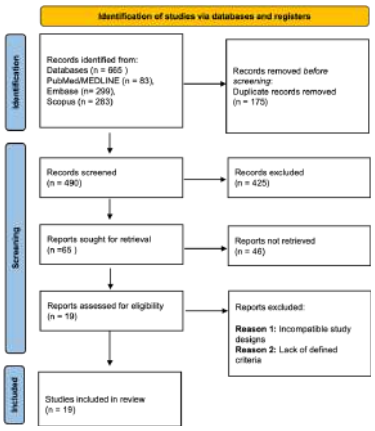
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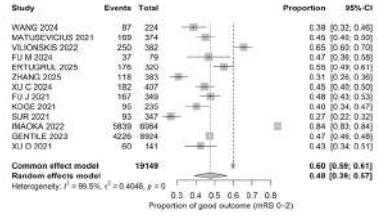
COMPETING PRIORITIES IN ACUTE ISCHEMIA: IMPACT OF CONCOMITANT CARDIAC DYSFUNCTION ON OUTCOMES AFTER MECHANICAL THROMBECTOMY

ENRICO PORTES VIEIRA LEITE URBAN1; GIOVANA DOMICIANO VARNIER1; FELIPE MESQUITA MOREIRA MOTA RODRIGUES1; DIEGO FARIA COLA1;

(1) UNIVERSIDADE SANTO AMARO (UNISA) - SÃO PAULO - SP - BRASIL;

Introduction/Background: Acute ischemic stroke (AIS) is a leading cause of global disability. While mechanical thrombectomy (MT) is the gold standard for large vessel occlusion, its success depends on rigorous perioperative hemodynamic management. Patients with cardiac dysfunction, such as atrial fibrillation and heart failure, face unique challenges where high blood pressure (BP) may cause reperfusion injury and low BP can exacerbate ischemia. Current guidelines lack specific targets for this group, creating a scenario of competing priorities between cerebral perfusion and myocardial stress. Objectives: To evaluate the association between perioperative BP parameters and clinical outcomes in patients with cardiac dysfunction undergoing MT. Methods: Following PRISMA 2020 guidelines, this systematic review and meta-analysis (PROSPERO CRD420261360557) searched PubMed, Embase, and Scopus for studies published between 2015 and 2025. It included adults with AIS and cardiac dysfunction treated with MT. A random-effects model was used to estimate the pooled rate of favorable functional outcomes (mRS 0–2 at 90 days). Resultados e Conclusions: RESULTS: Nineteen studies were analyzed. The pooled rate of favorable outcome was 48% (95% CI: 39%–57%), with high heterogeneity (I^2=99.5%). Atrial fibrillation, heart failure, and reduced ejection fraction were consistently linked to poorer recovery and higher mortality. High BP variability and nocturnal systolic BP were significant predictors of neurological deterioration and “futile recanalization,” where technical success fails to yield clinical benefit. CONCLUSION: Cardiac dysfunction and hemodynamic instability are critical independent prognostic determinants. Clinical success is heavily modulated by cardiovascular reserve; technical recanalization alone does not ensure recovery. These findings support a shift toward personalized, physiology-guided targets. Multidisciplinary integration is essential, and randomized trials are needed to define specific protocols for this vulnerable subgroup.





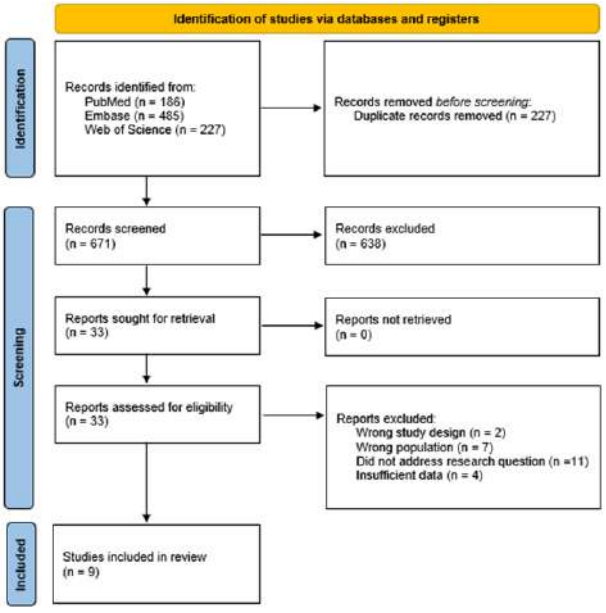
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DURABILITY OF PROSTHETIC VALVES IN TRANSCATHETER AORTIC VALVE IMPLANTATION (TAVI) VERSUS SURGICAL AORTIC VALVE REPLACEMENT (SAVR) IN PATIENTS UNDER 75 YEARS: A SYSTEMATIC REVIEW

GABRIEL RIBEIRO GONÇALVES ACCIOLY SOUZA1; YURI FELIX BRANDÃO1; ISADORA EGYPTO MACHADO1; GIOVANA PEREIRA GURGEL1; JAMES NOBRE DE SENA1;

(1) UNIVERSIDADE DE FORTALEZA - UNIFOR - FORTALEZA - CE - BRASIL;

Introduction/Background: Aortic stenosis is one of the most prevalent valvular heart diseases and is associated with high morbidity and mortality when untreated. Surgical aortic valve replacement (SAVR) has long been the standard treatment, with well-established long-term outcomes. Transcatheter aortic valve implantation (TAVI), initially indicated for high-risk patients, has progressively expanded to lower-risk and younger populations. However, concerns remain regarding the long-term durability of transcatheter prostheses. Objectives: To evaluate prosthetic valve durability in patients under 75 years with aortic stenosis, comparing outcomes between TAVI and SAVR. Methods: We conducted a systematic review in accordance with PRISMA guidelines and registered it in PROSPERO (CRD420261363624). A literature search was performed in PubMed, Web of Science, and Embase databases, without time restriction and limited to English-language studies. The research question was structured according to the PICO framework, including patients under 75 years with aortic stenosis (P), undergoing TAVI (I), compared with SAVR (C), and assessing durability outcomes such as structural valve deterioration, bioprosthetic valve failure, reintervention, and hemodynamic performance (O). Eligible studies directly compared TAVI and SAVR in this population. Studies without a comparator group, without durability outcomes, involving patients ≥75 years without subgroup analysis, or non-original designs were excluded. Resultados e Conclusions: A total of 898 records were identified, with 227 duplicates removed. After screening 671 titles and abstracts, 33 studies were assessed for full-text eligibility, and 9 were included. The studies showed similar outcomes between TAVI and SAVR in the short and mid-term, with low rates of structural valve deterioration and reintervention. TAVI demonstrated superior hemodynamic performance, with lower transvalvular gradients. No significant differences were observed in mortality or neurological events up to 5 years. However, long-term data, particularly in younger populations, suggest higher mortality associated with TAVI. Additionally, TAVI was associated with higher rates of permanent pacemaker implantation and paravalvular regurgitation. Therefore, although TAVI represents an effective and less invasive alternative, its use in patients with longer life expectancy should be carefully considered, and further long-term studies are needed.



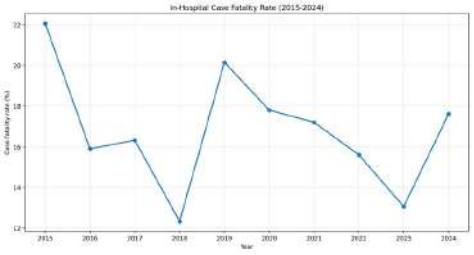
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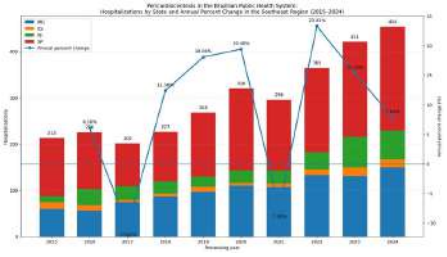
PERICARDIOCENTESIS IN THE BRAZILIAN PUBLIC HEALTH SYSTEM: A DECADE OF HOSPITALIZATIONS AND MORTALITY TRENDS IN THE SOUTHEAST REGION (2015-2024)

LUIZA MORAIS DINIZ1; LÍVIA LARA MARQUES2; LÍVIA KOBARG AKERMAN3; SELENA MENDES BRANDÃO4; LOUISE MOTA DA ROCHA SADY5; LUCAS FERNANDES ANANIAS6; TUANY CAROLINE BERNARDI6;

(1) UFSJ - UNIVERSIDADE FEDERAL DE SÃO JOÃO DEL-REI - SÃO JOÃO DEL-REI - MG - BRASIL; (2) PONTIFÍCIA UNIVERSIDADE CATÓLICA DE MINAS GERAIS, CAMPUS CONTAGEM - CONTAGEM - MG - BRASIL; (3) UNIARP - UNIVERSIDADE DO ALTO VALE DO RIO DO PEIXE - CAÇADOR - SC - BRASIL; (4) UNIVERSIDADE DE UBERABA - UBERABA - MG - BRASIL; (5) CENTRO UNIVERSITÁRIO FACID WYDEN - TERESINA - PI - BRASIL; (6) CENTRO EDUCACIONAL DINIZ - CAMPINA GRANDE - PB - BRASIL;

Introduction/Background: Pericardial effusion can cause hemodynamic instability and cardiac tamponade, making pericardiocentesis an essential diagnostic and therapeutic procedure. Despite its clinical relevance, Brazilian population data on hospitalizations and mortality related to this procedure in the SUS remain scarce, as most evidence derives from single-center studies. Objectives: To analyze temporal trends of hospitalizations and hospital mortality due to pericardiocentesis in the SUS, Southeast Region of Brazil, from 2015 to 2024. Methods: This observational, ecological, and retrospective study used secondary data from the SUS Hospital Information System (SIH/SUS) via DATASUS. Hospitalizations with procedure code 0406010773 in the Southeast region (SP, MG, RJ, ES) were analyzed. Variables included hospitalizations, deaths, year, and federative unit. Data were tabulated and exported for descriptive analysis of temporal trends, mortality rates, and annual percentage variation. Using public anonymized data, the study is exempt from Ethics Committee review (Resolution 510/2016). Resultados e Conclusions: Between 2015 and 2024, 2,992 hospitalizations for pericardiocentesis were recorded in the SUS Southeast Region, with 498 deaths and an average hospital lethality of 16.8%. A trend of progressive increase in hospitalizations was observed, rising from 213 cases in 2015 to 454 in 2024, indicating a possible growth in demand or access to this procedure, but also an increase in the incidence or severity of underlying conditions. São Paulo concentrated the largest share [1,531 hospitalizations (51.16%) and 237 deaths (54.81%)]; in contrast, Espírito Santo presented the lowest absolute volume [111 hospitalizations (3.70%) and 13 deaths (2.61%)]. This pattern highlights a strong concentration of the procedure in states with higher population density and greater installed capacity. Hospital lethality varied from 22.06% in 2015 to 12.33% in 2018, remaining high despite the increase in the number of procedures, indicating that it remains a marker for critically ill patients, in an emergency context. From the pandemic period onwards, a growth in hospitalizations was observed without a reduction in mortality, suggesting greater severity of cases, possible delays in seeking care, or systemic complications. Therefore, the increase in hospitalizations for pericardiocentesis in the analyzed period is consistent with the maintenance of high lethality and evidences that the procedure remains linked to severe and high-complexity conditions.





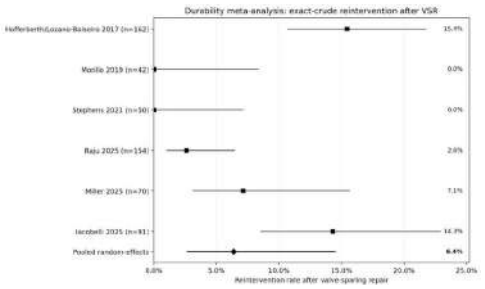
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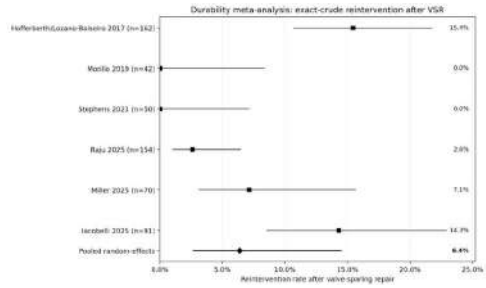
PREOPERATIVE ANATOMIC AND IMAGING PREDICTORS OF DURABLE PULMONARY VALVE–SPARING REPAIR IN TETRALOGY OF FALLOT

ANTONIO JHONATA ALVES LIMA1; JAMES NOBRE DE SENA2; MARIA CLARA AGUIAR TOMAZ3; YURI FELIX BRANDÃO4; NEWTON DIÓGENES PINHEIRO NETO4; AILTON CÉSAR DE ARAÚJO FILHO5; ROBERTO VICTOR PAIVA CAMURÇA6; EMILY BITTENCOURT DE SOUZA MARTINS6; ANNA LETÍCIA ALVES BOMFIM6; BENJAMIM ANTÔNIO PINHEIRO VIEIRA6;

(1) UNIVERSIDADE ESTADUAL DO CEARÁ - QUIXERAMOBIM - CE - BRASIL; (2) UNIVERSIDADE ESTADUAL DO CEARÁ - FORTALEZA - CE - BRASIL; (3) UNICHRISTUS - FORTALEZA - CE - BRASIL; (4) UNIVERSIDADE DE FORTALEZA - UNIFOR - FORTALEZA - CE - BRASIL; (5) UECE - QUIXERAMOBIM - CE - BRASIL; (6) UECE - FORTALEZA - CE - BRASIL;

Introduction/Background: In Tetralogy of Fallot (TOF), the operative challenge is identifying which anatomy supports valve-sparing repair (VSR) without causing residual right ventricular outflow tract (RVOT) obstruction. While transannular patch (TAP) relieves obstruction, it leads to chronic pulmonary insufficiency and right ventricular volume overload. VSR offers a physiologic repair, but its feasibility and long-term durability require clearer definition. Objectives: To evaluate preoperative anatomic and imaging predictors for VSR in TOF, focusing on factors influencing the selection between VSR and TAP, the association between pulmonary annulus z-scores and surgical decision-making, and pooled reintervention rates. Methods: Systematic review and meta-analysis of predictors for VSR selection and durability. Outcomes included procedural selection, moderate/severe pulmonary regurgitation, residual RVOT gradient, reintervention, pulmonary valve replacement, and mortality. Risk of bias was assessed via QUIPS. Quantitative synthesis used pooled mean difference (MD) in preoperative z-scores and pooled reintervention rates. Resultados e Conclusions: Thirty cohorts were identified (21 for selection; 19 for durability). In the primary selection analysis (7 studies; 1,044 patients), VSR patients had significantly larger preoperative pulmonary annulus z-scores than TAP/non-VSR (MD 1.79; 95% CI, 1.38–2.20; I^2=83.0%), confirming annular size as a primary discriminator. However, high heterogeneity suggests no universal z-score cutoff. Qualitative synthesis associated successful VSR with favorable valve morphology, less main pulmonary artery hypoplasia, and lower residual gradients. For durability (6 studies; 569 patients), the pooled reintervention rate after VSR was 6.38% (95% CI, 2.66%–14.54%; I^2=75.3%). An expanded analysis (629 patients) showed a 7.32% rate (95% CI, 3.53%–14.57%). Findings indicate VSR has acceptable mid-term durability in selected patients. Late failure was driven by the interaction of annular dimensions, leaflet quality, RVOT geometry, and the adequacy of the index relief.Preoperative pulmonary annular z-score is a strong but incomplete predictor of VSR. Durable preservation depends on a broad anatomic profile beyond annular size. Data support patient-specific strategies to maximize preservation while minimizing late insufficiency and reintervention.





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15642

ANOMALOUS LEFT CORONARY ARTERY ORIGIN (ALCAPA): A DESCRIPTIVE STUDY OF CASES MANAGED OVER THE LAST 15 YEARS AT A QUATERNARY CARE CENTER

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Introduction/Background: Anomalous Left Coronary Artery from the Pulmonary Artery (ALCAPA) is a rare congenital heart disease (1:300,000 live births) characterized by the anomalous connection of the left coronary artery (LCA) to the pulmonary artery, leading to severe myocardial ischemia and high mortality if not treated early. Clinical presentation ranges from heart failure in infancy to asymptomatic cases in adulthood when sufficient collateral circulation is present. Diagnosis is established through echocardiography and cardiac computed tomography angiography. Surgical correction, involving reimplantation of the LCA into the aorta, is essential to reduce complications such as mitral regurgitation, ventricular dysfunction, arrhythmias, and sudden cardiac death. Postoperative mortality in some centers is reported to be 14%, with risk factors including left ventricular dysfunction and older age at the time of surgery. In the long term, survival rates exceed 98% at 20 years. Objectives: To evaluate the clinical outcomes of patients diagnosed with ALCAPA over the last 15 years at a quaternary referral center. Methods: This is a descriptive study based on epidemiological data and clinical outcomes (ventricular dysfunction, heart transplantation, and death), collected from medical records in the database of a quaternary hospital, including patients diagnosed with ALCAPA between 2010 and 2024. Resultados e Conclusions: The initial sample included 489 patients. After excluding incomplete records, duplicates, and cases with incorrect ICD coding, 71 cases remained. Of these, 56.3% were female, and most had no associated comorbidities. Two patients did not undergo surgery; among those operated on, 36.2% also underwent mitral valve repair. Mean age at surgery was 3 years and 3 months, with a median of 6 months. Left ventricular dysfunction was found in 38% of patients, with functional recovery in 59.2% of cases. Follow-up was lost in 26 cases; among those followed, 1 patient required heart transplantation and 4 died—3 in the first year of life and 1 at 59 years old, one year after diagnosis without surgery. These findings reinforce the importance of early diagnosis of ALCAPA. Despite its severity, most surgically treated patients had favorable outcomes, including ventricular function recovery. Mortality was 5.7%, mostly early, consistent with the literature. Loss to follow-up may have affected long-term mortality analysis.

Variable	Absolute number (n)	Percentage (%)
Sex		
Female	40	56.3
Male	31	43.7
Surgery		
Not operated	2	2.8
Repair without mitral valve repair	25	35.2
Repair with mitral valve repair	44	62.0
Age at surgical correction		
Not operated	2	2.8
Less than 6 months	28	39.4
6 months to 1 year	20	28.2
>1 year to 10 years	14	20.0
>10 years to 20 years	3	4.2
>20 Years	4	5.4
Left ventricular dysfunction		
No dysfunction	44	62.0
Dysfunction with recovery of function	16	22.5
Dysfunction without recovery of function	11	15.5
Others		
Reoperation	6	8.5
Transplant	1	1.5
Death	4	5.6
Total patients	**71**	**100**

Table 1 – Data analyzed and prevalence in the studied sample.

19841

DIAGNOSTIC VALUE OF DUCTUS ARTERIOSUS PULSATILITY INDEX IN FETAL DUCTAL CONSTRICTION: A SYSTEMATIC REVIEW

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Introduction/Background: Fetal ductal constriction is a clinically relevant condition associated with increased right ventricular afterload, altered fetal hemodynamics, and adverse perinatal outcomes. The Doppler-derived pulsatility index (PI) of the ductus arteriosus is widely used as a surrogate marker of ductal flow dynamics; however, its diagnostic performance as an isolated parameter remains uncertain. Objectives: To evaluate the diagnostic performance and clinical reliability of the ductus arteriosus pulsatility index as an isolated parameter for detecting fetal ductal constriction. Methods: A systematic review was conducted according to PRISMA guidelines and registered in PROSPERO 2026 CRD420261380023. A comprehensive search was performed in PubMed and Embase, complemented by manual reference screening. Eligible studies included original clinical investigations assessing fetal ductal constriction with Doppler echocardiographic evaluation of the pulsatility index. Data extraction included study design, population characteristics, diagnostic criteria, Doppler parameters, and clinical outcomes. Due to methodological heterogeneity, a qualitative synthesis was performed. Resultados e Conclusions: RESULTS Fetal ductal constriction was consistently associated with increased systolic and diastolic ductal flow velocities and reduced pulsatility index values. However, considerable overlap between normal and pathological PI ranges was observed. Pharmacological and dietary exposures, including non-steroidal anti-inflammatory drugs and polyphenol-rich substances, demonstrated a direct and reversible effect on PI values, confirming its sensitivity to ductal tone. PI variability was influenced by physiological and hemodynamic factors such as fetal heart rate, loading conditions, and right ventricular performance. Studies incorporating additional echocardiographic parameters, including ductal flow patterns and ventricular remodeling, showed improved diagnostic accuracy compared to isolated PI assessment. CONCLUSION The pulsatility index of the ductus arteriosus is a sensitive marker of fetal ductal hemodynamics but lacks sufficient specificity when used in isolation. A comprehensive echocardiographic approach integrating functional and structural parameters is essential to improve diagnostic accuracy and guide clinical decision-making.

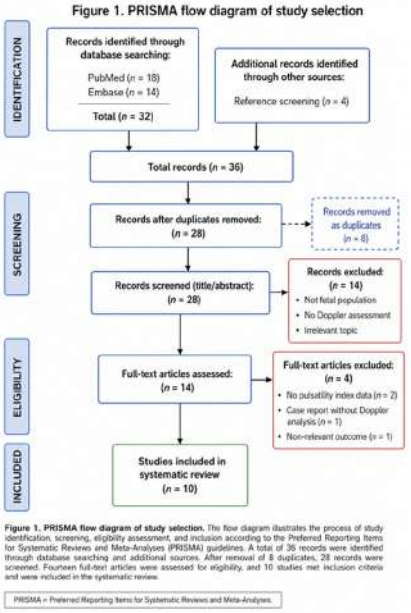


Figure 1. PRISMA flow diagram of study selection. The flow diagram illustrates the process of study identification, screening, eligibility assessment, and inclusion according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. A total of 36 records were identified through database searching and additional sources. After removal of 8 duplicates, 28 records were screened. Fourteen full-text articles were assessed for eligibility, and 10 studies met inclusion criteria and were included in the systematic review.

PRISMA = Preferred Reporting Items for Systematic Reviews and Meta-Analyses.

20297

ECHOCARDIOGRAPHIC ASSESSMENT OF HEMODYNAMIC REPERCUSSION IN VENTRICULAR SEPTAL DEFECT: THE ROLE OF VSD/LVD RATIO AND QUANTITATIVE DOPPLER.

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Introduction/Background: Ventricular septal defect (VSD) is the most prevalent congenital heart disease and is frequently associated with pulmonary overcirculation and left ventricular (LV) volume overload. The definition of hemodynamic significance and the indication for intervention rely on complex echocardiographic and hemodynamic parameters, including the pulmonary-to-systemic flow ratio (Qp/Qs). In this context, simplified echocardiographic indices, such as the ratio between VSD diameter and left ventricular diameter (VSD/LVD), have been proposed as adjunctive tools for functional stratification. Objectives: To evaluate the applicability of echocardiographic parameters in the stratification of hemodynamic repercussion in isolated VSD, with emphasis on the VSD/LVD ratio and its association with Qp/Qs and cardiac chamber dilation. Methods: This systematic review was conducted according to PRISMA recommendations. Searches were performed in PubMed, LILACS, and SciELO databases, complemented by manual reference screening. Original clinical studies involving patients with isolated VSD undergoing echocardiographic assessment of hemodynamic repercussion were included. Evaluated parameters comprised ventricular structural measurements, quantitative Doppler methods, and proportional indices relating septal defect size to cardiac dimensions. Extracted data included population characteristics, echocardiographic findings, and markers of functional repercussion. Resultados e Conclusions: Quantitative Doppler methods demonstrated significant correlation with invasive pulmonary-to-systemic shunt measurements (Qp/Qs), with correlation coefficients ranging from r≈0.73 to r≈0.82, supporting their utility in hemodynamic stratification of VSD. Structural left ventricular measurements showed adequate reproducibility and interobserver reliability, reinforcing their role as indirect markers of volume overload. In addition, the VSD/LVD ratio demonstrated consistent association with traditional parameters of hemodynamic repercussion, suggesting potential applicability as a simplified echocardiographic index in functional assessment of VSD. Echocardiographic parameters demonstrated relevant association with the hemodynamic repercussion of VSD, particularly when integrated with structural and quantitative Doppler assessment. The VSD/LVD ratio showed potential as a complementary tool for functional stratification of isolated VSD, although prospective and standardized studies are still required for definitive validation of its clinical applicability.

14405

LONG-TERM ASSESSMENT OF MYOCARDIAL DEFORMATION (STRAIN) IN CHILDREN AND ADOLESCENTS WITH PEDIATRIC MULTISYSTEMIC INFLAMMATORY SYNDROME ASSOCIATED WITH COVID-19

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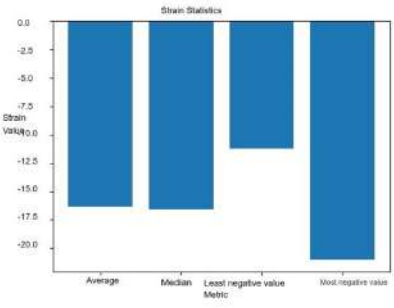
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Introduction/Background: Introduction/Background—In 2020, the World Health Organization (WHO) declared COVID-19 a pandemic. In children, systemic symptoms were observed to emerge approximately 2 to 4 weeks after infection, a clinical condition termed Pediatric Multisystem Inflammatory Syndrome (P-MIS), or Multisystem Inflammatory Syndrome in Children (MIS-C). In this context, cardiovascular repercussions were observed. Objectives: Objectives:To analyze the assessment of myocardial deformation using Global Longitudinal Strain (GLS) of the left ventricle (LV) one year after diagnosis to detect late subclinical ventricular dysfunction. To compare Global Longitudinal Strain (GLS) values of the left ventricle (LV) in vaccinated and unvaccinated patients, those with vaccinated and unvaccinated parents, and those with Kawasaki and non-Kawasaki phenotypes. Methods: Methodology: Prospective, observational, and longitudinal study in patients with MIS-C. Clinical follow-up was conducted for up to 3 years after diagnosis. Patients up to 18 years of age were included, according to WHO criteria, with informed consent. The primary focus of the echocardiographic analysis of LV GSL (Figure 1) was to detect late subclinical ventricular dysfunction. LVEF values between -18% and -22% were considered normal; borderline values: -16% to -17,9%; and abnormal values: less negative than -16% (severe dysfunction: less negative than -8%). Resultados e Conclusions: Results: A total of 38 patients (71.1% male) were analyzed, with a mean age at diagnosis of 4.29 years and an interquartile range (IQR) of 4.6. Of the total, SLG was assessed in 21 patients, revealing a mean of -16.35% and a median SLG of -16.6%, ranging from -11.2% to -21% (Figure 1). Of the total SLG sample, 40.9% had reduced SLG. Table 1 illustrates the results. No statistically significant difference was observed between SLG values in patients with and without the Kawasaki phenotype (p = 0.52). When comparing SLG values between patients with vaccinated and unvaccinated parents and between vaccinated and unvaccinated patients, no significant difference was found, with p-values of 0.68 and 0.83, respectively. Conclusions: Approximately 40% of the study sample presented reduced SLG values during long-term follow-up, indicating the presence of subclinical ventricular dysfunction, even after resolution of the acute inflammatory phase of MIS-C. The findings suggest that SLG is an important tool in late follow-up for MIS-C.

Table 1. Echocardiographic findings up to 3 years of follow-up:

Echocardiographic findings (ECHO)	Up to 3 years of follow-up
LVEF ≤ 55%: n, (%)	0/22 (0)
LVEF: Mean % (±SD)	-16.35 ± 2.56
SLGVE: Median %	-16.6
Reduced: n, (%).....	9/21 (40.9)

Values presented as n and (%) for categorical variables
n – number of individuals; SD – standard deviation;
LVEF – left ventricular ejection fraction



20398

NEURODEVELOPMENTAL OUTCOMES AND COGNITIVE-MOTOR SCORES AFTER EARLY CARDIAC SURGERY IN COMPLEX CONGENITAL HEART DISEASE: A SYSTEMATIC REVIEW

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Introduction/Background: Improved survival among children with complex congenital heart disease (CHD) has highlighted neurodevelopmental outcomes as an important prognostic factor. These children present cerebral vulnerability from the neonatal period, including delayed brain maturation, reduced brain growth, and increased susceptibility to white matter injury associated with fetal hemodynamic alterations, chronic hypoxia, and perioperative factors. Consequently, motor, cognitive, and behavioral deficits may emerge early and persist throughout development. Objectives: To evaluate neurodevelopmental outcomes in children with complex CHD undergoing primary cardiac surgery within the first nine weeks of life, emphasizing motor (Bayley PDI), cognitive (Bayley MDI), and global intelligence (Wechsler scales) scores. Methods: A systematic review was conducted using the PubMed database, including studies published within the last 10 years following PRISMA guidelines. Prospective cohort studies and randomized clinical trials assessing neurodevelopmental outcomes after neonatal cardiac surgery in patients with complex CHD were included. The descriptors “Congenital Heart Disease,” “Neurodevelopmental Outcomes,” and “Cardiac Surgery” were used. Risk of bias was assessed using the ROB 2.0 and ROBINS-I tools, and evidence quality was evaluated using GRADE. Resultados e Conclusions: The included studies demonstrated significant neurodevelopmental delay during the first years of life, particularly in motor domains. PDI and MDI scores were approximately one standard deviation below age-expected population values. Children with single-ventricle physiology showed worse motor and cognitive outcomes compared with those with biventricular circulation. During school age and adolescence, cognitive deficits showed relative attenuation, although IQ scores remained slightly below population averages. The quality of evidence was considered low for infant outcomes and low to moderate for assessments at older ages due to methodological heterogeneity and the limited number of eligible studies. Overall, children with complex CHD undergoing early cardiac surgery present significant neurodevelopmental delay during the first years of life, especially in motor domains. Although some deficits show relative attenuation over time, differences compared with the general population persist, particularly among patients with single-ventricle physiology. Study heterogeneity reinforces the need for standardized longitudinal follow-up and neurodevelopmental monitoring.

18821

PRENATAL DIAGNOSIS, SURGICAL TIMING, AND MORTALITY IN CRITICAL CONGENITAL HEART DISEASES: SYSTEMATIC REVIEW WITH SUBGROUP ANALYSIS

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Introduction/Background: Critical congenital heart diseases, especially single-ventricle anomalies and hypoplastic left heart syndrome, present the highest lethality rates among cardiac malformations. The standard management requires complex surgical palliation in multiple stages. However, the true clinical impact of the accuracy of fetal screening, the optimization of shunt techniques in the first stage, and the definition of the exact timing for surgical advancement remain widely debated challenges for improving survival. Objectives: To evaluate the accuracy of prenatal echocardiographic diagnosis and to analyze the impact of the surgical timing of the second stage of palliation, the shunt technique in the Norwood procedure, and predictors of extreme clinical severity on patient mortality and morbidity. Methods: A systematic review was conducted with searches in the PubMed, Embase, Scopus, and Web of Science databases. Six studies were included, totaling 5,371 patients with critical congenital heart diseases (predominantly single ventricle and hypoplastic left heart syndrome), stratified by treatment phase: prenatal screening, hospitalization for the Norwood procedure, and the interstage/second palliation period. Study selection and data extraction were performed by independent reviewers. The accuracy of fetal echocardiography, the impact of shunt type (RVPAS vs. MBTS), the surgical timing of the second stage, and clinical outcomes in severity subgroups, including ECMO indication, were analyzed. Methodological quality was assessed using the Newcastle-Ottawa Scale. Statistical analysis was conducted using RStudio software. Resultados e Conclusions: Fetal echocardiography showed high accuracy in screening for critical congenital heart diseases (sensitivity 92%; specificity 99.6%). Early progression to the second stage (<140 days) was associated with worse outcomes, doubling the risk of prolonged mechanical ventilation (OR 2.28; 95% CI: 1.07–4.84). Overall first-year mortality was 29.8% (95% CI: 26.1–33.8), concentrated during Norwood hospitalization (16.0%) and the interstage period (11.7%). RVPAS was a protective factor (OR 0.63), while non-elective surgery (OR 3.81) and prior ECMO (OR 7.59) were major predictors of mortality. Conclusion: Despite high diagnostic accuracy, mortality remains elevated in early phases. Early second-stage surgery does not improve survival and increases morbidity, requiring careful timing, risk stratification, and clinical optimization.

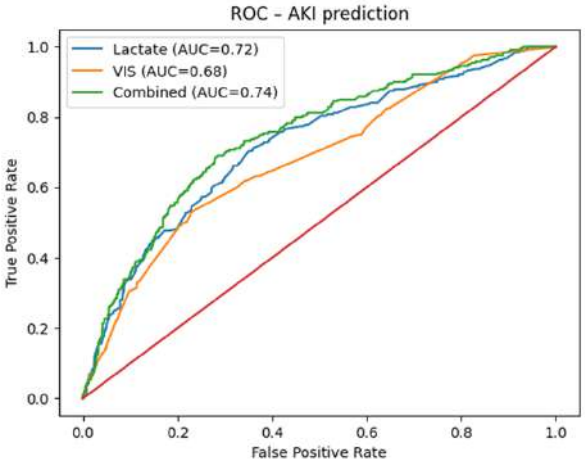
15775

RISK FACTORS FOR ACUTE KIDNEY INJURY IN INFANTS UNDERGOING CARDIAC SURGERY: THE ROLE OF HEMODYNAMIC AND METABOLIC PARAMETERS

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Introduction/Background: Acute kidney injury (AKI) is a frequent complication after pediatric cardiac surgery and is associated with increased morbidity and worse clinical outcomes. Its development reflects a complex interplay between baseline vulnerability and postoperative hemodynamic instability. Objectives: To identify clinical and perioperative factors associated with AKI and to evaluate the role of lactate levels and vasoactive-inotropic score (VIS) in its early prediction. Methods: This retrospective cohort study included 1,264 infants (<2 years) undergoing cardiac surgery at a tertiary referral center (2018–2024). Patients were stratified by AKI occurrence. Demographic, preoperative, and postoperative variables were analyzed. Continuous variables were expressed as mean ± SD or median (IQR 25–75) and compared using Student's t-test or Mann–Whitney U test; categorical variables were compared using the chi-square test. A multivariable framework prioritized clinically relevant preoperative and early postoperative variables, including weight, baseline creatinine, preoperative mechanical ventilation, lactate levels, and VIS. ROC curve analysis evaluated predictive performance. Resultados e Conclusions: AKI occurred in 241 patients (19.1%). Those with AKI had lower weight (4.03 vs 5.64 kg, p<0.001), lower oxygen saturation (86.9% vs 89.7%, p<0.001), higher baseline creatinine (0.47 vs 0.36 mg/dL, p=0.029), and more frequent preoperative mechanical ventilation (36.9% vs 21.0%, p<0.001). Postoperatively, AKI was strongly associated with higher lactate levels (POI: 3.72 vs 2.37 mmol/L; POD1: 3.37 vs 1.70; POD2: 2.23 vs 1.40; p<0.001) and higher VIS (POI: 20.5 vs 11.6; POD1: 17.3 vs 8.6; POD2: 15.0 vs 6.5; p<0.001). Patients with AKI required longer mechanical ventilation [168 (72–432) vs 72 (22–240) h, p<0.001] and had prolonged ICU stay [480 (240–792) vs 324 (144–648) h, p<0.001]. Major complications were more frequent: low cardiac output syndrome (89.2% vs 37.6%), ventricular dysfunction (44.8% vs 19.6%), sepsis (19.1% vs 5.3%), SIRS (67.6% vs 14.3%), ECMO use (12.4% vs 2.0%), and open chest (24.2% vs 4.1%) (p<0.001). Lactate showed good discrimination for AKI (AUC 0.72), outperforming VIS alone (AUC 0.68). The combined model improved prediction (AUC 0.74), highlighting complementary metabolic and hemodynamic contributions. AKI affects nearly 1/5 of infants and is linked to hypoperfusion; lactate and VIS together may improve early risk stratification.



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20446

AI-ENABLED ELECTROCARDIOGRAPHY AS A NONINVASIVE IMAGING SURROGATE FOR HEART FAILURE WITH PRESERVED EJECTION FRACTION: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introduction/Background: Heart failure with preserved ejection fraction (HFpEF) is highly prevalent and frequently underdiagnosed, owing to its heterogeneous presentation and reliance on advanced imaging and biomarker integration. Artificial intelligence (AI)–enabled electrocardiography (ECG) has emerged as a scalable, noninvasive approach for heart failure detection, but its diagnostic performance for HFpEF has not been systematically synthesized. Objectives: To evaluate the diagnostic accuracy of AI-enabled ECG models for the detection of HFpEF. Methods: We performed a systematic review and meta-analysis of three observational studies (25,239 patients) evaluating AI–based ECG algorithms for HFpEF detection. Eligible studies compared AI-ECG outputs with contemporary diagnostic reference standards. Pooled sensitivity, specificity, positive and negative predictive values, and area under the receiver-operating characteristic curve were estimated using a bivariate random-effects model, with summary receiver-operating characteristic analysis. Resultados e Conclusions: Three observational cohort studies were included in the quantitative synthesis. The pooled AUC for HFpEF detection was 0.81 (95% CI: 0.72–0.92). Pooled sensitivity was 90.4% (95% CI: 58.1–98.4), and pooled specificity was 72.9% (95% CI: 61.6–81.9). The pooled PPV was 58.6% (95% CI: 44.9–71.1), while the pooled NPV was 94.7% (95% CI: 79.3–98.8). SROC analysis demonstrated consistent overall diagnostic performance, with moderate dispersion of individual study estimates. Conclusions: These findings support AI-enabled ECG as a scalable, noninvasive imaging surrogate capable of enriching HFpEF diagnostic pathways and identifying patients who may benefit from targeted imaging evaluation.

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ARTIFICIAL INTELLIGENCE FOR ELECTROCARDIOGRAM PRIORITIZATION IN THE EMERGENCY DEPARTMENT: A RETROSPECTIVE STUDY OF TWO BRAZILIAN COHORTS

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Introduction/Background: In emergency departments (ED), timely electrocardiogram (ECG) acquisition and accurate interpretation remain vital for acute cardiac care. Yet, ECG interpretation accuracy varies significantly among clinicians, potentially impacting prognosis. Artificial Intelligence (AI) has emerged as a promising technology to identify abnormal patterns and to reduce the misinterpretation gap across specialization levels in ED. However, the real-world impact of AI integration into ED ECG protocols on clinical outcomes is unclear. Objectives: To investigate the association of AI-enhanced ECG triage with clinical and quality outcomes, used in chest pain protocols at two Brazilian hospitals: a general ED and a specialized cardiology ED. Methods: We retrospectively analyzed 3,340 patients admitted with chest pain in two private hospitals: a specialized cardiology ED in São Paulo (SP) and a general ED hospital in Brasília (DF). Patients were divided into an AI-prioritized group (ECG-AI) with semi-automatic physician-validated report, and a standard care group (ECG-SC) with local reading. Primary metrics included door-to-ECG (DTE) time, door-to-medication time, intervention frequency, length of stay (LOS), and admission rates. Statistical analysis employed pairwise comparisons, with a significance level of 5%. Resultados e Conclusions: In the specialized hospital, ECG-AI showed no significant difference in median DTE (5.0 min for both, p=0.905) or LOS compared with ECG-SC (TABLE). In the general hospital, ECG-AI was associated with a statistically significant, though clinically modest, 1-minute reduction in median DTE (9.0 vs 10.0 min, p<0.001). Paradoxically, the ECG-AI group in the DF hospital had a longer median LOS than ECG-SC (269 vs 222 min, p=0.001). Notably, only in the general hospital, AI-assisted triage was associated with a greater frequency of anatomic stratification and angioplasty (3.5% vs 0.7%, p<0.001). No significant differences were found in mortality or ICU admission rates at either site. AI integration for ECG prioritization is clinically feasible and maintains high-quality temporal standards. Opposite to our hypothesis, ECG-AI was not associated with short-term clinical outcomes. Interestingly, in the general ED, ECG-AI had a greater rate of invasive procedures, closer to the rates in specialized EDs. ECG-AI may serve as a potential tool in less specialized settings to support decision-making, which must be validated in prospective clinical studies.

Table – Comparison between ECG-SC and ECG-AI findings in both hospitals

Variables	São Paulo Hospital (n = 1,865)			Distrito Federal Hospital (n = 1,468)		
	ECG-SC (n=1,387)	ECG-AI (n=478)	p-value	ECG-SC (n=844)	ECG-AI (n=634)	p-value
Hospitalization, n (%)						
Inpatient care	366 (26.4%)	116 (24.3%)	0.394†	223 (26.4%)	166 (26.2%)	0.965†
Intensive Care Unit	317 (22.9%)	100 (20.9%)	0.417†	193 (22.9%)	158 (24.9%)	0.392†
Interventions						
Coronary angiography	186 (13.4%)	59 (12.3%)	0.605†	13 (1.5%)	35 (5.5%)	<0.001†
Coronary Angio CT	189 (13.6%)	60 (12.6%)	0.605†	14 (1.7%)	35 (5.5%)	<0.001†
PTCA	69 (5.0%)	21(4.4%)	0.698†	6 (0.7%)	22 (3.5%)	<0.001†
Door-to-ECG (minutes) (median [IQR])	5.0 [3.0-9.0]	5.0 [4.0-7.0]	0.905*	10.0 [7.0-13.0]	9.0 [6.0-12.0]	<0.001*
Door-to-Medication (minutes) (median [IQR])	70.0 [52.0-96.0]	67.0 [51.0-92.5]	0.261*	35.0 [25.0-72.0]	42.0 [29.0-64.0]	0.186*
Length of Stay (minutes) (median [IQR])	207.0 [124.0-1626.0]	210.0 [127.0-468.5]	0.995*	222.0 [129.0-2301.0]	269.0 [158.5-2572.0]	0.001*

Legend: *Mann-Whitney U Test; † Chi-square Test; ‡ Fisher's exact test; ECG-AI: Electrocardiogram using artificial intelligence for prioritization; ECG-SC: Electrocardiogram under standard care without AI prioritization IQR: Interquartile Range; CT: Computed Tomography; PTCA: percutaneous transluminal coronary angioplasty.

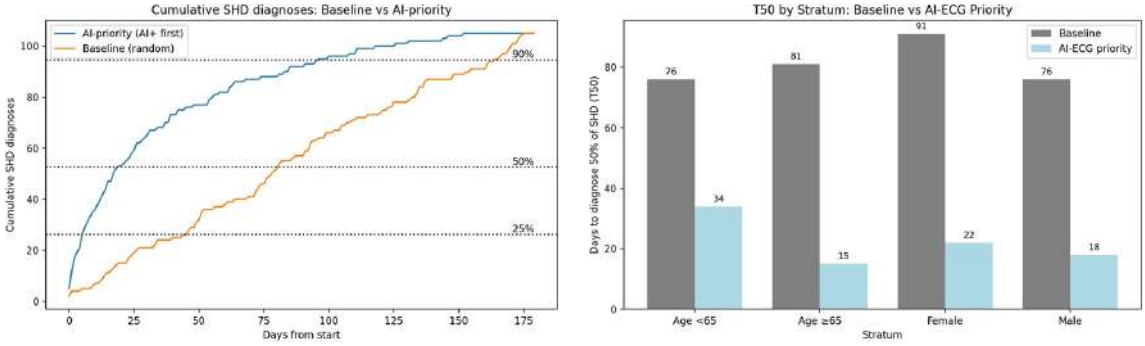
17617

ARTIFICIAL INTELLIGENCE-ENABLED ECG FOR PRIORITIZING ECHOCARDIOGRAPHY AND ACCELERATING DIAGNOSIS OF STRUCTURAL HEART DISEASE

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Introduction/Background: Echocardiography (echo) is the gold standard for diagnosing structural heart disease (SHD), but in low-resource settings, limited capacity can delay its timely detection. Objectives: We hypothesize that AI applied to ECGs (AI-ECG) to identify those at SHD risk can enable resource-efficient prioritization for echo testing. Methods: We recruited a prospective cohort of 1831 consecutive individuals referred for echo based on clinical evaluation in Brazil, who had undergone an initial ECG. First, we deployed our validated AI-ECG tool for multiple SHDs, using subsequent echo to define its classification performance. Second, given the current echo capacity of 200/month, we examined the time to diagnosis of SHD after echo referral, comparing the standard vs a potential AI strategy, where echos for high AI-ECG are prioritized. For each scenario, we calculated the cumulative proportion of SHD diagnoses over a 6-month period. We also assessed the time to diagnosis of 50% of SHD cases within age and sex strata. Resultados e Conclusions: Among 1,475 patients with complete data (mean age 65±13 years, 54% women), 105 (7%) had SHD on echo. The AI-ECG achieved an AUROC of 0.83, and 22.9% were flagged high risk at Youden's J threshold. Based on the standard scheduling, 25%, 50%, 75%, and 90% of all SHD cases were diagnosed in 46, 81, 131, and 164 days. With AI prioritization, these milestones were reached at 6, 19, 54, and 96 days, with a median time to diagnosis reduced by 65 days (IQR 51-73). AI prioritization consistently reduced the time to diagnosis across age and sex groups. Therefore, AI-ECG-guided prioritization may substantially accelerate SHD detection within existing echo capacity, enabling earlier identification and treatment of high-risk patients.



15756

ARTIFICIAL INTELLIGENCE–ASSISTED CARDIOLOGY CONSULTATIONS IMPROVE EFFICIENCY AND CLINICAL DOCUMENTATION QUALITY WHILE ENHANCING CONTINUITY OF CARE: A PROSPECTIVE PRE–POST STUDY

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Introduction/Background: The integration of artificial intelligence (AI) into clinical workflows has been proposed as a strategy to address increasing demand and time constraints in cardiology outpatient care. However, evidence remains limited regarding whether gains in efficiency can be achieved without compromising the quality of clinical documentation and continuity of care, particularly in referral-based systems. Objectives: To evaluate the impact of an AI-based clinical support tool on consultation duration, structured documentation completeness, and perceived continuity of care in cardiology outpatient visits. Methods: This prospective pre–post study included 60 consecutive cardiology consultations in a university-affiliated outpatient setting, involving patients referred from primary care. The control group comprised 30 consultations conducted without AI assistance, while the intervention group included 30 consultations supported by an AI-based tool integrated into clinical workflow. Consultation duration was recorded in minutes. Documentation quality was assessed using the Structured Clinical Documentation Completeness Score (SCDCS), a multidimensional checklist encompassing history, physical examination, management plan, and follow-up. Continuity of care was evaluated through referring primary care teams using a Likert-based satisfaction scale (1–5). Continuous variables were expressed as mean ± standard deviation and compared using two-tailed t-tests, with statistical significance defined as $p < 0.05$. Resultados e Conclusions: AI-assisted consultations were associated with a substantial reduction in consultation time (27.3 ± 4.8 vs. 45.1 ± 6.2 minutes; $p < 0.001$), representing a 39.5% relative decrease. Documentation completeness significantly improved, with higher SCDCS scores in the intervention group (92.4 ± 5.1 vs. 74.6 ± 7.8; $p < 0.001$), reflecting consistent gains across all domains, particularly in follow-up planning. Satisfaction scores from primary care teams increased from 3.0 ± 0.6 to 4.3 ± 0.5 ($p < 0.001$), corresponding to a 43% relative improvement, indicating enhanced continuity and clarity of communication. These findings demonstrate that AI integration can simultaneously optimize efficiency and elevate the quality of cardiology consultations without trade-offs between speed and clinical rigor.

14979

ARTIFICIAL INTELLIGENCE–BASED ECG AS A TRIAGE TOOL FOR ACUTE MYOCARDIAL INFARCTION: A DIAGNOSTIC SYSTEMATIC REVIEW AND META-ANALYSIS

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Introduction/Background: Rapid and accurate identification of acute coronary syndromes (ACS), particularly acute myocardial infarction (AMI), is essential in cardiovascular care. The 12-lead electrocardiogram (ECG) is central to early triage, but conventional interpretation lacks sensitivity, especially in non–ST-segment elevation presentations and occluded myocardial infarction (OMI), leading to delays in reperfusion and adverse outcomes. Artificial intelligence (AI) has enhanced ECG analysis by identifying complex patterns beyond human recognition. Across emergency and prehospital settings, AI-enabled ECG models have demonstrated improved diagnostic performance for STEMI, NSTEMI, and OMI compared with traditional criteria, with high negative predictive value supporting their use as triage tools. Objectives: To systematically evaluate the diagnostic performance of AI-enabled ECG algorithms for the detection of AMI, including ST-segment elevation myocardial infarction (STEMI) and non–ST-segment elevation myocardial infarction (NSTEMI), across diverse clinical settings. Methods: This diagnostic systematic review and meta-analysis was conducted in accordance with PRISMA guidelines and registered in PROSPERO (CRD420261292271). PubMed, Embase, and Cochrane CENTRAL were searched through January 2026. Studies evaluating AI-based ECG models for AMI detection and reporting sufficient data to reconstruct 2×2 contingency tables were included. Pooled sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) were estimated using random-effects models (restricted maximum likelihood). Summary receiver operating characteristic (SROC) curves and area under the curve (AUC) were generated. Prespecified subgroup analyses were performed for STEMI and NSTEMI. Resultados e Conclusions: Ten observational studies comprising 94,510 participants were included. For overall AMI detection, AI-ECG demonstrated a pooled sensitivity of 89.4% (95% CI, 79.7–94.8) and specificity of 96% (95% CI, 91.2–98.2). The pooled NPV was 98.7% (95% CI, 94.1–99.7), and the pooled PPV was 73.3% (95% CI, 50.2–88.2). The SROC AUC was 0.97 (95% CI, 0.92–0.98). In STEMI, pooled sensitivity and specificity were 94.4% and 97.5%, respectively (AUC 0.98). In NSTEMI, pooled sensitivity was lower at 65.0%, with specificity of 87.5% and an AUC of 0.71. Heterogeneity was substantial, particularly among NSTEMI cohorts.

20876

BEYOND TRADITIONAL RISK SCORES: AI-BASED PHENOMAPPING AS A NEW FRONTIER FOR RISK STRATIFICATION IN ISOLATED CABG

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Introduction/Background: Traditional surgical risk scores may fail to capture the biological heterogeneity of patients undergoing Coronary Artery Bypass Grafting (CABG), as they often combine objective physiology with subjective variables such as urgency or critical status. AI-based unsupervised learning may offer a clinically useful alternative by identifying natural phenotypes based on objective markers of physiological reserve. Objectives: To identify clinical phenotypes in patients undergoing isolated CABG using unsupervised Machine Learning applied to objective preoperative variables, and to assess their association with in-hospital mortality. Methods: This study included 4,000 consecutive patients undergoing isolated CABG. To reduce coding bias, acute contextual variables were intentionally excluded. Nine objective variables were selected: age, sex, body mass index, preoperative creatinine clearance, preoperative hemoglobin, left ventricular ejection fraction, prior atrial fibrillation, heart failure, and use of cardiopulmonary bypass. Data were normalized and analyzed using K-Means clustering. In-hospital mortality was compared across clusters ($p<0.001$). Resultados e Conclusions: The algorithm identified three distinct phenotypes with markedly different mortality. The “Preserved Reserve” cluster (n=1,822; mortality 1.7%) included younger patients (mean age 58 years) with preserved renal function (creatinine clearance >89 mL/min) and hemoglobin levels (>13.8 g/dL), showing excellent survival despite higher body mass index. The “Frail Elderly” cluster (n=2,455; mortality 4.3%) was characterized by older age (mean 67 years), reduced renal function (~56 mL/min), and lower hematologic reserve, suggesting chronic physiological vulnerability rather than acute instability. The “Arrhythmic-Inflammatory Phenotype” (n=176; mortality 9.1%) was defined by prior atrial fibrillation and moderate ventricular dysfunction, with mortality more than five times higher than the preserved reserve group. These findings indicate that mortality after isolated CABG is concentrated in recognizable vulnerability phenotypes rather than distributed linearly across isolated risk factors. AI-based phenomapping may complement traditional scores by offering a more intuitive and actionable framework for clinical cardiologists, highlighting patients who may benefit from renal optimization, anemia correction, and closer perioperative surveillance when atrial fibrillation is present.

19386

CLONAL HEMATOPOIESIS AND RISK OF HEART FAILURE WITH PRESERVED EJECTION FRACTION: A SYSTEMATIC REVIEW

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Introduction/Background: Clonal hematopoiesis of indeterminate potential (CHIP) is increasingly recognized as a non-traditional cardiovascular risk factor mediated by chronic inflammation and adverse myocardial remodeling. Its role in heart failure with preserved ejection fraction (HFpEF) and mildly reduced ejection fraction (HFmrEF) remains incompletely characterized. Objectives: To systematically evaluate the association between CHIP and HFpEF/HFmrEF, focusing on gene-specific effects, cardiovascular outcomes, and inflammatory mechanisms. Methods: A PRISMA 2020-compliant systematic review was conducted using PubMed, Embase, Web of Science, Scopus, Cochrane Library, and LILACS. Observational studies evaluating adults with molecularly confirmed CHIP and reporting HFpEF/HFmrEF outcomes were included. Two reviewers independently screened studies, extracted data, and assessed risk of bias using an adapted Newcastle–Ottawa Scale. Due to methodological heterogeneity, findings were synthesized narratively. Resultados e Conclusions: Five studies involving approximately 19,950 participants were included. CHIP prevalence was consistently higher or characterized by larger clone size among HFpEF patients. TET2-driven CHIP demonstrated the strongest association with incident HFpEF, with adjusted hazard ratios ranging from 1.40 to 2.50 and a pooled estimate of 2.35 (95%CI 1.34–4.11). In contrast, composite CHIP and DNMT3A variants showed weaker or inconsistent associations, although the DNMT3A R882 hotspot variant predicted HFpEF in one cohort. CHIP was not consistently associated with heart failure with reduced ejection fraction, supporting a phenotype-specific inflammatory mechanism. CHIP carriers also presented worse diastolic function, higher natriuretic peptide levels, and increased cardiovascular hospitalization, particularly in the presence of elevated C-reactive protein. Experimental studies demonstrated that TET2 deficiency promotes myocardial fibrosis and diastolic dysfunction through NLRP3/IL-1β-mediated inflammatory signaling. No included study separately analyzed HFmrEF. Current evidence supports CHIP, especially TET2-related CHIP, as an independent modifier of HFpEF risk and prognosis, highlighting inflammatory pathways as potential therapeutic targets.

Study	Design	Cohort / N	Age (years)	CHIP method	Follow-up	Key outcomes
Reiner et al., 2023	Nested case-control	WHI; N=5,214	Mean 62	WGS; VAF ≥2%	15 years	HFpEF, HFrEF
Ezzat et al., 2025	Prospective cohort	WHI; N=6,677	Median 80	smMIPS; VAF ≥2%	10.1 years	CHD, HFpEF
Schuermans et al., 2024	Pooled cohorts	Total N=8,090	56–67	WGS; VAF ≥2%	12–15.3 yr	HFpEF primary
Cochran et al., 2023	Case-control	81 HFpEF + 36 ctrl	71 ± 6	20 genes; VAF ≥0.5%	~3.7 yr	CV hosp., mortality
Pandey et al., 2025	Observational	UTSW + TOPCAT	Adults	Deep sequencing	Variable	HF hospitalization

Study	Selection	Comparability	Outcome / Exposure	Total / 9	Overall quality
Reiner et al., 2023	3	2	1 (preprint; cohort overlap)	6	Moderate
Ezzat et al., 2025	4	2	3 (deep sequencing)	9	High
Schuermans et al., 2024	4	2	3 (two cohorts)	9	High
Cochran et al., 2023	3	2	3 (SCAN-MP validation)	8	High
Pandey et al., 2025	3	2	2 (Research Letter)	7	High

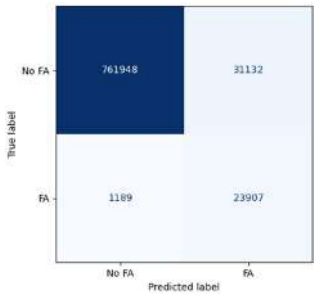
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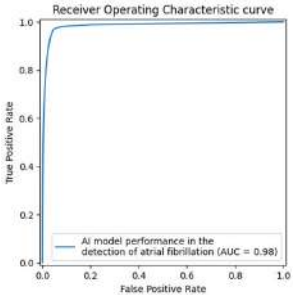
DEEP LEARNING–BASED ATRIAL FIBRILLATION SCREENING: REAL-WORLD NATIONWIDE VALIDATION USING OVER 818,000 ECGS INTEGRATED INTO A TELECARDIOLOGY WORKFLOW IN BRAZIL

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Introduction/Background: Atrial fibrillation (AF) is the most common sustained cardiac arrhythmia worldwide and is associated with substantial morbidity, mortality, and nearly 20% of ischemic strokes. As population aging accelerates, scalable screening strategies capable of improving early AF detection have become increasingly relevant. Artificial intelligence (AI)–based electrocardiogram (ECG) analysis has emerged as a promising approach for large-scale cardiovascular screening and workflow optimization in real-world clinical practice. Objectives: To evaluate the diagnostic performance and real-world feasibility of a deep learning model for automated AF detection using a nationwide Brazilian ECG database integrated into a telecardiology workflow. Methods: We analyzed digital ECGs collected from public and private healthcare services across all five geographic regions of Brazil. All ECGs underwent standardized preprocessing and expert physician labeling. A one-dimensional convolutional neural network based on a ResNet architecture was developed for automated AF detection and prospectively integrated as an AI-assisted triage tool within a real-world telecardiology workflow. Resultados e Conclusions: A total of 818,176 ECGs were analyzed, including 457,004 (55.9%) from female patients and 361,172 (44.1%) from male patients. AF was identified in 25,096 ECGs, including 13,543 cases in men (54.0%) and 11,553 in women (46.0%). The model achieved an overall accuracy of 96.1%, with recall of 95.3% for AF detection and specificity of 96.1% for non-AF cases. Precision reached 99.8% for non-AF ECGs, while the area under the receiver operating characteristic curve (AUC) was 0.98. F1-scores were 0.597 for AF and 0.979 for non-AF cases, reflecting the marked class imbalance inherent to real-world screening datasets. A total of 55,039 ECGs were flagged by the AI model as AF-positive, supporting its operational feasibility as a scalable triage strategy in routine telecardiology practice. Deep learning–based AF detection demonstrated high diagnostic performance in a large-scale real-world Brazilian population exceeding 818,000 ECGs. Integration into routine telecardiology workflows supports the feasibility of AI-assisted AF screening as a scalable strategy to improve early diagnosis and expand access to cardiovascular care. Despite substantial class imbalance, the model maintained high sensitivity and robust discriminatory performance, reinforcing its potential for population-level implementation in contemporary cardiovascular medicine.





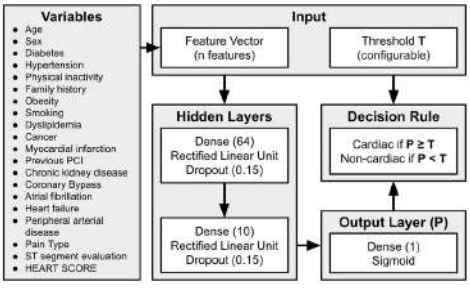
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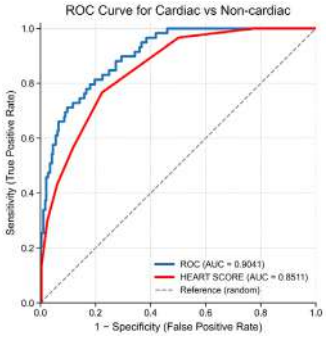
DEEP LEARNING–BASED PROBABILISTIC MODEL FOR IDENTIFICATION OF TRUE CARDIAC CHEST PAIN IN A TERTIARY CARE CENTER

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Introduction/Background: Chest pain is a frequent emergency complaint with multiple etiologies. Differentiating between cardiac and non-cardiac pain remains complex. Traditional clinical scores rely on predefined variables and linear assumptions, limiting their performance, whereas machine learning can better capture complex data patterns and potentially improve diagnostic discrimination. Objectives: Develop and evaluate a deep learning-based model for classifying patients with chest pain into cardiac etiologies or not, using real-world data. Methods: Retrospective study using structured clinical dataset of chest pain patients from a tertiary center. Primary outcome was cardiac etiology (ST-elevation and non-ST myocardial infarction, unstable angina). Non-classifiable diagnoses were excluded. Demographics, comorbidities, HEART score and clinical presentation were the input. Data was processed using multiple imputation by chained equations (MICE) for both numerical and categorical variables, one-hot encoding for categorical features, and standardization of continuous variables, then split into training and testing subsets (85%/15%) with stratification by outcome. The neural network was defined according to image 1. Performance of the test was assessed using area under the receiver operating characteristic curve (ROC-AUC). Additionally, model behavior was analyzed across multiple probability thresholds to evaluate its clinical applicability under different decision strategies. The same was done to the HEART score in this population. Resultados e Conclusions: The model demonstrated adequate discrimination performance. With an AUC of 0.90 while HEART score showed 0.85. The probabilistic output enables flexible threshold selection. Lower probability thresholds favors high sensitivity, supporting strategies aimed at safely ruling out cardiac disease, whereas higher thresholds improve specificity, facilitating identification of high-risk patients. Despite promising results, limitations must be considered. Machine learning models performance depends on training data, which may limit external generalizability. Underrepresented populations may be at risk of misclassification, raising concerns regarding equity and fairness in clinical deployment. These considerations underscore the need for rigorous external validation, transparency in model development, and stronger regulatory frameworks governing the safe use of artificial intelligence in healthcare.





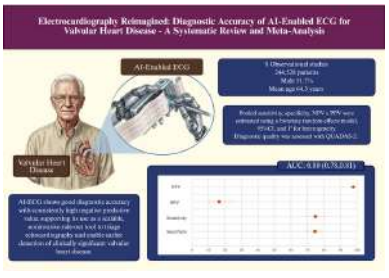
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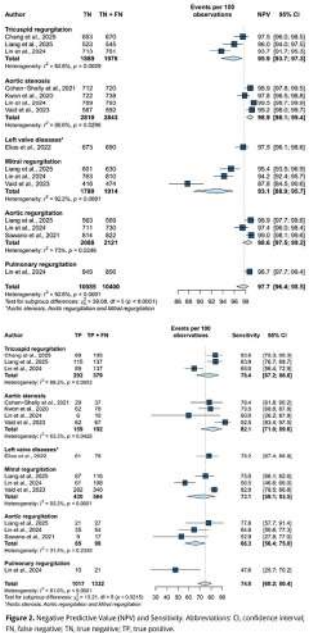
ELECTROCARDIOGRAPHY REIMAGINED: DIAGNOSTIC ACCURACY OF AI-ENABLED ECG FOR VALVULAR HEART DISEASE - A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introduction/Background: Valvular heart disease (VHD) is a major and growing global health burden, frequently underdiagnosed due to reliance on transthoracic echocardiography, which is resource-intensive and unsuitable for population-level screening. Artificial intelligence–enabled electrocardiography (AI-ECG) has emerged as a scalable, noninvasive approach for detecting clinically significant valvular lesions, but its diagnostic performance has not been systematically quantified. Objectives: To evaluate the diagnostic accuracy of AI-ECG for the detection of clinically significant VHD. Methods: We conducted a systematic review and meta-analysis of studies assessing AI-ECG algorithms for VHD detection. Pooled sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and area under the receiver-operating characteristic curve (AUC) were estimated using random-effects models. Overall diagnostic performance was summarized using a summary receiver-operating characteristic (SROC) curve, with prespecified subgroup analyses by valve pathology. Resultados e Conclusions: Eight studies met inclusion criteria. For overall VHD detection, pooled sensitivity was 74.8% (95% CI: 68.2–80.4) and pooled specificity was 74.5% (95% CI: 69.7–78.8). The pooled NPV was high at 97.7% (95% CI: 96.4–98.5), whereas pooled PPV was 16.4% (95% CI: 10.7–24.3). SROC analysis demonstrated good overall discrimination with an AUC of 0.80 (95% CI: 0.78–0.81) (Figure 1). Valve-specific analyses showed the strongest performance for aortic stenosis and tricuspid regurgitation, with more modest accuracy for regurgitant lesions (Figure 2). Conclusions: AI-ECG demonstrates good diagnostic performance for detecting clinically significant VHD, characterized by consistently high NPV. These findings support its role as a scalable, noninvasive rule-out and triage tool to guide targeted echocardiography and facilitate earlier recognition of valvular disease.





17486

EMPOWERING COMMUNITY HEALTH WORKERS WITH CLINICAL DECISION SUPPORT IN VULNERABLE SETTINGS: A MIXED-METHODS STUDY

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Introduction/Background: Community health workers (CHWs) are essential in supporting continuity of care for individuals with hypertension and diabetes, particularly in underserved settings. Clinical decision support systems (CDSS) have the potential to enhance early recognition of clinical worsening and support appropriate referral within primary care services. Objectives: To describe the design, deployment, and assessment of a CDSS incorporated into a multicomponent intervention aimed at assisting CHWs during home visits for patients with hypertension and diabetes. Methods: This mixed-methods sub-analysis of the CHArMING Project was carried out in 5 low-resource municipalities in the Jequitinhonha and Mucuri Valleys, Brazil, following the RE-AIM framework. A tablet-based CDSS was developed for use during household visits, integrating automated blood pressure measurement and urine glucose testing, with prompts and care guidance triggered by predefined thresholds. The intervention also included standardized training and remote tele-mentoring to support clinical evaluation, lifestyle advice, and use of the tool. CHWs from 18 primary care facilities were involved. Quantitative data were summarized descriptively, while qualitative insights from focus groups explored adoption, usability, and implementation factors. Resultados e Conclusions: Between March/2024 and January/2025, 984 evaluations were completed across 680 individuals. Among 648 patients with hypertension, 26.2% presented uncontrolled blood pressure levels. Of 242 individuals with diabetes, 33.9% reported recent random glucose values above 250 mg/dL, 31.4% described symptoms consistent with hyperglycemia, and 24.8% had detectable urine glucose. Among 41 insulin-treated patients, 26.8% lacked access to a glucometer and 17.0% reported unavailability of test strips. Reported enablers of CDSS use included usability, availability of technical support, increased professional confidence, improved patient interaction, and better-informed decision-making. Challenges included time constraints, difficulties in referral coordination, uncertainty in interpreting urine glucose findings, limited internet connectivity, and occasional data synchronization failures. Overall, the CDSS proved feasible and showed promise in supporting early identification of clinical deterioration, strengthening communication, and facilitating timely referral. Overcoming infrastructure and workflow barriers will be critical for long-term sustainability and scalability in resource-limited contexts.

16500

EPIDEMIOLOGICAL MODELING AND TERRITORIAL DETERMINANTS OF STEMI CARE IN A HEALTHCARE NETWORK IN THE PROVINCE OF BUENOS AIRES, ARGENTINA (2009–2025)

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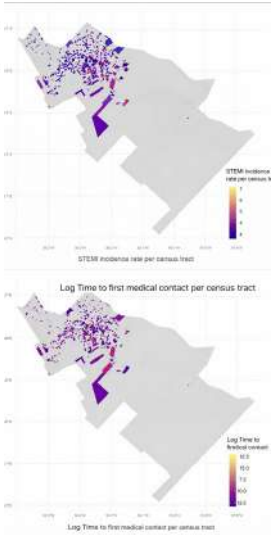
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Introduction/Background: ST-segment elevation myocardial infarction (STEMI) is a global health problem. Early diagnosis and treatment are associated with reduced mortality. It is well established that multiple social determinants, such as poverty, educational level, and access , individually influence delays in STEMI care. However, the impact of the unequal socio-spatial distribution of these determinants remains insufficiently explored. Objectives: To analyze incidence rate (IR) and time to first medical contact (TFMC) in a cohort of STEMI patients, and to develop an ecological explanatory model of incidence rates and delays in care times based on georeferenced sociodemographic variables at the census-tract level within a STEMI network in the metropolitan area of Buenos Aires, Argentina. Methods: A prospective study was conducted between 2009–2025 including all patients with STEMI. Cases were geocoded based on patients' home addresses and aggregated at the census-tract level, the smallest geostatistical unit in Argentina. Assessment of the association between IR and TFMC and area-level variables such as distance to the geographic center of the network, unmet basic needs, sewerage coverage, and related contextual indicators was made. These findings were displayed using choropleth maps, with spatial pattern exploration, cluster detection, and identification of critical areas with prolonged delays. Statistical analyses were performed in RStudio. The full set of variables was used to fit generalized additive models (GAMs) in order to identify nonlinear associations, incorporating penalization and shrinkage-based selection. Two main outcomes were evaluated: TFMC per census tract, modeled using a Gaussian distribution after log transformation, and IR adjusted for population size. Resultados e Conclusions: A total of 1,650 STEMI events were analyzed; the main clinical characteristics are shown in Table 1. The median TFMC was 97.5 minutes (IQR, 45–248 mins). TFMC was independently associated with mortality. Figures 1A and 1B illustrate the geographic distribution of IR and TMFC, respectively. The multivariable GAM using territorial mean TFMC delay showed limited explanatory performance (1% of deviance explained). In contrast, STEMI IR showed consistent associations in the GAM, explaining 30.6% of the deviance, with significant effects of distance, population density, sewerage coverage and number of households. These findings allow identification of spatial patterns and may help target interventions in order to improve STEMI care.

Table 1. Baseline characteristics

Characteristic	N = 1,588[1]
Age	56.0 (49.0–61.0)
Unknown	37
Gender	
F	237 (15%)
M	1,336 (85%)
Unknown	15
Hypertension	860 (54%)
Diabetes	340 (21%)
Hypercholesterolemia	433 (27%)
Smoking status	
Current	923 (64%)
Former	257 (18%)
No	257 (18%)
Unknown	151
Prior STEMI ACS	167 (11%)
Prior NSTEMI ACS	74 (4.7%)
Mortality	115 (7,2%)

[1] Median (Q1–Q3); n (%)



14585

EVIDENCE OF VALIDITY OF A MOBILE APPLICATION PROTOTYPE FOR PATIENT SELF-MANAGEMENT AFTER ACUTE MYOCARDIAL INFARCTION.

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Introduction/Background: Cardiovascular diseases continue to be the leading cause of mortality worldwide, accounting for nearly 30% of all deaths. Within this group, acute myocardial infarction is particularly prominent due to its high incidence, clinical severity, and substantial contribution to morbidity and mortality related to coronary artery disease.Following the acute event, patients are required to adopt significant lifestyle modifications and engage in long-term clinical follow-up to minimize the risk of recurrence. Nevertheless, current evidence indicates that adherence to recommended therapeutic and behavioral interventions remains suboptimal, ultimately compromising clinical outcomes and negatively impacting quality of life. Objectives: To develop and validate, in collaboration with healthcare and technology experts, a prototype self-management application for patients diagnosed with Acute Myocardial Infarction (AMI), while generating evidence regarding its content validity and usability. Methods: This is a methodological, descriptive study with a quantitative approach, focused on the development of a mobile health application, following the software development stages proposed by Pfleeger. Content validation was conducted using the Content Validity Index (CVI), inter-rater agreement was assessed through the Intraclass Correlation Coefficient (ICC), and internal consistency was evaluated using Cronbach's alpha coefficient. Resultados e Conclusions: Twenty expert judges in the subject area participated in the study, resulting in an overall CVI of 0.78. The CCI was 0.87, indicating high agreement among the evaluators. The Cronbach's alpha coefficients obtained were greater than 0.70, demonstrating good internal consistency. And a score on the System Usability Scale (SUS) of 93.34 indicates that the application has a high level of usability. The prototype of the application developed for the management of patient care in the post-MI period presented robust validation results, both in relation to content and usability, demonstrating compliance with rigorous methodological standards and with the main international guidelines in cardiology. The combination of a satisfactory content validity index with an excellent score on the SUS indicates that the tool is reliable, functional and highly acceptable by the target audience.



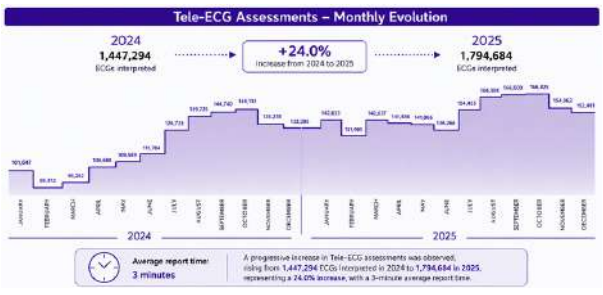
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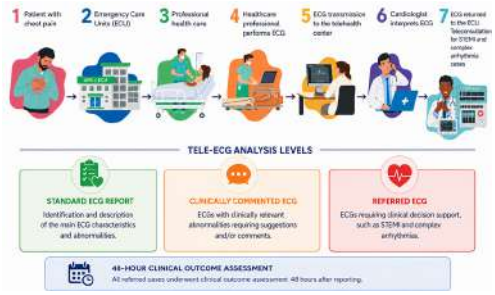
EXPANDING TIMELY ACCESS TO CARDIOVASCULAR DIAGNOSIS THROUGH TELE-ECG IN BRAZILIAN PUBLIC PREHOSPITAL EMERGENCY CARE: A NATIONAL QUALITY IMPROVEMENT EXPERIENCE

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Introduction/Background: Brazil is a continental country marked by significant regional inequalities in healthcare access. Cardiovascular diseases remain a leading cause of mortality, placing a substantial burden on health systems. In this context, fixed prehospital emergency care units are key entry points for cardiovascular emergencies, supporting early diagnosis and management. However, limited timely access to diagnostic tests and specialist electrocardiogram (ECG) interpretation remains an important barrier to the prompt identification and treatment of acute cardiac conditions. Objectives: This study aimed to describe the outcomes of a national tele-electrocardiography (Tele-ECG) and cardiology teleconsultation program implemented in fixed public prehospital emergency care units across Brazil. Methods: A descriptive, quantitative study was conducted as part a cardiological best-practices program implemented in partnership with the Brazilian Ministry of Health and a private tertiary hospital that provided access to Tele-ECG and cardiology teleconsultation services in 735 public fixed prehospital emergency care units across Brazil between 2024 and 2025. The study included patients whose ECGs were interpreted through the program and who were diagnosed with ST-elevation myocardial infarction (STEMI) or malignant arrhythmias. Resultados e Conclusions: A progressive increase in Tele-ECG assessments was observed, rising from 1.447,294 ECGs interpreted in 2024 to 1.794,684 in 2025, representing a 31.8% increase, with a 3-minute average report time with clinically relevant ECG abnormalities in 46.4% and 47.1% of exams, respectively . Cardiology teleconsultation adherence remained above the institutional target, increasing from 62% in 2024 to 75% in 2025. Among interpreted ECGs, 24,286 (1.35%) cases of malignant arrhythmia, 20,756 (1.16%) STEMI cases, and 1,352 (0.08%) other clinically relevant abnormalities were identified. Analysis of 48-hour outcomes showed inter-facility transfer as the most frequent disposition (n=16,610, 56.95%), followed by discharge from the prehospital unit (n=9,065, 31.08%). Other outcomes included in-unit mortality (n=1,296, 4.44%), continued stay (n=1,513, 5.19%), and left against medical advice (n=670, 2.30%). National implementation of Tele-ECG and cardiology teleconsultation proved to be feasible and enabled standardized specialist diagnosis in prehospital emergency care, enhancing early risk recognition, clinical decision-making, and ultimately patient safety.





20359

IMPACT OF BANGLA HEART MANUAL IN PEOPLE WITH CORONARY HEART DISEASE AND THEIR CAREGIVERS IN BANGLADESH: A FEASIBILITY STUDY

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Introduction/Background: Cardiac rehabilitation (CR) is essential for improving outcomes in people with coronary heart disease (CHD), yet access in Bangladesh is limited., in conclusion, The culturally adapted Bangla Heart Manual is home-based CR model offers a practical alternative to centre based CR to increase accessibility and patient engagement. Objectives: To assess the feasibility and acceptability of the home-based Bangla Heart Manual CR programme for people with CHD following revascularisation. Methods: This single-centre feasibility pilot study used a mixed-methods, single-arm pre–post design coordinated at a tertiary cardiac hospital. Thirty-three individuals with CHD undergoing coronary artery bypass grafting or percutaneous coronary intervention were recruited between June and July 2024. The Bangla Heart Manual intervention consisted of a 6-week home-based CR programme including exercise, education, self-care, psychological support and risk factor management, facilitated by healthcare professionals. Study primary outcomes were feasibility and acceptability study recruitment and retention and intervention adherence assessed by quantitative data and qualitative interviews with patients, caregivers and staff. Secondary Participant included health-related quality of life (HeartQoL, EQ-5D-5L), psychological well-being, exercise capacity and adverse events assessed before and after Bangla Heart Manual Intervention. . Resultados e Conclusions: Of 72 screened, 33 individual (46%) were recruited; of whom 30 (91%) completed follow-up and attended 6 session out of 8 (75%) adhered to the CR intervention. Participants were predominantly male (88%) with a mean age of 55 years. Improvements were observed in patient-reported outcomes and exercise capacity following the intervention. Two deaths and one rehospitalisation occurred during the study period, unassociated with the CR intervention. The Bangla Heart Manual was found to be feasible and acceptable for both people following revascularisation and healthcare providers. These findings support progression to a multicentre randomised controlled trial to formally evaluate the clinical and cost-effectiveness of the Bangla Heart Manual.

Table 1: Summary of feasibility outcome measures.

Outcomes	Definition	Prespecified success criteria	Study outcome
Recruitment	Number of consented participants relative to the total number of eligible patients approached for consent	Recruitment rate of ≥30%	33 patients were recruited/ 72 were screened over a 2 month period (33/2) ≥ 16 patients per months, 46%
Retention	Number of participants who complete the final study assessment relative to the total number of participants enrolled for pilot trial.	Retention rate of ≥80%	2 deaths and dropout 1 (30/33), 91%
Adherence	Percentage of completion of the Bangla Heart Manual intervention components according to training logs.	Intervention adherence of ≥75%	(6 session out of 8 session delivered in 6 weeks programme), 75%

Table 2: Secondary outcomes: HeartQoL physical and emotional subscale, HADS and EQ-5D-5L at baseline and 3-months follow up

HeartQoL physical and emotional subscale				
	Baseline (n=33) mean (SD)	Follow-up (n=30) Mean (SD)	Mean difference and 95% CI	P Value
Physical Subscale	1.69 (0.64)	2.62 (0.41)	0.94 (0.66 to 1.21)	<0.0001
Emotional Subscale	1.78 (.79)	2.67 (.55)	0.87 (0.47 to 1.27)	
HADS				
	Baseline (n=33) mean (SD)	Follow-up (n=30) Mean (SD)	Mean difference and 95% CI	P Value
Anxiety	6.79 (4.08)	1.55 (1.56)	5.24 (3.94 to 6.55)	
Depression	5.27 (3.39)	2.12 (2.30)	1.93 (1.14 to 2.72)	<0.0001
EQ-5D-5L dimensions				
	Baseline (n=30), Mean (SD)	Follow-up (n= 29) Mean (SD)	Mean difference and 95% CI	P-Value
Mobility	2.23 (1.15)	1.13 (0.35)	1.10 (0.64 to 1.56)	<0.0001
Self-care	1.74 (1.06)	1.2 (0.41)	0.52 (0.15 to 0.92)	0.01
Usual activities	1.84 (1.07)	1.1 (0.31)	0.76 (0.34 to 1.17)	0.0008
Pain or discomfort	2.19 (0.91)	1.5 (0.51)	0.66 (0.23 to 1.07)	0.004
Anxiety or Depression	2.29 (0.86)	1.3 (0.47)	1.03 (0.69 to 1.38)	<0.0001
EQ-5D-5L VAS				
EQ-VAS	Baseline (n=30), Mean (SD)	Follow-up (n= 29) Mean (SD)	Mean difference and 95% CI	P-Value
VAS score, Mean (SD)	66 (18)	86 (09)	17 (11.16 to 22.91)	<0.0001
EQ-5D-5L utility scores using Indian population health value norms				
EQ-5D-5L pre and post (value norms)	Baseline (n=30), Mean (SD)	Follow-up (n=29) Mean (SD)	Mean difference and 95% CI	P-value
EQ-5D-5L index score	0.69 (0.37)	0.94 (0.06)	0.25 (0.11 to 0.39)	0.00094

20863

IMPACT OF CREATININE CLEARANCE ON OPERATIVE MORTALITY IN AORTIC ANEURYSM SURGERY: A NEW PERSPECTIVE THROUGH MACHINE LEARNING-ASSISTED NON-LINEAR ANALYSIS

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Introduction/Background: Traditional risk scores, largely based on logistic regression models, often oversimplify the physiological complexity of renal function. This restrictive approach may fail to adequately stratify patients with moderate renal dysfunction, masking important therapeutic windows. In contrast, Machine Learning techniques can detect hidden non-linear patterns and redefine the prognostic impact of creatinine clearance in high-complexity aortic surgery. Objectives: To build and apply advanced Machine Learning algorithms to investigate the non-linear relationship between renal function and operative mortality, identifying critical inflection thresholds and quantifying survival gains associated with each 5 mL/min increase in glomerular filtration rate. Methods: This cohort study included 610 patients undergoing thoracic aortic aneurysm repair between 2010 and 2025. The analytical strategy employed: 1) Ensemble Learning algorithms (ExtraTrees) for Feature Importance ranking, surpassing traditional logistic regression; and 2) Generalized Additive Models (GAM) with cubic splines for vectorized risk curve modeling. Analyses isolated the marginal effect of renal function while adjusting for multiple confounders, including cardiopulmonary bypass time, surgical complexity, and other perioperative variables. Resultados e Conclusions: Overall mortality was 5.6%. Non-linear modeling established a distinct risk hierarchy, with preoperative creatinine clearance emerging as the second strongest determinant of survival, surpassed only by cardiopulmonary bypass time. Contrary to the linear behavior assumed by traditional scores, AI-assisted analysis demonstrated an exponential risk profile with a critical inflection point at 60 mL/min. A “golden zone” for clinical optimization was identified between 40 and 70 mL/min, in which each 5 mL/min increase in renal function translated into a 22% relative reduction in mortality risk. Above 75 mL/min, the benefit reached a safety plateau, with persistently low operative risk even among patients with major comorbidities. These findings demonstrate that the kidney-mortality relationship is governed by non-linear dynamics and reveal a critical therapeutic window frequently underestimated by conventional models. AI-based approaches may therefore support a new paradigm of “Precision Surgery,” offering refined preoperative targets that static risk scores are unable to provide.

21659

IMPROVING CARDIOVASCULAR RISK CONTROL THROUGH TELEHEALTH IN PRIMARY CARE: EVIDENCE FROM A REAL-WORLD INTERVENTION IN BRAZIL

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Introduction/Background: Hypertension and diabetes mellitus are major cardiovascular risk factors, yet control rates remain suboptimal in Brazil. Telehealth has been increasingly incorporated into primary care, with the potential to improve chronic disease management through clinical decision support systems (CDSS) and care reorganization. Objectives: To evaluate the impact of a multifaceted telehealth intervention on hypertension and diabetes control in primary care settings in a resource-constrained region of Brazil. Methods: This is a quasi-experimental sub-study of the HealthRise–Teófilo Otoni project. A multifaceted telehealth intervention was implemented in primary care across 10 municipalities in the Vale do Mucuri region, Minas Gerais, Brazil, from October/2017 to February/2020. The intervention included the implementation of a CDSS, training of primary care professionals, strengthening of multidisciplinary care processes, and improved access to diagnostic testing. Effectiveness was assessed by comparing baseline and final clinical parameters among patients with hypertension and/or diabetes, including systolic and diastolic blood pressure, LDL cholesterol, glycated hemoglobin (HbA1c), and body mass index. Resultados e Conclusions: A total of 3,095 patients were included (median age 56.0 years, 67.0% female), of whom 94.1% had hypertension and 32.1% had diabetes. Among hypertensive patients with at least two blood pressure measurements (n=2,111), there was a significant reduction in systolic and diastolic blood pressure (p<0.001), an increase in the proportion of patients with controlled blood pressure (48.1% vs 59.5%, p<0.001), and a reduction in LDL cholesterol levels (p=0.005), with improved attainment of LDL targets. Among patients with diabetes (n=463 with ≥2 HbA1c measurements), there was no significant change in median HbA1c; however, the proportion achieving HbA1c <8% increased (53.8% vs 59.0%, p=0.025). Significant reductions in blood pressure and LDL cholesterol were also observed, along with improved blood pressure control (51.3% vs 58.2%, p=0.004). No significant changes were observed in body mass index. In conclusion, the intervention was associated with improvements in blood pressure and lipid control among patients with hypertension and diabetes in a resource-limited setting. These findings support the potential of telehealth-enabled strategies to strengthen chronic disease management, although further efforts are needed to enhance glycemic control and ensure long-term sustainability and scalability.

21016

IMPROVING TIMELY ACUTE CORONARY SYNDROME CARE THROUGH IMPROVEMENT SCIENCE AND LEAN HEALTHCARE ACROSS 100 FIXED PRE-HOSPITAL CARE FACILITIES IN BRAZIL

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Introduction/Background: Care practices adopted in fixed pre-hospital services within Brazil's public health system directly influence patient safety and clinical outcomes. In the context of Acute Coronary Syndrome (ACS), failures in standardizing initial care, reflected in delays, care variability, and low adherence to evidence-based practices, represent significant challenges to care quality. The implementation of managed clinical protocols aligned with recognized guidelines, combined with Improvement Science and Lean Healthcare methodologies, constitutes a structured approach to minimize unwarranted variation and optimize care delivery. Objectives: To describe the impact of applying Improvement Science and Lean Healthcare on reducing care times and standardizing ACS care in fixed pre-hospital services within Brazil's public health system. Methods: A multicentre project was implemented across 100 fixed pre-hospital public health services in Brazil from June 2024 to December 2025, with June and July 2024 designated as the baseline period. Interventions were based on Improvement Science and Lean Healthcare and included implementing guideline-aligned ACS clinical protocols, team training, process standardization, and monthly monitoring of key indicators through Plan–Do–Study–Act (PDSA) cycles. Resultados e Conclusions: Following implementation involving 10,561 patients (mean age 63; 58.6% male), services showed a sustained reduction in door-to-ECG time, from 24 to 12 minutes (50% reduction). Door-to-physician time also improved from 20 to 17 minutes, a sustained 15% reduction. Finally, adherence to guideline-recommended pharmacological therapy for ACS increased from 33% to 67% during the monitoring period.



21056

SMARTPHONE-BASED CRANIOFACIAL AI SCREENING FOR OBSTRUCTIVE SLEEP APNEA IDENTIFIES INDIVIDUALS AT INCREASED HYPERTENSION RISK

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Introduction/Background: Obstructive sleep apnea (OSA) is strongly associated with hypertension and cardiovascular disease, yet remains markedly underdiagnosed due to limited access to polysomnography, particularly in large-scale and real-world settings. Objectives: To evaluate whether a smartphone-based craniofacial artificial intelligence (AI) model for OSA risk identification is associated with hypertension across clinical and real-world cohorts. Methods: We developed a machine learning model using frontal and profile facial photographs, age, and sex to estimate OSA risk without clinical questionnaire variables. Craniofacial features associated with upper airway anatomy were extracted from smartphone images to generate high- versus low-risk OSA classification.The model was developed and evaluated using multicenter clinical cohorts with polysomnography as the diagnostic reference standard, and subsequently assessed in real-world smartphone users. A total of 5,220 participants were included across a clinical cohort (n=846) and two independent real-world cohorts evaluated before (n=3,285) and after (n=1,089) deployment of the refined model. Logistic regression was used to evaluate associations between predicted OSA risk and self-reported hypertension. Resultados e Conclusions: Clinical validation demonstrated robust discriminative performance for OSA detection (AUC 0.83 for AHI≥5). Individuals with hypertension consistently showed higher prevalence of high OSA risk across all cohorts. In the clinical cohort, high-risk classification occurred in 92.4% of hypertensive versus 74.8% of non-hypertensive participants (OR 4.08, 95% CI 2.55–6.53; p<0.001). In the real-world cohort evaluated before deployment of the refined model, prevalence was 75.3% versus 45.1% (OR 3.71, 95% CI 2.93–4.69; p<0.001), with similar findings after deployment (73.2% vs 44.7%; OR 3.38, 95% CI 2.24–5.11; p<0.001). Smartphone-based craniofacial phenotyping identified individuals at increased risk for OSA and demonstrated consistent association with hypertension across clinical and real-world settings. These findings support scalable, non-invasive AI-based screening strategies for early cardiovascular risk identification while expanding access to OSA screening in underserved populations.

Supplementary Table 1 – Preliminary Testing Across AHI Thresholds

Preliminary performance of models across different AHI thresholds (≥5, ≥10, ≥15), using image-only, demographic, and Berlin 1 combinations as features.

Threshold	Features	Sens.	Spec.	Accuracy	AUC
AHI ≥ 5	Image only	0.9359	0.6364	0.8989	0.7861
	Image + Demographics	0.9231	0.7373	0.8989	0.8252
	Image + Demographics + Berlin 1	0.9326	0.7778	0.9065	0.8552
AHI ≥ 10	Image only	0.8280	0.6316	0.7865	0.7301
	Image + Demographics	0.8714	0.6842	0.8315	0.7778
	Image + Demographics + Berlin 1	0.7858	0.7368	0.7753	0.7613
AHI ≥ 15	Image only	0.8167	0.5852	0.7416	0.7014
	Image + Demographics	0.7167	0.7241	0.7191	0.7204
	Image + Demographics + Berlin 1	0.7167	0.7241	0.7191	0.7204

Note. AHI: Apnea-Hypopnea Index; AUC: Area Under the ROC Curve; Berlin 1: first version of the Berlin Questionnaire score used in feature combination.

Supplementary Table 2 – Cranial Feature Descriptions

Descriptions of the craniofacial features extracted from standardized frontal and lateral facial images. Features include linear distances, angular relationships, and proportional metrics used as input to image-based classification models.



View	Feature Name	Description
Front	Distance Eye Left Outer to Nose Left	Horizontal distance from the outer corner of the left eye to the left side of the nose.
Front	Distance Cheek Right to Cheek Left	Facial width between the right and left cheeks.
Front	Distance Nose Right to Nose Middle	Horizontal distance from the right side of the nose to its midpoint.
Front	Area Cheek and Chin	Area covering cheeks and chin, used as a proxy for facial shape.
Front	Distance Eye Right Width	Width of the right eye.
Front	Distance Eye Left Inner to Nose Left	Horizontal distance from the inner corner of the left eye to the left side of the nose.
Front	Proportion Jaw Width and Height	Ratio of jaw width to vertical jaw height.
Front	Proportion Jaw Width and Width	Ratio of jaw width to overall facial width.
Front	Distance Nose Middle to Nose Left	Horizontal distance from nose midpoint to left side.
Front	Proportion Interocular and Width	Ratio of distance between eyes to total facial width.
Front	Distance Chin Right to Chin Left	Horizontal chin width from right to left edge.
Front	Distance Eye Right Outer to Nose Right	Horizontal distance from the outer corner of the right eye to the right side of the nose.
Front	Distance Cheek Left to Eye Left Outer	Distance from left cheek to the outer corner of the left eye.
Front	Distance Nose Right to Nose Left	Overall nose width.
Front	Distance Eye Left Width	Width of the left eye.
Front	Distance Eye Right Inner to Nose Right	Horizontal distance from the inner corner of the right eye to the right side of the nose.
Front	Proportion Interocular and Height	Ratio of inter-eye distance to facial height.
Front	Proportion Mandibular Bottom Width and Width	Ratio of bottom mandibular width to total facial width.
Front	Proportion Mandibular Bottom Width and Height	Ratio of bottom mandibular width to mandibular height.
Front	Proportion Mandibular Top Width and Width	Ratio of top mandibular width to facial width.
Front	Distance Cheek Right to Eye Right Outer	Distance from right cheek to the outer corner of the right eye.
Side	Proportion Area Max and Area Rect	Ratio of maximum visible facial area to bounding rectangular area.
Side	Proportion Right Mandible Angle Bottom to Right Chin and Height	Ratio from mandible bottom angle to chin over total height.
Side	Proportion Right Chin to Nose Columella and Height	Ratio from chin to columella (nasal base) over height.
Side	Proportion Right Chin to Nose Columella and Width	Ratio from chin to columella over facial width.
Side	Proportion Right Ear Tragus to Right Chin and Width	Ratio from tragus to chin over width.
Side	Proportion Right Ear Tragus to Right Chin and Height	Ratio from tragus to chin over height.
Side	Proportion Right Ear Tragus to Right Mandible Angle Top and Width	Ratio from tragus to mandible top angle over width.
Side	Proportion Right Ear Tragus to Right Mandible Angle Top and Height	Ratio from tragus to mandible top angle over height.
Side	Proportion Right Mandible Angle Bottom to Right Chin and Width	Ratio from mandible bottom angle to chin over width.

20855

USE OF MACHINE LEARNING TO IDENTIFY CRITICAL THRESHOLDS OF EXPONENTIAL RISK IN CORONARY ARTERY BYPASS GRAFT SURGERY

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Introduction/Background: Traditional statistical models often assume a gradual and linear increase in surgical risk. However, human homeostasis operates through complex functional reserve limits. In this context, non-linear models may identify “Breakpoints,” defined as thresholds beyond which compensatory mechanisms collapse and adverse outcomes become exponential. Machine learning may therefore provide a risk stratification approach more consistent with biological reality. Objectives: To build and apply Machine Learning algorithms to detect non-linear relationships between physiological variables and in-hospital mortality, aiming to rank predictor importance and identify critical risk thresholds in Coronary Artery Bypass Grafting (CABG). Methods: This retrospective observational cohort included 4,388 consecutive patients undergoing isolated elective CABG. Predictive modeling was performed using the Random Forest Classifier algorithm to map complex non-linear interactions beyond logistic regression limitations. “Gini Importance” was calculated to rank predictor relevance, while Partial Dependence Plot analysis with decile stratification was used to identify thresholds where risk curves showed significant positive inflection. Resultados e Conclusions: AI-based modeling identified a distinct risk hierarchy compared with traditional scores. Cardiopulmonary Bypass Time (29.9%) and Creatinine Clearance (27.2%) emerged as the dominant predictors, surpassing age (14.0%) and ejection fraction (13.4%). Partial dependence analysis exposed physiological cliffs in which mortality abruptly increased: mortality doubled (3.4% to 7.3%) when perfusion time exceeded 108 minutes and tripled (9.1%) when creatinine clearance fell below 41 mL/min. Preoperative anemia also demonstrated an exponential pattern, with mortality reaching 8.5% for hemoglobin levels below 10.6 g/dL. In contrast, age and ejection fraction showed stable safety curves up to thresholds of 75 years and 40%, respectively. These findings demonstrate that Machine Learning can refined the mathematical understanding of risk in elective cardiac surgery, demonstrating that risk progression is governed by breakpoints rather than linear behavior. Interpreting variables solely as linear averages may conceal zones of extreme vulnerability. Defining these breakpoints provides objective perioperative safety targets and may support earlier interventions before patients cross thresholds associated with exponential risk.

Epidemiology and Health Policy / Global Health



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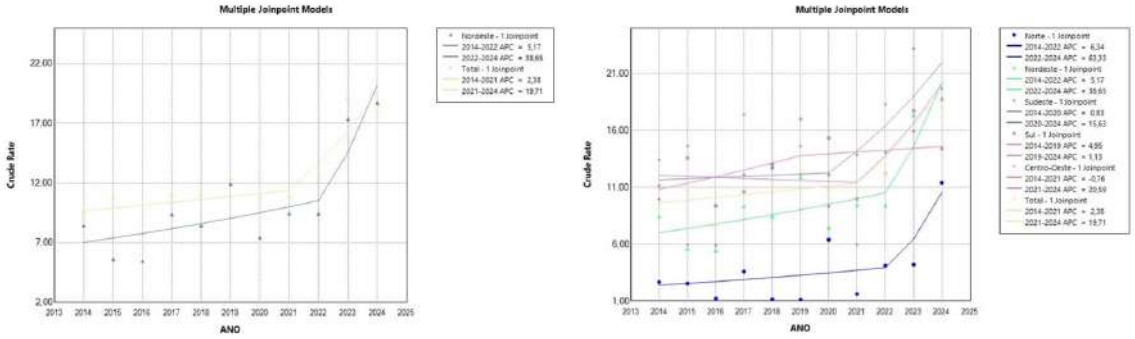
15273

AMYLOIDOSIS MORTALITY IN BRAZIL, 2014–2024: NATIONAL OVERVIEW OF A RARE DISEASE AND TREND ANALYSIS USING JOINPOINT REGRESSION.

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Introduction/Background: Amyloidosis is a rare disease characterized by extracellular deposition of amyloid proteins, often with cardiac involvement and a significant impact on morbidity and mortality. In Brazil, there are still few studies on mortality related to this condition. Objectives: To analyze the temporal trend and epidemiology of mortality due to amyloidosis in Brazil from 2014 to 2024. Methods: This is an observational, ecological time-series study using data from the Mortality Information System (SIM-DATASUS) related to amyloidosis (ICD-10: E85). Variables included sex, age group, race/ethnicity, and region of residence. Mortality rates were calculated per 100,000 inhabitants, and temporal trends were evaluated using Joinpoint Regression, with calculation of Annual Percent Change (APC) and Average Annual Percent Change (AAPC). Resultados e Conclusions: Between 2014 and 2024, a total of 1,918 deaths due to amyloidosis were recorded in Brazil, with predominance of males (59.4%) compared to females (40.6%). Age distribution showed higher concentration among individuals aged 70–79 years (27.2%), followed by ≥80 years (25.7%) and 60–69 years (22.3%), indicating greater impact on older adults. Regarding race/ethnicity, there was predominance of White individuals (56.9%), followed by mixed-race (28.7%) and Black individuals (10.7%). In regional analysis, Southeast region accounted for highest proportion of deaths (52.7%), followed by Northeast (21.9%), South (16.5%), Midwest (6.9%), and North (2.0%), possibly reflecting greater availability of diagnostic resources and case identification. In temporal trend analysis, APC indicated stationary pattern in Brazilian regions. However, AAPC demonstrated increasing trend in national mortality (7.30%; 95% CI: 0.17–14.93) and Northeast region (11.14%; 95% CI: 0.06–23.45). Increase observed in Brazil and Northeast may be associated with improvements in diagnostic capacity over study period. Cardiovascular involvement stands out as main prognostic determinant, frequently associated with late diagnosis, advanced heart failure, and high lethality. These findings reinforce need to improve early recognition, diagnostic qualification, and organization of care for infiltrative cardiomyopathies in country.

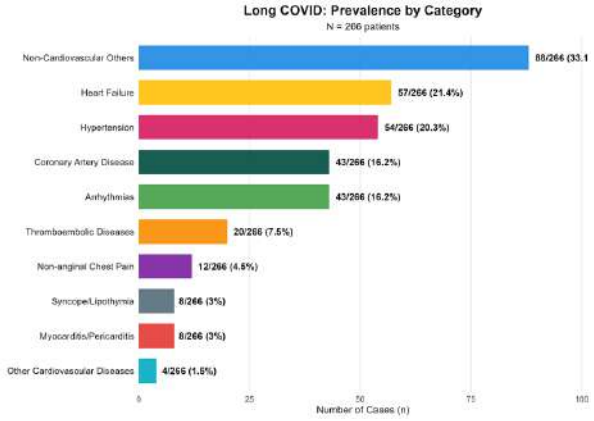


16650

CARDIOVASCULAR OUTCOMES IN LONG COVID: A TWO-YEAR OBSERVATIONAL FOLLOW-UP STUDY

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Introduction/Background: Post-acute sequelae of SARS-CoV-2 infection (Long COVID) is associated with persistent clinical manifestations, including cardiovascular complications. However, the prevalence and factors associated with cardiovascular outcomes in Long COVID remain incompletely characterized. Objectives: We aimed to describe the prevalence of cardiovascular and non-cardiovascular outcomes and to identify factors associated with cardiovascular outcomes in people with Long COVID. Methods: Persons with persistent symptoms of dyspnea, chest pain, or tachycardia post COVID-19 were included and followed for up to two years with outpatient visits scheduled every 6 months. Routine assessments included electrocardiography (ECG) and echocardiography. Additional diagnostic tests such as Holter monitoring and cardiac catheterization, were performed at the discretion of the attending physician based on clinical judgment. Outcomes were classified as non-cardiovascular or cardiovascular, including heart failure, hypertension, coronary artery disease, arrhythmias, thromboembolic diseases, non-anginal chest pain, myocarditis or pericarditis, syncope or lipothymia. Multivariable logistic regression models were used to identify factors associated with cardiovascular outcomes, expressed as odds ratios (OR) and 95% confidence intervals (95% CI). The study was reviewed and approved by the local Ethics Review Board. All analyses were conducted with R 4.2.3 Resultados e Conclusions: A total of 266 participants were included. The median age was 58 years (IQR 50–66) Women reported palpitations/tachycardia more frequently than men (42% vs. 21%; p < 0.001). Non-cardiovascular outcomes were observed in 33.1% of patients. Among cardiovascular outcomes, heart failure was the most prevalent condition (21.4%), followed by hypertension (20.3%), coronary artery disease (16.2%), and arrhythmias (16.2%). In multivariable analysis, age (OR 1.04; 95% CI 1.01–1.08), dyslipidemia (OR 4.42; 95% CI 1.76–12), diastolic dysfunction (OR 2.35; 95% CI 1.01–5.55), left ventricular ejection fraction (OR 0.92; 95% CI 0.85–0.97) and low white blood cell count (OR 4.15; 95% CI 1.03–19.5) were associated with cardiovascular outcomes. Patients with Long COVID exhibited a high prevalence of cardiovascular outcomes, with heart failure, hypertension, coronary artery disease and arrhythmias as the most frequent conditions, highlighting the importance of systematic cardiovascular assessment in this population.

16619

CLINICAL IMPACT OF CARDIOVASCULAR DIAGNOSTIC CAMPAIGNS ON RISK PRIORITIZATION IN SUS WAITING LISTS: EVIDENCE FROM MINAS GERAIS, BRAZIL

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Introduction/Background: Background: In public health systems, chronologically organized waiting lists for cardiac testing may delay the identification of patients at imminent risk of severe cardiovascular events. Cardiovascular diagnostic campaigns may help overcome this limitation by expanding access to testing while enabling risk-based prioritization of care. Objectives: Objective: To assess the clinical impact of cardiovascular diagnostic campaigns on risk stratification and identification of priority cases among patients awaiting cardiac evaluation in the Brazilian Unified Health System (SUS). Methods: Methods: We performed a descriptive cross-sectional study using data from two cardiovascular diagnostic campaigns conducted in Divinópolis and Poços de Caldas, Minas Gerais, Brazil. Electrocardiograms and echocardiograms were obtained from patients previously registered on SUS waiting lists. During the campaigns, participants were classified in real time as normal, abnormal requiring outpatient follow-up, or clinical priority, defined as the need for urgent intervention. Clinical impact was assessed using the Number Needed to Screen (NNS) for abnormal findings, priority cases, and activations of the Mobile Emergency Care Service (SAMU). Resultados e Conclusions: Results: A total of 3,832 patients underwent electrocardiographic and echocardiographic evaluation. Median age was 66 years in both municipalities. Overall, 1,013 patients (26.4%) had abnormal findings and 273 (7.1%) were classified as clinical priority cases. Divinópolis showed a higher proportion of priority cases than Poços de Caldas (9.0% vs. 5.3%). Thirty-two SAMU activations for immediate hospital transfer were recorded and occurred on every day of the campaigns. The NNS was 4 (95% CI, 3.6–4.0) for abnormal findings, 14 (95% CI, 12.5–15.7) for priority cases, and 120 (95% CI, 84.7–169.4) for one SAMU-triggered hospital transfer. Conclusions: Cardiovascular diagnostic campaigns demonstrated meaningful clinical impact by identifying high-risk patients concealed within chronologically organized SUS waiting lists. Beyond expanding diagnostic access, this strategy may enhance risk-based prioritization, improve patient safety, and support more efficient organization of care delivery in resource-constrained public health settings.

Table 1. Distribution of screened patients and clinical outcomes

Indicator	Total	Divinópolis N (%)	Poços de Caldas N (%)
Patients screened	3,832	1,831 (47.8)	2,001 (52.2)
Abnormal findings	1,013 (26.4)	524 (28.6)	489 (24.4)
Clinical priority	273 (7.1)	166 (9.0)	107 (5.3)
SAMU activations	32 (0.8)	25 (1.4)	7 (0.4)

Table 2. Clinical yield of the diagnostic campaigns

Indicator	Identified cases (n)	Prevalence (%)	NNS	95% CI
Abnormal findings	1,013	26.43	4	3.6–4.0
Priority cases	273	7.12	14	12.5–15.7
SAMU activation	32	0.83	120	84.7–169.4

Abbreviations: NNS, Number Needed to Screen; SAMU, Mobile Emergency Medical Services.

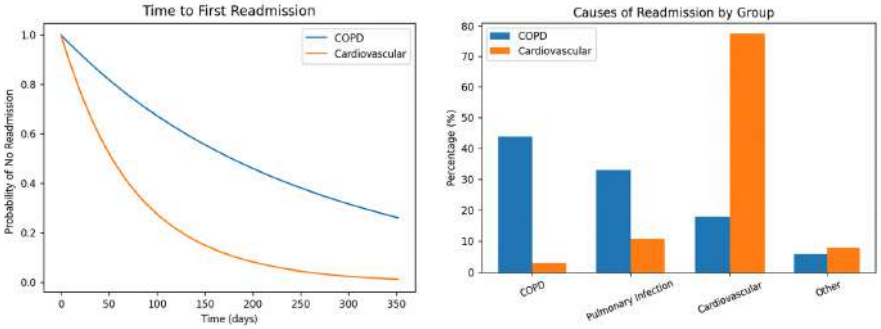
13889

COMPARATIVE ANALYSIS OF IN-HOSPITAL OUTCOMES FOLLOWING ADMISSIONS FOR COPD VERSUS ACUTE CORONARY SYNDROMES IN THE BRAZILIAN POPULATION.

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Introduction/Background: Chronic Obstructive Pulmonary Disease (COPD) and Acute Coronary Syndromes (ACS) are among the leading causes of hospitalization in Brazil, with a substantial impact on morbidity and mortality. Despite their distinct clinical trajectories, both are associated with a significant risk of readmission. Large-scale comparative analyses within the context of the Brazilian Unified Health System (SUS) remain limited. Objectives: To compare in-hospital outcomes, including readmissions, time to first event, and in-hospital mortality, between patients with a first hospitalization for COPD versus ACS in the Brazilian population. Methods: Retrospective cohort including 702,560 patients hospitalized in the Brazilian Unified Health System (SUS) between 2008 and 2024, using publicly available DATASUS data extracted via the TT Disease Explorer platform (Techtrials), which continuously integrates and updates epidemiological information. The system uses Microsoft Azure, SQL, M, DAX, and Power BI for data processing and visualization. Artificial intelligence (ETLs and web crawlers) enables collection of structured, encrypted, and de-duplicated data, ensuring unique patient identification. First hospitalizations for COPD or Acute Coronary Syndromes were included, defined as no prior admissions in the previous five years. Outcomes included readmission, time to event (Kaplan–Meier), and in-hospital mortality, analyzed using logistic regression and Cox models. Resultados e Conclusions: Among patients with COPD (n=35,478), 34.5% were readmitted, mainly due to COPD (43.8%) and pulmonary infection (32.8%). In the ACS group (n=201,008), 33.8% were readmitted, predominantly due to cardiovascular causes (77.7%). Time to readmission was longer in COPD (271 days; 95% CI 259–283) compared with ACS (84 days; 95% CI 82–87). Patients with ACS had a higher risk over time (HR 1.26–1.27) and a greater likelihood of 30-day readmission (OR 3.08; 95% CI 2.91–3.26). In-hospital mortality during the first admission was similar between groups (OR 0.98; p=0.44), but was higher during the second admission in COPD (10.0% vs 8.3%; OR 0.81 for cardiovascular; p<0.001). These findings highlight distinct patterns: the cardiovascular group shows a higher risk of early events and immediate recurrence, whereas COPD is associated with higher late mortality and readmissions related to disease progression. Therefore, care strategies should be tailored accordingly, prioritizing early transitional care in ACS and longitudinal management in COPD.



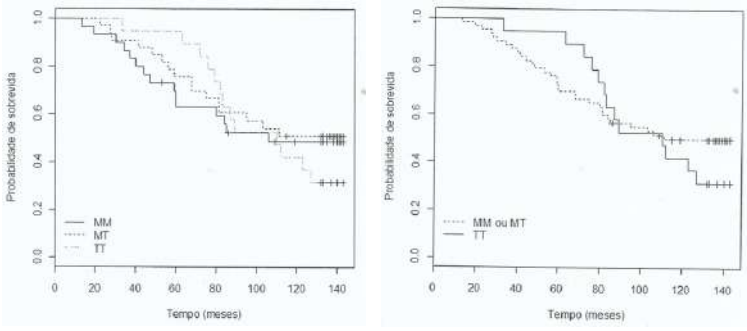
16101

COULD ANGIOTENSINOGEN GENE POLYMORPHISM BE A RISK FACTOR FOR POOR CARDIOVASCULAR PROGNOSIS IN CHRONIC HEMODIALYSIS PATIENTS?

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Introduction/Background: Patients undergoing hemodialysis (HD) continue to experience a significant increase in morbidity and mortality, especially from cardiovascular diseases (CVD). The presence of risk factors (RF) may indicate a higher probability of a particular outcome occurring. A better understanding of RFs linked to the prognosis of patients undergoing dialysis treatment is relevant in predicting mortality. Traditional cardiovascular risk factors alone are not sufficient to explain the high mortality rate in the population with chronic kidney disease requiring dialysis in our region. Other factors, such as genetic factors, need to be investigated. In our view, the key to greater survival lies in a better understanding of the risk factors, traditional or otherwise, associated with the prognosis of this population. Objectives: Primary: To evaluate the association of the M235T polymorphism of angiotensinogen (AGT) with survival in a hemodialysis population in Hardy-Weinberg equilibrium. Secondary: To evaluate the main causes of mortality. Methods: This was an observational study designed to investigate the role of a RAS gene. Using the same cohort from our doctoral thesis, we decided in 2026 to analyze an arm of that study in a subpopulation that presented at the same time of hemodialysis treatment. Eighty-two patients treated with chronic hemodialysis in four dialysis units in the state of Rio de Janeiro were analyzed. The follow-up period was 11 years. Survival rates were calculated using the Kaplan-Meier method, and differences between the curves were evaluated using the Tarone-Ware, Peto-Prentice, and Log-rank tests. Logistic and multinomial regression models were also used. A p-value <0.05 was considered statistically significant. • Feedback Resultados e Conclusions: The survival rate was 44% over 11 years. The main causes of death were circulatory system diseases (41%), with atherothrombotic vascular disease (ischemic heart disease + stroke) accounting for 37% of cases, followed by infections (15%). Although not statistically significant, it is interesting to note that 22% of the deceased patients had diabetes, while only 14% of the surviving patients had this disease. Logistic regression analysis in relation to the TT angiotensinogen genotype, with a p-value of 0.0844, indicated a significant trend with an odds ratio of 3.931 (95% CI: 0.128 to 1.231) for higher lethality. The TT polymorphism of AGT M235T showed a trend towards association with mortality in these patients.



17426

DESIGNING SUSTAINABLE MULTISECTOR GOVERNANCE FOR HYPERTENSION AND NCD CONTROL: A CO-CREATION AND IMPLEMENTATION SCIENCE APPROACH FROM BRAZIL

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Introduction/Background: Despite growing recognition of multisectoral collaboration for noncommunicable diseases (NCDs), health systems still struggle to translate this principle into structured and sustainable governance models. This gap is particularly evident in large public systems, where coordination remains fragmented, accountability unclear, and implementation capacity uneven. In low- and middle-income settings, these challenges are intensified by resource constraints and system complexity. Hypertension, a leading modifiable risk factor for cardiovascular disease, exemplifies this disconnect, as large-scale control depends on coordinated governance and sustained multisector engagement. Objectives: To evaluate the co-creation, design, and implementation of a multisector governance model ("Coalition") for hypertension and NCD control, analyzing its structure, coordination mechanisms, and scalability. Methods: A descriptive implementation research design was applied to analyze the coalition model. A structured co-creation process engaged 13 organizations from government, academia, civil society, philanthropy, and the private sector. The approach combined Human-Centered Design, implementation science, and participatory tools across iterative phases (situational analysis, stakeholder mapping, priority setting, and governance design). Analysis included stakeholder mapping with qualitative Social Network Analysis, SDG-aligned impact diagnosis, Impact Canvas modeling, and development of a Logical Framework/Theory of Change. Data were synthesized through inductive thematic analysis. Resultados e Conclusions: At the time of analysis, the initiative had expanded to 45 municipalities, reaching approximately 12.7 million people. Stakeholder mapping identified 70 organizations and 15 potential revenue streams, reflecting a diversified ecosystem for sustainability. The process generated three outputs: (1) a three-phase pathway from philanthropic to hybrid and impact-driven governance; (2) the GIFT-C framework (Governance, Impact, Financing, Technology, Communication); and (3) a coalition-specific Logical Framework linking inputs to long-term impact. Stakeholders reported high perceived impact (mean 4.3/5). These findings position the coalition as a governance innovation capable of integrating multisector actors, aligning incentives, and supporting long-term transformation of cardiovascular and NCD care.

19794

EPIDEMIOLOGIC DIFFERENCES AMONG PATIENTS ADMITTED DUE TO CARDIOLOGICAL PATHOLOGY TO A PUBLIC AND A PRIVATE INTENSIVE CARE UNIT IN BRAZIL'S COUNTRYSIDE

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(1) HOSPITAL MUNICIPAL DE EMERGENCIA HENRIQUE SERGIO GREGORI - RESENDE - RJ - BRASIL;

Introduction/Background: Cardiological pathology is one of the main causes of admission in the ICU. Understanding the epidemiologic profile of these patients is essential for developing health management policies. We seek to provide data that can contribute to improving the quality of intensive care in countryside regions of middle and low income countries. Objectives: Research Questions Assess the epidemiologic profile among patients admitted due to cardiological pathology to a public (PUB) and private (PVT) ICU in Brazil's countryside and identify the epidemiologic differences between the subgroups. Methods: Methods We conducted a prospective cross-sectional study between 2022 and 2024. Data was collected in the ICU from each patient admitted due to cardiological pathology. We analyzed the epidemiologic profile and the differences between the PUB and PVT subgroups. We used SPSS v20.0 for statistical analysis. We assessed quantitative variables using the Kolmogorov Smirnov test with mean and standard deviation, using the interquartile range in case of asymmetry. We compared quantitative variables using the Student's t-test for independent samples, and in case of asymmetry, using the Mann-Whitney test. We used the Chi-square test to compare proportions, and Fisher's exact test as appropriate. P<0,05 was considered statistically significant. Resultados e Conclusions: Results There were 1438 patients, of which 361 (25,1%) were in the PUB subgroup. The mean age in PUB was 65,3 +- 14,2 and in PVT 54,6 +- 17,1, p<0,0001; SAPS 3 in PUB was 63,3 +- 16,8 and in PVT 40,7 +- 9,0, p<0,0001; length of stay in PUB was 7,5 and in PVT 3,6, p<0,0001; mortality rate was 56 (3,9%), in PUB 33 (9,3%) and 23 (2,1%) in PVT, p<0,0001; HTN in PUB accounted for 274 (75,9%) patients and in PVT 589 (54,7%), p<0,0001; AF in PUB was 37 (10,2%) and in PVT 62 (5,8%), p=0,005; HF NYHA II-III in PUB was 102 (28,3%) and in PVT 88 (8,2%), p<0,0001; MI in PUB was 61 (16,9%) and in PVT 56 (5,2%), p<0,0001; sequelae of stroke in PUB was 12 (3,3%) and in PVT 15 (1,4%), p=0,025; and COPD in PUB was 32 (8,9%) and in PVT 28 (2,6%), p<0,0001. Sex, BMI, dialysis and HF NYHA IV were not statistically significant. Conclusion The comorbidities HTN, AF, HF NYHA II-III, MI, sequelae of stroke and COPD were more common in PUB patients, which were also older, had a higher mortality rate and SAPS 3 and had a longer length of stay. There were no statistical differences between the groups for sex, BMI, dialysis and HF NYHA IV.

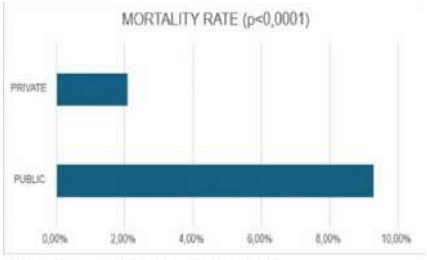


Figure 1. Mortality Rate

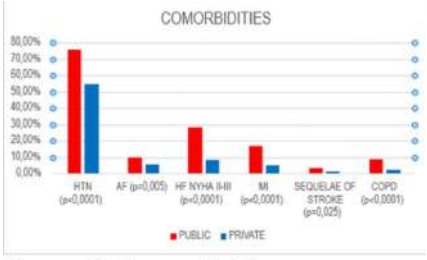


Figure 2. Comorbidities

16144

EPIDEMIOLOGICAL PROFILE AND MORTALITY TRENDS OF HEART FAILURE HOSPITALIZATIONS IN PARAÍBA, BRAZIL

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Introduction/Background: Heart failure (HF) is a clinical syndrome resulting from the heart's inability to eject blood to meet its metabolic needs. It affects more than 23 million people worldwide and, in Brazil, is considered the main cardiovascular cause of hospitalizations. State studies on the epidemiological profile of HF are limited. Objectives: The aim of this analysis is to assess the epidemiological and mortality profile of HF hospitalizations in the state of Paraiba, Brazil, between 2013 and 2023. Methods: This is an epidemiological, retrospective descriptive study with a quantitative approach, based on data from patients over 15 years old with HF, available from DATASUS. Resultados e Conclusions: In the period analyzed, there were 28,646 hospital admissions for HF in Paraiba, with a downward trend of 55.6% when comparing 2023 with 2013. It showed an average hospitalization time of 7.64 (± 1.29) and a total cost of R$47,486,508.03, with an increase in the average length of stay and average cost of 75% and 91.1%, respectively, over the last 10 years. Of the total number of cases, 52.2% were male patients and 73.4% were aged over 60, with the highest proportion in the 70-79 age group. In addition, the self-declared brown population accounted for 60% of hospitalizations. In addition, excluding data with no information, the type of care and its regime corresponded to 98% emergency care and 61% in private services, respectively. The number of deaths was 6,763 during the period, with an average population mortality rate of 676.3 (± 63.27) and an average population mortality rate of 13.68/100,000 (± 2.88) in Paraiba, resulting in a decline of 5.8% and 10.23%, respectively, from 2013 to 2022. The mortality rate in hospitalizations was 13.7%, with a higher proportion in the elderly over 80 years old. There was a 77.6% increase in the frequency of mortality in hospitalizations in 2023 compared to 2013. Even with the reduction in the absolute number of hospitalizations, HF persists as a public health problem due to the increase in the average length of stay, death rate and cost of hospitalization. The development of this study allowed us to learn more about the epidemiology of HF in the state of Paraiba, providing a better assessment of the evolution of this disease over time.

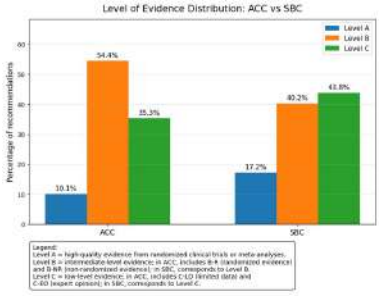
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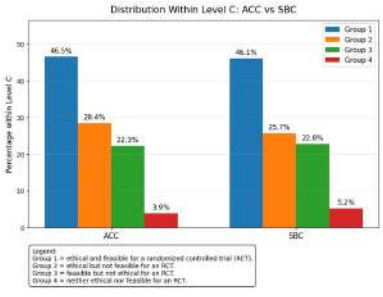
ETHICAL AND FEASIBILITY CONSTRAINTS UNDERLYING LEVEL C RECOMMENDATIONS IN ACC/AHA AND SBC CARDIOLOGY GUIDELINES: AN AI-ASSISTED MAPPING STUDY

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Introduction/Background: ACC/AHA and SBC clinical practice guidelines grade recommendations by class and level of evidence. Level C recommendations often rely on expert consensus and may be interpreted as “low evidence”, although many remain untested because randomized controlled trials (RCTs) are ethically unacceptable and/or operationally impractical. Objectives: To quantify recommendation class and level of evidence across ACC/AHA and SBC guidelines and, among Level C recommendations, to map ethical and feasibility constraints for RCTs. Methods: Formal recommendations with explicitly stated class and level of evidence were extracted from 24 ACC/AHA (2011–February 2026) and 36 SBC (2015–2024) guidelines using an AI-assisted pipeline with predefined parsing rules, externally validated against human assessment. Native grading systems were preserved; for summary reporting, ACC/AHA B-R and B-NR were grouped as Level B, and C-LD and C-EO as Level C. Level C recommendations were classified into four RCT-constraint groups: Group 1, ethical and feasible; Group 2, ethical but not feasible; Group 3, feasible but not ethical; and Group 4, neither. Constraints were mapped using a predefined framework informed by the CONSORT extension for pilot/feasibility trials, the Declaration of Helsinki, and CIOMS. Resultados e Conclusions: Sixty guidelines were analyzed: 24 ACC/AHA and 36 SBC. In ACC/AHA, Class I, IIa, IIb, and III recommendations accounted for 46.5%, 29.8%, 16.2%, and 8.8%, respectively; Level C accounted for 35.3%. In SBC, the corresponding proportions were 44.7%, 30.5%, 13.8%, and 9.4%, with Level C accounting for 43.8%. Among Level C recommendations, ACC/AHA showed 46.5% in Group 1, 28.4% in Group 2, 22.3% in Group 3, and 3.9% in Group 4; SBC showed 46.1%, 25.7%, 22.8%, and 5.2%, respectively. Level C recommendations were frequent in both societies’ guidelines, with remarkably similar distributions. Many consensus-based recommendations may reflect ethical and feasibility constraints rather than lack of scientific rigor. This framework may help prioritize research and support alternative evidence-generation strategies when RCTs are not acceptable, while underscoring the continuing role of clinical judgment in guideline development and dissemination of good clinical practice.





19087

EVOLUTION OF MORBIDITY AND MORTALITY AND HOSPITAL EFFICIENCY IN THE MANAGEMENT OF ACUTE MYOCARDIAL INFARCTION IN BRAZIL: REGIONAL DISPARITIES AND THE IMPACT OF THE COVID-19 PANDEMIC (2016-2025)

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Introduction/Background: Acute myocardial infarction (AMI) is the leading cause of cardiovascular death in Brazil. The COVID-19 pandemic impacted coronary syndrome management and epidemiological profile, suggesting pent-up demand and changes in clinical outcomes and hospital efficiency post-pandemic. Regional analysis is crucial to assess SUS resilience and cardiovascular care evolution in the last decade. Objectives: Analyze AMI morbidity, mortality, and hospital efficiency in Brazil, comparing pre- and post-COVID-19 periods, focusing on regional disparities. Methods: Epidemiological, descriptive, and analytical study, with an ecological and retrospective design, based on SIH/SUS data via DATASUS/TABNET (2016-2025). Hospitalizations, deaths, hospital mortality rate (HMR), and average length of stay were compared between the pre-pandemic (2016-2019) and post-pandemic (2021-2025) periods, using 2020 as the transition. Means were compared using Student’s t-test ($p < 0.05$). Percentage variations quantified the magnitude of regional changes. Resultados e Conclusions: A significant increase ($p < 0.001$) in the average volume of AMI hospitalizations occurred in all regions post-pandemic. The largest increase was in the Central-West (+73.3%), followed by the North (+57.5%) and Northeast (+47.0%), indicating high healthcare pressure. Concurrently, the average mortality rate (AMR) decreased nationwide, with sharp drops in the Central-West (-30.4%; $p = 0.0049$) and North (-29.9%; $p = 0.0007$), and significant reductions in the Southeast, South, and Northeast ($p < 0.05$). The average length of stay decreased in the Central-West (-19.5%; $p < 0.001$), Southeast (-13.7%; $p = 0.012$), and North (-7.1%; $p = 0.03$), remaining stable in the Northeast and South ($p > 0.05$). Despite the increased burden of ischemic heart disease post-pandemic, the healthcare system demonstrated resilience and greater efficiency in AMI management. The simultaneous reduction in mortality and length of stay suggests optimization of flows and protocols. The Northern region stands out for the largest proportional decrease in mortality compared to the increase in hospitalizations, indicating advances in the regional emergency network. The data reflect better clinical outcomes and cardiovascular management in Brazil, with demand absorbed through hospital efficiency. The study reinforces the importance of regionalized public policies for maintaining efficiency gains observed in the post-crisis scenario.

Tabela 1: Número de Internações por Região (2016-2025)

Ano	Norte	Nordeste	Sudeste	Sul	Centro-Oeste
2016	4506	20606	53610	33603	6681
2017	4993	22144	55800	33538	7622
2018	5335	23439	56168	32795	9250
2019	5344	24814	55081	34699	10213
2020	5122	24156	54864	35062	11153
2021	6467	28833	68590	36879	12702
2022	7688	31218	79928	38917	14123
2023	7880	33439	82428	33662	14508
2024	8360	36408	86925	33846	15192
2025	9090	39708	91869	34341	16218

Tabela 2: Número de Óbitos por Região (2016-2025)

Ano	Norte	Nordeste	Sudeste	Sul	Centro-Oeste
2016	571	2601	3629	2294	779
2017	564	2665	5832	2264	789
2018	556	2794	3937	2388	859
2019	607	2970	3948	2297	830
2020	564	2798	4058	2298	823
2021	562	3182	4522	2572	912
2022	722	3863	4922	2886	1016
2023	648	3826	4776	2321	1039
2024	609	3704	4814	2212	1046
2025	651	3762	4479	2299	985

Tabela 3: Taxa de Mortalidade (%) por Região (2016-2025)

Ano	Norte	Nordeste	Sudeste	Sul	Centro-Oeste
2016.0	12.659883	13.0911	10.995512	10.126694	12.021885
2017.0	11.295201	12.033776	10.397849	9.7890082	10.430333
2018.0	11.171500	11.920004	10.98403	10.037289	9.2864865
2019.0	11.358583	11.975477	9.4966805	9.2797279	8.5019064
2020.0	11.031326	11.581128	8.4561688	8.0132534	7.4029777
2021.0	8.9993361	11.045626	6.5974273	6.7181578	7.188815
2022.0	9.3912591	10.454983	6.1479633	8.0408837	7.6686764
2023.0	8.2239503	9.5406356	5.7265076	6.9073269	7.1629534
2024.0	7.2993568	8.5755088	5.4088582	7.1128386	6.8852037
2025.0	7.1569921	7.9631308	4.906734	6.6966216	5.8883309

21571

FOLLOW-UP OF ONE YEAR IN A NATIONAL COHORT OF ATHEROTHROMBOSIS: FINAL RESULTS FROM THE NETWORK TO CONTROL ATHEROTHROMBOSIS (NEAT) REGISTRY

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Introduction/Background: Atherothrombosis is a disruption of atherosclerotic plaque with superimposed thrombosis and, as a group, is the leading cause of death in Brazil and other developing countries. Contemporary prospective data from Latin America assessing prognostic factors in patients with atherothrombotic disease are limited. The Network to control atherothrombosis (NEAT) registry is a national prospective observational study of patients with known coronary artery disease (CAD) and/or peripheral arterial disease (PAD) in Brazil. After one year of follow-up, it highlights determinants observed in the study population. Objectives: To evaluate one-year clinical outcomes and identify independent prognostic factors among patients with established atherothrombotic disease enrolled in the Brazilian NEAT registry. Methods: The NEAT registry was a prospective, national, multicenter observational study including adults with CAD and/or PAD in Brazil. Outcomes at 1 year included all-cause mortality, cardiovascular mortality, total hospitalizations, and cardiovascular hospitalizations. Multivariable analysis was performed to identify independent prognostic factors in this very high-risk population. Resultados e Conclusions: Among 1,382 patients included in the one-year analysis, worsening renal function was linked to a progressive rise in hospitalizations or death. Event rates were 16% for those with CrCl ≥60 mL/min, 30% for CrCl 30–59 mL/min or albuminuria, and 51% for CrCl <30 mL/min. Compared with CrCl ≥60 mL/min, event risk was higher with CrCl 30–59 mL/min or albuminuria (HR 1.97; 95% CI 1.54–2.52) and with CrCl <30 mL/min (HR 4.27; 95% CI 2.99–6.09). After multivariable adjustment, renal dysfunction remained independently associated with adverse outcomes: CrCl 45–59 mL/min or albuminuria (HR 1.70; p<0.001), CrCl 30–44 mL/min (HR 1.79; p=0.001), and CrCl <30 mL/min (HR 3.15; p<0.001). Additional predictors were heart failure (HR 1.85), isolated PAD (HR 1.78), combined PAD/CAD (HR 1.73), and age (HR 1.15 per decade). In this very high-risk population with established atherothrombotic disease, chronic kidney disease was a major independent prognostic factor for one-year hospitalization or death. Renal dysfunction, along with age, heart failure, PAD, and combined PAD/CAD, should be considered in prognostic stratification.

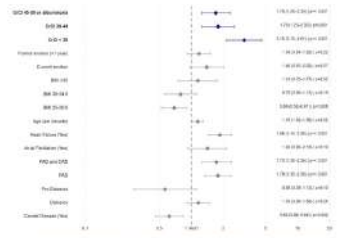


Figure 1: Independent predictors of one-year hospitalization or death in multivariable analysis

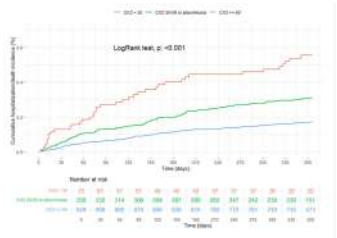


Figure 2: Cumulative one-year hospitalization or death according to renal function

17600

FROM CO-CREATION TO SYSTEM TRANSFORMATION: THE IMPACT OF AN INTEGRATED PACKAGE OF SOLUTIONS ON CHRONIC DISEASE CARE IN BRAZIL

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Introduction/Background: Isolated interventions have proven insufficient to sustainably improve care for chronic noncommunicable diseases (NCDs), particularly cardiovascular conditions, in complex health systems. Despite the availability of evidence-based guidelines, a persistent know–do gap limits large-scale effectiveness, especially in primary health care, where fragmentation, weak governance, and limited data use constrain implementation. Additionally, many individuals with cardiovascular risk factors remain outside health services, hindering early detection and continuity of care. Objectives: To describe the development and implementation of an integrated package of 10 solutions and analyze its role as a structuring mechanism for systemic transformation of cardiovascular and NCD care. Methods: The package was developed through a design thinking process grounded in implementation science, engaging multiple stakeholders (health managers, professionals, patients, and communities). Iterative cycles of diagnosis, co-creation, prototyping, and implementation generated over 80 solutions, of which 10 were selected based on essentiality, feasibility, and scalability. The package integrates actions across care organization, access, treatment adherence, governance, and data use. Implementation occurred in multiple Brazilian municipalities using a context-adaptive approach combining in-service strategies (e.g., opportunistic screening in primary care) and community-based outreach, including active case finding. Resultados e Conclusions: The package demonstrated high adaptability and acceptability across more than 45 municipalities. Impact resulted from the synergistic effect of integrated solutions rather than isolated interventions, reflected in improvements in care cascade indicators, strengthened primary health care capacity, enhanced governance, and increased use of data for decision-making. The model also improved alignment and standardization of existing practices and expanded reach to previously underserved populations. These findings suggest that coordinated implementation of a core solution set can bridge the know–do gap and enable scalable, sustainable transformation of cardiovascular care within health systems.

17639

FROM LOCAL IMPLEMENTATION TO GLOBAL LEARNING: BRAZIL AS A LIVING LAB FOR URBAN HYPERTENSION CONTROL IN ALIGNMENT WITH THE WHO CALL TO ACTION

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Introduction/Background: Hypertension remains the leading modifiable risk factor for cardiovascular disease and the second for premature mortality worldwide, with persistent gaps between evidence-based guidelines and implementation—especially in urban settings in low- and middle-income countries. In response to the World Health Organization Call to Action on hypertension control, the Initiative has evolved in Brazil as a “Living Lab,” integrating multisector governance, data-driven management, and scalable care models within public health systems. Objectives: To describe the development, implementation, and scale-up of the Initiative as a Living Lab in Brazil, and assess its contribution to translating global hypertension strategies into measurable population health outcomes.c Methods: A mixed-methods implementation science approach was applied across multiple urban contexts in Brazil. The Living Lab model integrates: (1) multisector coalitions involving public managers, private sector, and civil society; (2) standardized clinical and operational pathways aligned with strengthening primary health care; (3) data-driven management using care cascade indicators and real-time dashboards; and (4) continuous cycles of co-creation and adaptive learning. Quantitative data were obtained from routine health systems and program monitoring tools, including screening, diagnosis, treatment, and blood pressure control. Qualitative evidence was collected through stakeholder engagement and governance analysis. Resultados e Conclusions: Since its implementation, the Living Lab in Brazil has expanded from a single-city experience to a multiterritorial coalition, reaching over 45 municipalities and marking a shift from pilot interventions to a scalable model. Key advances include expanded hypertension screening and diagnosis through community strategies; strengthened care pathways within primary health care; improvements in care cascade indicators, particularly adherence and blood pressure control; and governance models enabling co-investment and multisector coordination. The Living Lab enabled rapid adaptation across diverse urban contexts while generating evidence to inform policy and planning. This experience shows that bridging the gap between global recommendations and local implementation is feasible, requiring integrated governance, data-driven decisions, and continuous learning. It also provides a replicable framework to operationalize the WHO Call to Action on hypertension, supporting sustainable scale-up in urban health systems globally.

21947

HEAT WAVES AND CARDIOVASCULAR MORBIDITY AND MORTALITY: A SYSTEMATIC LITERATURE REVIEW

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Introduction/Background: Heat waves represent a growing threat to global cardiovascular health. Climate change has increased the frequency, intensity, and duration of these extreme events, amplifying their impact on vulnerable populations. Epidemiological evidence demonstrates an association between exposure to extreme heat and increased cardiovascular morbidity and mortality, especially among older adults and individuals with pre-existing cardiovascular diseases. Objectives: To systematically review the scientific literature on the association between heat waves and cardiovascular outcomes, identifying vulnerable populations and the main epidemiological findings. Methods: A systematic review was conducted in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. A search was performed in the PubMed database using the MeSH terms and keywords “heat waves,” “cardiovascular diseases,” “mortality,” and “climate change,” combined using the Boolean operators. We included observational studies, systematic reviews, and meta-analyses published in English between 1990 and 2026. The exclusion criteria were studies without specific cardiovascular outcomes, case reports, letters to the editor, and experimental studies. Of the 79 records identified, 18 studies met the eligibility criteria and were included in the final analysis. Resultados e Conclusions: A consistent association was observed between heat waves and increased cardiovascular morbidity and mortality across diverse geographic regions. The meta-analysis by Liu J et al. (comprising 266 studies) demonstrated a 2.1% increase in cardiovascular mortality for every 1°C rise above the minimum mortality temperature (RR 1.021; 95% CI 1.020–1.023), along with an 11.7% increase during heat-wave events (RR 1.117; 95% CI 1.093–1.141). Furthermore, the data indicated higher rates of hospitalizations and emergency admissions, particularly among adults aged ≥65 years, individuals with pre-existing cardiovascular diseases, and urban populations affected by the urban heat island effect. Adaptive strategies, including the expansion of urban green spaces and the implementation of extreme heat action plans, demonstrated significant protective potential. Current evidence shows a significant global association between extreme heat and adverse cardiovascular outcomes. In the context of climate change, targeted public health policies and adaptive strategies for vulnerable populations are essential to reduce the cardiovascular burden of extreme heat.

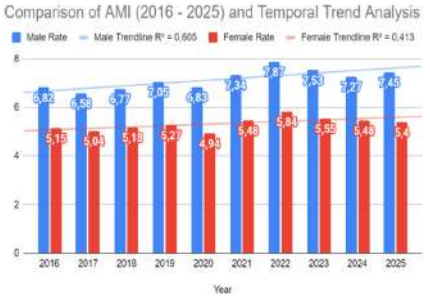
21858

HOSPITAL MORTALITY DUE TO ACUTE MYOCARDIAL INFARCTION IN BRAZIL: EPIDEMIOLOGICAL ANALYSIS BY SEX AND AGE GROUP (2016–2025)

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Introduction/Background: Acute Myocardial Infarction (AMI) remains one of the leading causes of cardiovascular mortality in Brazil. Understanding the epidemiological profile, particularly regarding gender disparities and the temporal behavior of mortality rates, is essential for planning prevention policies as well as strategies aimed at case control. Objectives: This study analyzes the trend of hospital deaths from AMI in Brazil, focusing on the distribution between men and women throughout the decade from 2016 to 2025. Methods: Epidemiological, descriptive, and retrospective study, with a quantitative approach. Records were extracted from the "SUS Hospital Morbidity (SIH/SUS)" section via the TabNet/DATASUS platform. The study population comprised hospital deaths under the diagnosis of AMI, according to the "ICD-10 Morbidity List". The variables analyzed were the annual mortality rate (per 100,000 inhabitants), calculated based on population projections generated by "Demográficas e Socioeconômicas" from TabnetDATASUS, as well as sex, and age group throughout the national territory, covering the period from 2016 to 2025. Resultados e Conclusions: The temporal trend analysis using Simple Linear Regression demonstrated a progressive and statistically significant increase in the AMI mortality rates (per 100,000 inhabitants) over the decade (2016-2025). The estimated average annual growth was 0.10 deaths/100,000 inhabitants for males ($R^2 = 0.60$; $p = 0.008$) and 0.05 deaths/100,000 inhabitants for females ($R^2 = 0.41$; $p = 0.046$). Furthermore, the comparison of historical means by Student's t-test confirmed a highly significant predominance of mortality in males compared to females ($p < 0.001$), evidencing a consistently unequal epidemiological burden between genders even after adjusting for population growth. The AMI mortality in Brazil shows a statistically significant upward trend over the last decade, confirming an unequal epidemiological burden with a highly significant predominance in males. In 2020, there was a drop in the number of cases, which may have occurred as a consequence of the COVID-19 pandemic causing missed diagnoses. On the other hand, the jump in records from 2021 onwards highlights the need to strengthen prevention and control strategies for diseases such as hypertension, diabetes, and dyslipidemia, as they are risk factors for AMI. Furthermore, ensuring rapid access to reperfusion therapy in emergency networks is essential to mitigate the growing burden of cardiovascular deaths in the country.



Statistical Analysis:

Linear Regression Male:
Growth: +0.10 / 100 mil hab.
$R^2 = 0.60$ | $p = 0.008$

Linear Regression Female:
Growth: +0.06 / 100 mil hab.
$R^2 = 0.41$ | $p = 0.046$

T test (Male x Female):
$p < 0.001$

19165

IMPACT OF CLIMATE SEASONALITY ON HOSPITALIZATIONS AND HEALTHCARE COSTS FOR HEART FAILURE IN RIO DE JANEIRO

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Introduction/Background: Heart failure (HF) is one of the leading causes of hospitalization worldwide and imposes a substantial economic burden on the Brazilian Unified Health System. Environmental and climatic factors, particularly temperature variation, have been associated with HF decompensation and increased healthcare demand. However, local evidence exploring this relationship in large urban centers such as Rio de Janeiro remains limited, especially regarding its economic impact. Objectives: To analyze the association between HF hospitalizations and climate seasonality and to assess its impact on hospital costs in Rio de Janeiro. Methods: Ecological, longitudinal, retrospective, and quantitative study using data from the Brazilian Hospital Information System (SIH/SUS), the National Institute of Meteorology, and the Center for Weather Forecasting and Climate Studies. HF hospitalizations (ICD-10), length of stay, costs, and mean monthly temperature were analyzed between January 2015 and December 2025. Spearman and Pearson correlation tests were applied. Resultados e Conclusions: A total of 28,865 HF hospitalizations were recorded, with a mean length of stay of 14.64 days and an average of 218.6 admissions per month. Total costs reached R$83.1 million, with a mean cost of R$2,850.34 per hospitalization and R$198.18 per day. The mean temperature was 23.7°C. Hospitalizations were more frequent in winter (30.2%) and less frequent in summer (21.8%). A moderate negative correlation was observed between temperature and hospitalizations (Spearman ρ=-0.462; Pearson r=-0.391; $p<0.005$; R^2=0.153). A negative correlation was also found between length of stay and daily cost (R^2=0.0925). Lower temperatures were significantly associated with increased HF hospitalizations, indicating a relevant seasonal pattern. The high economic burden reinforces the importance of climate-informed planning strategies to optimize healthcare resource allocation.

19942

IMPROVING EMERGENCY CARDIOVASCULAR CARE THROUGH CARE BUNDLES: ADHERENCE AND SYSTEM-LEVEL OUTCOMES OF A CITYWIDE PUBLIC HEALTH POLICY FOR ACUTE MYOCARDIAL INFARCTION AND STROKE IN A LARGE LATIN AMERICAN METROPOLIS

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Introduction/Background: Cardiovascular diseases remain the leading cause of death in large urban centers. In the municipality of São Paulo, official epidemiological surveillance data indicate that diseases of the circulatory system account for approximately 30–33% of all deaths, with acute myocardial infarction (AMI) ranking as the leading specific cause and cerebrovascular diseases (stroke) among the second and third causes of mortality. In complex, high-demand public health systems, variability in emergency care processes contributes to avoidable delays, inequities in access, and worse clinical outcomes. The implementation of evidence-based care bundles, integrated into structured public health policies, represents a strategy to improve the reliability of care for time-sensitive cardiovascular conditions. Objectives: To describe the implementation of a municipal public health policy for emergency cardiovascular care based on care bundles for AMI and stroke, and to analyze early adherence data to these bundles as system-level performance indicators aimed at reducing avoidable cardiovascular mortality Methods: This quality improvement study was conducted within the municipal emergency care network of a large Latin American metropolis, using routinely collected care process indicators and epidemiological surveillance data. Evidence-based AMI and stroke care bundles were implemented in Emergency Care Units as a citywide public health policy. The bundles were aligned with national and international guidelines and organized according to the '5 Rs of Rescue' framework (Recognize, Rescue, Reassess, Refer, and Reflect). Implementation strategies included clinical governance, multiprofessional workforce training, standardized clinical pathways, and continuous monitoring using Plan–Do–Study–Act (PDSA) cycles. Bundle adherence was measured through key process indicators related to critical early phases of AMI and stroke care, analyzed across sequential monitoring rounds (R1 and R2). Resultados e Conclusions: The implementation of AMI and stroke care bundles as a structured municipal public health policy resulted in high adherence to critical care processes, even in high-pressure emergency environments. . For the AMI care bundle, adherence rates reached up to 91% in participating emergency units, with sustained adherence in subsequent monitoring cycles of approximately 89%.

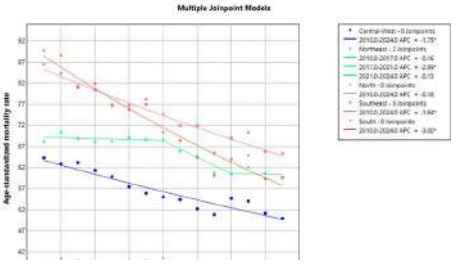
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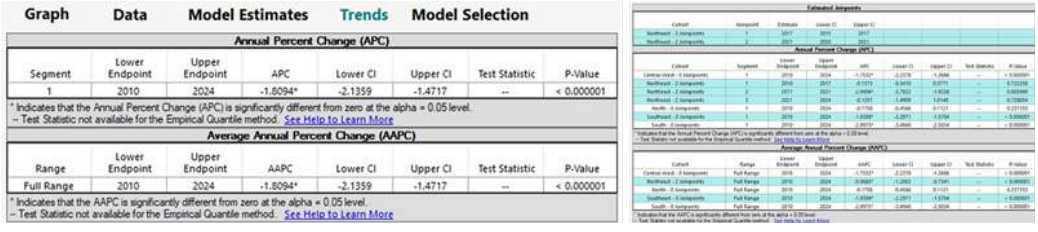
MORTALITY TRENDS BY CARDIOVASCULAR DISEASE: DATA FROM BRAZIL AND REGIONS BETWEEN 2010–2024

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Introduction/Background: Heart failure (HF) is a complex clinical syndrome defined by the heart's inability to maintain adequate cardiac output due to structural or functional abnormalities. Ischemic heart disease is the leading etiology, with hypertension, valvular disease, and myocarditis among other contributors. Objectives: To analyze trends in mortality by IHD among Brazilian population in the years 2010-2024. Methods: It was conducted a retrospective ecological study of deaths attributed to ischemic heart disease and related circulatory conditions (ICD 10: I20–I25; I00–I09; I11; I13) in Brazil from 2010 to 2024, using mortality records from the Mortality Information System (Ministry of Health) and population estimates from the Brazilian Institute of Geography and Statistics (IBGE). Age standardized mortality rates (reference: 2010 population) were calculated. Temporal trends were evaluated using Joinpoint regression to estimate Annual Percent Change (APC) for each segment and Average Annual Percent Change (AAPC) for the overall period. Multivariable regression models adjusted for age, sex, region, and year were used to estimate Mortality Rate Ratios (MRR). The study used exclusively aggregated, de identified, publicly available secondary data. Results are reported with 95% confidence intervals and p values< 0,05. Resultados e Conclusions: Age standardized mortality rates for 2010 declined in Brazil between 2010 and 2024 without identifiable inflection points; the overall AAPC was −1.809% per year (95% CI: −2.1359 to −1.4717; p < 0.001). Both sexes experienced significant declines without joinpoint changes: men AAPC = −1.571%/yr and women AAPC = −2.057%/yr. Regionally, the Central West, Southeast, and South showed significant continuous decreases (AAPC = −1.732%, −1.939%, and −2.975%/yr, respectively), with the South exhibiting the largest reduction. The North showed a non significant slight decline (AAPC = −0.1758%; 95% CI: −0.4566 to 0.1121; p = 0.237). The Northeast presented two joinpoints (2017, 2021): non significant trend 2010–2017, significant decline 2017–2021 (APC = −2.906%; 95% CI: −3.7022 to −1.9326; p = 0.006), and non significant trend 2021–2024; overall AAPC = −0.968% (95% CI: −1.2003 to −0.7341; p < 0.001). Age standardized mortality declined in Brazil (2010–2024), with heterogeneous regional and sex patterns. Standardization to the 2010 population controls for age structure changes, suggesting much of the rise in crude rates is attributable to population aging rather than increased age adjusted risk.





Graph Data Model Estimates Trends Model Selection

Annual Percent Change (APC)

Segment	Lower Endpoint	Upper Endpoint	APC	Lower CI	Upper CI	Test Statistic	P-Value
1	2010	2024	-1.8094*	-2.1359	-1.4717	--	< 0.000001

* Indicates that the Annual Percent Change (APC) is significantly different from zero at the alpha = 0.05 level.
-- Test Statistic not available for the Empirical Quantile method. See Help to Learn More

Average Annual Percent Change (AAPC)

Range	Lower Endpoint	Upper Endpoint	AAPC	Lower CI	Upper CI	Test Statistic	P-Value
Full Range	2010	2024	-1.8094*	-2.1359	-1.4717	--	< 0.000001

* Indicates that the AAPC is significantly different from zero at the alpha = 0.05 level.
-- Test Statistic not available for the Empirical Quantile method. See Help to Learn More

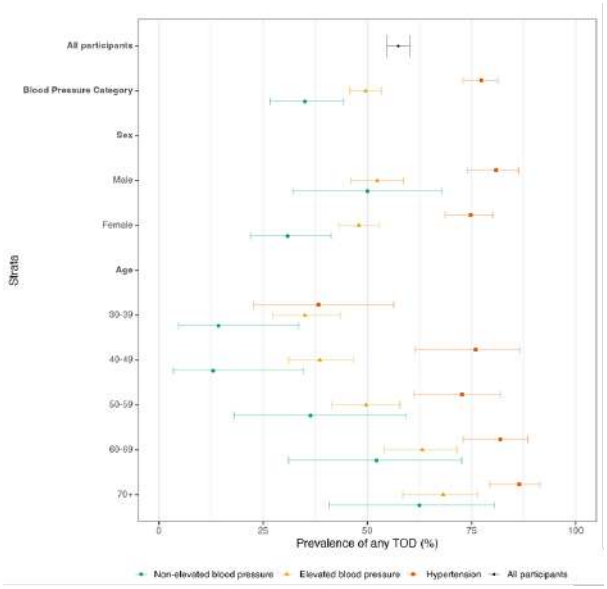
20258

PREVALENCE OF TARGET ORGAN DAMAGE IN RURAL KENYA AND THE GAMBIA: A CROSS-SECTIONAL STUDY

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Introduction/Background: Sub-Saharan Africa is experiencing a crisis of hypertension. Compared to high income settings, hypertension in SSA is characterised by younger onset, suboptimal control, and worse cardiovascular disease (CVD) outcomes. Rural SSA faces a particular challenge with lower awareness and poorer access to healthcare. Together, this may contribute to the earlier onset of target organ damage (TOD), a strong predictor of long-term CVD. However, population-level data on TOD prevalence in rural SSA are lacking. Objectives: To determine the prevalence of TOD in two rural SSA populations in Kenya and The Gambia. Methods: This cross-sectional, population-based study in Kilifi (Kenya) and Kiang West (The Gambia) ran from July 2023 to December 2024. An age-stratified random sample of adults aged ≥30 years underwent 24-hour ambulatory blood pressure measurement, electrocardiography, echocardiography, pulse-wave velocity measurement, and renal function assessment. TOD was defined as left ventricular hypertrophy (LVH), reduced global longitudinal strain (GLS), left ventricular systolic dysfunction (LVSD), arterial stiffness, or renal dysfunction. Resultados e Conclusions: Of 1819 participants screened,1379 were recruited, and 1212 were included in the analysis (mean age 56.8±14.8 years; 62.9% female). Elevated blood pressure was present in 56.6% and hypertension in 33.5%. Overall, 57.4% had at least 1 TOD marker, increasing from 35.0% for non-elevated blood pressure to 77.3% for hypertension (p<0.001). TOD prevalence rose from 32.7% in those 30–39 years to 77.0% in those >70 years (p<0.001). Common markers were electrocardiogram LVH (31.1%) and arterial stiffness (38.0%). Echocardiogram LVH was observed in 10.0%, reduced GLS in 16.7%, LVSD in 9.8%, and renal dysfunction in 3.8%. Prevalence was higher in The Gambia (64.8%) than Kenya (50.9%) (p<0.001). TOD clustering increased with blood pressure. No participants with non-elevated blood pressure had four TOD markers compared to 3.3% of those with hypertension (p<0.001). Target organ damage is common in rural SSA, including in younger individuals. These findings provide important information on how TOD assessment should be incorporated into cardiovascular care pathways and help determine optimal ages for CVD screening.



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REGIONAL DISPARITIES IN CLINICAL AND ECONOMIC OUTCOMES OF HEART FAILURE HOSPITALIZATIONS IN BRAZIL: A 2021–2025 ANALYSIS

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Introduction/Background: Heart Failure (HF) is a clinical syndrome characterized by the heart's inability to adequately meet the body's metabolic demands, representing a leading cause of global morbidity and mortality. In Brazil, it imposes high mortality rates and significant healthcare costs on the public health system. However, the unequal distribution of resources exacerbates regional disparities in quality of care and outcomes. Objectives: To evaluate regional disparities in financial investments, average length of stay, and in-hospital mortality rates associated with heart failure hospitalizations in Brazil from 2021 to 2025. Methods: This is an epidemiological, retrospective, and analytical study based on data from the Hospital Information System (SIH/SUS). Records of hospitalizations and in-hospital deaths due to heart failure across the five Brazilian regions between 2021 and 2025 were included. The variables analyzed were hospital costs, average length of stay, and in-hospital mortality. Regional comparisons were performed in JAMOVI software (v. 2.6.44.0), using Welch's ANOVA and Games-Howell post-hoc test ($p < 0.05$). Resultados e Conclusions: Statistical analysis showed significant regional differences across the three variables evaluated. The Southeast region had the highest average hospital costs (R$ 209.5 million), while the North had the lowest (R$ 25.5 million) (Welch's ANOVA, $F(4, 9.51) = 54.3$, $p < 0.001$). Mean length of hospital stay was highest in the Northeast (8.98 days) and lowest in the South (6.86 days) (Welch's ANOVA, $F(4, 9.65) = 59.9$, $p < 0.001$). The in-hospital mortality rate was highest in the Southeast (13.37%) and lowest in the Central-West (10.4%) (Welch's ANOVA, $F(4, 9.68) = 7.74$, $p = 0.005$). Post-hoc analysis showed consistent differences between the North, Northeast, and Central-West regions compared to the South and Southeast. This study demonstrates that regional disparities in public healthcare investment directly influence clinical and operational outcomes in heart failure care in Brazil. The concentration of costs and higher mortality in the Southeast, combined with longer hospital stays in the Northeast, suggest that resource distribution and healthcare efficiency are not uniform. These findings reinforce the need for targeted public policies that address regional vulnerabilities to optimize care and reduce mortality across Brazil.

Table 1. Total hospital costs (R$) for Heart Failure hospitalizations by Brazilian macro-regions, 2021–2025.

Regions	2021	2022	2023	2024	2025
North	15,627,873.27	23,905,279.29	28,691,010.03	27,797,581.08	31,635,703.2
Northeast	71,781,062.85	93,144,859.43	99,888,981.53	106,373,230.04	118,013,536.27
Southeast	146,788,823.51	206,293,901.26	220,482,159.31	230,215,591.35	243,890,233.55
South	71,560,569.8	89,447,850.56	94,490,715.41	101,245,717.23	106,659,250.21
Central-West	25,252,752.96	32,614,285.33	38,484,396.29	39,331,196.83	40,656,291.91

Table 2. Mean length of stay (days) for Heart Failure hospitalizations across Brazilian regions, 2021–2025.

Regions	2021	2022	2023	2024	2025
North	8.4	9.2	8.8	8.8	8.1
Northeast	8.1	8.8	9.1	9.4	9.5
Southeast	8.2	8.8	8.7	8.7	8.7
South	6.6	6.9	7	6.9	6.9
Central-West	7.7	8.2	8.1	7.9	8

Source: SIH/SUS - Hospital Information System, Ministry of Health.

Table 3. In-hospital mortality rates (%) for Heart Failure hospitalizations across Brazilian regions, 2021–2025.

Regions	2021	2022	2023	2024	2025
North	12.65	12.31	11.39	10.54	10.41
Northeast	12.5	12.09	11.24	11.94	11.57
Southeast	14.86	13.42	12.98	12.91	12.67
South	12.59	11.01	10.35	10.51	10.39
Central-West	11.45	10.88	9.87	10.15	9.66

Source: SIH/SUS - Hospital Information System, Ministry of Health.

17895

RESULTS OF MASSIVE ECHOCARDIOGRAPHIC SCREENING JOINT EFFORTS IN THE BRAZILIAN PUBLIC HEALTH SYSTEM: PREVALENCE OF STRUCTURAL HEART DISEASE AMONG PATIENTS IN WAITING QUEUES FOR CARDIOVASCULAR CARE

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Introduction/Background: Structural heart disease (SHD) is a major cause of morbidity and mortality in Brazil, with underserved populations facing prolonged waiting times for echocardiography (echo). Delayed diagnosis contributes to advanced disease at presentation. Objectives: We aimed to evaluate the feasibility of integrating comprehensive echocardiography with remote interpretation into public health through joint efforts, and to determine the prevalence of significant SHD among patients on waiting queues, to prioritize care. Methods: In 11 days, 15 certified cardiologists performed transthoracic echo at 2 public facilities of 2 mid-size cities of the state of Minas Gerais, southeast Brazil, during scheduled joint-efforts. Consented patients in waiting queues, referred for echo for clinical indications or found in screening, answered a clinical questionnaire and underwent a comprehensive echo protocol (GE Vivid Q and Vivid IQ), interpreted by the acquiring physician, with adjudication by a second expert. Significant SHD was defined as moderate/severe valve disease, left (LV) and right (RV) ventricular dysfunction/hypertrophy, pericardial effusion or wall-motion abnormalities. Clinical and demographic predictors of SHD on echo were assessed using multivariable logistic regression. Resultados e Conclusions: In March (5 days) and November (6 days) 2025, 3832 patients underwent echo; mean age was 64±14 years, 57% were females. At total 56.7% had cardiovascular symptoms, being the most frequent chest pain (33.7%) and dyspnea (29%); 74.9% had hypertension and 36.9% diabetes. SHD was found in 1186 (31.2%) patients, and 342 (9%) were considered top priorities for care. Moderate/severe SHD was observed in: LV dysfunction 185 (4.8%), LV hypertrophy 143 (3.8%), mitral regurgitation 118 (3.1%), mitral stenosis 61 (1.6%), aortic stenosis in 64 (1.7%), aortic regurgitation 77 (2.0%), tricuspid regurgitation 115 (3.0%), and any LV segmental wall-motion abnormalities in 537 (14%). Independent predictors of SHD were: age (every 10y) (OR=1.39 (95%CI 1.31-1.48), dyspnea (OR=1.37 (1.13-1.65), previous history of Chagas disease (OR=1.95 (1.06-3.60), coronary artery disease (OR= 2.42 (1.99-2.96), and heart failure (OR= 1.53 (1.27-1.85). In conclusion, large-scale integration of comprehensive echo in Brazilian public health settings is feasible and enables rapid identification of a high burden of SHD among patients on waiting lists, holding promise for improvement of timely access for high-risk individuals.

21306

TEMPORAL TRENDS IN OBESITY MORTALITY IN BRAZIL, 2003–2023: REGIONAL AND DEMOGRAPHIC DISPARITIES

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Introduction/Background: Obesity is classified by the World Health Organization as a chronic disease resulting from complex interactions among genetics, neurobiology, eating behaviors, diet access, market forces, and the broader environment. It is strongly associated with increased risk of non-communicable diseases, particularly cardiovascular conditions, and with premature mortality. Objectives: To evaluate temporal trends in obesity mortality in Brazil from 2003 to 2023, stratified by sex, age group, and region. Methods: A retrospective ecological study analyzed deaths due to obesity (ICD-10 E66) from the Mortality Information System of the Ministry of Health and population data from the Brazilian Institute of Geography and Statistics (IBGE). Descriptive statistics were applied, followed by Joinpoint regression to assess temporal trends. Annual Percent Change (APC) was estimated for each segment, and Average Annual Percent Change (AAPC) summarized overall trends. Multivariable Poisson regression models with log(population) offset were fitted to estimate Mortality Rate Ratios (MRR), adjusted for age, sex, region, and year. Analyses were conducted in R 4.5.1 (R Core Team, 2025) with RStudio, using tidyverse, readxl, and MASS packages. Resultados e Conclusions: Results: Obesity mortality tripled (0.56 to 1.70 deaths/100,000), with an inflection in 2009: accelerated growth initially (APC = 10.6%) followed by slower but sustained increase (AAPC = 6.3%; p < 0.001). Adjusted analyses showed average annual growth of 4.5% (MRR = 1.045; 95% CI: 1.041–1.048; p < 0.001). Mortality rose in both sexes, but men had continuous growth (AAPC = 6.5%), while women showed inflection in 2009 (AAPC = 5.8%). Proportionally, increases were greater in men (230%) than women (188%). Age exerted the strongest effect: mortality in ≥80 years was ~195 times higher than in 0–19 years (MRR = 194.618; p < 0.001). Regionally, the North had 45% lower mortality than the Southeast (MRR = 0.550), while the South was 24% higher (MRR = 1.240). Conclusion: Obesity mortality increased significantly and unevenly across Brazil, driven largely by aging, with marked differences by sex and region. Findings highlight the need for targeted public health policies and preventive strategies adapted to demographic and regional disparities, reinforcing the cardiovascular burden of obesity

Table 1. Mortality Rate Ratio (MRR) for Obesity by Year, Sex, Age Group, and Region. Brazil, 2003–2023.

Variável	Category	MRR*	IC 95%	p-valor
Ano	By calendar year	1,045	1,041 – 1,048	< 0,001
Sexo				
	Female (ref.)	1,000	—	—
	Male	0,706	0,677 – 0,735	< 0,001
Faixa etária				
	0 a 19 years(ref.)	1,000	—	—
	20 a 39 years	18,123	16,173 – 20,358	< 0,001
	40 a 59 years	67,487	60,320 – 75,699	< 0,001
	60 a 79 years	134,728	120,375 – 151,175	< 0,001
	80 years or older	194,618	173,169 – 219,236	< 0,001
Região				
	Southeast (ref.)	1,000	—	—
	South	1,240	1,170 – 1,314	< 0,001
	Central-West	1,110	1,042 – 1,183	0,001
	Northeast	0,725	0,684 – 0,768	< 0,001
	North	0,550	0,512 – 0,591	< 0,001

**MRR: Mortality Rate Ratio. 95% CI: 95% Confidence Interval. ref.: reference category. Negative binomial regression model with log(population) offset, simultaneously adjusted for year, sex, age group, and region.*

Source: Mortality Information System, Ministry of Health, Brazil, 2026

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TRENDS IN HEART FAILURE HOSPITALIZATIONS IN RIO DE JANEIRO BEFORE AND AFTER THE INTRODUCTION OF CARDIOPROTECTIVE THERAPIES

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Introduction/Background: Heart failure is a major cause of hospitalization and cardiovascular mortality in Brazil. Recent advances, including angiotensin receptor-neprilysin inhibitors and SGLT2 inhibitors, have improved disease management and were incorporated into the public health system in 2022. Objectives: To analyze trends in HF hospitalizations and outcomes before and after the introduction of cardioprotective therapies in the public health system. Methods: Ecological time-series study using SIH/SUS data. HF hospitalizations (ICD-10: I50) in Rio de Janeiro between 2015 and 2025 were analyzed. Variables included hospitalization rates, in-hospital mortality, total and mean costs, and length of stay. Data were grouped into pre-implementation (2015–2021) and post-implementation (2022–2025) periods. Resultados e Conclusions: A total of 122,624 hospitalizations were recorded. Hospitalization rates increased from 62.9 to 67.8 per 100,000 inhabitants (+7.8%). In-hospital mortality also increased from 16.7% to 18.0% (+7.8%). The mean cost per hospitalization rose from R$1,476 to R$2,492 (+68.8%), while total costs increased from R$113 million to R$124 million (+9.7%). Length of stay remained stable (10.1 vs 10.5 days). Although a general downward trend in hospitalizations was observed over the full period, the post-implementation phase showed increases in hospitalization rates, mortality, and costs. These findings may reflect changes in disease severity and patient complexity, highlighting the importance of continuous epidemiological monitoring after the introduction of new therapies.

Experimental Cardiology (Basic Science)



81º CONGRESSO BRASILEIRO DE CARDIOLOGIA together with WORLD CONGRESS OF CARDIOLOGY





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CHEMICAL PROFILING OF ANNONA SENEGALENSIS LEAF EXTRACT AND COMPUTATIONS WITH BETA-ADRENERGIC RECEPTOR AND YES-ASSOCIATED PROTEIN IMPLICATED IN CARDIOVASCULAR DISEASES

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Introduction/Background: Annona senegalensis (Figure 1), also known as the African custard apple or wild custard apple, is a plant native to Africa, with wide therapeutic applications for its several pharmacological compounds (Lawal et al., 2021). Cardiac organ is rich in Beta-blocker receptors, responsible for signaling in the sympathetic nervous system. Fu et al. (2022) documented that YES-Associated protein (YAP) induces proliferation of cardiomyocytes. Objectives: This study examined the chemical composition of Annona senegalensis leaf methanol extract and In-silico profile .of its selected phytochemicals against Beta-blocker receptor and YAP. Methods: Fresh leaves of Annona senegalensis were collected in May, 2024 at Obamoro village (7.760 N, 4.150 E), Iwo, Osun State, Nigeria. The leaves were air-dried and grinded to obtain powder (300 g), which was subjected to Soxhlet extraction with methanol. The mixture obtained was dried to obtain Annona senegalensis Leaf Methanol Extract (ASLME). Fourier Transform-Infra Red (FT-IR) spectroscopy and High-Performance Liquid Chromatography (HPLC) were carried out on the ASLME. Computational studies were carried out on some of the phytochemicals of ASLME identified via HPLC, using atenolol and metoprolol as standard beta -blockers, and verteporfin as a standard inhibitor of YAP using virtual screening Schrodinger. Resultados e Conclusions: The HPLC of ASLME identified compounds including annogalene, annosenegalin, kaurenoic acid, roemerine (Fig.1). The binding energies of annogalene, annosenegalin, kaurenoic acid, roemerine, atenolol and metoprolol with Beta-adrenergic receptor were found to be –11.0, -9.3, -8.8, -8.8, -7.9 and -7.5 (kcal/mol), respectively. However, the binding energies of annogalene, annosenegalin, kaurenoic acid, roemerine and verteporfin with YAP were -9.9, -10.0, -6.8, -7.7 and -6.4 (kcal/mol), respectively (Tables 1 and 2). In molecular docking, the four compounds from ASLME antagonized beta-adrenergic receptor better than atenolol and metoprolol, and inhibited YAP better than verteporfin (Figs 2 – 7) Annona senegalensis leaf extract has cardio-protective potential, hence could be a promising source of alternative agents for development of drugs against cardiomyopathy, hypertension and cardiac failure.





Fig. 2. 2D Docking interactions with beta-adrenergic receptor



Fig. 4. 2D Docking interactions with beta-adrenergic receptor

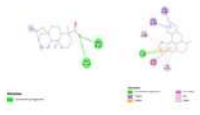


Fig. 6 2D Docking interactions with Yes- Associated protein (Yap)



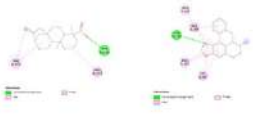


Fig. 8. 2D Docking interactions with beta-adrenergic receptor



Fig. 5 2D Docking interactions with Yes-Associated protein (Yap)



Fig. 7 2D Docking interaction with Yes- Associated protein (Yap)

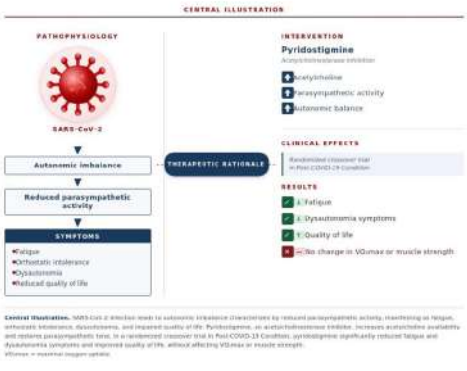
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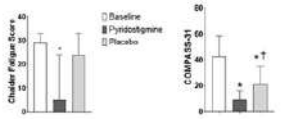
PYRIDOSTIGMINE FOR AUTONOMIC DYSFUNCTION SYMPTOMS IN POST-COVID-19 CONDITION: A RANDOMIZED CROSSOVER CLINICAL TRIAL.

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Introduction/Background: Fatigue is among the most prevalent and disabling manifestations in Post COVID-19 condition, impairing functional capacity and quality of life. Dysautonomia has been proposed as a potential mechanism underlying these symptoms, whereas pyridostigmine bromide, an acetylcholinesterase inhibitor, may improve autonomic function and alleviate fatigue in this population. Objectives: To determine whether pyridostigmine bromide could serve as a therapeutic strategy to alleviate fatigue, improve dysautonomia symptoms and enhance quality of life in individuals with post-COVID-19 condition. Methods: A randomized, double-blind, placebo-controlled, crossover clinical trial was conducted. Fifteen participants (age 41.8±9.1 years; 8 male, 7 female) received pyridostigmine bromide (60 mg, three times daily) or placebo for 30 days, respecting a washout period between treatments. Assessments included the Chalder Fatigue Scale, WHOQOL-Bref, and COMPASS-31 questionnaires; echocardiography; 12-lead electrocardiogram; cardiovascular autonomic tests (Valsalva maneuver, deep breathing, active standing); handgrip strength; maximal inspiratory pressure; spirometry; and cardiopulmonary exercise testing. Resultados e Conclusions: The pyridostigmine bromide administration improved fatigue (Chalder Fatigue Scale, p<0.01), dysautonomia symptoms (COMPASS-31, p<0.001), and quality of life (WHOQOL-Bref domains “perception of quality of life,” p=0.003; “satisfaction with health,” p=0.001) compared with placebo and baseline. Maximal inspiratory pressure (p=0.01) and peak expiratory flow (p=0.02) also improved with pyridostigmine bromide and placebo, while no changes were observed in autonomic test responses or aerobic capacity. CONCLUSIONS: Pyridostigmine bromide effectively reduced fatigue and dysautonomia symptoms and enhanced quality of life in patients with Post COVID-19 condition. These findings support its potential as a therapeutic strategy to promote functional recovery and reintegration into daily activities after COVID-19.





Chalder Fatigue Score (CFS) and Composite Autonomic Symptom Score-31 (COMPASS-31 score) at baseline, after 30 days of placebo and after 30 days of pyridostigmine. (*) vs baseline; (†) vs PYR.

World Health Organization Quality of Life-Bref (WHOQOL-Bref).

	Baseline	Placebo	Pyridostigmine	P value
Physical domain	2 [3-2]	3 [3-2]	4 [4-3]*	.02
Psychological domain	3 [4-2]	4 [4-2]	4 [4-4]*	.01
Level of independence	36 (3)	48 (5)*	64 (4)*†	< .01
Social relationships	64 (5)	72 (3)	73 (3)	.07
Environment	49 (4)	53 (3)	54 (4)	.06
Personal beliefs	55 (4)	60 (3)	63 (4)	.12

Values are median and [interquartile range]. Values are mean and (standard deviation). (*) vs baseline; (†) vs PYR.

Composite autonomic symptom score-31 (COMPASS-31).

Score domain	Baseline	Placebo	Pyridostigmine	P value
Orthostatic dysfunction	23.2 (11.9)	19.6 (10.3)*†	1.2 (5.1)*	< .001
Vasomotor score	0.1 (0.5)	0.0 (0.0)	0.0 (0.0)	-
Secretomotor score	8.9 (4.0)	4.6 (3.8)*	2.8 (3.1)*	< .001
GIT symptom score	8.7 (4.8)	4.3 (3.9)*	3.6 (3.2)*	< .001
Bladder score	0.4 (0.8)	0.1 (0.3)	0.2 (0.7)	.27
Pupillomotor score	1.9 (1.5)	1.1 (1.1)	1.2 (1.2)	.07
Total COMPASS-31 score	42.3 (16.6)	21.3 (13.8)*	9.4 (6.8)*†	< .001

Values are mean and (standard deviation). GIT, gastrointestinal; COMPASS-31, Composite Autonomic Symptom Score-31. A cutoff score of 12.5 was identified as the optimal threshold for detecting autonomic dysfunction[20]. (*) vs baseline; (†) vs PYR.

Cardiovascular autonomic reflex tests (CARTs).

Test	Baseline	Placebo	Pyridostigmine	P value
Deep breathing	1.18 (0.01)	1.18 (0.02)	1.13 (0.01)	.09
Valsalva Maneuver	1.37 (0.05)	1.45 (0.04)	1.46 (0.07)	.19
HR ratio 30s/ 15s after standing up	1.08 (0.03)	1.06 (0.02)	1.06 (0.03)	.80
Systolic BP response in standing up (mmHg)	16 (6)	5.6 (5.7)	8.3 (5.14)	.39
Delta HR handgrip(bpm)	17 (1)	18 (2)	22 (5)	.57

Values are mean (standard deviation). HR: heart rate; BP: blood pressure.

Geriatric Cardiology



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21211

FALLS IN ANTICOAGULATED ELDERLY PATIENTS: SHOULD WE BE CONCERNED?

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Introduction/Background: Concerns regarding major bleeding often lead to the underprescription or discontinuation of anticoagulants in patients with a history of falls. This systematic review, focusing on evidence from the past 5 years, evaluated whether fall risk should influence the decision to initiate, continue, or discontinue anticoagulation in this population. Objectives: To evaluate whether fall risk should influence clinical decision-making regarding the use of anticoagulants in older adults, analyzing safety, risk of intracranial hemorrhage, mortality, and the clinical benefit of anticoagulation. Methods: A PubMed search was conducted for the past 5 years (2021–2026) using the Boolean terms: elderly AND falls AND anticoagulation AND risk. Of the 31 studies identified, abstracts were screened and 16 were selected for inclusion. Eligible studies involved patients aged >65 years using oral anticoagulants (DOACs or VKAs) with a known risk or history of falls. Primary outcomes were major bleeding, intracranial hemorrhage (ICH), mortality, and clinical benefit. Resultados e Conclusions: Analysis demonstrated that fall risk, in isolation, is not an independent predictor of ICH or mortality when adjusted for age or frailty. The incidence of post-fall ICH in anticoagulated patients remains low (0.9–6.2%), and DOACs demonstrated a superior safety profile compared to VKAs, with a consistent reduction in ICH risk (OR 0.63; 95% CI 0.43–0.91). Interestingly, one study evaluating antiplatelet therapy found it was associated with an equal or higher risk of traumatic ICH compared to anticoagulation (RR 1.72 vs. 1.08). Decision models suggest that a patient would need to fall between 35 and 458 times per year for the bleeding risk to outweigh the benefits of anticoagulation, depending on the agent. Furthermore, discontinuing anticoagulation after a single fall increases thromboembolic risk without a clear benefit in reducing major bleeding events. Fall risk alone should not contraindicate anticoagulation in elderly patients. Clinical management should prioritize thromboembolic prevention, prefer DOACs when appropriate, implement multifactorial fall prevention strategies, and individualize the risk-benefit assessment to avoid unnecessary treatment discontinuation.

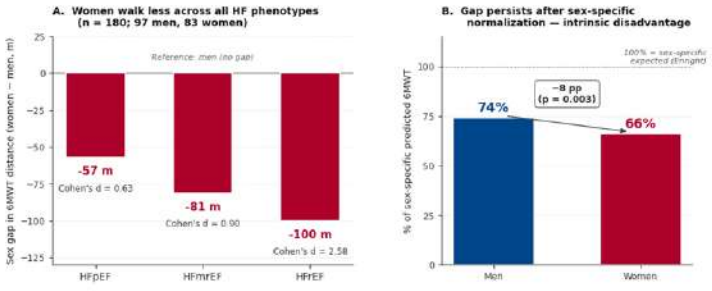
20252

OLDER WOMEN WITH HEART FAILURE WALK 62 M LESS THAN MEN: A BODY-COMPOSITION-INDEPENDENT GAP THAT PERSISTS AFTER SEX-SPECIFIC NORMALIZATION IN 180 OUTPATIENTS

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Introduction/Background: Heart failure (HF) is a leading cause of morbidity and functional limitation among older adults, with impaired exercise capacity being a central feature associated with poor prognosis and reduced quality of life. The six-minute walk test (6MWT) is a widely used, simple, and reliable tool to assess functional capacity in this population, reflecting the integrated response of cardiovascular, pulmonary, and musculoskeletal systems. Sex differences in HF have been increasingly recognized, with women often presenting distinct clinical profiles and outcomes compared to men. In particular, previous studies have consistently shown that women tend to walk shorter distances on the 6MWT. However, the mechanisms underlying this disparity remain uncertain. Differences in body composition, especially body mass index (BMI), are frequently proposed as a potential explanation, yet few studies have formally evaluated this hypothesis using robust analytical approaches such as mediation analysis. Objectives: We aimed to quantify the sex gap in 6MWT distance in elderly heart-failure outpatients, test whether body mass index (BMI) mediates it, and check whether the gap remains after normalization to sex-specific predicted values. Methods: Cross-sectional analytical study (STROBE) of 180 outpatients aged 60 years or older with heart failure (97 men, 83 women). The primary outcome was 6MWT distance. We fitted multiple linear regression adjusted for age, BMI, LVEF, log-BNP, NYHA class and comorbidities; logistic regression for 6MWT <300 m; and a causal mediation analysis with 2,000 bootstrap samples for the indirect effect of BMI on the sex–6MWT pathway. Distances were normalized to Enright's sex-specific predicted 6MWT, with subgroup analysis by ejection-fraction phenotype Resultados e Conclusions: Women walked 62 m less than men (300 ± 102 vs 362 ± 69 m; p < 0.001). Adjustment for age, BMI, LVEF, BNP, NYHA class and comorbidities had minimal impact (β = −55.1 m; p < 0.001). Women had higher odds of walking <300 m (OR 3.95). The gap persisted across HF phenotypes and BMI mediated only 1.4% of the effect. After normalization to sex-specific predicted values, women still achieved lower performance (66% vs 74%; p = 0.003). These findings indicate a consistent, body-composition-independent disadvantage, supporting the need for sex-tailored cardiac rehabilitation.



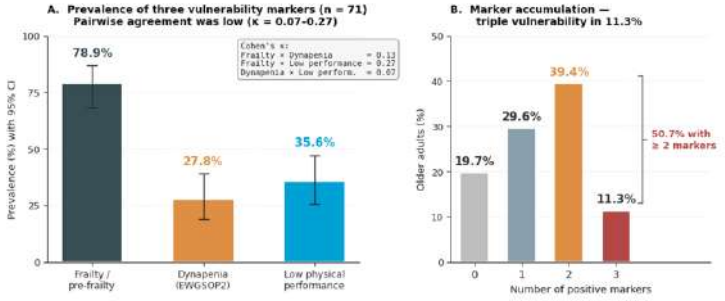
20669

THREE MARKERS, THREE DIFFERENT PATIENTS: LOW AGREEMENT BETWEEN FRAILTY, DYNAPENIA AND PHYSICAL PERFORMANCE ASSESSMENTS IN COMMUNITY-DWELLING OLDER ADULTS

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Introduction/Background: Frailty, dynapenia and low physical performance each predict adverse cardiovascular outcomes in older adults, and cardiogeriatric guidelines now recommend functional vulnerability screening as part of routine assessment. But which one to use? If the three instruments tag the same patients, single-instrument screening is enough; if they tag distinct subgroups, single-instrument screening misses vulnerable older adults. Objectives: We estimated the prevalence and pairwise agreement of three functional vulnerability markers in older adults seen at a cardiogeriatric outpatient clinic, and looked for clinical predictors of combined vulnerability. Methods: Cross-sectional retrospective analysis of 71 consecutive community-dwelling adults aged 60 years or older with complete records. Three markers were assessed: Fried frailty phenotype (frail or pre-frail vs robust); EWGSOP2 dynapenia (handgrip <27 kgf in men, <16 kgf in women; Jamar dynamometer with standardized protocol); and low physical performance (five-times sit-to-stand ≥15 s). Pairwise agreement was quantified with Cohen's κ, and combined vulnerability was defined a priori as ≥2 positive markers. Predictors were tested by multivariable logistic regression adjusted for age, sex, BMI, COPD and smoking; α = 0.05. Resultados e Conclusions: Half of the older adults (50.7%) screened positive for two or more functional vulnerability markers, and 11.3% scored positive on all three. Among 71 patients (median age 69 years; 52% male; median BMI 27.9 kg/m²), prevalence was 78.9% (95%CI 68.0–86.8) for frailty or pre-frailty, 27.8% (18.8–39.0) for dynapenia and 35.6% (25.6–47.1) for low physical performance. Pairwise agreement was uniformly low: frailty × dynapenia κ = 0.13, frailty × low performance κ = 0.27, dynapenia × low performance κ = 0.07. Older adults with triple vulnerability were older (median 78.5 vs 69.0 years; p = 0.022), had weaker handgrip (p = 0.032), worse sit-to-stand (p = 0.001) and lower MMSE (p = 0.015). In multivariable analysis, age (aOR 1.61 per 5 years; 95%CI 1.03–2.51; p = 0.036) and COPD (aOR 3.52; 95%CI 0.99–12.57; p = 0.052) predicted combined vulnerability. The three instruments tag overlapping but largely distinct individuals, so a single-instrument screen will miss vulnerable older adults; a brief multi-instrument battery deserves prospective evaluation as a bedside tool in cardiogeriatric care.



Hypertension / Renal Denervation



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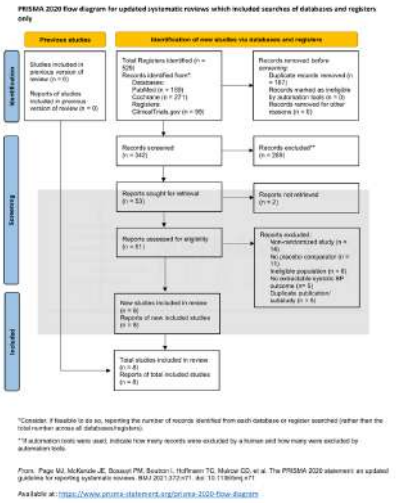


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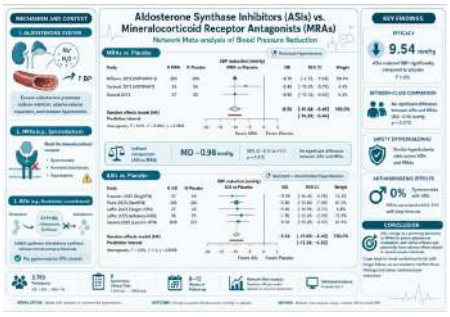
ALDOSTERONE SYNTHASE INHIBITORS VERSUS MINERALOCORTICOID RECEPTOR ANTAGONISTS FOR BLOOD PRESSURE REDUCTION: A NETWORK META-ANALYSIS

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Introduction/Background: Mineralocorticoid receptor antagonists (MRAs) are recommended for resistant hypertension but limited by antiandrogen effects. Aldosterone synthase inhibitors (ASIs) represent a novel class that suppresses aldosterone production upstream without steroid receptor blockade. Objectives: We aimed to perform a network meta-analysis to indirectly compare these drug classes for systolic blood pressure (SBP) reduction. Methods: PubMed, Cochrane Library, and ClinicalTrials.gov were searched up to March 2026 for randomized clinical trials (RCTs) comparing ASIs (baxdrostat, lorundrostat) or MRAs (spironolactone) versus placebo in adults with resistant or uncontrolled hypertension. ASI trials enrolled both populations, whereas MRA trials enrolled exclusively resistant hypertension. Blood pressure (BP) measurement methods varied across trials. Pooled effect estimates across active doses were used to represent overall drug effect per study. Mean difference (MD) with 95% confidence intervals (CIs) was computed. Heterogeneity was assessed using I² statistics. Network meta-analysis used a random-effects model with placebo as common comparator. Statistical analyses were performed using R version 4.5.3. Resultados e Conclusions: Eight RCTs were included: five ASI trials (n=1,990) and three MRA trials (n=793), comprising 2,783 participants. Follow-up ranged from 8 to 12 weeks. Both ASIs (MD −9.54 mmHg; 95%CI −10.69 to −8.40; p0.001; I²=0%) and MRAs (MD −8.56 mmHg; 95%CI −10.64 to −6.49; p0.001; I²=0%) significantly reduced SBP versus placebo. Indirect comparison showed no significant difference between ASIs and MRAs (MD −0.98 mmHg; 95%CI −3.13 to +1.17; p=0.372). Sensitivity analyses confirmed result robustness; transitivity was supported by similar placebo responses despite heterogeneity in population severity and BP measurement methods. Hyperkalemia rates were comparable between classes, and gynecomastia was not reported with ASIs (0%), whereas MRAs are associated with rates of 6–10% in longer-term use due to their antiandrogen mechanism. No significant difference was detected between classes, suggesting comparable antihypertensive efficacy. ASIs emerge as a promising alternative for patients requiring potent aldosterone modulation without the risk of steroid-related adverse effects. Head-to-head randomized trials with longer follow-up are warranted to confirm these findings and evaluate cardiovascular outcomes.



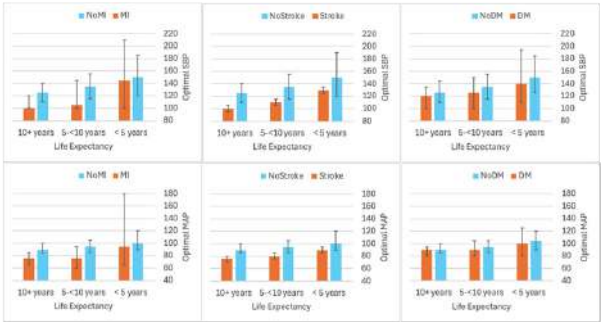
20832

ARTIFICIAL INTELLIGENCE–DERIVED INDIVIDUALIZED BLOOD PRESSURE TARGETS TO MINIMIZE MAJOR ADVERSE CARDIOVASCULAR EVENTS

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Introduction/Background: Hypertension is the leading modifiable risk factor for major adverse cardiovascular events (MACE), yet current guidelines recommend uniform blood pressure (BP) targets despite substantial heterogeneity in cardiovascular risk, co-morbidities, life expectancy and treatment response. Excessive lowering of diastolic BP (DBP) during systolic BP (SBP) lowering may increase cardiovascular risk, yet composite measures such as mean arterial pressure (MAP) are underutilized. Objectives: To develop and evaluate an artificial intelligence (AI)-based approach to identify individualized BP ranges associated with the lowest future risk of MACE. Methods: We developed BP-GPS, a transformer-based AI model integrating longitudinal data and cross-linked electronic health records data from 673,694 Veterans with hypertension receiving anti-hypertensive therapy within a national integrated healthcare system from 2000-2024. Eligible patients had documented outpatient SBP and DBP measurements from a randomly selected hypertension encounter (index date). The model incorporated SBP, DBP, MAP, demographic, and clinical variables to estimate individualized BP ranges associated with minimized 1-year MACE risk. Analyses were stratified by prior myocardial infarction (MI), stroke, diabetes and life expectancy categories (>10 years, 5-10 years, <5 years). Life expectancies were estimated using observed survival among the 428,809 patients who died during the follow-up. Resultados e Conclusions: BP-GPS demonstrated strong discrimination for predicting individualized BP targets associated with lower MACE risk (AUC 0.84). Median (interquartile ranges) optimal individualized SBP values were 125 (105-140), 135 (110-155) and 150 (120-190) mmHg, while optimal individualized MAP values were 90 (85-100), 95 (85-105), and 100 (85-125) mmHg among patients with a life expectancy >10 years, 5-10 years, <5 years, respectively. Among patients with life expectancy >10 years, prior MI or stroke had median optimal SBP values 25 mmHg lower and optimal MAP values 15mmHg lower versus patients without these conditions, while patients with diabetes had SBP and MAP values 5mmHg lower. Patients whose SBP was within their AI-predicted optimal range had lower MACE rates versus those outside range (7.7 vs. 15.5%; OR 0.72 [0.7-0.74];p<0.001). Similarly, patients within optimal MAP range had lower MACE rates than those outside the range (7.1 vs. 16.4%;OR 0.68 [0.67-0.70];p<0.001). These findings support a precision medicine framework for hypertension management.



21264

EFFECT OF BEETROOT EXTRACT SUPPLEMENTATION ON BLOOD PRESSURE IN PATIENTS WITH RESISTANT HYPERTENSION

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Introduction/Background: Resistant hypertension (RH) is defined as the failure to achieve blood pressure (BP) values < 140/90 mmHg despite the use of triple therapy with different classes of antihypertensive drugs, including a diuretic, at maximum tolerated doses, and is associated with increased complications and mortality. In addition to pharmacological treatment, diet plays a key therapeutic role, and dietary supplements have been investigated for better BP control without the need for increasing medications. Beetroot is a source of inorganic nitrate, known for its vasodilatory effects; thus, its use in RH in association with pharmacologic treatment is potentially beneficial. Objectives: To evaluate the effect of beetroot-derived nitrate on the BP of patients with RH. Methods: Double-blind, randomized, placebo-controlled, crossover study of adult patients with RH. Participants received 10g of beetroot extract (BE) (400mg of inorganic nitrate) or 10g of maltodextrin as a placebo (PL) for 60 days, followed by a 30-day washout period, and then crossed over to BE or PL for an additional 60 days. Office BP was recorded at each study visit, and ambulatory BP monitoring (ABPM) was performed at baseline and after each intervention. Comparisons were performed using the Student's t-test, with a significance level of 5%. Resultados e Conclusions: Forty-four patients were evaluated (50% male; mean age 61.8±8.6 years). Patients´ medications were vasodilators (79.5%), ACE inhibitors (77.3%), thiazide diuretics (77.3%), calcium channel blockers (31%), non-thiazide diuretics (56.8%), beta-blockers (50%), and alpha-2 adrenergic agonists (45.4%). Mean pre-intervention BP was 147.6 x 86.3 mmHg. After 60 days of BE or placebo use, there was no significant difference in office systolic BP (SBP): BE=147.6 mmHg vs. PL=149.6 mmHg (p=0.661); in office diastolic BP (DBP): BE=86.3 mmHg vs. PL=87.3 mmHg (p=0.638); in ABPM SBP: BE=133.2 mmHg vs. PL=134.8 mmHg (p=0.642); and in ABPM DBP: BE=78.5 mmHg vs. PL=79.0 mmHg (p=0.814). No significant reduction in either office or ABPM pressures was observed after 60 days of BE supplementation when compared to placebo. In this high-risk population, dietary supplementation with BE may be insufficient to promote clinically detectable effects. Further evaluation of a larger patient cohort is necessary, though, to confirm this absence of effect.

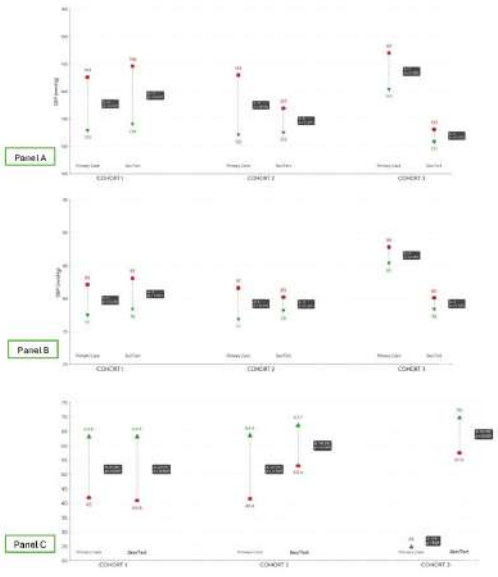
15617

EFFICACY OF PROTOCOL-BASED BLOOD PRESSURE MANAGEMENT IN THE OUTPATIENT SETTINGS

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Introduction/Background: Despite established guidelines, blood pressure (BP) control remains suboptimal worldwide. Poor implementation of guidelines is identified as a contributing factor. Implementation of guidelines has been challenging, especially in low-middle-income countries (LMIC). The World Health Organization(WHO) has proposed protocol-based BP management (PB-BPM) to mitigate this. However, the efficacy of PB-BPM from South Asia is sparse. Therefore, we assessed the efficacy of PB-BPM in improving BP control among patients with hypertension followed up for 6 or more months at outpatient clinics (primary, secondary, and tertiary care hospitals) where PB-BPM is implemented in Sri Lanka. Objectives: General objective To study the efficacy of guideline based blood pressure control using the data of blood pressure programme proposed by Ministry of health. Specific objectives To study the mean change in blood pressure over 6, 12 and 18 months period. To study the change in percentage with controlled blood pressure over 6,12 and 18 months period Methods: PB-BPM was initiated stepwise from November 2023, and BP data of all patients with 6 or more months' follow-up by 31st December 2025 were analysed. Controlled BP was defined as <140/90 mmHg per the WHO guideline. We compared mean BP and the percentage with controlled BP between baseline and the end of follow-up, stratified into three cohorts based on follow-up duration (Cohorts 1, 2, and 3 with follow-up durations of 6, 12, and 18 months, respectively). Resultados e Conclusions: Results We studied BP control in 13 097 patients (male 3 480(26.6%, mean age 64(SD 10.2) years, 7 679(58.6%) from primary and 5 418(41.4%) from secondary/tertiary healthcare facilities. Mean Systolic BP (SBP p<0.001), diastolic BP(DBP p<0.001), and the percentage with controlled BP (p<0.001) improved significantly at follow-up compared to baseline, in all three cohorts. Mean reductions in SBP/ DBP were better at primary compared to secondary/tertiary care facilities (p<0.001/ p<0.001) and with higher baseline SBP/ DBP (r=0.671, p<0.001/ r=0.639, p<0.001). Conclusion PB-BPM improved BP control among outpatients managed in primary, secondary, and tertiary healthcare facilities in Sri Lanka, with greater efficacy at primary healthcare facilities and among patients with high baseline BP.



15623

FIXED-DOSE TRIPLE ANTIHYPERTENSIVE THERAPY IN WOMEN: CONSISTENT EFFICACY REGARDLESS OF MENOPAUSAL STATUS

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Introduction/Background: Hypertension in women is a dynamic condition influenced by multiple factors, including hormonal transitions, which are associated with distinct cardiovascular risk profiles and specific therapeutic needs. In this context, the impact of hormonal changes on antihypertensive treatment, particularly with the use of fixed-dose triple combination therapy, remains underexplored. Objectives: To characterize the clinical profile of hypertensive women and to evaluate the influence of menopausal status on the antihypertensive response to a fixed-dose triple combination. Methods: The OPTION TREAT study was a randomized, double-blind, controlled, multicenter clinical trial including 703 participants in Brazil (NCT05920005). In this subanalysis, women participants were evaluated by analyzing the change in systolic blood pressure (ΔSBP) from baseline to week 12, stratified by menopausal status as as fixed effects, the treatment–menopause interaction, and baseline SBP as a covariate. Resultados e Conclusions: A total of 441 women were included, with a mean age of 58 ± 10.2 years and a mean BMI of 31.5 ± 5.9 kg/m². The most prevalent comorbidities were menopause and dyslipidemia (54.0%), obesity (37.6%), and type 2 diabetes mellitus (21.1%). Among women of reproductive age (n = 203), the experimental treatment (candesartan cilexetil 16 mg, chlortalidone 12.5 mg, and amlodipine 5 mg) achieved a significantly greater reduction in SBP compared with the reference treatment (valsartan 160 mg, hydrochlorothiazide 12.5 mg, and amlodipine 5 mg), with a least-squares mean difference of −4.94 mmHg (95% CI: −8.2 to −1.6; p = 0.004). In postmenopausal women (n = 238), SBP reduction was also greater with the experimental treatment (−3.30 mmHg; 95% CI: −6.3 to −0.3; p = 0.034). In the overall population, the experimental treatment resulted in a significantly greater SBP reduction (−4.11 mmHg; 95% CI: −6.4 to −1.9; p < 0.001). After adjustment for menopausal status, non- menopause women exhibited a significantly greater SBP reduction (p = 0.038), regardless of treatment group. The novel fixed-dose triple combination demonstrated consistent antihypertensive efficacy across menopausal status groups, with greater systolic blood pressure reductions observed in non-menopausal women.

21557

FROM GLOBAL RECOMMENDATIONS TO NATIONAL POLICY: SINGLE-PILL COMBINATION ANTIHYPERTENSIVES IN SUB-SAHARAN AFRICA

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Introduction/Background: Blood pressure control rates in Sub-Saharan Africa (SSA) remain among the lowest worldwide. Single-pill combinations (SPCs) are endorsed by the World Health Organization (WHO) and major international guidelines as an effective strategy to improve treatment adherence and cardiovascular outcomes. However, access to SPCs in SSA is largely shaped by national policy decisions, particularly their inclusion in Essential Medicines Lists (EMLs), clinical guidelines, and national health policy (NHP) documents. Objectives: To evaluate how SPC antihypertensive therapies are incorporated, positioned, and recommended across these policy instruments in SSA. Methods: We conducted a comparative document review of national EMLs, hypertension clinical guidelines, and NHP documents retrieved from official government sources, WHO repositories, and regional institutional platforms. Analyses were performed across countries using a descriptive and comparative approach, informed by the WHO Health System “Leadership and Governance” framework. Resultados e Conclusions: All countries had an identifiable EML, but only 21 (42.9%) included at least one antihypertensive SPC. Uptake was higher in Eastern and Southern Africa and remained limited in Central Africa. SPC inclusion was more frequent in recently updated EMLs, particularly after the 2019 revision of the WHO Model List of Essential Medicines. National hypertension guidelines were identified in only 15 countries; among these, four mentioned SPCs, and only Kenya provided detailed, actionable recommendations. Concordance between EMLs and clinical guidelines was generally poor, with most countries either listing SPCs without corresponding guideline endorsement or recommending them without including them in EMLs. In conclusion, the adoption of SPC antihypertensive therapies across SSA remains inconsistent and incomplete. The observed gaps and lack of alignment between medicines selection and clinical guidance suggest limitations in national governance processes that may hinder access to WHO-recommended treatments. Improving policy coherence represents a key opportunity to enhance hypertension care and expand access to effective therapies in the region.

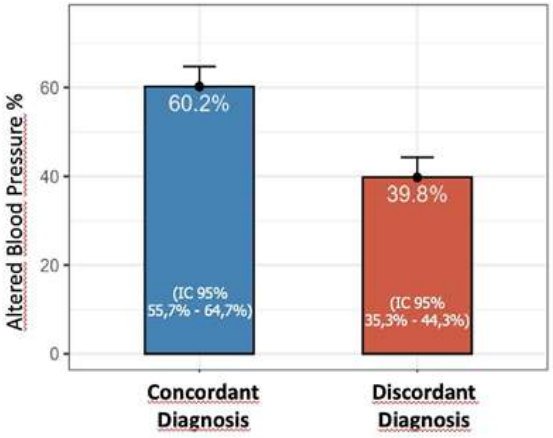
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HIGH DISCORDANCE BETWEEN OFFICE AND OUT-OF-OFFICE BLOOD PRESSURE PHENOTYPES IN INDIVIDUALS DIAGNOSED WITH HYPERTENSION

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Introduction/Background: Background: The diagnosis and management of hypertension have traditionally relied on office blood pressure (BP) measurements. However, substantial differences may exist between office and out-of-office BP values. Objectives: Objectives: To evaluate the concordance between office BP phenotypes and ambulatory blood pressure monitoring (ABPM), and to assess BP control according to antihypertensive treatment strategy. Methods: Methods: This prospective observational study included 455 individuals (mean age 55.2 years; 59.6% women), of whom 51.2% were not receiving antihypertensive treatment. All participants had altered office BP and were referred for ABPM using a validated device (SpaceLabs 90217). BP phenotypes of sustained hypertension (SH) and uncontrolled sustained hypertension (USH) established by office measurements were compared with ABPM findings. BP control rates were also evaluated according to monotherapy, dual therapy, or multiple-drug therapy. Fisher's exact test, Chi-square test, Shapiro–Wilk test, Student's t-test, and Wilcoxon Mann–Whitney test were performed using RStudio 2025.09.1, adopting p<0.05 as statistically significant. Resultados e Conclusions: Results: Concordance between office and ABPM hypertension phenotypes was observed in 274 individuals (60.2%; 95% CI 55.7%–64.7%). However, 181 individuals (39.8%; 95% CI 35.3%–44.3%; p<0.001) showed normal or normalized BP values on ABPM, consistent with white coat hypertension or white coat effect phenotypes, and discordant with the office-based diagnosis. Among untreated individuals, 37.8% (95% CI 23.6%–52.0%) were normotensive on ABPM. Among treated individuals, BP control rates were similar across therapeutic strategies: 42.5% with monotherapy, 40.5% with dual therapy, and 42.9% with multiple-drug therapy (p=0.958). Clinical characteristics of individuals with concordant and discordant phenotypes were similar to those of the overall sample. Conclusions: Nearly 40% of individuals with altered BP (SH and USH) based on office measurements were reclassified after ABPM evaluation. BP control rates were similarly low regardless of treatment strategy. These findings reinforce the importance of out-of-office BP assessment to improve the accuracy of hypertension diagnosis and management.



Percentages of concordance and discordance (altered blood pressure) between Office or Out-of-Office Blood messurements. The line segment indicates the upper limit of the 95% confidence interval. p<0.001.

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IMPACT OF HYPERTENSION ON COGNITIVE PERFORMANCE IN DIABETIC PATIENTS AT THE LUANDA DIABETES CLINIC CENTER, ANGOLA

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Introduction/Background: Hypertension (HTN) in diabetic patients significantly accelerates cognitive decline, resulting in poorer memory, slower thinking speeds, and increased dementia risk compared to either condition alone. Objectives: To evaluate the impact of HTN on cognitive performance in diabetic patients followed up at the Diabetic Clinic Center in Luanda. Methods: A cross-sectional study was carried out, including 148 patients (aged ≥18 years or older and followed up at the center). HTN was defined as systolic blood pressure (SBP) and/or diastolic blood pressure (DBP) ≥140/90 mmHg or the use of anti-hypertensive drugs. HTN control was defined as BP <130/80 mmHg. Physical activity (PA) was assessed using the IPAQ questionnaire. Cognitive function was assessed using the MoCA test. The Smirnov-Kolmogorov test was used for variable distribution analysis. The Spearman coefficient for bivariate correlation and multivariable regression to determine the predictors of cognitive performance. Statistical significance was set at 5%. Resultados e Conclusions: HTN prevalence was 73.0%; among HTN patients, 82.4% were aware, and 92.1% were undergoing treatment, but only 12.8% had BP under control. HTN patients were older (60.5±12.5 vs. 49.2±11.9 yrs; p<0.001) and had also a lower level of education (10.6±3.8 vs. 13.1±3.4; p<0.001). The duration of DM was longer in HTN patients (median: 12 vs. 8 years; p<0.001). Cognitive dysfunction was more prevalent in HTN patients (82.7% vs. 17.3%; p<0.001); 80.9% of HTN patients were sedentary/irregularly active. HTN diagnosis had a negative correlation with cognitive performance (r= -0.374; p<0.001); the risk of cognitive impairment was 5-fold higher compared to the normotensive (OR: 5.916, CI: 2.637-13.276). PA was positively correlated with cognitive performance (r=0.327; p<0.001), and the risk of cognitive impairment in the less active group (sedentary/irregularly active) was 4-fold higher compared to the more active (OR: 4.789; CI: 2.140-10.717). HTN diagnosis was a predictor of worse cognitive performance (B: -0.204; CI: -0.340 to -0.060), while a higher educational level was a predictor of better cognitive performance (B: 0.227; CI: 0.008-0.042). The prevalence of HTN was high; most HTN patients were aware and being treated, but BP control was low. Cognitive dysfunction was high and exacerbated by HTN. HTN diagnosis was a predictor of worse cognitive performance, while higher education level was a predictor of better cognitive performance.

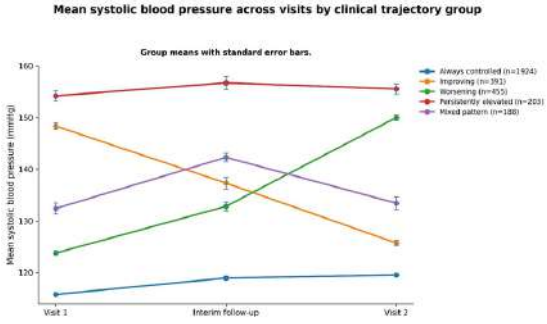
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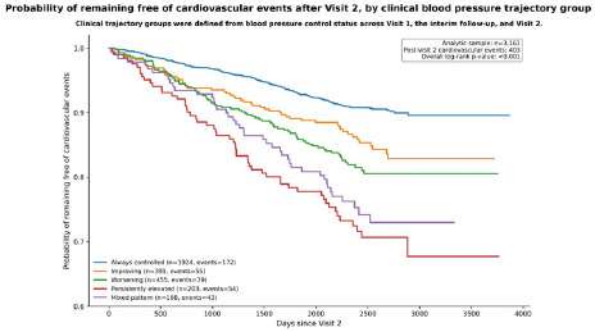
LONGITUDINAL BLOOD PRESSURE PATTERNS AND CARDIOVASCULAR RISK IN THE SLEEP HEART HEALTH STUDY

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Introduction/Background: Cardiovascular risk stratification traditionally relies on isolated blood pressure (BP) measurements, which may not reflect longitudinal control patterns. Persistent elevation or worsening BP status may provide additional prognostic information beyond a single cross-sectional assessment. Objectives: This study aimed to evaluate whether different clinical patterns of BP change across three time points were associated with subsequent cardiovascular risk in the Sleep Heart Health Study (SHHS). Methods: A longitudinal analysis was conducted using participants from the SHHS with BP measurements obtained at three time points: Visit 1, an interim follow-up, and Visit 2. Participants were classified into five clinical trajectory groups based on BP control status at each wave: always controlled, improving, worsening, persistently elevated, and mixed pattern. The primary outcome was the first cardiovascular event occurring after Visit 2, defined as the earliest occurrence of myocardial infarction, stroke, congestive heart failure, or cardiovascular death. Follow-up for the survival analysis started at Visit 2. Cox proportional hazards models were adjusted for age, sex, and body mass index, and, in a sensitivity analysis, additionally adjusted for baseline systolic BP. Resultados e Conclusions: A total of 3,161 participants were included; mean age was 62.7 years, 55.3% were women, 20.4% had uncontrolled BP at Visit 1, and 403 (12.7%) experienced a cardiovascular event after Visit 2. Compared with the always controlled group, cardiovascular risk was higher in the worsening (HR 1.36; 95% CI 1.04-1.78; p=0.026), persistently elevated (HR 1.70; 95% CI 1.24-2.32; p<0.001), and mixed pattern trajectories (HR 1.57; 95% CI 1.12–2.21; p=0.009) in the model adjusted for age, sex, and body mass index. In the sensitivity analysis with additional adjustment for baseline systolic BP, these associations were attenuated and no longer statistically significant: improving, HR 0.72 (95% CI 0.48–1.08; p=0.110); worsening, HR 1.23 (95% CI 0.94–1.62; p=0.134); persistently elevated, HR 0.89 (95% CI 0.58-1.37; p=0.597); and mixed pattern, HR 1.22 (95% CI 0.85–1.75; p=0.287). In the SHHS, clinical patterns of worsening BP and persistent elevation across three time points were associated with higher subsequent cardiovascular risk. These findings suggest that the clinical evolution of BP control may refine cardiovascular risk stratification beyond a single cross-sectional assessment.





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PREVALENCE OF HYPERTENSION IN COMMUNITY PHARMACIES ACCORDING TO DIFFERENT BLOOD PRESSURE THRESHOLDS: A LARGE REAL-WORLD ANALYSIS OF 49.068 MEASUREMENTS

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Introduction/Background: Out-of-office blood pressure (BP) measurement plays an increasingly important role in the diagnosis of hypertension. In community pharmacies, cutoff values are adapted from home and ambulatory measurements, without specific validation based on clinical outcomes. Standardization of the measurement method may significantly impact the accuracy of these estimates. Objectives: To evaluate the impact of different BP thresholds on the prevalence of hypertension using standardized measurements performed in community pharmacies. Methods: A cross-sectional observational study was conducted in 2025 within a large pharmacy chain in the state of Minas Gerais, Brazil. Measurements were obtained by previously trained pharmacists using a validated device (HEM-7349T, Omron) with TruRead technology (three consecutive measurements at 60-second intervals, with the average of the last two readings used for analysis). The prevalence of hypertension was estimated according to three BP thresholds: ≥140/90 mmHg, ≥135/85 mmHg, and ≥130/80 mmHg. Comparisons between proportions were performed using McNemar's test. Resultados e Conclusions: A total of 49.068 standardized BP measurements were analyzed. The population comprised 57.2% women and 42.8% men, with a mean age of 54.5 ± 17.7 years. The mean systolic BP was 126.6 ± 19.0 mmHg and the mean diastolic BP was 80.7 ± 11.8 mmHg. The prevalence of hypertension was 31.1% at the diagnostic threshold of BP ≥ 140/90 mmHg, 45.0% at BP ≥ 135/85 mmHg, and 60.5% at BP ≥ 130/80 mmHg. There were statistically significant differences across all thresholds analyzed (p<0.001 for all comparisons). Conclusions: The prevalence of hypertension in measurements obtained in community pharmacies varies substantially according to the BP threshold applied, even under standardized measurement conditions. These findings underscore the need to establish setting-specific cutoff values for this environment and have important implications for population screening strategies and public health policies.

Table 1. Characteristics of the study population and prevalence of hypertension across different blood pressure thresholds

Variables	n = 49.068
Age, years	54.5 ± 17.7
Male sex, %	21,013 (42.8%)
SBP, mmHg	126.6 ± 19.0
DBP, mmHg	80.7 ± 11.8
BP ≥140/90 mmHg	15.273 (31.1%)
BP ≥135/85 mmHg	22.066 (45.0%)†
BP ≥130/80 mmHg	29.692 (60.5%)†#

Plus–minus values are means ±SD. BP denotes blood pressure, SBP systolic blood pressure , DBP diastolic blood pressure and mmHg millimeters of Mercury.
†p<0.001 compared with the prevalence of hypertension considering BP ≥140/90 mmHg.
#p<0.001 compared with the prevalence of hypertension considering BP ≥135/85 mmHg.

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SEX DIFFERENCES IN HYPERTENSION PREVALENCE ACROSS BLOOD PRESSURE THRESHOLDS IN COMMUNITY PHARMACIES: A REAL-WORLD ANALYSIS OF 49.068 MEASUREMENTS

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Introduction/Background: Sex differences in awareness, treatment, and control of hypertension are well documented in the literature, with men demonstrating lower utilization of healthcare services and a higher burden of undiagnosed disease. However, it remains unclear whether these disparities persist or are further accentuated in screening settings conducted in community pharmacies. Objectives: To assess sex differences in blood pressure (BP) measurements and in the prevalence of hypertension according to different cutoff thresholds within a structured measurement program in community pharmacies. Methods: A cross-sectional observational study was conducted in 2025 within a large pharmacy chain in the state of Minas Gerais, Brazil. Measurements were obtained by previously trained pharmacists using a validated device (HEM-7349T, Omron) with TruRead technology (mean of the last two of three consecutive measurements obtained at 60-second intervals). The prevalence of hypertension was estimated according to three BP thresholds: ≥140/90 mmHg, ≥135/85 mmHg, and ≥130/80 mmHg. Comparisons between sexes were performed using the unpaired Student's t-test and the chi-square test. Age-adjusted linear and logistic regression models were used for additional analyses. Resultados e Conclusions: A total of 49.068 standardized BP measurements were analyzed. The population comprised 57.2% women and 42.8% men, with mean ages of 54.2 ± 18.2 and 54.8 ± 17.0 years, respectively. Mean systolic and diastolic BP were higher in men (p < 0.001), as was the prevalence of hypertension across all diagnostic thresholds (see Table 1). After adjustment for age, men had a higher risk of hypertension compared with women, with an odds ratio (OR) of 1.50 (95% confidence interval [CI] 1.44–1.58) for ≥140/90 mmHg (p < 0.001), OR 1.57 (95% CI 1.52–1.63) for ≥135/85 mmHg (p < 0.001), and OR 1.68 (95% CI 1.61–1.74) for ≥130/80 mmHg (p < 0.001). Conclusions: Men have a higher prevalence of hypertension compared with women in the community pharmacy setting. The widening of this difference with lower BP thresholds suggests a greater burden of unrecognized hypertension in this group, underscoring the role of community pharmacies as a relevant strategy for early detection of this condition.

Table. Sex-based differences in blood pressure and prevalence of hypertension according to diagnostic thresholds

Variables	Women (*n*=28,055)	Men (*n*=21,013)	*p*-value
Age, years	54.2 ± 18.2	54.8 ± 17.0	<0.001
SBP, mmHg	123.4 ± 19.3	130.8 ± 17.7	<0.001
DBP, mmHg	79.7 ± 11.7	82.1 ± 11.9	<0.001
Prevalence of hypertension, n (%)			
BP ≥140/90 mmHg	7.679 (27.4%)	7.594 (36.1%)	<0.001
BP ≥135/85 mmHg	11.263 (40.1%)	10.803 (51.4%)	<0.001
BP ≥130/80 mmHg	15.512 (55.3%)	14.180 (67.5%)	<0.001

Plus–minus values are means ±SD. BP denotes blood pressure, SBP systolic blood pressure, DBP diastolic blood pressure and mmHg millimeters of Mercury.

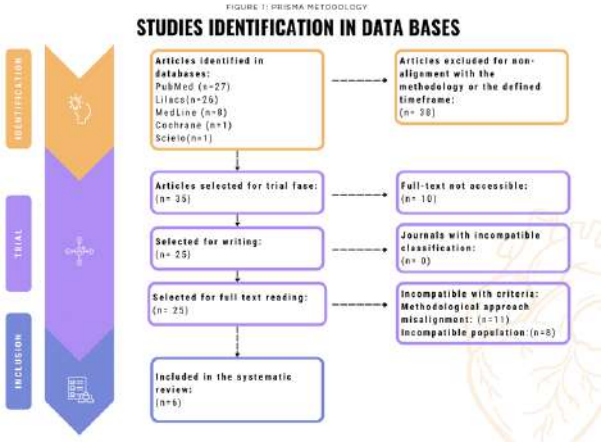
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THE EFFICACY OF RENAL DENERVATION SURGERY COMPARED TO SIMULATED PROCEDURES IN LOWERING BLOOD PRESSURE IN PATIENTS WITH RESISTANT HYPERTENSION: A SYSTEMATIC REVIEW

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Introduction/Background: Resistant hypertension is defined as blood pressure that remains above normal levels despite the use of antihypertensive medications. Renal denervation surgery has emerged as a therapeutic alternative because it is a minimally invasive procedure that aims to lower blood pressure by modulating the sympathetic nervous system. Objectives: To evaluate the efficacy of renal denervation surgery in controlling resistant hypertension, compared to sham procedures. Methods: A systematic literature review following the PRISMA guidelines. The databases PubMed, Medline, Lilacs, Cochrane, and Scielo were used with the following search terms: ("Renal denervation" AND "Sham"). Articles published in the last 5 years were included, provided the full text was publicly available and the study had a Qualis Capes A1 impact factor. Studies not directly related to the research question or with inadequate methodology were excluded. Resultados e Conclusions: Results: After data processing, 6 articles were selected for inclusion in the review, resulting in a sample size of 1,173 patients. The randomized clinical trials comparing renal denervation surgery with a sham procedure, notably the studies by Xiongjing Jiang et al. and Michel Azizi et al., reported a reduction in blood pressure with renal denervation surgery, which lowers the risk of major cardiovascular complications. Regarding safety, hematomas were observed in patients treated with the aforementioned surgery, with full recovery and no major complications. Conclusion: The included studies demonstrated the advantages of renal denervation surgery compared to the simulated procedure in terms of blood pressure reduction, a factor that lowers the risk of clinical complications.



21013

WRIST HBPM WITH NOCTURNAL MEASUREMENTS OVERESTIMATES THE SLEEP–WAKE BLOOD PRESSURE DECLINE AND SHOWS POOR AGREEMENT WITH ABPM, REGARDLESS OF SLEEP QUALITY: RESULTS FROM THE BRACELET STUDY

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Introduction/Background: Ambulatory blood pressure monitoring (ABPM) is the gold standard for assessing the circadian pattern of blood pressure. Home blood pressure monitoring (HBPM) using wrist devices with nocturnal measurements has emerged as a more comfortable and potentially applicable alternative; however, its ability to accurately reflect the physiological sleep–wake blood pressure decline remains uncertain. Objectives: To compare the sleep–wake blood pressure decline obtained by ABPM and wrist HBPM and to evaluate the impact of sleep quality on this parameter. Methods: We conducted a pragmatic multicenter study including 172 hypertensive patients (mean age 57.6 ± 15.5 years; 56% women) who underwent both ABPM and HBPM while on the same antihypertensive regimen, with a median interval of 26 [12–96] days between assessments. The sleep–wake decline was calculated as the percentage reduction from wakefulness to sleep. Sleep quality was categorized as good or impaired (fair/poor). Blood pressure (BP) data are presented as median [interquartile range]. Comparisons were performed using nonparametric tests (Wilcoxon, McNemar, and Kruskal–Wallis, as appropriate), and correlations were assessed using Spearman's test. A p-value <0.05 was considered statistically significant. Resultados e Conclusions: Systolic (SBP) and diastolic (DBP) BP values during wakefulness and sleep were 121 [113–129]/76 [71–83] and 110 [102–119]/65 [58–74] mmHg with ABPM, and 125 [118–135]/79 [71–87] and 117 [109–127]/71 [63–79] mmHg with HBPM, respectively. Patients reported good sleep quality more frequently during HBPM than during ABPM (74% vs. 24%; p<0.001). The sleep–wake BP decline was significantly greater with HBPM compared with ABPM (SBP: 10.5 [3.9–15.8]% vs. 7.1 [0.8–12.9]%; DBP: 15.7 [8.0–21.9]% vs. 9.0 [2.7–17.0]%; p<0.001). In analyses stratified by sleep quality, the decline did not differ significantly between patients with good versus impaired sleep in either method (ABPM: p>0.05; HBPM: p>0.05). Correlation of the sleep–wake decline between methods was weak (r=0.14, p=0.06 for SBP; r=0.017, p=0.029 for DBP). These findings indicate that HBPM is more comfortable and potentially more applicable. The sleep-wake BP decline was greater but not equal to ABPM, meaning that we can assess circadian BP profile with HBPM but the reference values may be different.

Insuficiência Cardíaca / Transplante / Dispositivos de Assistência Ventricular / Cardiomiopatias



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16813

ACUTE EFFECT OF NON-INVASIVE NEUROSTIMULATION ON DISTANCE WALKED IN PEOPLE WITH HEART FAILURE: A RANDOMISED CONTROLLED CLINICAL TRIAL.

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Introduction/Background: Introduction: Heart failure is a chronic condition associated with high morbidity and mortality rates. Clinically, HF manifests through a series of debilitating symptoms, including dyspnea, extreme fatigue, peripheral edema, and exercise intolerance, significantly impacting individuals' quality of life. The six-minute walk test (6MWT) is a simple method to investigate exercise capacity in cardiac patients. When compared to a traditional cardiopulmonary exercise test, it is found that, as a rule, patients performing the 6MWT do not reach predicted maximum ventilation or heart rate levels, therefore being considered a submaximal test. High-definition transcranial direct current stimulation (HD-TDCS) has emerged as a promising neuromodulatory approach, with potential influence on cardiovascular function, However, its effects on heart failure are still poorly understood Objectives: Objective: To evaluate the effects of HD-TDCS on the distance covered in the 6MWT, heart rate, and subjective perception of effort in individuals with heart failure Methods: Methods: A randomized clinical trial was conducted in individuals diagnosed with NYHA class II and III heart failure. Participants underwent three 20-minute HD-TDCS sessions (stimulation, inhibition, and sham), applied to the left temporal cortex at an intensity of 3 mA. After each session, a six-minute walk test was performed. The variables analyzed included the distance covered in the 6MWT, heart rate, and Borg's rating of perceived exertion scale. Data were analyzed using the Shapiro-Wilk test and the Friedman test, considering the non-normal distribution of the data Resultados e Conclusions: Results: Twenty-four individuals participated in the study, with a mean age of 53.46 ± 10.92 years, a minimum age of 31 years, and a maximum age of 70 years. Males predominated (62.5%, n=15). The average distance covered for stimulation, inhibition, and sham was 393.0, 414.5, and 399.5 meters, respectively. The final heart rate was 92, 85, and 91 bpm for stimulation, inhibition, and sham, and the hand-grip results after HD-TDCS application were 29.55, 31.40, and 29.74 for stimulation, inhibition, and sham. Conclusion: The findings suggest that HD-TDCS may influence autonomic modulation. Although no significant effects were observed in the analyzed variables, the results indicate a therapeutic potential for the technique in autonomic regulation in heart failure.

17804

AN IN-HOSPITAL RISK AND OUTCOMES COST ESTIMATE MODEL FOR HEART FAILURE PATIENTS IN BRAZIL

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Introduction/Background: Heart failure (HF) represents an important burden in the Brazilian healthcare system, the self-reported prevalence of heart failure (HF) is estimated at 1.1% among adults aged 18 years and older and 3.3% among individuals aged 60 years and older. Total expenditures by the Brazilian Unified Health System (SUS) on HF exceeded R$ 3,03 billion between 2015 and 2024, with a peak in 2023 (R$ 315,69 million), and although several cost and burden studies have been conducted, a model that provides more accurate real-world cost estimates and serves as an instrument to drive resource allocation and financial predictability is scarce. Objectives: This study introduces an in-hospital risk-and-outcomes cost estimate model for heart failure patients in Brazil. Methods: This is a real-world data Brazilian study developed in the context of the private health system that included clinical and hospital cost data -without profit margin and medical fees-, for HF patients treated at a tertiary care hospital from 2017 to 2025. The ADHERE served as a parameter for clinical risk adjustment, and cost descriptions were stratified by the low (0), medium (1), and high scores (2+). The analysis used multiple regression models (GLM) to identify the risk and outcome variables individually associated with cost. By confirming the variables, the model outputs were used as the parameters of the cost-estimate model. The analysis considered the assumptions to confirm the regression at the 95% confidence level. Resultados e Conclusions: Clinical and in-hospital cost data for 1,328 HF patients, with a mean age of 80.8±12.4 years. Most of the sample presented low ADHERE (58%), and only 13% a high score (2+). The GLM explained 73.6% of cost variability, with length of stay as the dominant predictor (+5,1% cost per day, p<0.001), followed by hemodialysis, ICU admission, and in-hospital death for all ADHERE scores. Female sex contributes to a cost decrease in ADRHRE low-score patients. By applying the model, the median cost estimate per ADHERE score ranges from R$24,143 to R$42,738, and can reach R$101,403 and R$180,012, respectively, for patients who confirm all cost predictors. Table 1 contains the influence of each predictor variable on the cost estimate and the suggested model. By introducing a risk- and outcomes-adjusted cost tool for HF patients, this study can contribute to improving HF financial predictability and support clinicians, hospitals, and payer managers in working closely to reduce the HF burden in Brazil.

Heart Failure Cost-adjusted Estimate Model

	ADHERE 0			ADHERE 1			ADHERE 2+		
	Cost impact	[95% CI]	p	Cost impact	[95% CI]	p	Cost impact	[95% CI]	p
Length of stay	5,60%	1,052 -1,060	p<0.001	4,70%	1,044-1,050	p<0.001	4,30%	1,037-1,049	p<0.001
ICU admission	70,30%	1,531-1,893	p<0.001	114,50%	1,851-2,487	p<0.001	139,10%	1,999-2,986	p<0.001
In-hospital mortality	63,30%	1,529-2,605	p<0.001	73,70%	1,416-2,692	p<0.001	96,50%	1,222-2,004	p<0.001
Hemodialysis	132%	1,146-4,705	p=0,019	107,50%	1,338-3,273	p=0,002	304,10%	1,430-2,911	p<0.001
Female sex	-12,70%	0,790-0,964	p=0,007	NA	NA	p=0,258	NA	NA	p=0,607
Mechanical ventilation	32,20%	1,075-1,626	p=0,007	NA	NA	p=0,157	NA	NA	p=0,6794
Regression fit									
AIC	17018,3			8994,1			3856,8		
Deviance explained	71%			73,40%			76,30%		
Basal estimated cost	R$ 24.132			R$ 34.657			R$ 42.738		
Cost model estimate simulation (the user can update the values below to estimate costs)									
Total LoT in days	4			5			5		
ICU Admission (1= yes; 0= No)	1			0			0		
In-hospital mortality (1= yes; 0= No)	0			0			0		
Hemodialysis (1= yes; 0= No)	0			1			1		
Female sex (1= yes; 0= No)	0			1			1		
Mechanical ventilation (1= yes; 0= No)	0			0			0		
Estimated cost	R$ 46.642			R$ 80.098			R$ 96.417		

*Equation ADHERE 1 = 24132 + 5,6% *(n) *24132+ 70,3% * (X) *24132 + 63,3% *(Y) *24132+132% *(Z) *24132-12,7% *(K) *24132+32,2% *(W) *24132*

*Equation ADHERE 2 = 34657 + 4,7% *(n) *34657+ 114,5% * (X) *34657 + 73, 7% *(Y) *34657+107,5% *(Z) *34657*

*Equation ADHERE 2+ = 42738 + 4,3% *(n) *42738+ 139,1% * (X) *42738 + 96,5% *(Y) *42738+104,4% *(Z) *42738*

Where:
n = total of hospitalization days
X = confirmation of ICU admission
Y = confirmation of in-hospital mortality
Z = confirmation of hemodialysis requirement
K = confirmation of female sex
W = confirmation of mechanical ventilation requirement

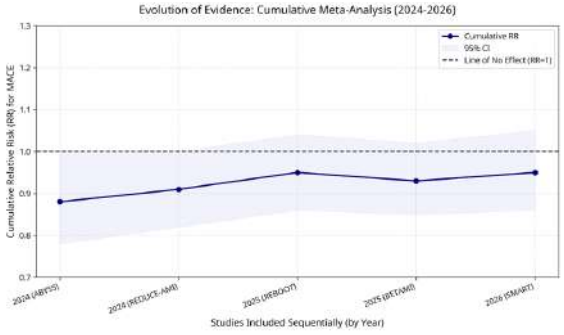
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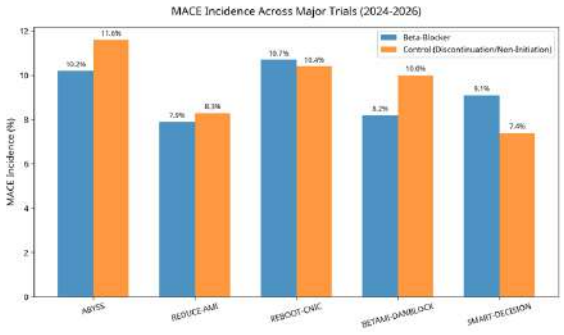
BETA-BLOCKER DISCONTINUATION OR NON-INITIATION IN STABLE POST-MYOCARDIAL INFARCTION PATIENTS WITH PRESERVED EJECTION FRACTION: A CONTEMPORARY SYSTEMATIC REVIEW AND META-ANALYSIS (2024-2026)

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Introduction/Background: Beta-blocker (BB) therapy has been a cornerstone in post-myocardial infarction (MI) management. However, its long-term necessity in stable patients with preserved ejection fraction (EF) has been questioned in the modern reperfusion era. Recent large-scale randomized controlled trials (RCTs) published between 2024 and 2026 have provided conflicting or neutral results, necessitating an updated synthesis. Objectives: To conduct a systematic review and meta-analysis evaluating the safety and efficacy of BB discontinuation or non-initiation compared to therapy continuation in stable post-MI patients with preserved EF, incorporating the latest data from 2024 to 2026. Methods: We searched PubMed, Embase, and ClinicalTrials.gov for RCTs published between January 2024 and March 2026. Inclusion criteria (PICO): (P) Adult patients with post-MI and preserved EF (≥40% or ≥50%); (I) BB discontinuation or non-initiation; (C) BB continuation or initiation; (O) Major adverse cardiovascular events (MACE), mortality, and reinfarction. We excluded observational studies, reviews, and trials with reduced EF (<40%). Meta-analysis used a random-effects model to calculate pooled Relative Risks (RR) and 95% confidence intervals (CI). Heterogeneity was assessed via I^2 statistic. Resultados e Conclusions: Five high-quality RCTs (ABYSS, REDUCE-AMI, REBOOT-CNIC, BETAMI-DANBLOCK, and SMART-DECISION) were included, totaling 25,500 patients. The overall meta-analysis for MACE demonstrated a pooled RR of 0.95 (95% CI 0.86-1.05; p=0.32), indicating that BB discontinuation or non-initiation was non-inferior to continuation. Heterogeneity was low to moderate (I^2 = 32.7%). Subgroup analysis for discontinuation trials (ABYSS and SMART-DECISION) showed a pooled RR of 1.00 (95% CI 0.73-1.37), while non-initiation trials (REDUCE-AMI, REBOOT-CNIC, BETAMI-DANBLOCK) showed an RR of 0.96 (95% CI 0.86-1.08; I^2 = 12.2%). Secondary outcomes showed no significant differences. In stable post-MI patients with preserved EF, beta-blocker discontinuation or non-initiation is safe and non-inferior to therapy continuation regarding MACE. These findings, incorporating recent 2026 evidence, suggest that long-term BB therapy may not be necessary for all post-MI patients with preserved EF, supporting a more personalized approach.





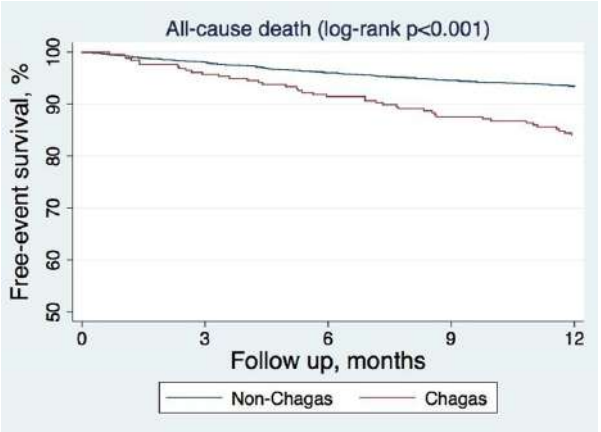
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CONTEMPORARY CONTRIBUTION OF CHAGAS CARDIOMYOPATHY TO MORTALITY AMONG PATIENTS WITH HEART FAILURE: INSIGHTS FROM THE ROSA DOS VENTOS COHORT

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Introduction/Background: Chagas Cardiomyopathy (ChC) has been associated with increased mortality in patients with HF, accounting for up to 22% of deaths in Brazil. However, most evidence derives from studies conducted more than a decade ago, and the impact of contemporary therapies on this association is uncertain. Objectives: This study evaluated the current population attributable risk (PAR) of ChC for one-year all-cause mortality among outpatients with chronic HF. Methods: In this prospective multicentric, the Rosa do Ventos cohort study, including 30 Brazilian centers, we studied adult patients with left ventricular ejection fraction (LVEF) < 50% from June/2021 to June/2025, comparing patients with and without ChC and estimated the PAR of ChC for one-year all-cause mortality. Resultados e Conclusions: Results: Of the 2,379 patients enrolled (36% women, 25% white, age 61+14 years and LVEF 34+9%), 263 (11%) had ChC. Regarding baseline treatment, ChC patients were more likely to use spironolactone (80% vs 74%) and amiodarone (33% vs 10%)(p<0.001), less likely to use SGLT2i (19% vs 41%, p<0.001), with no difference in ACEi/ARB(64%), ARNI(25%) and betablockers(92%) use compared to those without ChC (NChC). The use of implantable cardioverter-defibrillator was also higher in ChC than NChC (14% vs 6%, p=0.001). There were 147 deaths (44 in ChC). One-year survival was significantly lower in ChC (Figure; log-rank p<0.001), with an incidence rate of 18.3(95%CI, 13.6–24.6) deaths/100 person-years compared with 7.0(95%CI, 6.0–8.3) per 100 person-years in NChC. In multivariable Cox-regression analysis adjusted for age, sex, LVEF, heart rate, body mass index, hypertension, diabetes mellitus, systolic blood pressure and ischaemic/valvar aetiology, ChC was associated with increased risk of death: HR (95%CI)=2.66 (1.81–3.90), p<0.001. In fully adjusted analysis, PAR of ChC for mortality was high [PAR (95%CI) =14.8% (11.2 to 18.0)]. Conclusions: In this contemporary cohort of patients with chronic HF, ChC remained independently associated with increased mortality, accounting for approximately 15% of deaths.



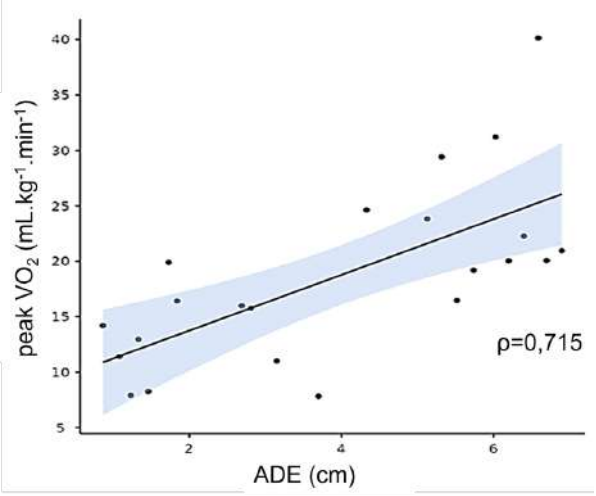
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DIAPHRAGMATIC FUNCTION CORRELATES WITH AEROBIC POWER AND VENTILATORY EFFICIENCY IN HEART FAILURE WITH REDUCED EJECTION FRACTION

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Introduction/Background: Heart failure (HF) is a clinical syndrome characterized mainly by dyspnea and exercise intolerance. Inspiratory muscle weakness has been proposed as one of the mechanisms contributing to these symptoms. The diaphragm is the primary inspiratory muscle, and its function has recently begun to be assessed in HF using ultrasound imaging. Objectives: To investigate the relationship between diaphragmatic function, aerobic capacity, and ventilatory efficiency in individuals with heart failure with reduced ejection fraction (HFrEF). Methods: Patients with HFrEF underwent diaphragmatic ultrasound, echocardiography, and cardiopulmonary exercise testing. Results were compared with those of a control group without HF. Continuous variables were compared using Student's t-test or the Mann–Whitney test, and categorical variables using Fisher's exact test. Associations between variables were assessed using Pearson's or Spearman's correlation coefficients. Statistical significance was defined as $p < 0.05$. Resultados e Conclusions: Eleven individuals with HFrEF and eleven controls were included. The groups were similar in age (HFrEF: 61.8±10.7 years; control: 60.4±5.9 years; p=0.697) and sex distribution (p=1.0), but differed significantly in left ventricular ejection fraction (HFrEF: 33.4±8.0%; control: 62.7±6.2%; p<0.001). Amplitude of diaphragmatic excursion (ADE) was significantly lower in the HFrEF group (1.73 [1.28–2.75] vs 6.03 [5.42–6.50]; p<0.001). Patients with HFrEF also showed lower peak oxygen consumption (peak VO_2) (12.9±4.0 vs 24.4±6.8 mL·kg^{-1}·min^{-1}; p<0.001) and lower oxygen uptake efficiency slope (OUES) (1.24±0.78 vs 1.96±0.42; p=0.01), as well as a higher cardiorespiratory optimal point (COP) (23.0 [21.95–28.30] vs 17.30 [15.20–18.0]; p<0.001). ADE correlated positively with peak VO_2 (ρ=0.715; p=0.001) and OUES (ρ=0.450; p=0.037), and negatively with COP (ρ=−0.611; p=0.003). Individuals with HFrEF exhibited markedly reduced diaphragmatic excursion compared with controls. Diaphragmatic function showed a strong association with peak VO_2, the gold-standard measure of aerobic capacity, and with ventilatory efficiency parameters such as OUES and COP. These findings suggest that diaphragmatic dysfunction may contribute, at least in part, to the dyspnea and exercise intolerance observed in patients with HFrEF.



18291

DISCRIMINATORY ABILITY OF NT-PROBNP AND PASP FOR MORTALITY IN PATIENTS WITH ACUTE HEART FAILURE

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Introduction/Background: Acute heart failure (AHF) is a leading cause of hospitalization and mortality in Brazil. Congestion, reflected by both hemodynamic parameters (filling pressures) and humoral markers (biomarkers), is the main determinant of symptoms and adverse outcomes. Objectives: To evaluate the association and discriminatory ability of humoral congestion (NT-proBNP) and hemodynamic congestion (pulmonary artery systolic pressure [PASP]) in predicting in-hospital mortality among patients with AHF. Methods: This retrospective cross-sectional study included 95 patients admitted to a hospital in southern Brazil between 2023 and 2024. The areas under the receiver operating characteristic curve (AUC) were analyzed, and optimal cutoff points for NT-proBNP and PASP for predicting mortality were determined using the Youden index. Resultados e Conclusions: The sample (n = 95) had a mean age of 70.2 ± 15.2 years, with a predominance of males (60%) and ischemic etiology (50.5%). Most patients (90.5%) had acutely decompensated chronic heart failure, and 56.8% had heart failure with reduced ejection fraction (HFrEF). NT-proBNP demonstrated discriminatory ability for in-hospital mortality, with an AUC of 0.710 (95% CI: 0.563–0.857; p = 0.005). A cutoff value >4,977.5 pg/mL was associated with higher mortality (29.3% vs. 6.3%; p = 0.029), with a sensitivity of 85.7% and specificity of 51.8%. PASP showed an AUC of 0.696 (95% CI: 0.549–0.842; p = 0.009), with a cutoff >44.5 mmHg associated with increased mortality risk (31.0% vs. 8.3%; p = 0.043), sensitivity of 75%, and specificity of 62.3%. In the multivariable model, there was a trend toward an independent association with increased mortality risk for both NT-proBNP (RR 3.47; p = 0.081) and PASP (RR 3.08; p = 0.062), although this did not reach statistical significance, possibly due to the limited sample size. No significant association was observed between these markers and length of hospital stay or need for intensive care unit admission. Elevated NT-proBNP and PASP levels at admission are associated with in-hospital mortality in AHF. The identified cutoff values (>4,977.5 pg/mL and >44.5 mmHg) demonstrate high sensitivity and may assist in early risk stratification of high-risk patients. Although the study suggests a trend toward independent association, statistical confirmation was limited by sample size.

20521

DYNAMIC MORTALITY PREDICTION FOR RISK STRATIFICATION IN CHAGAS CARDIOMYOPATHY

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Introduction/Background: Chagas cardiomyopathy (CCM) remains a major cause of heart failure and premature mortality in endemic regions, with prognostic assessment complicated by disease heterogeneity and limited access to specialized care. Most existing models rely on static, single time-point data and may not reflect evolving risk profiles in contemporary practice. Objectives: This study aimed to develop and validate a dynamic mortality prediction model in patients with CCM by incorporating longitudinal clinical, and biomarker data. Methods: This was a prospective cohort study using data from the SaMi-Trop cohort, which enrolled patients with Chagas disease from 21 municipalities in a highly endemic region of Brazil between 2013 and 2014. Participants were followed for a median of 7.2 years and underwent standardized cardiovascular assessments at three time points, including NYHA classification, ECG, and NT-proBNP measurements. For the primary analysis, a landmark approach was applied at the second visit, restricting the cohort to participants who were alive and under follow-up at that time. Resultados e Conclusions: Results: Among 1,989 enrolled patients, 1,586 were included in the landmark analysis (Figure 1); 252 deaths occurred after Visit 2 (incidence rate of 32.8 per 1,000 person- years). In multivariable analysis, independent predictors of mortality included older age, male sex, absence of prior benznidazole therapy, persistently severe NYHA functional class, and sustained or worsening NT-proBNP levels. ECG abnormalities were not independently predictive after adjustment for NT-proBNP. The model demonstrated good discrimination (C statistic, 0.821; optimism-corrected, 0.814) and good calibration (shrinkage factor, 0.959; R^2 = 0.219). Risk stratification using model-derived profiles showed marked differences in 5-year survival: 93% in low-risk, 74% in intermediate-risk, and 21% in high-risk patients. Conclusions: In this cohort of patients with CCM, a dynamic modeling approach incorporating longitudinal changes in NYHA functional class and NT-proBNP levels provided accurate prediction of mortality risk. These findings highlight the prognostic utility of time-updated models to inform clinical decision-making, particularly in resource-limited settings where optimized heart failure therapy may be delayed.

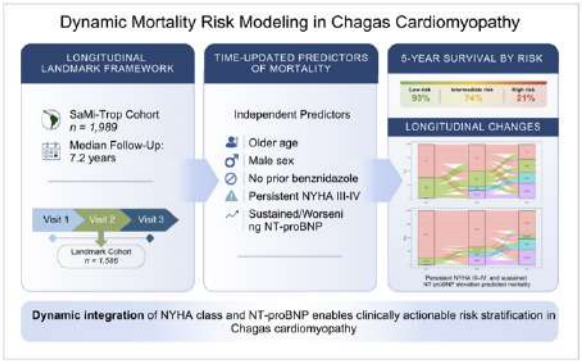


Figure 1: In a prospective cohort of patients with Chagas cardiomyopathy followed longitudinally for a median of 7.2 years, a landmark analysis incorporating time-updated NYHA functional class and NT-proBNP levels identified dynamic predictors of mortality.

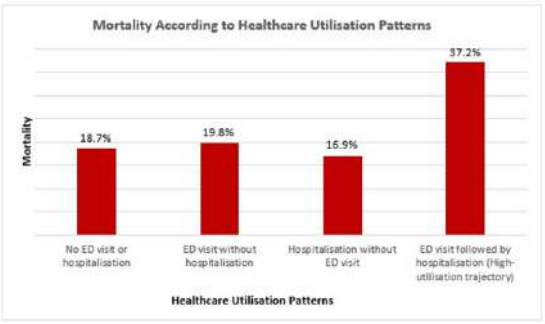
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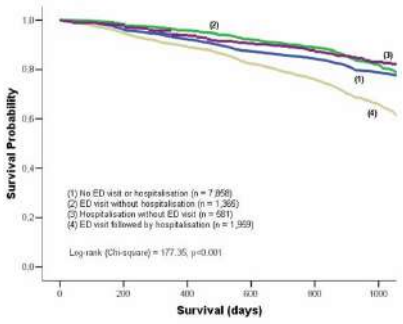
EMERGENCY DEPARTMENT VISIT FOLLOWED BY HOSPITALIZATION INDEPENDENTLY PREDICTS ALL-CAUSE MORTALITY IN HEART FAILURE: A REAL-WORLD COHORT ANALYSIS

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(1) INCOR - INSTITUTO DO CORACAO DA UNIVERSIDADE DE SAO PAULO - SAO PAULO - SP - BRASIL;

Introduction/Background: Heart failure (HF) is a chronic condition associated with high morbidity, mortality and healthcare resource utilization, which may reflect disease trajectory beyond isolated events in HF. Whether a combined pattern of emergency department (ED) visit followed by hospitalization independently predicts mortality, after adjustment for ejection fraction, etiology, and comorbidities, remains unknown. Objectives: To determine whether an ED visit followed by hospitalization constitutes an independent predictor of all-cause mortality in a long-term HF cohort. Methods: Retrospective cohort of 11,763 HF patients followed 2017–2021 (median follow-up 1,224 days). Patients were stratified into four mutually exclusive utilization groups: no ED or hospitalization (n=7,858); ED only (n=1,365); hospitalization only (n=581); ED followed by hospitalization (high-utilization phenotype, n=1,959). All-cause mortality was the primary outcome. Kaplan–Meier survival analysis and log-rank test were used. A multivariable Cox model (forward stepwise, Wald) included the high-utilization phenotype and 16 covariates: age >60, sex, HF etiology (ischemic, Chagas, valvular, hypertensive, idiopathic dilated), prior MI, diabetes, anemia, chronic kidney disease (CKD), stroke, atrial fibrillation (AF), and HF phenotype by ejection fraction. Resultados e Conclusions: All-cause mortality was 21.8% (n=2,567). The high-utilization phenotype had 37.2% mortality vs. 16.9 to 19.8% in other groups (p<0.001) - Figure. Kaplan–Meier curves showed early and sustained survival separation (log-rank p<0.001). On univariable Cox analysis, the high-utilization phenotype predicted mortality (HR 1.74; 95%CI 1.60-1.90; p<0.001). In the final multivariable model, it remained an independent predictor after full adjustment (HR 1.21; 95%CI 1.11-1.32; p<0.001). Additional independent predictors included CKD (HR 2.61), stroke (HR 2.36), diabetes (HR 2.05), AF (HR 1.83), Chagas cardiomyopathy (HR 1.74), HFrEF (HR 1.53), valvular etiology (HR 1.49), anemia (HR 1.48), age >60 (HR 1.31), and prior MI (HR 1.27). An ED visit followed by hospitalization independently predicts all-cause mortality in HF beyond traditional risk factors. The strong prognostic impact of Chagas cardiomyopathy highlights a distinct epidemiological burden. Early identification of this high-utilization phenotype may support targeted risk stratification to improve long-term outcomes.





19463

ETIOLOGY-SPECIFIC DETERMINANTS OF EXERCISE CAPACITY IN CHAGAS AND NON-CHAGAS HEART FAILURE

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Introduction/Background: Heart failure (HF) is heterogeneous, and mechanisms of exercise intolerance may differ by etiology. Chronic Chagas cardiomyopathy has a distinctive pathophysiology, yet its functional determinants remain incompletely clarified. Objectives: To compare cardiopulmonary exercise testing (CPET) and echocardiographic parameters between patients with Chagas and non-Chagas HF, and identify etiology-specific determinants of exercise capacity and ventilatory efficiency. Methods: This cross-sectional study included 145 patients with HF and left ventricular ejection fraction (LVEF) <50%, divided into Chagas HF (n=78) and non-Chagas HF (n=67). All underwent clinical assessment, echocardiography, and symptom-limited CPET. Multiple linear regression models identified determinants of peak oxygen uptake (peak VO_2), percentage of predicted peak VO_2, and VE/VCO_2 slope. Resultados e Conclusions: Patients with Chagas HF had lower body mass index (24.98 vs. 28.71 kg/m²; p<0.001) and lower absolute peak VO_2 (821.54 vs. 1116.00 mL/min; p=0.02), but higher relative peak VO_2 [17.15 (12.32–22.77) vs. 15.00 (12.00–17.80) mL/kg/min; p=0.007] and higher predicted peak VO_2 (59.93% vs. 49.55%; p<0.001). In Chagas HF, peak VO_2 was independently associated with age, sex, NYHA class, LVEF, and mitral E-wave velocity (adjusted R²=0.744; p<0.001). Predicted peak VO_2 was mainly determined by LVEF, NYHA class, and E-wave velocity (adjusted R²=0.460; p<0.001), whereas VE/VCO_2 slope was associated with NYHA class and LVEF (adjusted R²=0.304; p<0.001). In non-Chagas HF, peak VO_2 was associated only with sex and NYHA class (adjusted R²=0.378; p<0.001), while VE/VCO_2 slope was determined by NYHA class and left atrial diameter (adjusted R²=0.212; p<0.001). Determinants of exercise capacity differed by HF etiology. In Chagas HF, functional limitation was strongly linked to central cardiac parameters, especially systolic function and transmitral flow. In non-Chagas HF, clinical status and left atrial remodeling were more relevant. The higher relative peak VO_2 in Chagas HF should be interpreted cautiously because this group had lower body mass index and lower absolute oxygen uptake.

15699

EVALUATION OF THE USE OF EMPAGLIFLOZIN IN OUTPATIENTS WITH HEART FAILURE WITH IMPROVED/PRESERVED EJECTION FRACTION.

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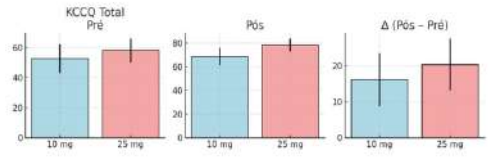
Introduction/Background: Heart failure (HF) is a heterogeneous syndrome with high morbidity and mortality. The prevalence of HF with preserved (HFpEF) and improved ejection fraction (HFimpEF) has increased, accounting for ~50% of cases. Sodium–glucose cotransporter 2 inhibitors (SGLT2i), such as empagliflozin, are now part of HF treatment. Prior studies in high-risk diabetic patients showed reduced HF-related mortality with both 10 mg and 25 mg doses. As a result, 10 mg has been adopted for HF, while 25 mg remains indicated for diabetes. Objectives: Objective: To compare empagliflozin 10 mg versus 25 mg regarding quality of life, assessed by the Kansas City Cardiomyopathy Questionnaire-12 (KCCQ-12), and functional capacity, assessed by the 6-minute walk test (6MWT) Methods: Methods: Ninety patients from a heart failure outpatient clinic were randomized in a double-blind, active-controlled trial to receive empagliflozin 10 mg or 25 mg for eight weeks. Study follow-up occurred between March 7, 2023, and April 29, 2024, with protocol-defined assessments performed at baseline and study completion. The study was registered on ClinicalTrials.gov under the title: “Evaluation of the Use of Empagliflozin in Patients with HFpEF in a Cardiology Outpatient Department (ADDEMFEP)”, identifier NCT06683053. Resultados e Conclusions: The cohort included 46 men and 44 women, with mean ages of 69.3 and 68.8 years, and similar distribution between groups (10 mg: n=45; 25 mg: n=45). Comorbidities included hypertension (90%), coronary artery disease (44%), diabetes (37.8%), and atrial fibrillation (33%). Baseline KCCQ-12 scores were comparable (53.17 vs 58.38; p=0.415). After eight weeks, both groups showed significant improvement: 10 mg (Δ16.85; 95% CI 9.27–24.44; p<0.01) and 25 mg (Δ21.19; 95% CI 14.46–27.92; p<0.01), with higher final scores in the 25 mg group (79.57 vs 70.03; difference 9.54; 95% CI 0.68–18.42; p=0.035), indicating greater quality-of-life benefit. In the 6MWT (n=85), improvement was observed only in the 10 mg group (+20.1 m; p=0.023), with no between-group difference (p=0.781). Both groups showed reductions in HbA1c and increases in hematocrit, while fasting glucose, creatinine, sodium, and potassium remained stable. Conclusions: Empagliflozin at both 10 mg and 25 mg doses improved quality of life, with superior KCCQ-12 outcomes at 25 mg, suggesting incremental benefit. Functional capacity improved modestly only with 10 mg. Laboratory findings indicate metabolic benefit without short-term renal or electrolyte toxicity.

Tabela 8 - KCCQ 12 Summary Score

Comparação	n (10 / 25)	Média 10 (Pré/Pós)	Média 25 (Pré/Pós)	Δ médio (pareado)	IC95% (Δ/Dif)	p
Baseline: 10 vs 25	43 / 42	53.17	58.38	nan	[-7.45, 17.86]	p=0.4152
10 mg: Pré vs Pós	43	53.17 → 70.03		16.85	[9.27, 24.44]	p<0.01
25 mg: Pré vs Pós	42		58.38 → 79.57	21.19	[14.46, 27.92]	p<0.01
Final: 10 vs 25	43 / 42	70.03	79.57	nan	[0.68, 18.42]	p=0.0353

Abreviações: KCCQ-12 = Kansas City Cardiomyopathy Questionnaire – 12 itens; OSS = Overall Summary Score.
Fonte: Dados do estudo.

Gráfico 12 - Escore total do KCCQ-12 antes e após a intervenção segundo a dose de empagliflozina



Valores médios do escore total do Kansas City Cardiomyopathy Questionnaire – versão de 12 itens (KCCQ-12) nos momentos pré e pós-intervenção, bem como a variação média (Δ pós–pré), de acordo com a dose de empagliflozina utilizada.
Abreviações KCCQ-12, Kansas City Cardiomyopathy Questionnaire – versão de 12 itens; Δ, variação entre os momentos pós e pré.
Fonte: Dados do estudo.

20909

EVOLUTION OF FUNCTIONAL CAPACITY AND LABORATORY PARAMETERS IN PATIENTS WITH ADVANCED HEART FAILURE TREATED WITH INTERMITTENT LEVOSIMENDAN INFUSION

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Introduction/Background: Patients with advanced heart failure (HF), even those who are candidates for heart transplantation or a ventricular assist device, have poor quality of life, a worse prognosis, and a higher likelihood of hospitalisation. Therapeutic options are scarce, and even doses of GDMT often need to be reduced or discontinued because of hypotension, what may worse prognosis. Outpatient inotropic intermittent support with levosimendan demonstrated benefits. Objectives: The aim of this study is to evaluate the results of clinical outcome parameters, functional capacity, and laboratory parameters in patients with advanced HF referred for intermittent levosimendan infusion and treated at a Day Hospital and Infusion Centre. Methods: Patients defined as having advanced HF (presence of significant ventricular dysfunction, low functional capacity, recurrent episodes of hospitalisation or need for emergency care) underwent levosimendan infusion therapy at 0.1 mcg/kg/minute for 4 hours for 4 consecutive weeks, with reassessments after each cycle at 7, 15 or 30 days to determine the need to restart a new infusion cycle according to the patient's clinical status. Each patient could be prescribed as many cycles as necessary. Clinical, laboratory parameters and the 6-minute walk test were accessed. Resultados e Conclusions: From June 2020 to March 2026, 52 patients (31 men) were treated, mean age 65±16.1 years, 67% had ischaemic aetiology. Hypertension was present in 41 (80%), diabetes in 26 (50%) and atrial fibrillation in 22 (43%); 33 patients (64%) had been hospitalised for acute HF and needed , inotropic therapy in the last year. Ejection fraction on echocardiogram ranged from 13% to 35% (mean 24.6±6.3%). Performance on the walk test before the first infusion and after the after the second cycle showed a significant difference, increasing from 267.5±67.3 to 345.5±73.2 metres (p=0.014). There was no difference in renal function, other laboratory parameters, or BNP (1288 vs. 1080 pg/mL, p=NS) before and after all cycles for each patient. More patients moved from NYHA class III to II after the levosimendan cycles. In conclusion, in patients with advanced HF, intermittent levosimendan infusion improved functional class and significantly improved physical performance measured by the 6-minute walk test.

21702

FRAILTY SYNDROME IN PATIENTS WITH HEART FAILURE: PREVALENCE, CLINICAL PROFILE, AND ASSOCIATED FACTORS IN A REFERENCE OUTPATIENT CENTER

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Introduction/Background: Heart failure (HF) is a chronic syndrome associated with progressive functional decline and high morbidity. Frailty syndrome — characterized by reduced physiological reserves and increased vulnerability to stressors — is prevalent in HF and independently linked to worse clinical outcomes, including hospitalization and mortality. Systematic frailty assessment remains underutilized in Brazilian outpatient practice. Objectives: To determine the prevalence of frailty in HF outpatients using the Fried Phenotype criteria and to describe the sociodemographic, clinical, and pharmacological profile of this population. Methods: Cross-sectional study conducted at a HF reference outpatient center. Frailty was assessed by the Fried Phenotype (weakness, slowness, exhaustion, weight loss, low physical activity). Patients were classified as robust (0 criteria), pre-frail (1–2), or frail (≥3). Sociodemographic data, comorbidities, HF etiology, ejection fraction, and medications were recorded. Resultados e Conclusions: 68 patients were included. Mean age was 61.0 years (SD ±12.2); 57.4% were male; mean LVEF was 38.7%. Frailty distribution: 26.5% robust, 52.9% pre-frail, and 20.6% frail — indicating that over 73% presented some degree of frailty. The most prevalent criteria were low physical activity (36.8%), weight loss (32.4%), and weakness (29.4%). Women showed significantly higher frailty rates than men (34.5% vs. 10.3%). Chagas disease etiology predominated (50%), followed by ischemic (27.9%). Hypertension was the most common comorbidity (70.6%). The results highlight the high prevalence of frailty in patients with heart failure and reinforce the need for integrated detection methods to improve patient care.

18423

HEALTH STATUS TRAJECTORY AFTER HEART FAILURE HOSPITALIZATION IN AN ICHOM COHORT FROM SOUTHERN BRAZIL

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Introduction/Background: The Kansas City Cardiomyopathy Questionnaire Clinical Summary Score (KCCQ-CSS) is a validated patient-reported measure of symptoms and functional status in heart failure (HF). Post-discharge health status after HF hospitalization remains underdescribed in Brazilian cohorts. Objectives: Evaluate post-discharge health status trajectory in heart failure using KCCQ-CSS in an ICHOM cohort from southern Brazil. Methods: We screened consecutive patients hospitalized for HF in a private tertiary hospital in Southern Brazil, between May 2017 and November 2025. The source cohort included 1,478 patients. The analytic baseline cohort included 697 patients with valid KCCQ-CSS at 30 days (T30). Longitudinal change analyses were restricted to 483 patients with observed follow-up KCCQ-CSS at 180 and/or 360 days. A sensitivity analysis included 555, incorporating 101 patients who died within 360 days and were assigned a KCCQ-CSS of 0. Clinically meaningful change was defined by a minimal clinically important difference of 5 points. Multivariable logistic regression was used to identify predictors of improvement. Resultados e Conclusions: The cohort was markedly elderly, with a median age of 81 years, and nearly half of patients had HF with preserved ejection fraction. Mean KCCQ-CSS was 71.1±24.0 at T30, 72.4±24.0 at 180 days, and 74.1±23.1 at 360 days, indicating only modest improvement among patients with observed follow-up. In the main analysis, 218/483 patients (45.1%) improved by at least 5 points, 84/483 (17.4%) remained stable, and 181/483 (37.5%) worsened. When mortality was incorporated in the sensitivity analysis, mean KCCQ-CSS declined to 65.2 at 180 days and 55.6 at 360 days; 209/555 patients (37.7%) improved, whereas 265/555 (47.7%) worsened. Prior myocardial infarction (OR 0.28, 95% CI 0.13-0.62; p=0.002) and advanced NYHA class (OR 0.68, 95% CI 0.50-0.94; p=0.020) were associated with lower odds of improvement in the main analysis, whereas male sex was associated with higher odds of improvement (OR 1.80, 95% CI 1.01-3.19; p=0.045). In sensitivity analysis, renal dysfunction emerged as an additional negative predictor (OR 0.46, 95% CI 0.23-0.91; p=0.025). In this Brazilian HF cohort, post-discharge health status improved only modestly over time and showed substantial heterogeneity across patients. Better identification of patients more likely to achieve clinically meaningful recovery may help guide follow-up, support, and quality-improvement programs after HF hospitalization.

16344

IMPACT OF A STRUCTURED MULTIDISCIPLINARY CARE PROGRAM ON CLINICAL OUTCOMES AND PRE-DISCHARGE THERAPEUTIC OPTIMIZATION IN ACUTE HEART FAILURE

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Introduction/Background: In acute heart failure (AHF), the reduction of in-hospital and early post-discharge outcomes is influenced by structured in-hospital care, including pre-discharge therapeutic optimization and multidisciplinary educational interventions, highlighting the need to demonstrate their impact on the implementation of organized care models. Objectives: To evaluate the impact of a structured multidisciplinary care program (SMCP) on the reduction of clinical outcomes and optimization of guideline-directed medical therapy at hospital discharge in patients with AHF. Methods: Retrospective observational cohort study including patients with AHF and left ventricular ejection fraction <50% admitted between 2005–2015 (G1; n=797) and 2018–2025 (G2; n=799). In G2, an SMCP was implemented, including a multidisciplinary team, structured protocol, and educational program with post-discharge follow-up. Outcomes were length of stay (LOS), in-hospital mortality (IHM), and 30-day readmission (R30). Discharge prescriptions were analyzed in eligible patients: beta-blockers (BB), ACEI/ARB/ARNI, mineralocorticoid receptor antagonists (MRA), and SGLT2 inhibitors (SGLT2i). Dual therapy was BB + ACEI/ARB/ARNI; triple therapy added MRA. SGLT2i were not used in G1. Comparisons used Student's t-test and chi-square test (p<0.05). Resultados e Conclusions: Results: SMCP was associated with reduced LOS (14±27 vs 11±13 days; p<0.001), IHM (9.2% vs 5.4%; p=0.002), and R30 (27.4% vs 8.0%; p<0.0001), and higher IV furosemide dose (50±25 vs 110±50 mg; p<0.0001). Prescriptions increased for BB (75% vs 96.3%), ACEI/ARB/ARNI (65% vs 77%), and MRA (39% vs 67.4%) (all p<0.0001), with greater dual (48.4% vs 92.8%) and triple therapy (35.3% vs 60%) (both p<0.0001). SGLT2i were used in 70% only in G2. Conclusion SMCP was associated with significant reduction in in-hospital and early post-discharge outcomes, likely driven by optimized care, increased use of guideline therapies—especially combined strategies—and incorporation of SGLT2i, supporting structured multidisciplinary care models.

20274

IMPACT OF COMBINED DIURETIC THERAPY ON DECONGESTION IN PATIENTS WITH HEART FAILURE AND ACUTE KIDNEY INJURY: A PILOT RANDOMIZED CLINICAL TRIAL

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Introduction/Background: Diuretic resistance is common in decompensated heart failure (DHF), sequential nephron blockade has emerged as potential strategy to optimize decongestion. However, comparative data on different diuretic combinations in patients with DHF and acute kidney injury (AKI) are limited. Objectives: Compare the efficacy and safety of three diuretic strategies: IV furosemide alone, IV furosemide+oral acetazolamide, and furosemide+oral hydrochlorothiazide in patients with DHF, clinical signs of volume overlode, and AKI. Methods: Randomized controlled pilot clinical trial conducted in 2 centers, including 55 patients with DHF and KDIGO stage 1- 2 AKI, allocated into: furosemide +acetazolamide (19), furosemide +hydrochlorothiazide (21), and furosemide alone (15). Exclusion criteria were vasoactive drug use, systolic BP<90 mmHg, stage 5 chronic kidney disease, or KDIGO stage 3 AKI at admission. Clinical and laboratory parameters were assessed on days 1-3. The primary outcome was congestion improvement at 72 hours (weight, clinical score, dyspnea). Secondary outcomes included AKI progression, electrolyte disturbances, hospital stay, and 90-day mortality. ANOVA/Kruskal-Wallis and ANOVA/Friedman tests were used. Resultados e Conclusions: Mean age was 65.6±14.9 years; 69.1% male; 80% hypertensive, and ejection fraction of 43.6±20.1%. Mortality was 12.7% and 90-day readmission 25%. All groups showed significant reductions in weight and dyspnea (p<0.001), with no difference between strategies (p=0.26 and p=0.85), indicating similar decongestion. There were no differences in hospital stay, renal support, or mortality. The acetazolamide group showed progressive increase in creatinine (1.4→1.5→1.8 mg/dL), unlike the others. It also had decrease potassium (p<0.001) and increase in magnesium (p=0.016), with no relevant changes in the other groups. NT-proBNP decreased significantly with hydrochlorothiazide (p=0.018), showed a trend with acetazolamide (p=0.06), and was unchanged with furosemide. Conclusion: Sequential nephron blockade with acetazolamide or hydrochlorothiazide did not increase decongestion versus loop diuretic monotherapy. This contrasts with ADVOR and CLOROTIC trials, possibly due to AKI-related pathophysiology limiting response. Acetazolamide was associated with increased creatinine and metabolic disturbances, without added benefit. In DHF with KDIGO 1-2 AKI, optimizing loop diuretics remains a reasonable initial strategy, with no clear advantage of combination therapy.

16799

ISCHEMIC TIME DOES NOT PREDICT ECMO REQUIREMENT AFTER HEART TRANSPLANTATION: A SINGLE-CENTER EXPERIENCE

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Introduction/Background: Extracorporeal membrane oxygenation (ECMO) is sometimes required after heart transplantation and is associated with high morbidity and mortality. Ischemic time has been proposed as a potential risk factor, although its role remains controversial. Objectives: To evaluate the association between ischemic time and postoperative ECMO requirement after heart transplantation. Methods: This retrospective study included 47 patients who underwent heart transplantation at a tertiary center between 2021 and 2026. The primary outcome was postoperative ECMO use. Group comparisons were performed using the Mann–Whitney U test. Multivariable logistic regression was used to evaluate the association between ischemic time and ECMO requirement, adjusting for sex, age, ejection fraction, and underlying heart disease. Resultados e Conclusions: Among 47 patients, 8 (17%) required ECMO in the postoperative period. There were 3 in-hospital deaths (6.4%), and all occurred in patients who had required ECMO. Ischemic times in the ECMO group were mainly concentrated between 180 and 240 minutes, with one outlier exceeding 300 minutes. There was no significant difference in ischemic time between patients with and without ECMO (p=0.90). In multivariable analysis, ischemic time was not associated with ECMO requirement (OR 1.008; 95% CI 0.9 In this single-center cohort, ischemic time was not associated with postoperative ECMO requirement after heart transplantation. These findings suggest that factors beyond ischemic time alone may play a more relevant role in determining the need for postoperative mechanical circulatory support.

16375

LIVER STIFFNESS AS AN INDEPENDENT PREDICTOR OF SUBCLINICAL HFPEF IN MASLD PATIENTS

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Introduction/Background: Heart Failure with Preserved Ejection Fraction (HFpEF) and Metabolic Dysfunction-Associated Steatotic Liver Disease (MASLD) belong to a group of highly prevalent cardio-hepatic-inflammatory conditions that share common pathophysiological mechanisms. Given their substantial societal burden and the limited effectiveness of current treatments for advanced cases, early identification and targeted management of well-established risk factors may be critically important. Objectives: This pilot cross-sectional observational study was conducted to evaluate the association between Liver Stiffness (LS) and elevated left atrial pressure (LAP) in individuals with MASLD. Methods: Asymptomatic patients with diabetes or obesity and MASLD, without alcoholic liver disease or positive hepatitis C serology, were recruited. After providing informed consent, participants underwent a comprehensive evaluation including transthoracic echocardiography according to the American Society of Echocardiography diastolic guidelines, transient hepatic elastography using the FibroScan® method, and complete laboratory testing. The study was approved by the Local Ethics Committee (protocol 7.172.537). The primary endpoint was to evaluate the association between the presence of significant LS and elevated LAP on echocardiography in patients with MASLD and preserved systolic function. A binary logistic regression model was used incorporating clinically rational predictors, including liver stiffness ≥8 kPa, age, sex, body mass index, and the presence of hypertension, diabetes, and dyslipidaemia. For all variables, the odds ratio (OR), 95% confidence interval (CI) and p-value were calculated. Resultados e Conclusions: A total of 111 patients were evaluated. Only age showed a normal distribution, with a mean of 60.0 years (SD 11.9). Hypertension was present in 74.6% of patients, while diabetes was observed in 70.3% of the sample. Median BMI was 31.9 kg/m² (IQR 28.2–36.3), haemoglobin A1c 6.9% (IQR 6.0–8.2), NT-proBNP 66 pg/mL (IQR 36–162) and C-reactive protein 2,2 mg/dL (IQR 0,9–5,9). Elevated HS and LAP were present in 41,6% and 23.9% of patients, respectively. Age (OR 1.25; p=0.016), BMI (OR 1.20; p=0.015), and hepatic stiffness ≥8 kPa (OR 9.88; p=0.049) were independently associated with elevated LAP. Other variables, including sex, hypertension, dyslipidaemia, and HbA1c, were not significant. The model explained approximately 34% of the variance in elevated LAP.

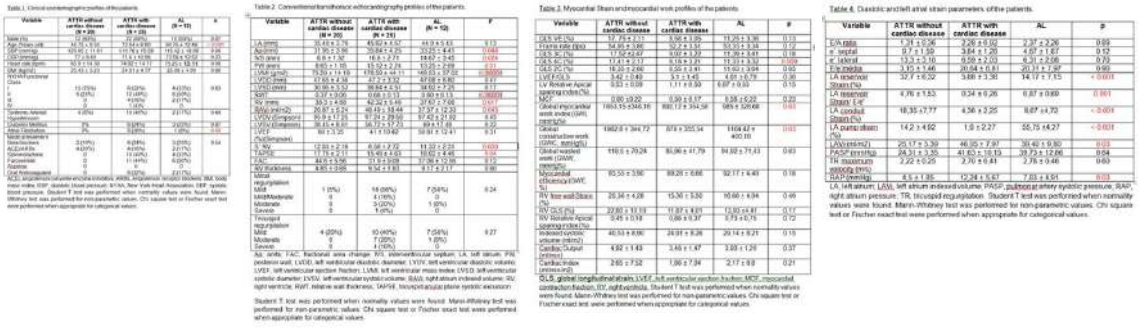
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MYOCARDIAL WORK ANALYSIS FOR THE DIFFERENTIAL DIAGNOSIS OF ATTR AND AL CARDIAC AMYLOIDOSIS

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Introduction/Background: Recently, patients diagnosed with cardiac amyloidosis (CA) have increased and impressive development of effective therapies was achieved. However, early diagnosis and defining the subtype of CA is essential for patient management. Myocardial work (MW) analysis by echocardiography is a promising tool and may add incremental value for this purpose. Objectives: To characterize myocardial work parameters in patients with transthyretin amyloidosis without cardiac involvement (ATTR), transthyretin cardiac amyloidosis (ATTR-CA), and light-chain cardiac amyloidosis (AL-CA). Methods: Fifty-seven patients were prospectively evaluated: ATTR (n=20), ATTR-CA (n=25), and AL-CA (n=12). All patients underwent clinical evaluation and comprehensive TTE, strain and MW analysis. Echocardiographic studies were acquired using the Vivid E95 system and analyzed offline with EchoPAC v203. Resultados e Conclusions: Results: Patients with ATTR were younger (p<0.001). Most patients were male. Atrial fibrillation was more prevalent in ATTR-CA. Compared with AL-CA, patients with ATTR-CA showed greater interventricular septal and posterior wall thickness, higher left ventricular (LV) mass index, and increased relative wall thickness. Conventional TTE parameters remained normal in ATTR. ATTR-CA patients also presented larger indexed biatrial volumes and higher right atrial pressure. Right ventricular (RV) systolic function, assessed by TAPSE and RV S' wave, was more impaired in ATTR-CA, while RV wall thickness was increased in both ATTR-CA and AL-CA compared with ATTR without CA. Despite preserved conventional TTE findings, ATTR exhibited mildly reduced LV global longitudinal strain (GLS). RV free-wall strain and RV GLS were significantly reduced in ATTR-CA and AL-CA. Global myocardial work index and global constructive work were more severely impaired in ATTR-CA than in AL-CA. Both ATTR-CA and AL-CA demonstrated increased LV and RV relative apical sparing indexes. Left atrial reservoir, conduit, and pump strain values were significantly lower in ATTR-CA compared with AL-CA. Conclusions: Although conventional TTE is insufficient for differentiating CA subtypes, integration of strain-derived cardiac mechanics and myocardial work parameters with clinical findings may improve discrimination between ATTR-CA and AL-CA. ATTR-CA patients demonstrated more advanced cardiac remodeling and greater impairment of LV, RV, and left atrial function, suggesting a more severe cardiac phenotype compared with AL-CA.



19869

PHENOTYPING OF ANABOLIC-ANDROGENIC STEROID–INDUCED CARDIOMYOPATHY: EARLY MYOCARDIAL DYSFUNCTION AND ACCELERATED CORONARY DISEASE

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Introduction/Background: Anabolic-androgenic steroid (AAS) misuse is an emerging cardiovascular risk factor. Unlike physiological athletic remodeling, AAS exposure induces a maladaptive phenotype driven by myocardial toxicity and chronic vascular injury, frequently undetected in early stages. Objectives: o define the imaging phenotype of AAS-induced cardiomyopathy and identify sensitive markers of early myocardial dysfunction. Methods: Structured review of studies from PubMed and LILACS including Speckle Tracking Echocardiography and Cardiac Magnetic Resonance. Parameters of cardiac geometry, myocardial strain, diastolic function, and coronary plaque burden were comparatively analyzed between chronic AAS users and controls. Resultados e Conclusions: AAS use is consistently associated with concentric remodeling, increased left ventricular (LV) mass, and focal fibrosis on cardiac magnetic resonance. Subclinical systolic dysfunction is a central feature, with significantly reduced global longitudinal strain (GLS) (−17.4% vs. −22.9%; p<0.01), despite only mildly reduced LV ejection fraction (49–52% vs. 63%).Left atrial (LA) dysfunction emerges as an early and robust marker, with LA strain <40% achieving 83.3% sensitivity and 92.1% specificity. Diastolic dysfunction is evident, with elevated filling pressures (E/e' 7.2 vs. 4.5), persisting even during off-cycle periods.Exposure burden is a key determinant of myocardial injury: annual duration of AAS use (β = −0.54; p<0.001) and LA volume independently predict strain impairment. Notably, cumulative exposure is associated with accelerated coronary atherosclerosis, with each 10 years of use corresponding to a 0.60 SD increase in plaque volume (p=0.008). AAS exposure defines a distinct cardiomyopathic phenotype characterized by early impairment in myocardial mechanics, atrial involvement, and premature coronary disease. Left atrial strain emerges as a highly sensitive marker of subclinical dysfunction. Multimodality imaging enables early detection and may redefine risk stratification in this population.

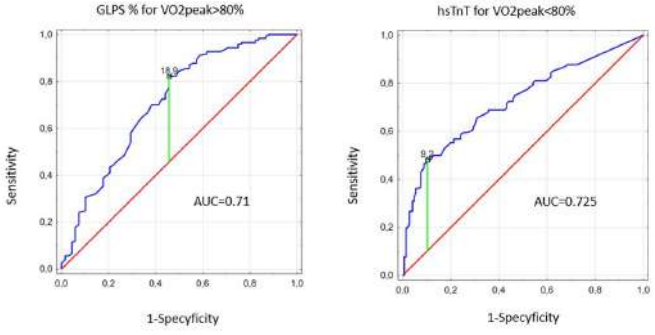
16561

PREDICTORS OF REDUCED EXERCISE CAPACITY IN PATIENTS WITH HEART FAILURE AND PRESERVED EJECTION FRACTION

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Introduction/Background: Background: Heart failure with preserved ejection fraction (HFpEF) is a highly heterogeneous syndrome. A significant proportion of these patients suffer from severely impaired exercise tolerance, which is a key clinical feature affecting their quality of life and prognosis. Objectives: Objective: To compare markers of functional impairment and identify clinical and biochemical predictors that differentiate HFpEF patients with reduced exercise capacity from those with preserved capacity. Methods: Methods: The study included 269 hospitalized patients diagnosed with HFpEF: 150 patients with non-reduced exercise capacity (VO2max >80% in spiroergometry; mean age 55 years) and 119 patients with reduced capacity (VO2max <80%; mean age 57 years). During hospitalization, patients underwent detailed clinical examination, echocardiography (Vivid E95), and non-invasive body composition analysis (Tanita). Laboratory assessments included NT-proBNP and modern biomarkers: Growth/differentiation factor 15 (GDF-15), galectin-3, fatty-acid-binding protein (FABP), copeptin, and Vascular Endothelial Growth Factor (VEGF), alongside ferritin and hsCRP. All patients completed symptom-limited cardiopulmonary exercise testing (CPET) on a cycle ergometer with metabolic gas analysis. Resultados e Conclusions: Compared with non-reduced exercise capacity, those with reduced VO2 max <80% exhibited increased left atrial volume index (LAVI; mediana 36 vs 31 mL/m², p=0.005), lower LVEF (mediana 63 vs 54%, p<0.0001) worse GLPS -18 vs -20, p<0,0001), lower TAPSE (24 vs 19 mm, p<0.0001) and higher E/E' (mediana 7.6 vs 8.7, p=0.004). Patients with markedly reduced exercise capacity revealed higher total body water (TBW mediana 39 vs35 kg, p<0.001), but no significant differences regarding BMI and fat. Metabolic and inflammatory markers were also higher in HFpEF patients with VO2max<80%: galectin (10 vs 8 ng/ml p=0.003), hsTnT (8,2 versus 4,6 ng/L p<0.0001) and NT-proBNP (264 vs 75 pg/ml, p<0.001). In multivariate logistic regression, global longitudinal peak strain (GLPS) <-18% (OR 2.9, 95% CI: 1.4–6.3, p=0.004) and hsTNT >9.2 (OR 4.8, 95% CI: 1.9–12.1, p=0.001) independently distinguished HFpEF patients with preserved and significantly reduced physical activity. Conclusions: The GLPS and hsTnT were identified as the strongest independent predictors of significant functional impairment underscoring the clinical utility of advanced echocardiographic strain analysis and biomarkers like hsTnT in the precise phenotyping of HFpEF.



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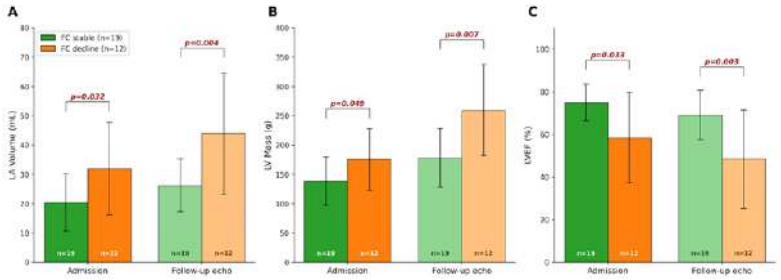
PROGRESSIVE ATRIOVENTRICULAR REMODELING DETERMINES FUNCTIONAL DECLINE AND SURVIVAL IN CHRONIC CHAGAS CARDIOMYOPATHY

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Introduction/Background: Chagas cardiomyopathy (CC) is driven by a persistent, low-grade inflammatory and fibrotic cascade that results in inexorable biventricular and atrial structural deterioration. Objectives: We hypothesized that progressive morphofunctional remodeling determines the rate of clinical decline, manifested as NYHA functional class (FC) worsening, serving as a direct putative mechanistic pathway to survival. Methods: We longitudinally evaluated 50 patients with chronic CC (age 51±9 years, 70% female), strictly in sinus rhythm at baseline, over an extensive follow-up at a tertiary center (mean 83.5±40.7 months). Serial echocardiographic assessments (parasternal long-axis) were utilized to derive LA volume (spherical model), LV mass (Devereux), and LVEF (Teichholz) at admission and at the study's conclusion, with paired data available for 34 patients. NYHA functional class (FC) worsening was defined as an increase of at least one class from baseline to final follow-up (ΔFC≥1). Clinical trajectories represented by ΔFC were mapped in 44 patients. LV dysfunction was defined a priori as LVEF <50%. Univariate logistic regression analysis identified predictors of survival, and the Spearman (ρ) coefficient assessed intervariable correlations. Resultados e Conclusions: At baseline, 82% had preserved LVEF. The incidence of de novo LV dysfunction was 0.94/100 person-years (95%CI [0.19–2.74]); of 9 patients with baseline dysfunction, 7 (78%) died. LVEF declined at 2.7±4.8%/year (p<0.001) while LV mass increased at 6.9±23.6 g/year (p=0.027). FC worsened in 18/44 patients (41%). Patients who worsened had larger final LA volume (44.0±20.7 mL vs 26.2±9.0 mL; p=0.004), lower final LVEF (47.4±22.4 % vs 69.1±11.7 %; p=0.003), and higher final LV mass (253.6±77.0 g vs 177.9±50.0 g; p=0.007) than those who remained stable (Figure). Per 1-NYHA class FC increase, ΔFC correlated with final LA (ρ=0.56, p=0.001), final LVEF (ρ=–0.61, p<0.001), and final LV mass (ρ=0.48, p=0.005). Non-survivors worsened FC faster than survivors (0.050±0.042 FC-class/year vs 0.003±0.006 FC-class/year; p<0.001), and any FC worsening was associated with increased mortality (OR=7.64; p=0.021). In Chagas cardiomyopathy, progressive ventricular and atrial remodeling is related to functional class worsening, which is strongly associated with survival. Integrating serial echocardiographic assessment with NYHA FC monitoring may improve early identification of high-risk patients.

Figure 2 — Cardiac Remodeling: FC Stable vs FC Decline (paired echocardiograms with FC data)



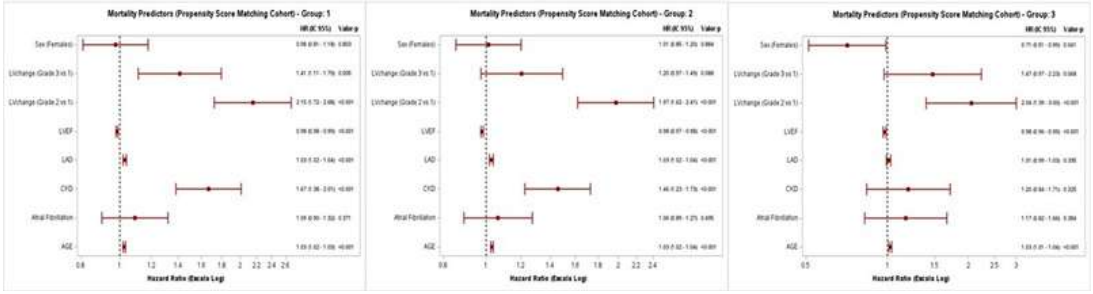
16140

SEX DIFFERENCES IN RESTING HEART RATE MODULATE PREDICTORS OF MORTALITY IN HEART FAILURE.

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Introduction/Background: Heart failure (HF) is associated with high morbidity and mortality. Persistent atrial fibrillation (PAF) adds further risk in these patients. However, sex differences in resting heart rate (RHR) and prognosis remain limited. Objectives: To evaluate how RHR modulates predictors of mortality in propensity-matched HF cohorts (RHR 1, 2, and 3). Methods: We conducted a retrospective cohort study of patients with HF evaluated between February 2017 and January 2024. Of 2,817 patients screened, propensity score matching yielded a final cohort of 1,662 patients: 1,059 men (63.7%), 603 women (36.3%). Baseline data included clinical characteristics and echocardiographic parameters. The left ventricular ejection fraction (LVEF) was categorized as improved (Grade 1), stable (Grade 2), or worsened (Grade 3). RHR was analyzed as continuous and categorical: RHR1 (<70 bpm), RHR2 (70–89 bpm), and RHR3 (≥90 bpm). The primary endpoint was all-cause mortality, analyzed using multivariable Cox regression. Resultados e Conclusions: In the RHR1 group (Figure: Group 1), lack of LVEF improvement (Grade 2 vs. Grade 1) was associated with increased mortality risk (HR = 2.13; p < 0.001), as was worsening (Grade 3) (HR = 1.41; p = 0.005). Chronic kidney disease (CKD) (HR = 1.67; p < 0.001), age (HR = 1.03; p < 0.001), and left atrial diameter (LAD) (HR = 1.03; p < 0.001) were independent predictors. LVEF had a protective effect (HR = 0.98; p < 0.001). In the RHR2 group (Figure: Group 2), unchanged LVEF (Grade 2 vs. 1) remained strongly associated with mortality (HR = 1.98; p < 0.001). CKD (HR = 1.45; p < 0.001), age (HR = 1.03; p < 0.001), and LAD (HR = 1.03; p < 0.001) were also significant, while LVEF had a protective effect (HR = 0.98; p < 0.001). In the RHR3 group (Figure: Group 3), unchanged LVEF (Grade 2 vs. 1; HR = 2.02; p < 0.001), and age remained associated with mortality (HR = 1.03; p < 0.001), and LVEF continued to be protective (HR = 0.98; p < 0.001). Females had lower mortality (HR = 0.71; p = 0.042), while CKD and other variables lost statistical significance. Conclusion: RHR modulates mortality predictors in HF. While LVEF variation remains a determinant across groups, the prognostic relevance of comorbidities such as CKD and LAD varies according to RHR profile. These findings support the incorporation of HR into risk stratification and clinical decision-making.



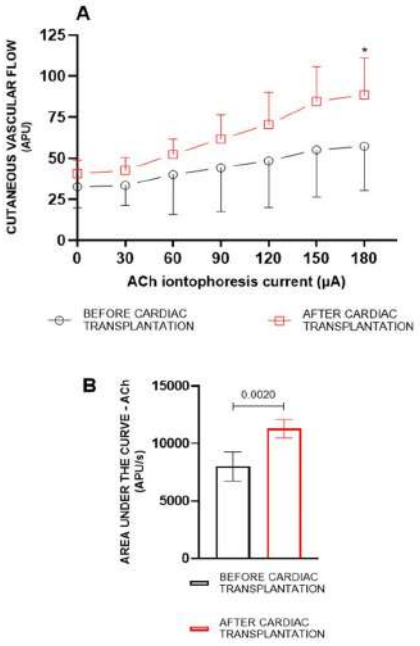
17666

SYSTEMIC MICROVASCULAR IMPROVEMENT IN PATIENTS UNDERGOING HEART TRANSPLANTATION

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Introduction/Background: Heart failure (HF) is a multifactorial syndrome characterized by structural or functional impairment of ventricular filling, resulting in significant morbidity and mortality. At the vascular level, endothelial dysfunction progresses in parallel with ventricular impairment. For patients who progress to refractory disease, advanced therapies such as heart transplantation (HT) or mechanical circulatory support become the only viable options. There is scarce evidence from patients evaluating the pattern of microvascular endothelial function after HT. Objectives: This study evaluated patients diagnosed with advanced HF, investigating the pattern of systemic microvascular dysfunction, assessed noninvasively both before and after HT. Methods: This was a prospective, cross-sectional study conducted at a quaternary referral center for advanced HF and HT, between March 2022 and April 2026. Six adult patients with advanced HF referred for HT were included. Cutaneous microvascular function was assessed both before and after HT, on the ventral forearm skin, using laser speckle contrast imaging (LSCI) coupled with pharmacological micro-iontophoresis. Drug delivery employed electrodes containing 200 µl of 2 % acetylcholine (ACh) solution for endothelial-dependent vasodilation. Incremental doses of ACh were delivered, and vasodilatory responses were expressed in arbitrary perfusion units (APU). Resultados e Conclusions: Patients listed for HT were aged 40.3 ± 12.7 years; 3 male. All patients had reduced left ventricular ejection fraction (LVEF), and the HF etiologies of HF were idiopathic (n=3), valvar (n=1), and post-myocarditis (n=1). Post-HF LVEF was 60.2±14.7%, and microvascular evaluation was performed 564.8±379.4 days after HT. The microvascular vasodilation induced by Ach iontophoresis (functional and endothelium-dependent) was 8,000 ± 1,264 APU/s before and 11,288 ± 817,3 APU/s after transplantation (P=0.002). The peak values of microvascular flow were higher after (93 ± 27 APU) than before (57 ± 27 APU) transplantation (P=0.027) (Figure 1A and 1B). The delta (peak-baseline) values of microvascular flow were also higher after (48 ± 19 APU) than before (25 ± 15 APU) transplantation (P=0.015). These data show for the first time with the employment of LSCI, a significant improvement in systemic microvascular endothelial function after HT. Additional patient recruitment will provide more robust and refined evaluation of the systemic microvascular effects of HT.



19870

THE HEART UNDER ATTACK IN DENGUE: CARDIOVASCULAR BURDEN, PREDICTORS OF SEVERITY, AND MORTALITY RISK

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Introduction/Background: Dengue is a rapidly expanding global disease with important cardiovascular implications. Beyond hypovolemia, systemic inflammation, endothelial dysfunction, and direct myocardial injury contribute to a broad and often underrecognized spectrum of cardiac involvement. Objectives: To delineate the cardiovascular phenotype associated with acute dengue infection and determine predictors of clinical severity and in-hospital mortality. Methods: Structured review of studies from PubMed, SciELO, and LILACS (2016–2026), excluding animal studies and reports without primary cardiovascular outcomes. Data on prevalence and predictors of adverse outcomes were analyzed, focusing on cardiac biomarkers (troponin I), electrocardiographic, and echocardiographic findings. Resultados e Conclusions: Cardiovascular events occur in 27.2% of dengue cases, with higher myocarditis prevalence in patients <20 years (33.8%). Acute infection markedly increases the risk of arrhythmias (aOR 18.4) and major adverse cardiovascular events (aOR 2.9). Myocarditis affects 4.2% of hospitalized patients and may progress to fulminant disease.In severe presentations, troponin I elevation is observed in 100% of cases, with ECG abnormalities in 59.5%. Echocardiography reveals right ventricular dilation (57%), left ventricular dilation (21%), and reduced ejection fraction (<55%) in 24%.Troponin I emerges as the strongest prognostic marker, independently predicting prolonged hospitalization (aOR 5.2) and conferring an eightfold increase in in-hospital mortality (aOR 8.2). Abnormal echocardiographic findings also independently predict adverse outcomes (aOR 4.3).Dengue-related mortality appears to involve not only hypovolemic shock but also direct cardiovascular involvement. Cardiac complications are frequent and clinically relevant, with potential prognostic implications. Troponin I may facilitate early identification of high-risk patients and should be incorporated into clinical assessment. Multimodal evaluation may improve risk stratification and clinical outcomes.

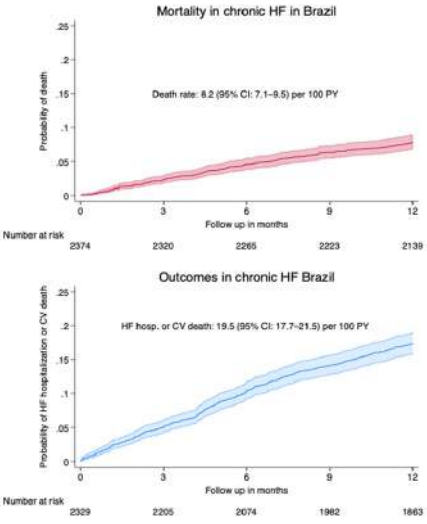
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TREATMENT PATTERNS AND OUTCOMES IN CHRONIC HEART FAILURE IN BRAZIL: A NATIONWIDE PROSPECTIVE STUDY

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Introduction/Background: Most evidence on heart failure (HF) derives from high-income settings and may not reflect the heterogeneity in socioeconomic conditions, healthcare access within a universal system, and HF etiology in Brazil. Contemporary nationwide data on treatment patterns and prognosis remain scarce. Objectives: To evaluate the use of HF-modifying therapies and clinical outcomes in patients with HF and reduced or mildly reduced ejection fraction in Brazil, and to assess regional variation. Methods: Prospective, multicenter cohort including patients ≥18 years with chronic HF and left ventricular ejection fraction (LVEF) <50%, enrolled from June 2021 to June 2024 across 30 sites in all five Brazilian macro-regions. Baseline characteristics and guideline-directed medical therapy (GDMT) were collected during outpatient visits. Follow-up was performed at 6 and 12 months. Endpoints were all-cause mortality and the composite of HF hospitalization or CV death at one year. Cox models assessed associations between geographic region and outcomes, adjusting for potential confounders. Resultados e Conclusions: Among 2,379 patients (age 61±14 years, 36% women, 25% White, LVEF 34%±9%), ischemic etiology was present in 37%, and Chagas cardiomyopathy in 11%. Socioeconomic burden was high (66% with low education level; median income US$ 243.00/month). Quadruple GDMT (renin-angiotensin system inhibitor, beta-blocker, mineralocorticoid receptor antagonist, and sodium-glucose cotransporter-2 inhibitor) was used in 28% (95% CI: 26%–30%) of patients and was similar across regions. All-cause mortality was 8.2 (95% CI: 7.1–9.5; Figure 1) and the rate of the composite endpoint 19.5 (95% CI: 17.7–21.5; Figure 2) per 100 person-years. Geographic region was not independently associated with all-cause death (p=0.15) or with the composite endpoint (p=0.33). In this nationwide contemporary cohort of chronic HF in Brazil, only one-quarter of patients received quadruple GDMT and approximately one in five experienced HF hospitalization or CV death at one year, with no significant regional differences. These findings reveal substantial gaps in HF care and highlight the need for strategies to improve implementation of evidence-based therapies.



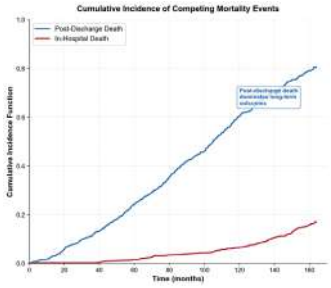
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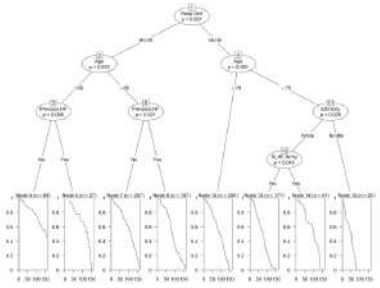
TWO-PATHWAY MORTALITY IN DECOMPENSATED HEART FAILURE: SOCIAL VULNERABILITY—FROM STRUCTURAL INEQUALITY TO MARITAL DISRUPTION—DRIVES POST-DISCHARGE DEATH

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Introduction/Background: Decompensated heart failure (DHF) mortality encompasses two competing events—in-hospital and post-discharge death—driven by potentially distinct biological and social mechanisms. Standard survival models that censor one event overestimate cumulative incidence and obscure the true prognostic architecture. Whether social determinants of health (SDH) and clinical variables differentially drive each competing outcome has not been established. Objectives: To disentangle the differential contributions of SDH and clinical variables to in-hospital versus post-discharge mortality in DHF, and to identify granular social vulnerability markers beyond broad contextual determinants. Methods: From 1,023 consecutive DHF patients at two centers (West Zone HDI 0.959 vs. North Zone HDI 0.814; median follow-up 6.9 years, IQR 4.4–9.9), Fine–Gray subdistribution hazard models were fitted separately for in-hospital death (n=110; 10.8%) and post-discharge death (n=656; 64.1%), with 26 covariates (α=0.10). Concurrently, Elastic Net logistic regression assessed granular SDH determinants of total mortality. Survival trees identified intersecting vulnerability phenotypes. Resultados e Conclusions: Post-discharge mortality was predominantly driven by social/structural variables: North Zone hospital (SHR 2.01, 95%CI 1.61–2.51; P<0.001), female sex (protective, SHR 0.79, 95%CI 0.68–0.91; P=0.001). In-hospital mortality was driven by clinical severity: severe LV dysfunction (SHR 2.25, 95%CI 1.35–3.77; P=0.002), chronic AF (SHR 1.85, 95%CI 1.24–2.75; P=0.003), prior HF (SHR 1.79; P=0.006). Severe dysfunction appeared “protective” post-discharge (SHR 0.62), reflecting survivor bias from early competing death. Elastic Net logistic regression identified granular SDH as powerful independent determinants: widowhood (OR 2.59, 95%CI 1.45–4.65; P=0.001), separation/divorce (OR 2.09; P=0.031), and middle/technical-level occupation (OR 1.85, 95%CI 1.15–2.96; P=0.011). Survival trees identified Brown/Black patients at the North Zone hospital as the highest-risk post-discharge node. This two-pathway model reveals that clinical severity determines early death whereas socioeconomic context—from broad structural inequality to granular social disruption—shapes long-term survival, supporting phase-specific and equity-informed interventions.





16685

VCAM-1 AS A BIOMARKER FOR EARLY CARDIAC PHENOTYPIC CHANGES IN FABRY DISEASE PATIENTS CARRYING THE GLA P.ARG363HIS VARIANT.

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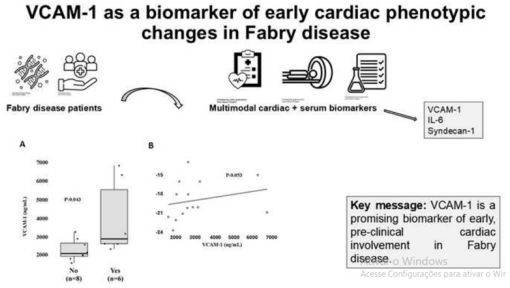
(1) HOSPITAL DE MESSEJANA - FORTALEZA - CE - BRASIL; (2) UFC - FORTALEZA - CE - BRASIL; (3) UNIVERSIDADE DE FORTALEZA - UNIFOR - FORTALEZA - CE - BRASIL;

Introduction/Background: Fabry Disease (FD) is a rare, X-linked inherited disorder caused by a deficiency of the enzyme alpha-galactosidase A, which results in the cellular and tissue accumulation of glycosphingolipids (Gb3/Lyso-Gb3). The most classic cardiac phenotype is Left Ventricular Hypertrophy, though this is a later marker of the disease. Biomarkers are measurable substances that indicate biological processes signaling pathological involvement, with early detection being a key desirable characteristic. Early detection of cardiac involvement in FD is necessary given the possibilities for early therapeutic intervention and the reduction of morbidity and mortality. Objectives: This study aims to compare the levels of biomarkers associated with inflammation/endothelial dysfunction versus the cardiac phenotype in a group of FD patients diagnosed after family cascade screening associated with a variant not previously described in the Brazilian population. Methods: This is a cross-sectional study for the clinical evaluation of patients carrying the GLA variant. Evaluations included cardiac screening exams such as electrocardiogram, echocardiogram, and cardiac magnetic resonance imaging to assess structural and functional changes. Additionally, biomarkers for inflammation and endothelial dysfunction—vascular cell adhesion molecule-1 (VCAM-1), IL-6, and Syndecan-1—were measured and compared to 30 control individuals. Resultados e Conclusions: Results: 14 patients were evaluated, consisting of 3 males (21.4%) and 11 females (78.6%). Patients had a mean age of 30 years, with a median of 6 (3-14) years of symptoms. The neurological system was identified as the primary symptomatology in 71.4% of cases, while the cardiovascular system accounted for 14.3%. Palpitations (50%) were the most common CV symptom. Only one patient presented a concentric LVH pattern (with a septum < 12mm). Diastolic dysfunction was present in 42.9%. Global longitudinal strain (GLS) was altered in 28.6%. Among the biomarkers, VCAM-1 was significantly higher compared to the control group (2,634.2 (2,048.7 - 3,173.6) ng/mL vs. 671.7 (490.3 - 765.1) ng/mL; p < 0.001). It was also elevated in patients with ventricular remodeling (p = 0.045) and showed a possible linear correlation with GLS (Rho = 0.526, p = 0.053). Conclusion: Elevated levels of VCAM-1 were found in FD patients compared to the control group, as well as higher levels in patients with ventricular remodeling and a trend toward correlation with GLS in patients with a pre-hypertrophic phenotypic pattern.

Table 3. Serum and urine biomarkers of patients with Fabry disease from the same family and control group.

	Control (n=31)	Fabry (n=14)	p-Value
Sex			0.11
Female	16 (51.60%)[2]	11 (78.60%)[2]	
Male	15 (48.40%)[2]	3 (21.40%)[2]	
Age (years)	29.00 (24.00 – 41.00)[1]	30.50 (24.00 – 48.00)[1]	0.649
Serum Creatinine (mg/dL)	0.70 (0.60 – 0.80)[1]	0.69 (0.59 – 0.77)[1]	>0.9
Albumin/creatinine ratio (mg/g-Cr)	7.04 (3.48 – 17.95)[1]	2.72 (1.65 – 19.31)[1]	0.868
Serum Syndecan-1 (ng/mL)	46.50 (36.80 – 66.80)[1]	58.10 (46.90 – 71.10)[1]	>0.9
Serum VCAM-1 (ng/mL)	671.70 (490.30 – 765.10)[1]	2,634.2 (2,048.70 – 3,173.60)[1]	**<0.001**
Serum IL-6 (pg/mL)	ND	15.0 ± 4.70[3]	**<0.001**

Data presented as [1]median and interquartile range (Q1 - Q3); [2]absolute and percentage count; [3]mean ± standard deviation.



Interventional Cardiology



81º CONGRESSO BRASILEIRO DE CARDIOLOGIA together with WORLD CONGRESS OF CARDIOLOGY





19790

A NOVEL AI - DERIVED FORWARD-VALIDATED PREDICTION SCORE (“BASE- BALLOON SUCCESS EVALUATION SCORE) FOR OUTCOMES IN BALLOON MITRAL VALVOTOMY– LOOKING BEYOND THE WILKINS’!!

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Introduction/Background: Determining the success of BMV has been attempted by many authors but risks cores to determine both BMV success and risk predictionm for post BMV Mitral regurgitation are not available Objectives: Aims: (1) To determine predictors of BMV success at our high-volume centre and (2) Generate an indigenous score for predicting BMV outcomes and validate it for accuracy. Methods: We are amont the largest BMV providing centres in the world with a database of 35000-plus procedures Material and methods: Data from 2625 patients (Males=1390) undergoing BMV was analysed and parameters studied for “success” of BMV and occurrence of post-BMV regurgitation. Predictors of success and MR were determined using both Multivariate regression and Machine learning. A composite score was generated and prospectively applied to 450 patients for determining accuracy. Resultados e Conclusions: Results: SEVEN predictors of success were determined by stepwise logistic regression and weighted as per their strength of association to create a prediction model. We categorised SIX as Binary variates: LA diameter > 55 mm with IAS septal bulge> 25 mm from midline:1, without the same as 2;Mobile leaflets in diastole as 2: lack of mobility as 1; Severe subvalve disease upto leaflet tip as 1, without as 2; ICDS v/s HBBS as 2 and 1 respectively, Rhythm: AF :0, SR:2 and RV systolic pressure for PAH: 0 if RVSP>70 mm, 2 if <70 mm Hg. Bicommissural fusion was graded as continuous variable: Both commissures fused without calcium:0,Partial fusion:1,commissural calcium nodule: 2.Of total score of 14, there was linear increase in immediate BMV success as the score increased in tertiles of < 7, 8-10 and > /=11. We used Precision-Recall curves for forward Validation analysis in 450 patients. The score could predict successful BMV outcomes (77% chance of success) as well as showed good prediction of MR: 86% accuracy in last tertile compared with only 21% patients in first (p < 0.001). It improvised upon Wilkins score in that in patients with Wilkins score >8, BASE score > 11 predicted BOTH positive and negative outcomes. This aspect is NOT COVERED by any existing score in literature Conclusion: Our clinical + echo-based score improvises upon current scores for successful BMV outcomes, ALONG WITH additionally good predictability of post – BMV possibility of MR. This is the first such score in rheumatic MS patients in world literature.

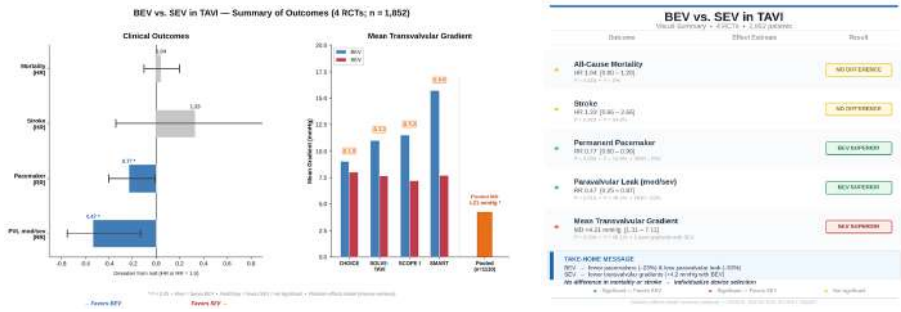
16715

CLINICAL OUTCOMES AND HEMODYNAMIC PERFORMANCE OF SELF-EXPANDING VERSUS BALLOON-EXPANDABLE VALVES IN TAVI: A SYSTEMATIC REVIEW AND META-ANALYSIS

OTAVIO AUGUSTO OLIVEIRA DE ARAGAO ARAGAO ARAGAO1; LEO NOANH CONSOLI CONSOLI2; ANDRE BASTOS PAIXAO PAIXAO1; SERGIO COSTA TAVARES FILHO TAVARES3; LAWRENCE ANDRADE ARAUJO ARAUJO1; WERSLEY ARAÚJO SILVA ARAUJO1; RAFAEL ALEXANDRE MENEGUZ-MORENO MENEGUZ MORENO1; ANTONIO TERCIO OLIVEIRA DE ALMEIDA OLIVEIRA1; ALLYSSON MATOS PORTO SILVA PORTO SILVA1; RICARDO F.O SURUAGY-MOTTA SURUAGY-MOTTA4; TATIANA BASTOS TATIANA1;

(1) ANGIOCOR / HOSPITAL CIRURGIA - ARACAJU - SE - BRASIL; (2) UNIVERSIDADE FEDERAL DA BAHIA - SALVADOR - BA - BRASIL; (3) HOSPITAL PRIMAVERA - ARACAJU - SE - BRASIL; (4) CESMAC - MACEIÓ - AL - BRASIL;

Introduction/Background: The choice of transcatheter heart valve platform remains a clinically relevant debate for transcatheter aortic valve implantation (TAVI). Balloon-expandable (BEV) and self-expanding valves (SEV) differ in implantation mechanism, hemodynamic profile, and complication rates. Head-to-head randomized controlled trials (RCTs) are scarce, and quantitative synthesis of available data may guide individualized device selection. Objectives: To compare clinical and hemodynamic outcomes between BEVs and SEVs in patients undergoing TAVI. Methods: We searched Pubmed, Embase and the Cochrane Library for RCTs comparing BEVs versus SEVs from inception to March 2026. Binary outcomes were synthesized as risk ratios (RRs) if short-term, or hazard ratio (HR), if long-term, with 95% confidence intervals (CIs). Continuous endpoints were estimated as mean difference (MD). Pooled estimates were calculated using a random-effects meta-analysis model. Statistical significance was defined as a two-tailed p-value<0.05. Between-study heterogeneity was assessed by the I² statistic. R studio was used for all analyses. Resultados e Conclusions: Four RCTs were included (CHOICE, SOLVE-TAVI, SCOPE I, SMART; n=1,852). No significant difference was observed in all-cause mortality (HR 1.04; 95% CI 0.90–1.20; p=0.625; I²=0%) or stroke (HR 1.33; 95% CI 0.66–2.66; p=0.423; I²=). BEV was associated with lower rates of permanent pacemaker implantation (RR 0.77; 95% CI 0.60–0.99; p=0.039; I²=24.6%) and moderate/severe paravalvular regurgitation (RR 0.47; 95% CI 0.25–0.87; p=0.016; I²=49.4%). Hemodynamically, effective orifice area was similar between platforms, but BEV demonstrated higher mean transvalvular gradients compared to SEV, reflecting the intra-annular implantation design of balloon-expandable devices. Device selection in TAVI should be individualized, favoring BEV when paravalvular leak or pacemaker risk is a concern, and SEV in patients at risk for prosthesis-patient mismatch.



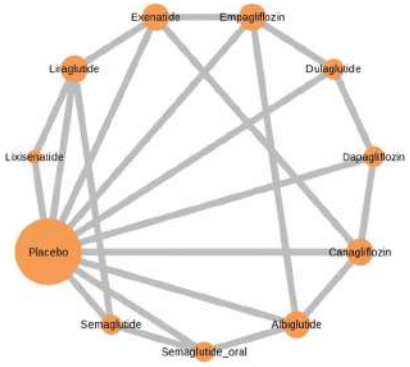
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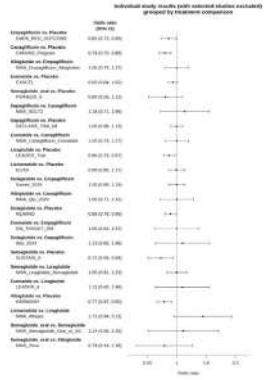
COMPARATIVE CARDIOVASCULAR EFFICACY OF SGLT2 INHIBITORS AND GLP-1 RECEPTOR AGONISTS: A BAYESIAN NETWORK META-ANALYSIS OF 22 RANDOMIZED TRIALS

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Introduction/Background: SGLT2 inhibitors and GLP-1 receptor agonists reduce major adverse cardiovascular events (MACE) in patients with type 2 diabetes. However, no large-scale head-to-head trials have directly compared these two classes. A network meta-analysis that jointly synthesizes evidence from both classes enables indirect comparisons and provides a probabilistic ranking of treatment efficacy Objectives: To indirectly compare the efficacy of SGLT2 inhibitors and GLP-1 receptor agonists in reducing MACE in patients with type 2 diabetes, and to rank treatments by their probability of being the most effective. Methods: Bayesian network meta-analysis of 22 two-arm RCTs (N=124,112) from cardiovascular outcome trials. Compared 11 treatments: three SGLT2 inhibitors (canagliflozin, dapagliflozin, empagliflozin), seven GLP-1 agonists (albiglutide, dulaglutide, exenatide, liraglutide, lixisenatide, subcutaneous semaglutide, oral semaglutide), and placebo. Primary outcome: MACE (cardiovascular death, nonfatal MI, nonfatal stroke). Random-effects model. Ranking by SUCRA. Resultados e Conclusions: Versus placebo, significant MACE reduction was seen with subcutaneous semaglutide (OR 0.773; 95% CrI 0.631–0.931), albiglutide (0.807; 0.703–0.939), canagliflozin (0.816; 0.716–0.934), liraglutide (0.822; 0.702–0.943), and empagliflozin (0.855; 0.747–0.978). Dulaglutide (0.880) and exenatide (0.899) had CrIs crossing unity. Dapagliflozin, lixisenatide, and oral semaglutide were not superior. SUCRA ranking: subcutaneous semaglutide (81.4%), oral semaglutide (76.1%), albiglutide (71.9%), canagliflozin (70.2%), liraglutide (66.9%), empagliflozin (55.7%), dulaglutide (46.1%), exenatide (40.3%), dapagliflozin (18.8%), placebo (11.3%), lixisenatide (11.3%). Heterogeneity low (sd=0.05). Subcutaneous semaglutide, albiglutide, canagliflozin, liraglutide, and empagliflozin significantly reduced MACE odds versus placebo. Subcutaneous semaglutide ranked highest in efficacy. This mixed-class approach supports therapeutic choice when either class is indicated.





18704

COMPLICATIONS AFTER TRANSCATHETER AORTIC VALVE IMPLANTATION AND THE IMPORTANCE OF SPECIALIZED CARE

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(1) HOSPITAL DE CLINICAS DE PORTO ALEGRE - PORTO ALEGRE - RS - BRASIL;

Introduction/Background: Transcatheter aortic valve implantation (TAVI) has emerged as an effective therapeutic option for patients with severe aortic stenosis, particularly those at high surgical risk. Despite technological advances, cardiovascular and systemic complications may occur in the peri-operative period, requiring intensive monitoring and specialized care in a coronary intensive care unit (ICU). Objectives: To describe patient characteristics and the main complications associated with TAVI in a coronary ICU. Methods: This cross-sectional, descriptive study was conducted from May to December 2025, including patients undergoing TAVI in a high-complexity cardiovascular referral center and admitted to a coronary ICU. Sociodemographic and clinical variables, peri-operative complications, ICU and hospital length of stay, and clinical outcomes were analyzed. The study was approved by the Institutional Research Ethics Committee (CAAE: 91641525.0.0000.5327) Resultados e Conclusions: : A total of 62 patients were included, with a mean age of 81±2 years and a predominance of males (53.7%). Most patients were white (88.1%), had incomplete elementary education (46.8%), and were from the interior of the state (44.8%) or Porto Alegre (30.6%). The majority were treated through the Brazilian Unified Health System (85.1%). Systemic arterial hypertension was present in 68.7% of cases. The mean procedural time was 78±3 minutes. Intra-procedural complications occurred in 28.4% of patients. Left bundle branch block was the most frequent event (25.4%), followed by vascular access site bleeding (11.9%). Early ambulation within 24 hours occurred in 71.7% of cases. Mean length of stay was 2±1 days in the coronary ICU and 5±2 days in the hospital. In-hospital mortality was 6.5%. Although most patients had favorable outcomes, branch conduction disturbances and vascular complications remain clinically relevant after TAVI. In this context, nursing care in the coronary ICU plays a key role in early detection of clinical changes, continuous monitoring, and timely interventions, contributing to patient safety and improved outcomes. These findings also reinforce the importance of structured post-procedural education strategies to enhance continuity of care, prevent complications, and support safer recovery.

14483

DISTAL RADIAL ACCESS IN THE ANATOMICAL SNUFFBOX VERSUS CONVENTIONAL RADIAL ACCESS FOR CORONARY ANGIOGRAPHY AND PCI: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED TRIALS

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Introduction/Background: Distal radial access (DRA) through the anatomical snuffbox has emerged as an alternative to conventional transradial access (TRA) for coronary angiography and percutaneous coronary intervention, with potential benefits in radial artery preservation and access-site safety. Objectives: To compare distal radial access (DRA) versus transradial access (TRA) for efficacy and safety in invasive coronary procedures. Methods: A PRISMA 2020 systematic review was performed using randomized evidence identified in PubMed and related indexed sources. Placebo is not applicable; therefore, only randomized head-to-head trials of DRA versus TRA for coronary angiography with or without PCI were considered. Quantitative estimates were based on a random-effects meta-analytic framework (DerSimonian–Laird). Effect measures were risk ratios (RR) for dichotomous outcomes and standardized mean differences (SMD) or mean differences (MD) for continuous outcomes. Between-study heterogeneity was assessed using I^2 and τ^2 statistics. Prespecified subgroup analyses (including STEMI and procedural setting) and leave-one-out sensitivity analyses were performed to explore robustness. Risk of bias was assessed using RoB 2, and certainty of evidence was judged using GRADE. Resultados e Conclusions: Fourteen randomized trials enrolling 6,208 patients were synthesized. Key trials included DAPRAO (Eid-Lidt, 2021), DISCO RADIAL (Aminian et al., 2022), the STEMI RCT by Wang et al. (2022), ANTARES (Koziński et al., 2023), and RAPID III (Li et al., 2025). DRA reduced radial artery occlusion at the longest follow-up (RR 0.36, 95% CI 0.23-0.56; p<0.001; I^2=28.3%) and in-hospital occlusion (RR 0.32, 95% CI 0.19-0.53; p<0.001; I^2=29.0%), and lowered EASY ≥II hematoma (RR 0.51, 95% CI 0.27-0.96; p=0.04). By contrast, DRA increased crossover (RR 3.08, 95% CI 1.88-5.06; p<0.001), puncture attempts (SMD 0.59, 95% CI 0.48-0.69; p<0.001), puncture time (SMD 3.56, 95% CI 0.96-6.16; p<0.001), and sheath insertion time (SMD 0.37, 95% CI 0.16-0.58; p<0.001). In emergency/STEMI subgroup analyses, the reduction in occlusion remained consistent overall, with shorter hemostasis time and no clear penalty in procedural success or safety. We judged certainty as moderate for radial artery occlusion and low-to-moderate for procedural efficiency outcomes. Overall, DRA offers a vessel-preserving strategy with lower occlusion and hematoma rates, at the cost of more challenging cannulation; it appears particularly attractive when radial preservation is clinically relevant.

18406

GENDER DISPARITIES IN CORONARY ARTERY BYPASS GRAFTING IN RIO DE JANEIRO: ADMISSIONS, LENGTH OF STAY, AND MORTALITY

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Introduction/Background: Coronary artery disease imposes a substantial burden of morbidity and mortality in Brazil, and coronary artery bypass grafting (CABG) remains a cornerstone therapeutic approach for complex cases within the Unified Health System (SUS). Although literature indicates worse outcomes in women, who are frequently subjected to intervention at more advanced stages, there is a gap in real-world data quantifying this inequity in large urban centers over historical series. Rio de Janeiro, located in the Southeast region — responsible for 45.9% of CABG admissions in the country between 2008 and 2026 — represents a strategic setting to assess these asymmetries and inform public health policy. Objectives: To evaluate sex disparities in the in-hospital outcomes of patients undergoing CABG through the SUS in Rio de Janeiro, with an emphasis on admission volume, in-hospital mortality, and length of stay. Methods: A descriptive ecological study with time-series analysis, based on secondary data from the SUS Hospital Information System (SIH/SUS). All CABG admissions in the municipality of Rio de Janeiro between January 2008 and February 2026 were analyzed and stratified by sex. The variables admission frequency, deaths, and length of stay were organized and analyzed descriptively, with a comparison between sexes over the study period. Resultados e Conclusions: Of 12,293 CABG admissions in Rio de Janeiro (2008-2026), 8,594 were men (69.9%) and 3,699 were women (30.1%), yielding a persistent 2.3:1 ratio. This disparity was consistent across all surgical modalities. Female mortality reached 11.0% (406 deaths), 54.9% higher than the male rate of 7.1% (606 deaths). Mean hospital stay was also significantly longer for women (20.29 vs. 18.43 days). These results underscore a marked sex asymmetry in surgical outcomes. Lower female volume, coupled with higher mortality and prolonged stay, suggests that women are often referred later with more advanced disease and complex clinical profiles. Such disparities likely stem from atypical symptom presentation, diagnostic delays, and unequal access to cardiovascular interventions within the Brazilian Unified Health System (SUS). These findings highlight urgent gaps in equitable care in large urban centers. Targeted public health strategies, including gender-sensitive referral protocols and early detection programs, are essential to mitigate these inequities, optimize resource allocation, and improve survival and recovery for female patients undergoing CABG.

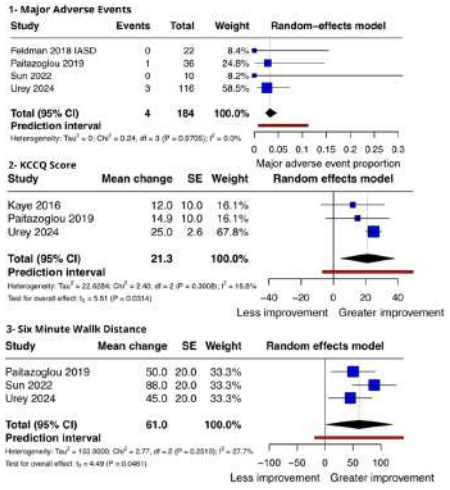
15776

INTERATRIAL SHUNT DEVICES IN HEART FAILURE WITH PRESERVED AND MILDLY REDUCED EJECTION FRACTION: A SINGLE-ARM SYSTEMATIC REVIEW AND META-ANALYSIS OF HEMODYNAMIC AND CLINICAL OUTCOMES

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Introduction/Background: Heart failure with preserved and mildly reduced ejection fraction (HFpEF/HFmrEF) is characterized by elevated left atrial pressure and limited therapeutic options. Interatrial shunt devices have emerged as a novel strategy to reduce left-sided filling pressures and improve symptoms. However, evidence remains fragmented across early-phase studies. Objectives: To evaluate the safety, hemodynamic effects, and clinical outcomes of interatrial shunt devices in patients with HFpEF and HFmrEF through a systematic review and single-arm meta-analysis. Methods: This systematic review and meta-analysis followed PRISMA guidelines. PubMed, Embase, and Cochrane Library were searched from inception to April 9, 2026, for studies evaluating interatrial shunt therapies in HFpEF/HFmrEF. Eligible studies included cohorts and clinical trials reporting safety, hemodynamic, or functional outcomes. The primary outcome was change in pulmonary capillary wedge pressure (PCWP), with secondary outcomes including major adverse events, 6-minute walk distance (6MWD), and KCCQ score. Random-effects models (REML) were used; proportions were pooled with logit transformation and continuous outcomes as mean differences. Resultados e Conclusions: A total of 311 patients across five studies were included in this analysis. Interatrial shunt therapy demonstrated a low pooled major adverse event rate (~3–4%), with no significant heterogeneity ($I^2 \approx 0\%$), supporting procedural safety. Significant improvements were observed in functional capacity, with a pooled increase in 6-minute walk distance, as well as in quality of life, reflected by clinically meaningful gains in KCCQ scores. Hemodynamic outcomes consistently showed reductions in pulmonary capillary wedge pressure, indicating effective left atrial decompression across studies. Collectively, these findings suggest that interatrial shunt devices represent a promising, mechanism-based therapeutic strategy targeting elevated left atrial pressure in HFpEF/HFmrEF, with a favorable safety profile and consistent improvements in symptoms and hemodynamics.



21446

INTRAVASCULAR ULTRASOUND (IVUS) VERSUS ANGIOGRAPHY-GUIDED PERCUTANEOUS CORONARY INTERVENTION FOR UNPROTECTED LEFT MAIN CORONARY ARTERY DISEASE (ULMCA): AN UPDATED SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS.

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(1) UNIG - NOVA IGUAÇU - RJ - BRASIL; (2) UNIVERSIDADE DO ESTADO DO PARA (UEPA) - BELÉM - PA - BRASIL; (3) INSTITUTO DANTE PAZZANESE DE CARDIOLOGIA - SAO PAULO - SP - BRASIL; (4) UNIVERSIDADE DO OESTE PAULISTA - UNOESTE - PRESIDENTE PRUDENTE - SP - BRASIL; (5) PUCRS - PORTO ALEGRE - RS - BRASIL;

Introduction/Background: Percutaneous coronary intervention (PCI) for unprotected left main coronary artery disease (ULMCA) is associated with substantial procedural complexity and major prognostic implications. Intravascular ultrasound (IVUS) guidance may optimize stent deployment and improve clinical outcomes, yet evidence from randomized controlled trials (RCTs) remains inconclusive in this specific anatomical subset. Objectives: To evaluate the efficacy and safety of IVUS-guided versus angiography-guided PCI in patients with ULMCA disease. Methods: RCTs comparing IVUS-guided with angiography-guided PCI in ULMCA patients were eligible. Outcomes of interest included mortality from cardiovascular causes (cardiovascular mortality) and myocardial infarction (MI). The longest available follow-up from each trial was analyzed. Pooled risk ratios (RR) with 95% confidence intervals (CI) were calculated using Mantel-Haenszel random-effects models. Confidence intervals were computed by the Hartung-Knapp-Sidik-Jonkman method. Between-study heterogeneity was assessed using I^2 statistics and Tau^2 estimated by the Restricted Maximum-Likelihood method. Statistical analysis was performed using Review Manager (version 5.4). This study was prospectively registered in PROSPERO and conducted following PRISMA guidelines. Resultados e Conclusions: Four RCTs were included (BENDARY, MING, TAN and TESTA), comprising 719 patients in the IVUS-guided arm and 727 in the angiography-guided arm (total N = 1,446). For cardiovascular mortality, the pooled RR was 0.66 (95% CI: 0.18–2.40), with no statistically significant difference between groups (of note, for BENDARY we used all-cause mortality due to a lack of data of on cardiovascular mortality). Moderate heterogeneity was observed (I^2 = 34%; Tau^2 = 0.27; Chi^2 = 4.52, P = 0.21). For myocardial infarction, the pooled RR was 0.86 (95% CI: 0.50–1.46), also non-significant with negligible heterogeneity (I^2 = 0%; Tau^2 = 0.00; Chi^2 = 1.85, P = 0.60). Total MI events were 37 (IVUS) versus 45 (angiography). In conclusion, in patients undergoing PCI for ULMCA disease, IVUS guidance did not demonstrate a statistically significant reduction in cardiovascular mortality or myocardial infarction compared with angiography guidance. The point estimates favored IVUS for mortality (RR 0.66), though confidence intervals were wide, reflecting limited statistical power. These findings underscore the need for larger, adequately powered RCTs to better establish the role of IVUS guidance in this high-risk anatomical subset.

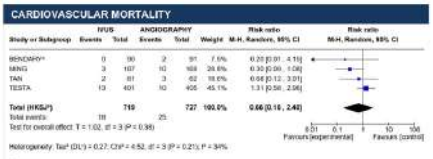


Table 1: Patients Characteristics

Author	Testa	Ming	Bendary	Tan
Follow-up (y)	3y	5y	1y	3y
Patients (n)	806	336	181	123
Age (y)	71,4 +- 10,7	65,1 +- 10,9	62+-9	76,19 +- 4,29
BMI ⚖	27,7 +- 5,0	24 +- 3,4	27,47+-2,94	NA
PAD ✿	109 (13.5)	32 (9.5)	21 (11.6)	NA
Prior CABG ·	17 (2.1)	4 (1.1)	2 (1.1)	NA
HBP †	639 (79.2)	238 (70.8)	129 (71.3)	54 (43.9)
Prior MI ✦	190(23.5)	53 (15.7)	29 (16)	23 (18.6)
DLP ♡	611 (75.8)	127 (37.7)	125 (69.1)	NA
UA ⅄	81 (10)	253 (75.2)	NA	84 (68.2)
Prior PCI ⟡	205 (25.4)	61 (18.1)	59 (32.6)	NA
DM ⁂	280 (34.7)	108 (32.1)	119 (65.7)	39 (31.7)
Prior stroke	NA	NA	6 (3.3)	17 (13.8)
Smoker	113 (14)	122 (36.3)	102 (56.4)	56 (45.5)

Abbreviations: y: Years; n : Numbers ; ⚖: Body mass index ; ✿ : Peripheral arterial disease ; † : Previous myocardial revascularization surgery ; † : Hypertension ; ✦ : Previous myocardial infarction ; ♡: dyslipidemia ; ⅄: Unstable angina ; ⟡ ; Previous Percutaneous Coronary Intervention ; ⁂ : Diabetes mellitus

16761

Long Term Clinical Outcomes of a Bioresorbable Scaffold Pilot Study with Complete Intravascular Imaging Use

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Introduction/Background: Background: The safety and performance of the absorb bioresorbable vascular scaffold (brs) (Abbott vascular, santa clara, ca) has been previously demonstrated with clinical data. However, these trials included patients with simple lesions. Absorb III, IV and AIDA trials demonstrated an excess of adverse events following brs implantation, though scarce was intravascular imaging use in these studies. Objectives: Objetctives: Aiming to evaluate clinical outcomes, we analyzed 9 years clinical follow up of a pilot study from a single center, including real world patients treated with brs implantation using optimal technique and complete intravascular image guidance in all cases. Methods: Methods: Observational prospective pilot study, including 100 patients treated with brs implantation from 12/2014 to 10/2016. Safety and efficacy outcomes were analyzed for in-hospital and 10 years follow-up . Resultados e Conclusions: Results: Mean age was 58.1 years; 88% were male, 31% had diabetes, and 28% presented with acute coronary syndromes. A total of 171 lesions in 141 vessels were treated with 190 brs (mean 1.9 scaffolds/patient). Further intervention following intravascular imaging to optimize brs implantation was required in 31% of patients. Procedure success was 100%. Median follow up 9.5 (25 th percentile 9.2, 75th percentile 10.1) years. Through latest follow-up no patient experienced a cardiac death or definite scaffold thrombosis. Major adverse cardiac events (the composite of all-cause death, any MI, or any revascularization) occurred in 29 patients (Kaplan-Meier estimated 10-year rate 29.4%); target vessel failure (TVF) (the composite of cardiac death, TVMI, or ischemia-driven target-vessel revascularization) occurred in 15 patients (10-year rate 15.0%); and target lesion failure (TLF) (the composite of cardiac death, TVMI or ischemia-driven target-lesion revascularization) occurred in 10 patients (10-year rate 10.0%). In landmark analysis, TVF between 3 and 10 years occurred in 7 patients (7.6%). Conclusions: In this real-world experience from this single center, long-term outcomes of BVS implanted in simple and complex coronary lesions with optimal technique including routine IVI guidance, were favorable, with no scaffold thrombosis.

16767

LONG-TERM DURABILITY OF TRANSCATHETER AORTIC VALVE IMPLANTATION VERSUS SURGICAL AORTIC VALVE REPLACEMENT IN PATIENTS WITH LOW-RISK AORTIC STENOSIS: A META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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Introduction/Background: Transcatheter aortic valve implantation (TAVI) has emerged as a standard alternative to surgical replacement (SAVR), yet its late durability in low-risk patients remains under investigation. We aimed to systematically evaluate valve integrity and reintervention in low-surgical-risk patients after long-term follow-up. Objectives: To compare long-term valve durability between TAVI and SAVR in low-risk patients with severe aortic stenosis through a systematic review and meta-analysis of randomized controlled trials. Methods: We searched Pubmed, Embase and the Cochrane Library from inception to March 2026 for randomized trials meeting eligibility criteria. We synthesized outcomes as hazard ratio (HR) or risk ratio (RR) with 95% confidence intervals (CIs) using a random-effects meta-analysis model. A two-tailed p-value <0.05 was considered statistically significant. Between-study heterogeneity was estimated with the I2 statistic. All analyses were performed in R studio. Resultados e Conclusions: We included three randomized trials encompassing 2639 patients (follow-up 7 to 10 years). No statistically significant difference was observed for a composite of bioprosthetic valve failure or reintervention (HR 1.06; 95% CI 0.63-1.79; P=0.82; I2= 67.4%), for reintervention alone (HR 1.42; 95% CI 0.96-2.12; P=0.08; I2=24.5%), bioprosthetic valve failure alone (HR 0.82; 95% CI 0.55-1.22; P=0.33; I2=0.0%) or structural valve deterioration (HR 0.84; 95% CI 0.58-1.23; P=0.37; I2=0.0%). Moderate or greater paravalvular leak at 5-years was more frequent in the TAVI group (RR 5.54; 95% CI 1.25-24.54; P=0.02; I2=0.0%). In low-risk patients with severe aortic stenosis, TAVI and SAVR demonstrated comparable rates of bioprosthetic valve failure, structural valve deterioration, and reintervention at mid-to-long-term follow-up. However, paravalvular leak of at least moderate severity was significantly more frequent after TAVI at 5-years, and a non-significant trend towards more reinterventions was observed.



18950

OUTCOMES OF ALTERNATIVE ACCESS ROUTES IN PATIENTS WITH CONTRAINDICATIONS TO TRANSFEMORAL ACCESS IN TAVI: A SYSTEMATIC REVIEW.

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(1) UNIVERSIDADE CHRISTUS - FORTALEZA - CE - BRASIL; (2) HOSPITAL DE MESSEJANA - FORTALEZA - CE - BRASIL;

Introduction/Background: Transcatheter aortic valve implantation (TAVI) is a minimally invasive procedure for the treatment of severe aortic stenosis, in which a prosthetic valve is implanted via a catheter. The transfemoral approach is the most commonly used. However, there are contraindications that include inadequate valve anatomy, active infection (endocarditis), the presence of intracardiac thrombi, and the inability to achieve safe vascular access, such as in highly calcified or small-diameter arteries, as these conditions increase the risk of complications, hinder proper prosthesis implantation, or reduce the clinical benefit of the procedure. Objectives: To compare stroke and mortality outcomes among different alternative TAVI techniques in patients with contraindications to the transfemoral approach. Methods: Following the PRISMA protocol. A search was conducted in the PubMed and Scopus databases using the search terms “Transcatheter Aortic Valve Replacement AND Vascular Access Devices AND Peripheral Arterial Disease” applied to title, abstract, and keywords. Full-text articles published in the last 10 years in English and Portuguese were included. Eligible studies included patients with contraindications to transfemoral access in TAVI. Primary outcomes were stroke and mortality; secondary outcomes included vascular complications, bleeding, and procedural success. Three reviewers independently selected the studies and extracted data using Rayyan, with a fourth reviewer resolving any discrepancies. Resultados e Conclusions: Of the 87 records identified, 9 met the inclusion criteria, all of which were clinical trials. The studies demonstrate that transcatheter aortic valve implantation (TAVR) is a safe and effective procedure, even in complex situations. The incidence of stroke ranges from 1% to 3% in large studies, while smaller series report no events, likely due to small sample sizes. Thirty-day mortality has decreased over time, from approximately 8% in earlier studies to about 4–5% in more recent analyses. Stroke stands out as the primary adverse prognostic factor, being associated with a significant increase in mortality. Thus, its prevention is essential. In addition, new approaches and devices have expanded the applicability of TAVR in patients with unfavorable anatomy. Taken together, the data indicate good clinical outcomes with low complication rates, although studies with larger patient cohorts are needed to confirm these findings.

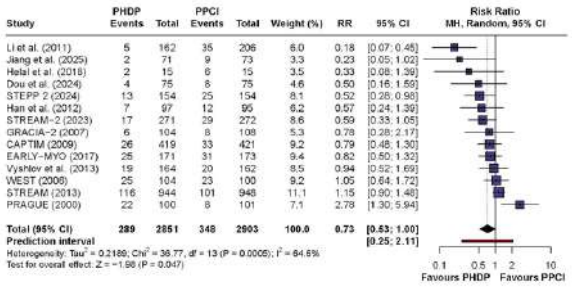
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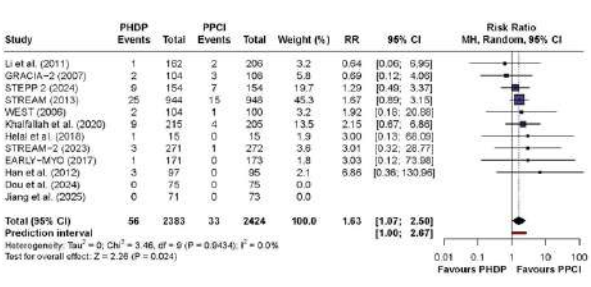
PHARMACOINVASIVE STRATEGY VERSUS PRIMARY PCI IN STEMI: A VIABLE ALTERNATIVE WHEN TIMELY PPCI IS NOT ACHIEVABLE

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Introduction/Background: Primary percutaneous coronary intervention (PPCI) is the guideline-recommended reperfusion strategy for ST-segment elevation myocardial infarction (STEMI) when performed within recommended time frames. However, timely access to PPCI remains inconsistent across regionalized systems of care, supporting the continued role of pharmacoinvasive strategies. Objectives: To compare the efficacy, reperfusion profile, and safety of a pharmacoinvasive strategy versus PPCI in patients with STEMI. Methods: We performed a systematic review and meta-analysis of comparative studies evaluating a pharmacoinvasive strategy versus PPCI in STEMI. The primary endpoint was major adverse cardiac events (MACE). Secondary outcomes included all-cause death, nonfatal reinfarction, stroke, heart failure, ischemia-driven revascularization, any bleeding, and major bleeding. Reperfusion outcomes included TIMI flow, post-PCI TIMI myocardial perfusion grade (TMPG), ST-segment regression ≥70%, and system delay. Pooled estimates used random-effects models, and heterogeneity and small-study effects were assessed. Resultados e Conclusions: The pharmacoinvasive strategy was associated with a borderline reduction in MACE compared with PPCI (risk ratio [RR]: 0.73; 95% confidence interval [CI]: 0.53-1.00; p = 0.0475). The pharmacoinvasive strategy also improved TIMI 3 flow, post-PCI TMPG 3, and ST-segment regression ≥70%. Major bleeding was increased (RR: 1.63; 95% CI: 1.07-2.50; p = 0.024), whereas any bleeding showed a nonsignificant excess (RR: 1.43; 95% CI: 0.94-2.18; p = 0.091), as shown in Figures 1 and 2. No significant differences were observed for all-cause death (RR: 0.92; 95% CI: 0.71-1.19), nonfatal reinfarction (RR: 1.19; 95% CI: 0.59-2.40), total stroke (RR: 1.70; 95% CI: 0.87-3.33), disabling stroke (RR: 1.53; 95% CI: 0.68-3.45), heart failure (RR: 0.79; 95% CI: 0.59-1.06), or ischemia-driven revascularization (RR: 0.74; 95% CI: 0.37-1.45). In summary, the pharmacoinvasive strategy was associated with improved reperfusion markers and a possible reduction in MACE, at the cost of increased major bleeding, with otherwise similar clinical outcomes compared with PPCI. These findings support the pharmacoinvasive strategy as a pragmatic alternative when timely PPCI cannot be achieved.





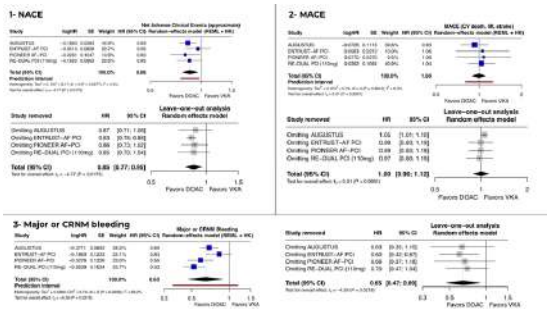
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REDEFINING ANTITHROMBOTIC PRECISION AFTER PCI IN ATRIAL FIBRILLATION: A SYSTEMATIC REVIEW AND META-ANALYSIS OF DIRECT ORAL ANTICOAGULANTS VERSUS VITAMIN K ANTAGONIST–BASED STRATEGIES

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Introduction/Background: The optimal antithrombotic strategy for patients with atrial fibrillation undergoing percutaneous coronary intervention (PCI) remains challenging due to the trade-off between bleeding and ischemic risks. Direct oral anticoagulant (DOAC)–based regimens have emerged as potential alternatives to vitamin K antagonist (VKA)–based triple therapy. Objectives: To compare the safety and efficacy of direct oral anticoagulant (DOAC)–based dual therapy versus vitamin K antagonist (VKA)–based triple therapy in patients with atrial fibrillation undergoing percutaneous coronary intervention, focusing on bleeding, ischemic outcomes, and net clinical benefit. Methods: A systematic review and meta-analysis of randomized controlled trials was conducted according to PRISMA guidelines. Trials comparing DOAC-based dual therapy versus VKA-based triple therapy in patients with atrial fibrillation undergoing PCI were included. The primary outcome was major or clinically relevant nonmajor (CRNM) bleeding. Key secondary outcomes included major adverse cardiovascular events (MACE), defined as cardiovascular death, myocardial infarction, or stroke, and net adverse clinical events (NACE). Random-effects models (REML) with Knapp–Hartung adjustment were applied. Resultados e Conclusions: A total of 10,969 patients across 4 randomized controlled trials were included. DOAC-based dual therapy significantly reduced major or clinically relevant nonmajor bleeding (HR 0.65, 95% CI 0.52–0.83; p=0.021; I²=69.2%), without increasing major adverse cardiovascular events (HR 1.00, 95% CI 0.93–1.08; p=0.99; I²=0%). This translated into a significant reduction in net adverse clinical events (HR 0.85, 95% CI 0.80–0.95; p=0.017; I²=0%). These findings demonstrate that DOAC-based dual therapy provides a superior safety profile without compromising ischemic protection, resulting in a favorable net clinical benefit and supporting its preferential use over VKA-based triple therapy in patients with atrial fibrillation undergoing PCI.



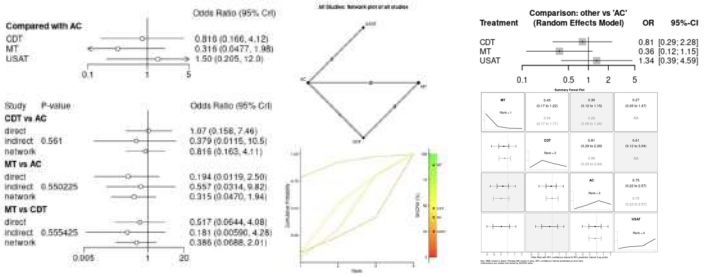
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REDEFINING REPERFUSION IN INTERMEDIATE-RISK PULMONARY EMBOLISM: A 2026 UPDATED BAYESIAN AND FREQUENTIST NETWORK META-ANALYSIS OF CONTEMPORARY CATHETER-BASED STRATEGIES

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Introduction/Background: The optimal reperfusion strategy for intermediate-risk pulmonary embolism (PE) remains controversial. While catheter-based therapies have expanded rapidly, comparative effectiveness across modalities in the contemporary era is not well established. Objectives: To compare the efficacy of contemporary catheter-based reperfusion strategies versus anticoagulation using an updated network meta-analytic framework. Methods: A systematic search of PubMed, Embase, Cochrane Library, and Web of Science was performed from inception through March 2026, capturing the most recent randomized and comparative evidence in the modern device era. Studies evaluating catheter-directed thrombolysis (CDT), ultrasound-assisted thrombolysis (USAT), and mechanical thrombectomy (MT) in intermediate-risk PE were included. Both Bayesian and frequentist network meta-analyses were conducted using odds ratios (ORs). Consistency was assessed with node-splitting models. Resultados e Conclusions: A total of 12 studies including 3,331 patients were analyzed, forming a well-connected network across four treatment strategies (AC, CDT, USAT, and MT). In the Bayesian framework, MT showed the strongest signal toward reduction in adverse clinical events compared with AC (OR 0.32, 95% CrI 0.05–1.47), followed by CDT (OR 0.82, 95% CrI 0.17–4.12), while USAT showed no benefit (OR 1.50, 95% CrI 0.21–12.0). Frequentist analysis demonstrated consistent findings, with MT numerically outperforming AC (OR 0.36, 95% CI 0.12–1.15), and CDT showing a neutral effect (OR 0.81, 95% CI 0.29–2.28). Head-to-head comparisons suggested a numerical advantage of MT over CDT (Bayesian OR 0.39, 95% CrI 0.07–2.01). Ranking analyses consistently favored MT as the top-ranked strategy, followed by CDT, AC, and USAT. Node-splitting analysis demonstrated no evidence of inconsistency (all P > 0.5), supporting the validity of indirect comparisons. Overall, in this updated 2026 network meta-analysis integrating Bayesian and frequentist approaches, contemporary catheter-based strategies, particularly mechanical thrombectomy, demonstrate a consistent signal toward improved outcomes compared with anticoagulation alone in intermediate-risk PE, although wide confidence intervals highlight persistent uncertainty and the need for adequately powered randomized trials.



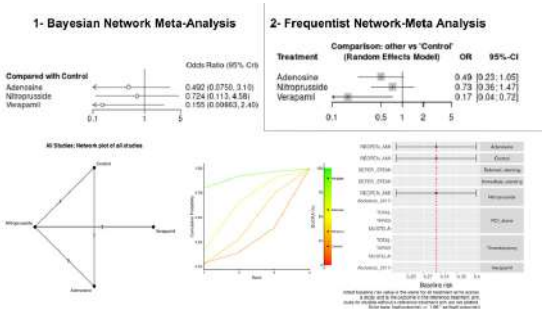
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TARGETING MICROVASCULAR DYSFUNCTION IN STEMI: A NETWORK META-ANALYSIS OF PHARMACOLOGIC AND MECHANICAL STRATEGIES TO PREVENT NO-REFLOW

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Introduction/Background: Microvascular obstruction (MVO) and the no-reflow phenomenon remain major determinants of adverse outcomes following primary percutaneous coronary intervention (PCI) in ST-elevation myocardial infarction (STEMI). The comparative effectiveness of pharmacologic and mechanical strategies remains unclear. Objectives: To compare the efficacy of pharmacologic and mechanical strategies in preventing no-reflow/MVO in patients with STEMI undergoing primary PCI using a network meta-analytic framework. Methods: A systematic review and network meta-analysis of randomized controlled trials was conducted according to PRISMA guidelines. Patients with STEMI undergoing primary PCI were included. The primary outcome was incidence of no-reflow/MVO. A frequentist random-effects model was used for the primary analysis, complemented by Bayesian analysis for treatment ranking (SUCRA). Resultados e Conclusions: A total of 6 randomized trials encompassing 12,044 patients formed a connected treatment network. In the frequentist analysis, compared with control, verapamil significantly reduced the risk of no-reflow (OR 0.17, 95% CI 0.04–0.72), whereas adenosine showed a non-significant trend toward benefit (OR 0.49, 95% CI 0.23–1.05) and nitroprusside demonstrated no significant effect (OR 0.73, 95% CI 0.36–1.47). Bayesian analysis confirmed these findings, with verapamil consistently ranking as the most effective strategy, followed by adenosine, nitroprusside, and control. Mechanical strategies, including thrombectomy and deferred stenting, did not demonstrate consistent benefit across analyses. These findings suggest that targeted pharmacologic modulation of microvascular dysfunction—particularly with verapamil—may represent the most effective strategy for preventing no-reflow in STEMI, outperforming mechanical approaches and supporting a mechanism-based shift in contemporary PCI practice.



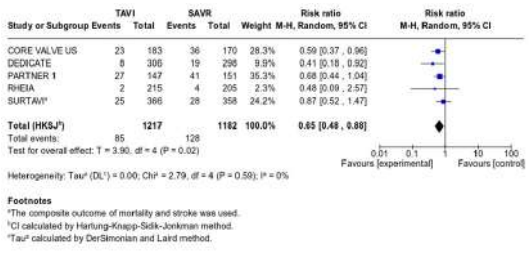
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TRANSCATHETER AORTIC VALVE IMPLANTATION (TAVI) VERSUS SURGICAL AORTIC VALVE REPLACEMENT (SAVR) IN WOMEN WITH AORTIC STENOSIS: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS.

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Introduction/Background: Women with severe aortic stenosis represent a distinct biological and clinical subgroup, with evidence suggesting differential outcomes following transcatheter (TAVI) versus surgical aortic valve replacement (SAVR). Despite this, sex-disaggregated data from randomized controlled trials (RCTs) remain underreported, limiting sex-specific recommendations in current clinical practice. Objectives: To evaluate the comparative efficacy and safety of TAVI versus SAVR in women with aortic stenosis through a systematic review and meta-analysis of RCTs. Methods: A systematic review and meta-analysis of RCTs was conducted and prospectively registered in the PROSPERO, following PRISMA guidelines. The review included women with aortic stenosis undergoing TAVI or SAVR. The primary analysis was all cause mortality at 1 year. The pooled effect measure was the risk ratio (RR), estimated using a random-effects model with the Mantel-Haenszel method. Confidence intervals were calculated using the Hartung-Knapp-Sidik-Jonkman (HKSJ) method. Heterogeneity was assessed using the I² statistic, Chi² test, and Tau² (DerSimonian and Laird method). Statistical analysis was performed using Review Manager (version 5.4). Resultados e Conclusions: Five RCTs were included: CORE VALVE US, DEDICATE, PARTNER 1, RHEIA, and SURTAVI, comprising 1,217 patients in the TAVI group and 1,182 in the SAVR group (total N = 2,399). Total events were 85 in the TAVI arm and 128 in the SAVR arm. The pooled analysis demonstrated a statistically significant reduction in the primary outcome of all-cause mortality at 1 year favoring TAVI over SAVR (RR 0.65 [95% CI 0.48–0.88]; p = 0.02). Individual study estimates ranged from RR 0.41 (DEDICATE) to RR 0.87 (SURTAVI). Heterogeneity was negligible (I² = 0%; Chi² = 2.79, df = 4, P = 0.59; Tau² = 0.00), indicating high consistency across trials. The SURTAVI trial contributed a composite endpoint of death or disabling stroke due to unavailable sex-specific mortality data at 1 year and was therefore included as a sensitivity-supportive estimate. In conclusion, in women with aortic stenosis, TAVI was associated with a significant 35% relative risk reduction in all-cause mortality compared to SAVR across five randomized controlled trials, with no between-study heterogeneity. These findings suggest that TAVI may represent a favorable therapeutic strategy in female patients and highlight the importance of sex-specific analyses in valve disease research.



Patients Characteristics

Author	PARTNER 1	CORE VALVE US	RHEIA	SURTAVI	DEDICATE
Follow-up (y)	2y	1y	1y	2y	1y
Female sex	268	353	420	724	604
Age (y)	84,9 +- 5,0	83,2 +- 6,8	75,2 +- 4,8	80 +- 5,9	74,8 +- 4,6
CAD ♪	192 (64,4)	226 (64)	80 (19)	353 (48,8)	147 (24,4)
DM ♪	105 (35,5)	136 (39)	112 (26,6)	222 (30,7)	174 (28,9)
BMI ♭	NA	NA	29,5 +- 5,7	NA	28,1
Prior stroke	NA	41 (11,6)	15 (3,5)	33 (4,6%)	38 (6,3)
HBP ♮	NA	340 (96,3)	NA	NA	506 (84,5)
AFIAFL ♩	NA	147 (41,6)	17 (4)	NA	133 (22)
CIED •	37(12,4)	70 (19,8)	13 (3)	50 (6,9)	18 (3)
COPD ♦	83 (21,2)	NA	NA	206 (28,5)	79 (12,9)
PAD ♣	108 (36,4)	125 (35,4)	16 (3,8)	184 (25,4)	21 (3,5)
Prior PCI ◦	81 (27,2)	101 (28,6)	NA	97 (13,4)	NA
Prior MI ▪	58 (19,5)	67 (18,9)	NA	NA	21 (3,5)

Abbreviations: y: years; ♪: Coronary artery disease; ♯: Diabetes mellitus; ♭ : body mass index; ♮: high blood pressure; ♩ : atrial fibrillation/atrial flutter; •: permanent pacemaker/prior defibrillator; ♦: chronic obstructive pulmonary disease; ♣: peripheral artery disease; ◦: previous percutaneous coronary intervention; ▪ : previous myocardial infarction; NA: not available

18393

VASOSPASTIC ANGINA IN ANOCA AND MINOCA: DIAGNOSTIC CRITERIA DEBATE AND REAL-WORLD IMPLICATIONS FROM A BRAZILIAN QUATERNARY CENTER

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Introduction/Background: Vasospastic angina (VSA) is a recognized endotype in ANOCA and MINOCA, but its diagnosis remains challenging because current criteria may not capture all clinically relevant vasomotor responses. COVADIS defines definitive VSA during acetylcholine testing by the simultaneous presence of epicardial spasm (>90% diameter reduction), symptom reproduction, and ischemic ECG changes. However, severe epicardial constriction associated with either typical symptoms or ECG changes is frequently encountered in routine care Objectives: To evaluate VSA prevalence and diagnostic implications in patients with ANOCA and MINOCA undergoing invasive coronary function testing (ICFT), comparing strict COVADIS criteria (3/3) with a clinically adapted approach (2/3) Methods: Single-center retrospective study (May 2025–April 2026). Patients with ANOCA or MINOCA (stenosis <50% or FFR >0.80) underwent ICFT including bolus thermodilution-derived CFR and IMR, intracoronary acetylcholine testing, and dobutamine-dFFR for myocardial bridging when indicated. Endotypes were classified according to COVADIS/AHA-ACC 2023 criteria adapted to the clinical context. Definitive VSA required all three criteria, whereas clinically relevant/probable VSA required severe epicardial spasm (>90%) plus symptom reproduction or ischemic ECG changes. Resultados e Conclusions: Twenty-two patients were included (mean age 53.6 years; 68.2% female): ANOCA 63.6%, MINOCA 36.4%. Sixteen patients (72.7%) underwent acetylcholine testing. Using the clinically adapted approach, VSA was the predominant endotype (37.5%), particularly in ANOCA (50%). Myocardial bridging was identified in 36.4%, representing a potential mechanical trigger for coronary hyperreactivity. Applying strict 3/3 criteria would reclassify cases, altering endotype distribution and therapeutic guidance. This uncertainty affects management, since VSA-directed therapy—calcium channel blockers and nitrates—was initiated based on alternative criteria. These findings underscore that heterogeneity in VSA thresholds affects prevalence estimates, treatment decisions, and study comparability. Prospective studies with harmonized criteria and quality-of-life assessment are needed to define the true burden and optimal management of VSA in ANOCA and MINOCA.

Neglected Cardiovascular Diseases



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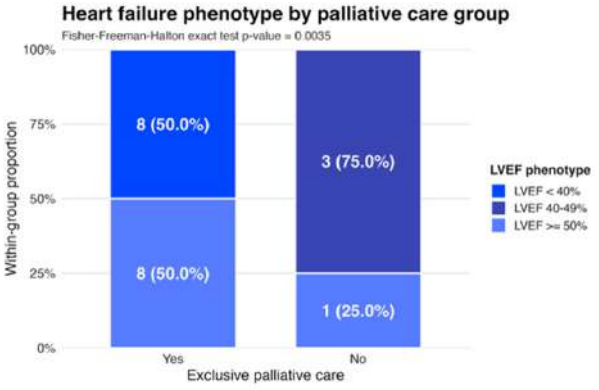
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BEYOND SYSTOLIC DYSFUNCTION: REDEFINING PALLIATIVE CARE ELIGIBILITY IN ADVANCED HEART FAILURE

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Introduction/Background: Advanced heart failure (HF) is characterized by refractory symptoms, progressive functional decline, and frequent hospitalizations, with mortality rates comparable to many malignancies despite optimal guideline-directed therapy. Palliative care emerges as an essential complementary approach, aimed at relieving suffering and aligning treatment with patient values throughout the disease trajectory. Nevertheless, despite recommendations from the American Heart Association, palliative care remains significantly underutilized in this population, with late and inconsistent referrals driven by prognostic uncertainty and the lack of structured integration between cardiology and palliative care teams. Identifying the clinical profile of patients who would most benefit from early palliative care integration. Objectives: To describe the demographic and clinical profile of patients with advanced HF in a tertiary hospital who received exclusive palliative care. Methods: This retrospective cohort study included 373 patients with advanced heart failure, of whom 20 died during hospitalization. Patients were stratified according to whether they received exclusive palliative care (yes vs. no). Demographic data, comorbidities, heart failure phenotype, previous hospitalizations, and time to death were analyzed using descriptive statistics. The software used were Python 3.9.6 and other. Due to the sample size and low expected frequencies, the association with ejection fraction was assessed using the Fisher-Freeman-Halton exact test. Resultados e Conclusions: The average age was 85.5 years. Patients who received palliative care were older (86.3 vs. 82.2 years), had more hospitalizations in the previous year (2.8 vs. 1.5), and shorter intervals between admission and death. Delirium was identified in 35% of cases. A statistically significant association was found between the reduced ejection fraction phenotype and referral to palliative care (Fisher-Freeman-Halton exact test, p = 0.0035). Referral to palliative care appears to be driven by worsening ejection fraction, potentially neglecting patients with preserved ejection fraction or in the intermediate range who may equally benefit from this approach. Despite the high prevalence of multimorbidity and recurrent hospitalizations, the integration of palliative care remains late and phenotype-dependent in this population. Earlier referral strategies are needed to optimize symptom control, support goal-directed care planning, and improve quality of life.



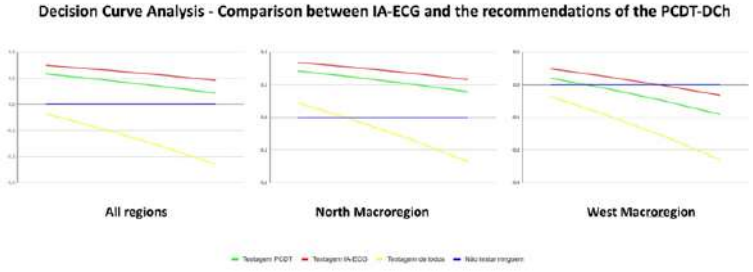
20884

DECISION CURVE ANALYSIS FOR CHAGAS DISEASE SCREENING: A COMPARISON BETWEEN THE AI-ECG-CHAGAS STRATEGY AND THE BRAZILIAN CLINICAL PROTOCOL AND THERAPEUTIC GUIDELINES (PCDT) RECOMMENDATIONS

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Introduction/Background: Chagas disease (CD) remains a neglected condition with a substantial unmet demand for diagnosis, despite the availability of diagnostic resources within the Brazilian public healthcare system (SUS). Novel approaches combining artificial intelligence analysis with electrocardiographic tracings (AI-ECG) have been developed to optimize the identification of seropositive individuals. Objectives: To compare the screening model recommended by the Clinical Protocol and Therapeutic Guidelines for Chagas Disease (PCDT-DCh) with an AI-ECG-based model for the screening and diagnosis of patients with chronic Chagas disease. Methods: A study was conducted in two health macro-regions of Minas Gerais, Brazil: the northern region, hyperendemic for Chagas disease (CD), and the western region, endemic for CD. The PCDT-DCh strategy was compared with the AI-ECG approach as alternative methods for CD screening and diagnosis using Decision Curve Analysis (DCA) within the context of the Brazilian public healthcare system. The primary outcome was serological confirmation of CD. Net benefit was calculated for threshold probabilities (TP) of 5%, 10%, 15%, and 20%, considering both screening strategies in comparison with the "test-all" approach and the "no-intervention" scenario. Resultados e Conclusions: Results: The AI-ECG strategy outperformed the PCDT-DCh approach across all scenarios, with net benefit values ranging from 0.149 to 0.092, while universal testing proved unfeasible. Regional heterogeneity was observed. In the hyperendemic northern region of Minas Gerais, AI-ECG achieved the highest net benefit (0.168). In the western endemic region, AI-ECG remained superior up to a 10% probability threshold (0.025), but values fell below the x-axis at thresholds ≥15% (-0.002), indicating the need for stricter thresholds in this setting. Increasing probability thresholds further amplified the net benefit advantage of AI-ECG over comparator strategies. Conclusions: Decision curve analysis suggests that opportunistic screening using AI-ECG is an effective strategy, particularly in highly endemic regions, and may improve timely diagnosis of chronic Chagas Disease within the Brazilian public health system. Further economic evaluations are needed to confirm its long-term superiority and sustainability.



20421

DEPRESSIVE SYMPTOMS AND SELF-REPORTED FUNCTIONAL CAPACITY ARE DETERMINANTS OF QUALITY OF LIFE IN PATIENTS WITH CHAGAS CARDIOMYOPATHY.

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Introduction/Background: Chagas cardiomyopathy affects multiple dimensions of health, including functional capacity, mental health, and quality of life. In addition to cardiac impairment, patients often experience social vulnerability, progressive physical limitation, and psychological burden, all of which may influence their perceived health status. The Minnesota Living with Heart Failure Questionnaire (MLHFQ) is widely used to assess quality of life in patients with heart disease, including those with Chagas cardiomyopathy; however, the main determinants of this outcome in this population remain insufficiently understood. Objectives: To investigate the determinants of quality of life, assessed by the MLHFQ, in patients with Chagas cardiomyopathy. Methods: This cross-sectional study included 57 patients with Chagas cardiomyopathy (64.18 ± 8.94 years), of whom 25 (43.9%) had systolic dysfunction, and 24 (42.1%) were female. Participants underwent assessment with the Human Activity Profile (HAP), the Duke Activity Status Index (DASI), the Beck Depression Inventory (BDI), the Cardiac Anxiety Questionnaire, the five-repetition sit-to-stand test, the 60-second sit-to-stand test, handgrip strength, and the MLHFQ. Correlations between MLHFQ score and the studied variables were initially tested. Variables showing significant associations were subsequently entered into a multivariable regression model. Resultados e Conclusions: MLHFQ score was significantly correlated with HAP (r=-0.461; p<0.001), DASI (r=-0.420; p=0.001), BDI (r=0.697; p<0.001), and cardiac anxiety (r=0.532; p<0.001), but not with five-repetition sit-to-stand performance (p=0.993), 60-second sit-to-stand performance (p=0.551), or handgrip strength (p=0.435). In the multivariable model, BDI (B=1.04; p<0.001) and maximum HAP score (B=-0.55; p=0.004) remained independent determinants of quality of life, together explaining 43% of the variance in MLHFQ score (R^2=0.43). These findings indicate that worse quality of life in patients with Chagas cardiomyopathy is primarily associated with greater depressive symptom burden and lower self-reported functional capacity, rather than with simple measures of muscle strength or sit-to-stand performance. This reinforces the importance of integrated care strategies that address both psychosocial and functional domains in the clinical management of this population.

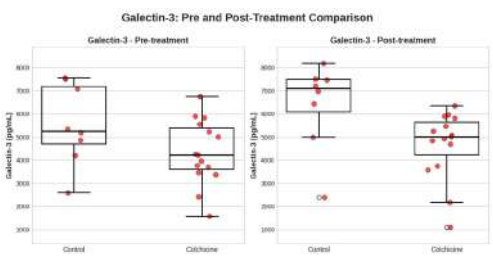
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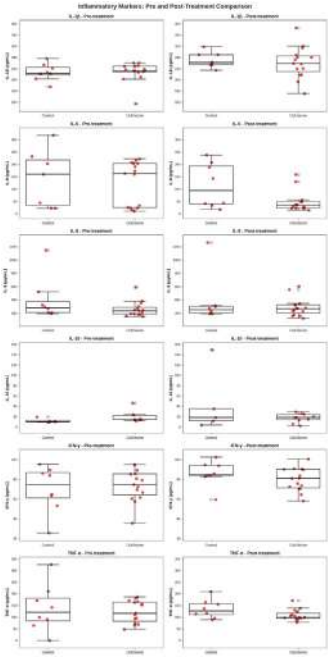
EFFECTS OF COLCHICINE ON MYOCARDIAL FIBROSIS IN CHAGAS CARDIAC DISEASE: LABORATORY AND STRUCTURAL ANALYSIS

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INTRODUCTION: Chagas disease (CD) is a neglected chronic condition with potential for progressive cardiac involvement. Myocardial fibrosis, mediated by a persistent inflammatory process, represents one of the main pathophysiological mechanisms underlying disease progression. Colchicine has been investigated for its possible effect in reducing fibrosis and modulating chronic inflammation. Objectives: OBJECTIVES: This study aimed to assess the effect of colchicine on the inflammatory profile and myocardial fibrosis in patients with stage B1 CD, through laboratory analysis, myocardial deformation assessed by speckle tracking echocardiography (STE), and cardiac magnetic resonance (CMR). Methods: METHODS: This was a prospective, double-blind, randomized study with 12 months of follow-up, including 24 patients with stage B1 CD and evidence of myocardial fibrosis or edema on CMR. Participants were randomly assigned to a control group (n=8) or to a colchicine group (n=16; 0.5 mg every 12h). Inflammatory markers (IL-1β, IL-6, IL-8, IL-10, TNF-α, IFN-γ, Gal3), STE, and CMR were performed at baseline and after 12 months of colchicine therapy. Resultados e Conclusions: RESULTS: The colchicine group demonstrated a significant reduction in IL-6 (p=0.002) and Gal3 (p=0.043), as well as a trend toward reduction in TNF-α (p=0.065) and IFN-γ (p=0.086). IL-1β levels increased in both groups, with lower magnitude in the colchicine group. CMR revealed no significant differences in myocardial fibrosis between groups, and no significant variations were observed in Global Longitudinal Strain on STE. CONCLUSION: Colchicine showed a potential beneficial effect on the modulation of inflammatory markers in stage B1 CD patients, although without significant impact on myocardial fibrosis progression. Larger studies are warranted to further evaluate its influence on fibrotic evolution in CD.





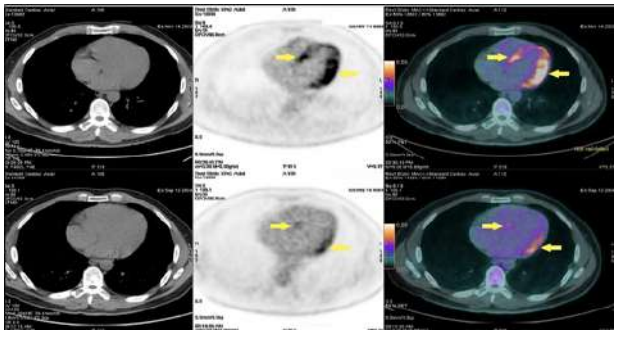
18434

EVALUATION OF THE REDUCTION IN CARDIAC INFLAMMATION AFTER SPECIFIC TREATMENT WITH BENZNIDAZOLE IN CHAGAS DISEASE BY CARDIAC PET.

SILVANA DE ARAÚJO SILVA1; MARIA DO CARMO PEREIRA NUNES1; ANTÔNIO LUIZ PINHO RIBEIRO1; ESTER CERDEIRA SABINO2; LEA CAMPOS DE OLIVEIRA DA SILVA2; HERIKA MARTINS MENDES1; ELOA SERPA NUNES1; LIVIA SPADER CAMARGO1; RAFAELA OLIVEIRA TORRES1; BRUNA VIEIRA GUARÇONI1; ARTHUR SOUZA LIMA1; LÍVIA VILELA GONCALVES1;

(1) HOSPITAL DAS CLINICAS DA UFMG - BELO HORIZONTE - MG - BRASIL; (2) HOSPITAL DAS CLINICAS USP - SÃO PAULO - SP - BRASIL;

Introduction/Background: Chagas disease (CD) remains a neglected endemic disease with high morbidity and mortality in our setting. Myocardial inflammation is the most important mechanism associated with the pathogenesis of chronic Chagas cardiomyopathy (CCC). Fluorodeoxyglucose positron emission tomography (F-FDG PET-CT) detects the inflammatory process and quantifies the response to treatment. Demonstrating the benefit of specific treatment with benznidazole, a medication approved since the 1970s, in reducing the inflammatory process in CD may improve understanding of the disease progression mechanism and its prognosis, especially in CCC. Objectives: Compare myocardial FDG uptake in patients with Chagas disease before and after completing benznidazole treatment. Methods: This observational study included patients followed at the medical service, aged over 18 years, with Chagas disease confirmed serologically by two different tests, without symptoms or signs of heart failure, and with Doppler echocardiography showing no severe ventricular dysfunction (LVEF >45%). All patients underwent medical consultation, electrocardiography, echocardiography, laboratory tests, and cardiac PET-CT before treatment and six months after completion of the full benznidazole regimen (300 mg/day for 60 to 80 days). For PET-CT analysis, regions of interest (ROI) were defined on the images and standardized uptake values (SUV) were calculated, reflecting the degree of inflammatory activity adjusted for body weight and tracer dose. Resultados e Conclusions: Seventy-four patients were included. The mean age was 55 ± 10 years, the majority were female (61%), and 53% were in the indeterminate chronic form of the disease. So far, 64 patients have undergone the second PET-CT scan. Overall, 69% showed no abnormal myocardial F-FDG uptake or demonstrated reduced uptake (Figure 1), 28% showed increased uptake, and 3% showed no change in uptake. PET-CT appears to be a useful and promising tool for monitoring the inflammatory response to benznidazole in patients with Chagas disease. Correlation with clinical outcomes may clarify the impact of these metabolic changes on disease progression.



18264

EVALUATION OF THE REDUCTION OF CARDIAC INFLAMMATION BY RESONANCE AFTER SPECIFIC TREATMENT WITH BENZNIDAZOLE IN CHAGAS DISEASE.

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Introduction/Background: Chagas disease (CD) remains endemic throughout Latin America, with high morbidity and mortality. The benefit of specific treatment with benznidazole in the chronic phase of the disease still needs to be better established, although myocardial inflammation is already well documented as the main factor associated with chronic Chagas cardiomyopathy (CCC). Assessing the reduction of this inflammatory process with benznidazole treatment may help elucidate the mechanisms of disease progression. Objectives: To assess the reduction of cardiac inflammation and fibrosis using Cardiovascular Magnetic Resonance (CMR). Methods: This is an observational study including patients followed at this center, aged over 18 years, with Chagas disease confirmed serologically by two distinct techniques, without symptoms or signs of heart failure, and with echocardiography (echo) showing no severe ventricular dysfunction (i.e., with LVEF >45%). All patients underwent medical consultation, electrocardiogram, echocardiography, laboratory tests, and CMR before treatment and six months after completing full treatment with benznidazole (300 mg/day for 60 to 80 days). Biventricular volumes and function, resting perfusion, and tissue characterization were assessed using late gadolinium enhancement, T1 mapping, T2 mapping, and extracellular volume (ECV). For statistical significance, an estimated p-value < 0.05. Resultados e Conclusions: Of the 57 patients included, 4 did not complete treatment—two due to severe adverse effects (dermopathy) and two due to withdrawal. The mean age was 52.4 years; most were women (47, 82%), and 25 patients (44%) had electrocardiographic abnormalities. T1 mapping, T2 mapping, and ECV analysis showed a reduction in fibrosis/inflammation after treatment compared to pre-therapy findings in T1 mapping (fibrosis assessment), anterior wall values decreased from 1029.51 ± 41.39 to 1010.82 ± 51.68, septal wall from 1051.57 ± 52.82 to 1005.78 ± 38.14, and lateral wall from 1042.06 ± 55.08 to 1018.87 ± 43.97. In T2 mapping (edema assessment), septal wall values decreased from 53.36 ± 3.54 to 51.74 ± 2.98. These results were statistically significant (p < 0.05). Treatment with benznidazole (BZN) reduces fibrosis/inflammation in the cardiac tissue of patients with Chagas disease and may impact disease progression, which is of great importance for the prognosis of these patients.

19227

FUNCTIONAL AND PSYCHOSOCIAL DIFFERENCES IN PATIENTS WITH CHAGAS CARDIOMYOPATHY LIVING IN A CAPITAL CITY VERSUS AN ENDEMIC REGION

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(1) UNIVERSIDADE FEDERAL DOS VALES DO JEQUITINHONHA E MUCURI - DIAMANTINA - MG - BRASIL;

Introduction/Background: Chagas cardiomyopathy (CCC) is associated with substantial functional impairment and psychosocial burden. These outcomes may be influenced not only by cardiac involvement but also by the territorial and social context in which patients live. Comparing patients from a capital city and from an endemic region may help identify health disparities and support more context-sensitive care strategies. Objectives: To compare functional status, quality of life, and depressive symptoms in patients with CCC living in a capital city versus an endemic region for Chagas disease. Methods: This cross-sectional study included 95 patients with CC: 35 (36.8%) living in the capital city (HDI 0.797) and 60 (63.2%) living in an endemic region (mean HDI 0.616). Overall, 59 patients (62.1%) were male. Depressive symptoms were assessed using the Beck Depression Inventory (BDI), self-reported physical activity using the Human Activity Profile (HAP; maximum activity score), and quality of life using the Minnesota Living with Heart Failure Questionnaire (MLHFQ). Echocardiographic variables included left ventricular ejection fraction and left ventricular end-diastolic diameter. Outcomes were compared between groups. Resultados e Conclusions: Patients from the endemic region were older than those from the capital city (67.89 ± 9.21 vs. 47.81 ± 8.27 years; p<0.001). They also showed higher depressive symptom scores on the BDI (14.15 ± 10.99 vs. 8.42 ± 8.28; p=0.002), lower self-reported physical activity on the HAP (53.63 ± 11.45 vs. 83.58 ± 7.21; p<0.001), and worse quality of life on the MLHFQ (30.07 ± 22.74 vs. 20.45 ± 21.11; p=0.008). In contrast, no significant between-group differences were observed in left ventricular ejection fraction (p=0.306) or left ventricular end-diastolic diameter (p=0.266). These findings indicate that patients living in the endemic region had a worse functional and psychosocial profile despite similar echocardiographic parameters. This pattern suggests that factors beyond cardiac structural impairment, including territorial and social context, may influence disease burden. Considering these determinants may help guide more comprehensive and equitable care strategies for patients with Chagas disease.

19361

MEASURED VERSUS ESTIMATED PEAK OXYGEN UPTAKE IN PATIENTS WITH CHAGAS CARDIOMYOPATHY: INSIGHTS FROM EXERCISE TESTING

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Introduction/Background: Chagas disease remains a major public health challenge in Latin America, and Chagas cardiomyopathy is its most frequent and most severe clinical presentation. Functional capacity may decline early in the course of cardiac involvement, making regular assessment especially important in this population. Cardiopulmonary exercise testing (CPET) is the gold standard for measuring peak oxygen uptake (VO2peak), but its high cost and limited availability restrict its use in low-resource and endemic settings. Treadmill exercise testing is more accessible; however, VO2peak is indirectly estimated, and the accuracy of commonly used prediction equations in patients with Chagas cardiomyopathy remains uncertain. Objectives: To compare VO2peak measured by CPET with VO2peak estimated by treadmill exercise testing in patients with Chagas cardiomyopathy. Methods: Sixty patients with Chagas cardiomyopathy (48.8 ± 10.4 years; NYHA class I–III) underwent CPET using the Bruce protocol. Estimated VO2peak was calculated using the equations VO2max = (2.9 × exercise time in minutes) + 8.33 and, for women, VO2max = (2.74 × exercise time in minutes) + 8.03. Differences between measured and estimated values were assessed using the Wilcoxon test. The association between methods was analyzed using Pearson's correlation, and agreement was evaluated using Bland-Altman analysis. Resultados e Conclusions: Measured VO2peak was 24.4 ± 8.3 mL/kg/min, whereas estimated VO2peak was 33.5 ± 7.4 mL/kg/min, showing a significant difference between methods (p<0.001). Estimated values overestimated measured VO2peak by 27%. Although a statistically significant correlation was observed between the two measures (r = 0.302; p = 0.020), the strength of the association was modest. Bland-Altman analysis showed that most observations remained within the limits of agreement, with a mean difference of 4.5 mL/kg/min, equivalent to 1.3 METs. In patients with Chagas cardiomyopathy, treadmill-based prediction equations substantially overestimated directly measured VO2peak, potentially limiting their clinical applicability. These findings support cautious interpretation of estimated functional capacity and highlight the need for disease-specific prediction models, particularly in settings where CPET is not readily available.

19301

PERFORMANCE OF CARDIOPULMONARY EXERCISE TESTING FOR DETECTING PULMONARY HYPERTENSION IN DILATED CHAGAS CARDIOMYOPATHY

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Introduction/Background: Background: Dilated Chagas cardiomyopathy is the most severe clinical manifestation of Chagas disease and is associated with poor prognosis. Pulmonary hypertension (PH) is a frequent complication in these patients and contributes to adverse clinical outcomes, including fatigue and dyspnea. Cardiopulmonary exercise testing (CPET) may help identify PH; however, no previous studies have comprehensively evaluated the accuracy of CPET-derived ventilatory parameters for detecting PH in patients with dilated Chagas cardiomyopathy. Objectives: Objectives: To assess the diagnostic accuracy of ventilatory variables obtained during CPET for identifying PH in individuals with dilated Chagas cardiomyopathy, with the potential to improve early diagnosis and therapeutic strategies. Methods: Methods: This diagnostic accuracy study included 41 patients with dilated Chagas cardiomyopathy (mean age 53.3 ± 10.6 years), of whom 9 had PH. All participants underwent echocardiography and CPET. PH was defined as a systolic pulmonary artery pressure greater than 40 mmHg. The following CPET variables were analyzed: peak oxygen uptake (VO2peak), the minute ventilation/carbon dioxide production slope (VE/VCO2 slope), and peak end-tidal carbon dioxide pressure (PETCO2peak). Diagnostic accuracy was determined using receiver operating characteristic (ROC) curves. Resultados e Conclusions: Results and Conclusions: The area under the curve for VO2peak, VE/VCO2 slope, and PETCO2peak was 0.802 (95% CI 0.63–0.97), 0.703 (95% CI 0.48–0.93), and 0.730 (95% CI 0.53–0.92), respectively. The optimal cutoff values were 17.0 mL/kg/min for VO2peak, 37.0 for VE/VCO2 slope, and 31.0 mmHg for PETCO2peak. Patients with abnormal VO2peak and VE/VCO2 slope values were 8.7 and 10.8 times more likely, respectively, to have PH. These findings suggest that VO2peak, VE/VCO2 slope, and PETCO2peak have acceptable accuracy for identifying PH in patients with dilated Chagas cardiomyopathy. CPET may therefore represent a valuable screening tool in this population, particularly in patients with ventilatory abnormalities, and may support earlier recognition of PH in clinical practice.

19154

QRS DURATION AS AN EARLY ELECTROCARDIOGRAPHIC MARKER OF RIGHT VENTRICULAR SYSTOLIC IMPAIRMENT IN CHRONIC CHAGAS CARDIOMYOPATHY WITH PRESERVED LEFT VENTRICULAR FUNCTION

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Introduction/Background: Right ventricular (RV) dysfunction in chronic Chagas cardiomyopathy (CCC) is associated with worse prognosis and reduced survival. Electrocardiography remains an important diagnostic and prognostic tool in CCC, with the advantages of low cost and wide availability. In this context, QRS duration, obtained from a standard electrocardiogram, may serve as a simple and accessible marker of early right ventricular involvement. Objectives: To evaluate the association between QRS duration and right ventricular systolic impairment in patients with CCC and preserved left ventricular ejection fraction (LVEF). Methods: This cross-sectional study included 138 patients with CCC and preserved LVEF, defined as LVEF >50%, followed at a tertiary referral center. Left and right ventricular systolic function were assessed by cardiac magnetic resonance imaging. The association between QRS duration and right ventricular ejection fraction (RVEF) was examined using multivariable linear regression analysis adjusted for age and sex. Results are expressed as beta coefficients, 95% confidence intervals (CI), and p values. Resultados e Conclusions: Results: The study population was predominantly female (70%), with a mean age of 59.8 years (median, 61 years). Mean LVEF was 66.4% (SD 8.56), and mean RVEF was 68.2% (SD 7.0). Right axis deviation was identified in 1.4% of patients. Mean QRS duration was 117 ms (SD 27.2). Longer QRS duration was independently associated with lower RVEF (β = -0.51 per 10-ms increment; 95% CI, -0.94 to -0.08; p = 0.021), after adjustment for age and sex. Conclusion: In patients with chronic Chagas cardiomyopathy and preserved LVEF, each 10-ms increase in QRS duration was associated with a mean 0.5-percentage-point reduction in RVEF, suggesting a potential role for electrocardiography as a simple and widely accessible marker of early right ventricular systolic impairment.

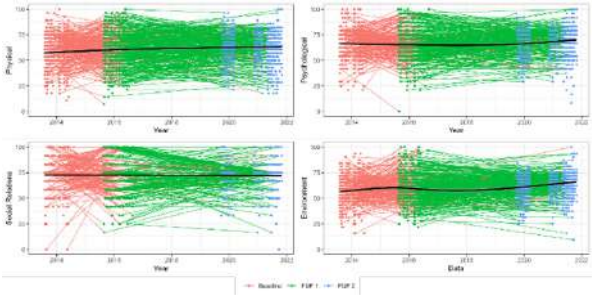
15636

QUALITY OF LIFE IN PATIENTS WITH CHRONIC CHAGAS DISEASE: REPEATED CROSS-SECTIONAL FINDINGS

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Introduction/Background: Chagas disease (ChD) remains an important cause of cardiomyopathy in Latin America and is associated with substantial morbidity and impaired quality of life (QoL). Cardiac involvement and functional limitation may adversely affect perceived health status, but evidence on QoL patterns across follow-up remains limited. Objectives: To evaluate QoL and its association with clinical characteristics using repeated cross-sectional assessments of individuals with chronic ChD. Methods: We analyzed data from individuals with confirmed chronic ChD enrolled in the SaMi-Trop cohort. QoL was assessed at baseline (2013–2014), follow-up 1 (2015–2016), and follow-up 2 (2019–2021). Associations were estimated using mixed-effects models with a random intercept for individuals, focusing on time-specific effects. QoL was measured using the Brazilian-validated WHOQOL-Bref, which includes four domains: physical, psychological, social relationships, and environment. Higher scores indicate better perceived QoL. Resultados e Conclusions: A total of 623, 611, and 907 participants were included at baseline, follow-up 1, and follow-up 2, respectively. Participants were predominantly women and mostly middle-aged or older adults. Chagas cardiomyopathy prevalence exceeded 50% at all time points. QoL remained relatively stable over time, with modest increases in physical, psychological, and environmental domains at follow-up (Figure 1). Worse functional class was consistently associated with poorer QoL across all domains. Chagas cardiomyopathy was associated with worse physical domain scores. Higher income and educational attainment were positively associated with QoL at some time points. QoL remained relatively stable over time but was influenced by clinical severity and socioeconomic conditions. Functional limitation was the factor most consistently associated with poorer QoL.



NURSING

81º CONGRESSO BRASILEIRO DE CARDIOLOGIA together with WORLD CONGRESS OF CARDIOLOGY

19350

ADVERSE EVENTS IN CARDIOVASCULAR MEDICATION ADMINISTRATION: ANALYSIS OF NURSING PRACTICE AND CONTRIBUTING FACTORS

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Introduction/Background: Adverse events related to cardiovascular medication administration represent a major challenge to patient safety, particularly due to the use of high-risk drugs. Failures in communication, workload, and process organization may increase the likelihood of errors in clinical practice. Objectives: o analyze adverse events related to cardiovascular medication administration and identify contributing factors associated with nursing practice. Methods: This cross-sectional observational study was conducted in a hospital inpatient unit between January and March 2026. Data were collected through structured questionnaires administered to nursing professionals. Variables included medication administration practices, communication among healthcare professionals, workload, and adherence to safety protocols. Descriptive statistical analysis was performed. Resultados e Conclusions: Preliminary findings suggest that adverse events are associated with communication failures, high workload, and lack of adherence to double-checking procedures for high-risk medications. Interruptions during medication preparation were also identified as relevant contributing factors. These findings highlight the impact of organizational and communication factors on patient safety and reinforce the need for strategies focused on effective communication and adherence to safety protocols in nursing practice.

14307

AGILE PROCESSES AND DIGITAL COMMUNICATION TOOLS IN ST-SEGMENT ELEVATION MYOCARDIAL INFARCTION CARE: IMPACT ON DOOR-TO-BALLOON TIME

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Introduction/Background: ST-segment elevation myocardial infarction (STEMI) represents one of the leading causes of cardiovascular morbidity and mortality in Brazil. Early reperfusion through primary percutaneous coronary intervention (pPCI) within 90 minutes is decisive in reducing myocardial damage and improving clinical outcomes. Strategies to optimize intra-hospital flow and digital communication tools between teams have the potential to reduce door-to-balloon time, yet local evidence regarding their impact remains limited. Objectives: To evaluate the impact of the physical presence of the hemodynamics team and the implementation of a digital communication group (WhatsApp) on door-to-balloon time in patients with STEMI. Methods: This is an observational analytical study involving 149 consecutive cases of STEMI treated at a hemodynamics service. Door-to-balloon time was compared between two groups: on-site team (Group 1) and on-call team requiring travel (Group 2). Additionally, door-to-balloon time was evaluated during the periods before and after the implementation of a WhatsApp group between the emergency and hemodynamics teams. Comparisons were performed using appropriate statistical tests, with $p < 0.05$ considered significant. Resultados e Conclusions: The mean door-to-balloon time was significantly lower in Group 1 (55 min) compared to Group 2 (70 min) ($p < 0.01$). Temporal analysis showed a significant reduction in door-to-balloon time following the implementation of the WhatsApp group: from 84 min in the pre-intervention period to 58 min in the post-intervention period ($p < 0.01$). Both strategies were associated with achieving the institutional goal of 60 minutes and improving clinical care indicators. The physical presence of the hemodynamics team and the adoption of a real-time digital communication tool were associated with clinically relevant reductions in door-to-balloon time for STEMI patients. These findings reinforce that investments in agile operational flows and effective communication between teams constitute cost-effective strategies for improving STEMI outcomes.

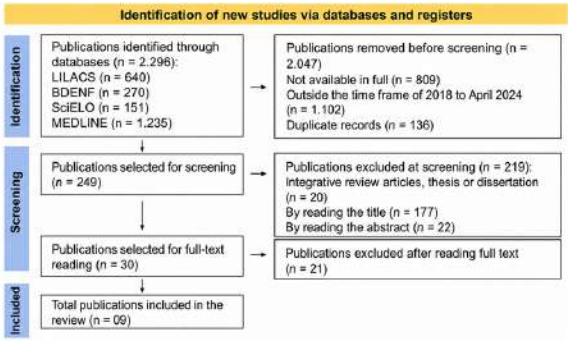
20746

AN INTRODUCTION TO NURSING CARE FOR PATIENTS UNDERGOING CARDIAC SURGERY WITH CARDIOPULMONARY BYPASS

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Introduction/Background: Cardiopulmonary bypass is an invasive technique, used primarily during cardiac surgery, that diverts the patient's blood to a machine that oxygenates it and pumps it back into the body, temporarily replacing the functions of the heart and lungs, and requiring a multidisciplinary approach to ensure the safety and comprehensiveness of care. In this context, nurses play a fundamental role, which involves thorough assessment and clinical management during the pre-, intra-, and postoperative periods. Objectives: The study aimed to analyze the nursing approach to patients in the perioperative period of cardiac surgery with cardiopulmonary bypass based on the literature. Methods: This is a systematic review conducted using the journal directory of the Scientific Electronic Library Online (SciELO), the Latin American and Caribbean Health Sciences Literature (LILACS) databases, the Nursing Database (BDENF), accessed through the Virtual Health Library (VHL), as well as the Medical Literature Analysis and Retrieval System Online (MEDLINE), via the National Library of Medicine (PubMed), by cross-referencing the Descriptors in Health Sciences (DeCS) and their respective Medical Subject Headings (MeSH), namely: Thoracic Surgery (Thoracic Surgery) AND Extracorporeal Circulation AND Cardiovascular Nursing AND Nursing Care, using the Boolean operator AND. Original articles, available in full text and published between 2018 and 2024, were included. Duplicate articles, integrative review articles, theses, dissertations, or those unrelated to the study's objective were excluded. The search and selection process was illustrated using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flowchart. Resultados e Conclusions: The final sample consisted of 9 articles. The study highlighted essential nursing practices in the perioperative period of cardiac surgeries with cardiopulmonary bypass, with an emphasis on the postoperative period and the prevention of complications. Among the main care measures identified are the monitoring of vital signs and hemodynamics, physical examination, evaluation of laboratory tests, and preventive measures for postoperative complications. The results reinforce the importance of multidisciplinary collaboration and the systematization of nursing care to ensure safety, quality of care, and a reduction in complications. Furthermore, they highlight the need for continuous training and evidence-based protocols to improve clinical practice and patient outcomes.



21868

ASSESSMENT OF QUALITY OF LIFE AND CLINICAL ASPECTS OF PATIENTS HOSPITALIZED FOR DECOMPENSATED HEART FAILURE

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Introduction/Background: Heart failure (HF) is associated with several comorbidities and complex treatment regimens, compromising patients' quality of life (QoL). Objectives: To evaluate the association between clinical profile and quality of life in patients with decompensated HF at the time of enrollment in a health educational intervention. Methods: Cross-sectional study nested within a randomized clinical trial. Patients aged ≥18 years who were hospitalized at a hospital in Porto Alegre were included. Participants completed the Kansas City Cardiomyopathy Questionnaire (KCCQ) and the Hospital Anxiety and Depression Scale (HADS). Associations were analyzed using the Mann–Whitney and Kruskal–Wallis tests, in addition to Spearman's correlation coefficient. The study was approved by the Scientific Committee of the Research Ethics Committee of PUCRS, under opinion 6.220.119 – CAAE 71836423.4.0000.5336. Resultados e Conclusions: A total of 65 patients were evaluated, with a mean age of 64.5±13.1 years, predominance of males (56.9%), BMI of 27.0±5.2 kg/m², and abdominal circumference of 98.8±15.1 cm. Ischemic etiology was the most frequent (50.8%), with a mean left ventricular ejection fraction (LVEF) of 38.1±18.0%. Patients with heart failure with reduced ejection fraction (HFrEF) predominated (66.2%), as well as New York Heart Association (NYHA) functional class III (47.7%) and the warm and wet clinical-hemodynamic profile (84.6%). In the KCCQ score, patients with a previous diagnosis of HF presented higher scores in the Social Limitation domain (p=0.043) compared with those diagnosed during hospitalization. Patients classified as NYHA IV presented lower scores in the Physical Limitation domain (p=0.003), Symptoms subitems — Frequency (p=0.022) and Severity (p=0.044) —, Total Symptom Score (p=0.014), and Quality of Life (p=0.030), compared with NYHA I patients. Most participants were classified as without anxiety (55.4%) and without depression (75.4%). Patients classified as NYHA IV presented worse quality of life, evidenced by lower scores in the domains of Physical Limitation, Symptoms (Frequency and Severity), Total Symptom Score, and Quality of Life. LVEF, as well as anxiety and depression levels, showed no significant association with quality of life in patients with HF.

20248

CARDIOVASCULAR EMERGENCIES HANDLED BY THE MOBILE EMERGENCY CARE SERVICE IN A CAPITAL CITY IN NORTHEASTERN BRAZIL

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Introduction/Background: The majority of cases handled by the Mobile Emergency Care Service (SAMU) involve cardiovascular emergencies, including hypertensive crises, angina, acute myocardial infarction, and cardiopulmonary arrest. Analyzing the sociodemographic profile of patients treated by SAMU—particularly given the heterogeneity of the regions surveyed—is essential for the development and management of public policies. Objectives: To analyze the sociodemographic profile of victims of cardiovascular emergencies attended by SAMU in São Luís, Maranhão (MA). Methods: A retrospective, documentary study conducted at the Dispatch Center and Mobile Units of SAMU in São Luís, MA. The sample included 70 cardiovascular emergency calls recorded in 2017. Data were collected from medical dispatch records and analyzed using descriptive statistics in the Statistical Package for the Social Sciences (SPSS), including frequencies, means, and standard deviations. The study was approved by the Research Ethics Committee (CEP) of the Federal University of Maranhão (UFMA). Resultados e Conclusions: A total of 82 incidents were identified, resulting in 70 calls. A predominance of males (54.3%) over females (38.6%) was observed, with missing records in 7.1% of cases. Regarding age group, there was a higher incidence among the elderly (≥60 years), accounting for 57.1% of the cases, followed by individuals aged 40–59 years (31.4%). The remaining age groups were underrepresented. The main pre-existing conditions were hypertension (55.7%), heart disease (24.3%), and diabetes (20.0%). The most frequent complaints were malaise (21.4%), cardiorespiratory arrest (15.7%), and precordial pain (11.4%). Regarding geographic distribution, the highest number of cases occurred in the Coroadinho health district (20.0%), followed by Bequimão (17.1%). As for place of residence, the Bequimão district stood out (10.0%), although a high rate of missing records was observed (57.1%). The profile of cardiovascular emergencies highlights greater vulnerability among elderly men with hypertension, reflecting the impact of population aging and inequalities in access to healthcare. The spatial concentration of cases suggests territorial disparities in care, reiterating the urgency of strategies targeting these groups to promote equity and effectiveness in the emergency care network.

20671

DEVELOPMENT AND IMPLEMENTATION OF A TELEMONITORING PROTOCOL FOR POST-DISCHARGE CARE OF PATIENTS WITH HEART FAILURE

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(1) UNIVERSIDADE FEDERAL DE SAO PAULO - UNIFESP - SÃO PAULO - SP - BRASIL;

Introduction/Background: heart failure (hf) is a complex, multifactorial syndrome. Patients have a 75% chance of readmission within 30 days of hospital discharge, with a high impact on morbidity and mortality. Poor treatment adherence and the patient's difficulty in recognizing signs of decompensation are the main factors contributing to this scenario. Telemonitoring emerges as an effective strategy in the post-discharge period, optimizing remote care and patient safety. Objectives: to report on the experience of developing a telemonitoring protocol and its application in patients with hf in the post-discharge period, focusing on the systematization of continuity of care and the early identification of warning signs. Methods: this is an experience report, based on the situational strategic planning (ssp) methodology, which identified weaknesses in treatment adherence during the most critical period following hospital discharge and the need for a protocol to guide telemonitoring and. The protocol was developed by integrating guidelines from the brazilian society of cardiology, the aha, and the esc, in addition to using the kansas city cardiovascular questionnaire (kccq) and validated medication adherence scales. Practical implementation was carried out by a resident nurse via voice calls (whatsapp®), with data collection and systematization performed via google forms®. Resultados e conclusions: the protocol was structured as a digital form containing multiple-choice questions and open-ended fields to assess signs of decompensation (edema, fatigue, weight gain), medication adherence, fluid restriction, and lifestyle habits. It proved to be a complementary tool that assists healthcare professionals, in line with guidelines, particularly during the first days following hospital discharge until the outpatient follow-up visit. Furthermore, it demonstrated itself to be a low-cost, feasible, and replicable intervention, utilizing accessible technological resources. The development of this structured protocol improves the transition from hospital to home care, promotes patient-centered self-care, and establishes telemonitoring as an essential complementary tool for maintaining clinical stability and optimizing post-discharge outcomes.

14264

DEVELOPMENT OF EDUCATIONAL TECHNOLOGY AS A SELF-CARE STRATEGY IN THE TREATMENT OF CHAGAS DISEASE IN NORTHEAST BRAZIL

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Introduction/Background: Chagas disease is a chronic condition caused by Trypanosoma cruzi and remains a neglected disease associated with high morbidity and mortality and major challenges for diagnosis, treatment and therapeutic adherence (World Health Organization, 2026). In this context, health education and self-care promotion strategies become fundamental, especially when associated with the use of accessible educational technologies, such as educational videos, capable of promoting understanding and stimulating behavioral changes. Objectives: To develop educational technology as a self-care strategy for the treatment of chronic Chagas disease in a public reference service in Northeast Brazil. Methods: This is a methodological study conducted at a Chagas disease reference outpatient clinic in Northeast Brazil. The development of the educational technology by the nursing team began with a literature review, using as one of its primary references the didactic material titled “Supported Self-Care Exercise Workbook”. The Canva® platform was utilized, employing animation features and graphic elements centered on themes of healthy eating, stress management, and physical exercises. Resultados e Conclusions: Educational videos regarding self-care in Chagas disease were developed by the nursing staff, featuring accessible narration and illustration, which gave the material an attractive cartoon-like aesthetic, fostering comprehension and interest among the target audience in the figure. Complementarily, illustrative charts were developed to enable self-assessment of lifestyle habits and to encourage the setting of individual goals, representing a playful and inclusive resource to support patient’s reflection on self-care. The study demonstrated that the use of educational technology, such as educational videos, constitutes an accessible and low-cost strategy to support self-care for patients with chronic Chagas disease. In addition to promoting understanding and engagement, the material has the potential for replication in other health services, including contexts of greater social vulnerability, reinforcing the importance of incorporating health education technologies into the treatment of Chagas disease.



16093

DIGITAL EDUCATIONAL TECHNOLOGY AS AN ENHANCEMENT OF HEALTH LITERACY IN HEART TRANSPLANT PATIENTS.

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(1) INSTITUTO NACIONAL DE CARDIOLOGIA - RIO DE JANEIRO - RJ - BRASIL;

Introduction/Background: Heart transplantation is the gold standard treatment for advanced heart failure; however, the post-transplant period requires strict adherence to immunosuppressive therapy, continuous follow-up, and lifestyle changes. In this context, health literacy is fundamental for self-care and prevention of complications. Digital educational technologies emerge as strategies to enhance understanding of health information and support the autonomy of transplant patients. Objectives: To develop and test a digital educational technology to support health literacy in post–heart transplant patients, based on evidence and expert co-creation. Methods: Methodological study with a qualitative approach and quantitative components, aimed at developing a digital educational technology for heart transplant patients. The process was based on Design Thinking, with stages of immersion, ideation, prototyping, and testing. During immersion, a scoping review of the literature and an investigation with patients and professionals were conducted to identify needs related to self-care and health literacy. Ideation was carried out through brainstorming with a multidisciplinary team. In the prototyping phase, an educational video was developed and validated by specialists. The testing phase involved heart transplant patients to evaluate usability using the System Usability Scale (SUS). Resultados e Conclusions: The scoping review identified a scarcity of studies on health literacy in the post-heart transplant setting, with 15 articles included after screening according to PRISMA recommendations. The analysis of the literature and the investigation with transplant patients and professionals revealed difficulties in understanding guidance related to continuous use of immunosuppressive therapy, recognition of rejection signs, and self-care management, in addition to anxiety and fear of graft rejection. A preference for audiovisual resources was observed, especially interviews with healthcare professionals and explanatory animations. Based on these findings and a brainstorming workshop with specialists, thematic axes were defined, including therapeutic adherence, warning signs, lifestyle, and prevention of complications, guiding the development of an educational video with accessible language.

15255

EVALUATION OF THE EUROPEAN SELF-CARE SCALE IN CHRONIC CHAGAS DISEASE IN NORTHEAST BRAZIL

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(1) UNIVERSIDADE DE PERNAMBUCO - RECIFE - PE - BRASIL; (2) PRONTO SOCORRO CARDIOLOGICO DE PERNAMBUCO - PROCAPE - RECIFE - PE - BRASIL;

Introduction/Background: Described by the Brazilian researcher Carlos Chagas, Chagas disease affects approximately 7 to 8 million people globally. Endemic in Latin America but also present in countries across Europe, North America, and Asia due to the immigration processes Self-care emerges as a non-pharmacological tool, mainly in reducing hospitalizations and when combined with health education actions led by nursing, it can improve quality of life and expand knowledge. Objectives: To evaluate the European Self-Care Scale in patients with chronic Chagas disease followed at a reference service in Northeast Brazil. Methods: A cross-sectional study with a quantitative approach, conducted at a Chagas disease reference outpatient clinic in the Brazilian Northeast region in 2025. The nursing team utilized the “European Heart Failure Self-care Behaviour Scale (EHFScBS),” validated for Brazil , which contains 12 self-care questions related to the perception of heart failure decompensation signs, nutritional habits, physical exercise, and vaccination. The higher the score on an item, the lower the self-care. Resultados e Conclusions: A total of 53 patients were evaluated, with a higher prevalence of females 75.5%, an average age of 66 years, 60% with incomplete primary education, 26.4% illiterate, 34% with an income of up to one minimum wage; 90.5% presented systemic arterial hypertension and 37.5% diabetes mellitus. Regarding the clinical classification of Chagas disease , 43.5% presented heart failure. As for polypharmacy, 60% reported using more than five daily medications, and 75.5% reported receiving the flu vaccine annually. Regarding the scale item “I weigh myself every day,” 34% stated they do not measure their weight daily, on the item “I limit the amount of fluids I drink,” 49% stated they restrict their daily fluid intake; regarding medication use, 81% demonstrated adequate adherence, and the item “I exercise regularly” showed 45% for “strongly disagree.” The average value obtained from the scale was 27.09, indicating a vulnerability in self-care.The population presented weaknesses regarding body weight control, fluid and salt intake, and the incorporation of physical exercise into their routine, essential factors for preventing decompensation episodes.Nevertheless, the discrepancy between medication adherence and non-pharmacological habits highlights the need for integrated strategies that consider not only the clinical dimension, but also the social determinants of health that affect patients with Chagas disease.

21017

INCIDENCE OF PRESSURE INJURY BEFORE AND AFTER THE IMPLEMENTATION OF EXCLUSIVE DIRECT NURSING CARE IN A CARDIAC INTENSIVE CARE UNIT

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Introduction/Background: Introduction: Critically ill cardiac patients admitted to the Intensive Care Unit (ICU) exhibit high vulnerability to adverse events, including pressure injuries (PI), which are associated with increased morbidity, prolonged hospital stays, and higher hospital costs. In this context, nursing care plays a strategic role in promoting patient safety. However, evidence regarding the impact of exclusive care provided by registered nurses on quality indicators in cardiac ICUs remains limited. Objectives: Objective: To analyze the incidence of pressure injuries before and after the implementation of an exclusive direct nursing care model in a cardiac ICU. Methods: Methods: A quantitative, retrospective, quasi-experimental study conducted in a cardiac ICU of a philanthropic hospital in São Paulo, Brazil. The intervention consisted of implementing a model of exclusive direct care provided by nurses, replacing the previous care model composed of both nurses and nursing technicians. Monthly indicators were compared for the pre-intervention (March 2023 to February 2024) and post-intervention (June 2024 to May 2025) periods. The analyzed outcome was the incidence of unit-acquired stage ≥2 PI. Clinical and care variables were also analyzed, including the number of patients per month, length of stay, and SAPS III. Comparisons between periods were performed using the Mann-Whitney test, with a significance level of 5%. The study was approved by the Research Ethics Committee (Opinion No. 7,981,946). Resultados e Conclusions: Results: A total of 1,357 patients admitted to a cardiac ICU were analyzed, comparing monthly indicators before and after the implementation of exclusive direct nursing care. The periods were similar regarding the median number of patients per month (57.5 vs. 56.5; p=0.762) and median length of stay (2 vs. 2 days; p=0.514). An increase in clinical severity was observed in the post-intervention period, evidenced by a higher median SAPS III (45 vs. 42 points; p<0.001). Despite this, the incidence of stage ≥2 pressure injuries decreased from 0.6% to 0.2%, representing a statistically significant difference (p=0.045). Conclusion: Notwithstanding the increase in patient severity, exclusive direct nursing care in the cardiac ICU was associated with a reduction in the incidence of pressure injuries. This demonstrates that the model contributes to patient safety and the quality of care in critical environments.

18376

INVOLVING PEOPLE WITH HEART DISEASE IN THE VALIDATION PROCESS FOR HEALTH EDUCATION TECHNOLOGY CONTENT

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Introduction/Background: Health education technologies must undergo scientific analysis before being incorporated into professional practice. The first step — validating content — must take the target audience into account, despite many researchers considering only so-called experts in this process. This overlooks the varying levels of health literacy among different populations, particularly people with heart disease who have conditions that can be managed without medication. Objectives: To describe the process of validating the content of a technology with people who have heart disease. Methods: A descriptive study with a quantitative approach was conducted at a leading cardiology hospital in Rio de Janeiro between December 2025 and February 2026. Participants were selected through non-probability sampling based on the following criteria: adults over 18 years of age, regardless of gender, who were hospitalized in clinical units. The instrument contained data on participant characteristics and on the technology. The Content Validity Ratio (CVR) was used to assess the essentiality of items in the content validity data, with a one-tailed test (α = 0.05) based on the critical CVR according to the number of participants defined by Lawshe. The study adhered to all stages pertaining to research involving human subjects. Resultados e Conclusions: A total of 12 participants took part in the study. The mean age of the participants was 58 years (range 35–80 years). The majority of participants were male (66.7%; n = 8). Of the participants, 16.7% (n = 2) had not completed elementary school, 33.3% (n = 4) had completed high school, 16.7% (n = 2) had not completed high school and 33.3% (n = 4) had completed college. Eighty-one per cent (n = 9) of participants had a religious affiliation, with 55.6% (n = 5) identifying as Catholic and 44.4% (n = 4) identifying as Evangelical. Family income ranged from one minimum wage for 50% (n = 6) to between two and five minimum wages for the remaining 50% (n = 6). The critical CVR was 0.47 and of the 97 items analysed by the participants, 13 did not reach the critical CVR. Participants reported difficulty reading sentences on coloured pages or in highly stylised fonts, low identification with certain motivational phrases, low acceptance of activities based on textual records, and the necessity of changes to the humour section. The participation of people with heart disease was essential to validate the content of the developed technology.

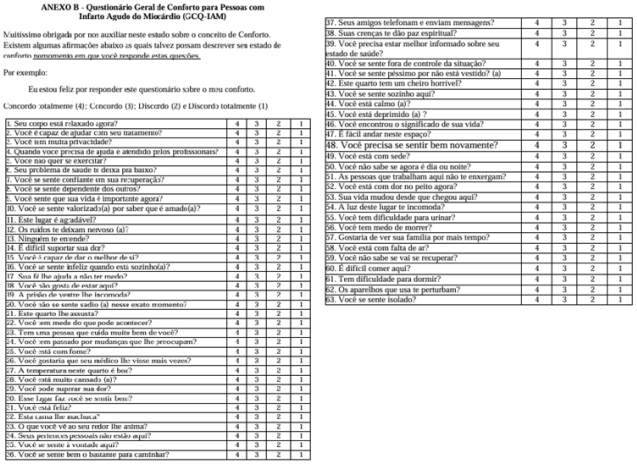
17281

MEASURING COMFORT IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION: INSTRUMENT VALIDITY OF A TOOL TO EVALUATE COMFORT

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Introduction/Background: Comfort is a phenomenon conceptualized as holistic and desired at different moments in the life cycle, especially during the hospitalization process(HP). The survival after an acute event provenient from cardiovascular diseases is an outcome provenient from epidemiological|demographic transition. In that way, the HP for acute myocardial infarction (AMI) is positive once the individuals survive the event, in turn, brings with it sensations and meanings capable of interfering with the comfort in the face of fear of death, finitude and worry, in addition to imposing changes in the physical, psychological and social spheres. For this reason, investigating the psychometric properties of a tool for measuring the comfort experienced by people with an AMI becomes relevant, providing properties that will confer validity and reliability on the measurement obtained. Objectives: The objective of this study is to evaluate the evidence of validity of the internal structure of the General Comfort Questionnaire-IAM. Methods: This is a cross-sectional psychometric study, which included a sample of 332 people hospitalized in an intensive care unit or inpatient units due to AMI in a cardiology specialized hospital in a city in the interior of Bahia. Data collection was conducted using the sociodemographic, clinical collection instrument and the instrument for measuring patient comfort, the GCQ-IAM. To the data analysis, it was used factorial exploratory (EFA) and confirmatory analysis (CFA). This study is allowed in conformity to Ethical Research Comity n° 1.374.838. Resultados e Conclusions: Originally, the GCQ-IAM was developed with 63 items with answers in a likert type scale 1 - totally disagree to 4 - totally agree, which had them inserted in four contexts. The factor analyzes (EFA and CFA) inferred a two-dimensional instrument model with 9 items, which have satisfactory psychometric characteristics regarding factor loadings (-0.476 - 0.724), CFI (0.927), TLI (0.899) and RMSEA (0.065) suitable. However, when analyzing the reliability results in terms of internal consistency, the ω (0.571) and the VME (0.3160) showed incipient results. Therefore, it is pertinent that there is a certain degree of caution regarding the use of the GCQ-IAM, being important to carry out new analyses to achieve better psychometric measurements, which indicates the necessity to be reevaluated with a bigger sample in a multicentric study, mainly in relation to the degree of reliability and internal consistency.



ANEXO B - Questionário Geral de Conforto para Pessoas com Infarto Agudo do Miocárdio (GCQ-IAM)

Muitíssimo obrigada por nos auxiliar neste estudo sobre o conceito de Conforto. Existem algumas afirmações abaixo as quais talvez possam descrever seu estado de conforto momento em que você responde estas questões.

Por exemplo:

Eu estou feliz por responder este questionário sobre o meu conforto.

Concordo totalmente (4); Concordo (3); Discordo (2) e Discordo totalmente (1)

1. Seu corpo está relaxado agora?	4	3	2	1
2. Você é capaz de ajudar com seu tratamento?	4	3	2	1
3. Você tem muita privacidade?	4	3	2	1
4. Quando você precisa de ajuda e atendido pelos profissionais?	4	3	2	1
5. Voce nao quer se exercitar?	4	3	2	1
6. Seu problema de saúde te deixa pra baixo?	4	3	2	1
7. Você se sente confiante em sua recuperação?	4	3	2	1
8. Você se sente dependente dos outros?	4	3	2	1
9. Você sente que sua vida é importante agora?	4	3	2	1
10. Você se sente valorizado(a) por saber que é amado(a)?	4	3	2	1
11. Este lugar é agradável?	4	3	2	1
12. Os ruídos te deixam nervoso (a)?	4	3	2	1
13. Ninguém te entende?	4	3	2	1
14. É difícil suportar sua dor?	4	3	2	1
15. Você é capaz de dar o melhor de si?	4	3	2	1
16. Você se sente infeliz quando está sozinho(a)?	4	3	2	1
17. Sua fé lhe ajuda a não ter medo?	4	3	2	1
18. Você não gosta de estar aqui?	4	3	2	1
19. A prisão de ventre lhe incomoda?	4	3	2	1
20. Você não se sente sadio (a) nesse exato momento?	4	3	2	1
21. Este quarto lhe assusta?	4	3	2	1
22. Você tem medo do que pode acontecer?	4	3	2	1
23. Tem uma pessoa que cuida muito bem de você?	4	3	2	1
24. Você tem passado por mudanças que lhe preocupam?	4	3	2	1
25. Você está com fome?	4	3	2	1
26. Você gostaria que seu médico lho visse mais vezes?	4	3	2	1
27. A temperatura neste quarto é boa?	4	3	2	1
28. Você está muito cansado (a)?	4	3	2	1
29. Você pode suportar sua dor?	4	3	2	1
30. Esse lugar faz você se sentir bem?	4	3	2	1
31. Você está feliz?	4	3	2	1
32. Esta causa lhe sua busca?	4	3	2	1
33. O que você vê ao seu redor lhe anima?	4	3	2	1
34. Seus preciosos pessoais não estão aqui?	4	3	2	1
35. Você se sente à vontade aqui?	4	3	2	1
36. Você se sente bem o bastante para caminhar?	4	3	2	1
37. Seus amigos telefonam e enviam mensagens?	4	3	2	1
38. Suas crenças te dão paz espiritual?	4	3	2	1
39. Você precisa estar melhor informado sobre seu estado de saúde?	4	3	2	1
40. Você se sente fora de controle da situação?	4	3	2	1
41. Você se sente péssimo por não está vestido? (a)	4	3	2	1
42. Este quarto tem um cheiro horrível?	4	3	2	1
43. Você se sente sozinho aqui?	4	3	2	1
44. Você está calmo (a)?	4	3	2	1
45. Você está deprimido (a) ?	4	3	2	1
46. Você encontrou o significado de sua vida?	4	3	2	1
47. É fácil andar neste espaço?	4	3	2	1
48. Você precisa se sentir bem novamente?	4	3	2	1
49. Você está com sede?	4	3	2	1
50. Você não sabe se agora é dia ou noite?	4	3	2	1
51. As pessoas que trabalham aqui não te enxergam?	4	3	2	1
52. Você está com dor no peito agora?	4	3	2	1
53. Sua vida mudou desde que chegou aqui?	4	3	2	1
54. A luz deste lugar te incomoda?	4	3	2	1
55. Você tem dificuldade para urinar?	4	3	2	1
56. Você tem medo de morrer?	4	3	2	1
57. Gostaria de ver sua família por mais tempo?	4	3	2	1
58. Você está com falta de ar?	4	3	2	1
59. Você não sabe se vai se recuperar?	4	3	2	1
60. É difícil comer aqui?	4	3	2	1
61. Tem dificuldade para dormir?	4	3	2	1
62. Os aparelhos que usa te perturbam?	4	3	2	1
63. Você se sente isolado?	4	3	2	1

15709

NURSING CARE AT ADMISSION OF POSTOPERATIVE VASCULAR SURGERY PATIENTS ANS ITS IMPACT ON THE INCIDENCE OF ADVERSE EVENTS

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Introduction/Background: The nursing care required at admission of postoperative vascular surgery patients can be measured using the Nursing Activities Score (NAS) to identify patients' specific needs, guide targeted nursing interventions, and improve patient safety. The NAS is one of the most comprehensive tools for the prospective assessment of nursing care, as it covers 81% of nursing activities. Objectives: To analyze the association between the intensity of nursing care at admission in postoperative vascular surgery patients and the incidence of adverse events. Methods: This prospective cohort study was conducted in vascular surgery units in Brazil and Canada, from October to November 2025. The NAS instrument consists of 23 items to measure the intensity of nursing care and can be applied at admission. Spearman's correlation test was used to assess the relationship between the number of adverse events, NAS at admission and patients' variables. The linear regression model was used to assess the association between NAS at admission and the number of adverse events. The significance level was $p<0.05$. Resultados e Conclusions: In Brazil, this study included 95 patients and found 176 adverse events. The mean NAS at admission was 41.70 (SD8.74), and 100% of patients experienced at least one adverse event. In Canada, the study included 210 patients and recorded 449 adverse events; 42.00% of patients experienced at least one adverse event. The mean NAS at admission was 70.15 (SD 10.63). The most frequent adverse event in both countries was severe pain (>8.0 on a 0-10 pain intensity scale), with 309 events (64.5%) in Brazil and 93 (51.70%) in Canada. In Brazil, a correlation indicated that as age and length of stay increased, the number of adverse events also increased. There was no association between NAS at admission and the number of adverse events. In Canada, higher NAS at admission and longer length of stay, higher incidence of adverse events. Moreover, the association test confirmed a statistically significant association between NAS at admission and the number of adverse events. Each point increase in NAS at admission was associated with a 0.4 increase in the incidence of adverse events ($p<0.05$). Thus, this study highlights that the intensity of nursing care at admission may influence the incidence of adverse events. Nurses have a crucial role at the admission of postoperative vascular surgery patients, implementing targeted interventions that may help reduce the incidence of adverse events.

15712

NURSING CARE INTENSITY AT DISCHARGE OF POSTOPERATIVE VASCULAR SURGERY PATIENTS AND 30-DAY READMISSION IN BRAZIL AND CANADA

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Introduction/Background: The assessment of nursing care intensity using the Nursing Activities Score (NAS) at discharge for vascular surgery patients enables nurses to identify specific patient needs on the last day of hospitalization and supports nursing decision-making regarding appropriate care strategies to address these needs prior to discharge and reduce 30-day readmission. The NAS instrument captures 81% of nursing activities, making it one of the most comprehensive tools currently available for measuring nursing care intensity. Objectives: To evaluate the association between NAS at discharge in postoperative vascular surgery patients and 30-day readmission. Methods: This prospective cohort study was conducted in cardiovascular surgery units in Brazil and Canada during October and November 2025. The NAS instrument was used to measure the intensity of nursing care at discharge in postoperative vascular surgery patients. Readmitted and non-readmitted patients were compared in both countries. A logistic regression model was used to assess the association between NAS at discharge and 30-day readmission in Brazil and Canada. The significance level was $p<0.05$. Resultados e Conclusions: The 30-day readmission rate was 22.10% in Brazil and 10.00% in Canada. In Brazil, NAS scores at discharge for readmitted and non-readmitted patients were 60.35 (±9.93) and 57.51 (±10.42), respectively, which were higher than those observed in Canada (56.02 ± 10.82 and 54.46 ± 8.66, respectively). The most frequent postoperative nursing activities at discharge in both countries involved medication, basic hygiene, basic mobilization, multidisciplinary communication and medical record management, as well as assistance with patient transport out of the unit (NAS items 3, 4.a, 6.a, 8.b and 23). No significant association was found between NAS at discharge and 30-day readmission in either Brazil or Canada. Even so, this study makes important contributions to the management of nursing care at discharge in postoperative vascular surgery patients. The main care demands at discharge were similar in both countries, and the higher 30-day readmission rate in Brazil than in Canada may be influenced by sociocultural factors that also contribute to higher NAS at discharge. This study provides innovative insights into the management of postoperative nursing care in vascular surgery and identifies potential interventions to reduce 30-day readmissions.

21219

NURSING WORKFORCE RECONFIGURATION FOLLOWING THE IMPLEMENTATION OF EXCLUSIVE DIRECT NURSING CARE IN A CARDIAC ICU

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Introduction/Background: Introduction: Exclusive nursing care models are promising strategies to enhance quality and safety in critical care. In Cardiac Intensive Care Units (ICUs), clinical complexity demands workforce reorganization. However, evidence on the impact of these models on human resource indicators, such as composition, absenteeism, and turnover, remains limited. Analyzing these metrics helps understand the organizational impact of nurse-centered models in high-complexity services. Objectives: Objective: To analyze changes in workforce composition and human resource indicators following the implementation of exclusive direct nursing care in a cardiac ICU. Methods: Method: A quantitative, retrospective, quasi-experimental study conducted in a cardiac ICU of a philanthropic hospital in São Paulo, Brazil. The intervention replaced the model composed of nurses and technicians with exclusive direct care by registered nurses. Monthly indicators from pre-intervention (Mar/2023–Feb/2024) and post-intervention (Jun/2024–May/2025) periods were compared, including staff composition, absenteeism, and turnover. The Mann-Whitney test was used (5% significance level). Approved by the Ethics Committee (No. 7,981,946). Resultados e Conclusions: Results: A total of 1,198 records were analyzed. The workforce was predominantly composed of mid-level nursing technicians (49.9%), mid-level registered nurses (39.4%), and females (62.1%). A significant staff reconfiguration occurred post-intervention, with a reduction in total professionals (52.0 vs. 46.0; p=0.004), an increase in nurses (17.5 vs. 31.0; p<0.001), and a reduction in technicians (35.0 vs. 15.0; p<0.001). No significant difference was found in total absenteeism (0.01 vs. 0.01; p=0.671), nor among nurses (p=0.242) and technicians (p=0.443). Total turnover increased post-intervention (0.01 vs. 0.03; p=0.004), with no significant difference for nurses (p=0.068) or technicians (p=0.443). Conclusion: Exclusive direct nursing care led to workforce reconfiguration with more nurses and fewer technicians, without affecting absenteeism. The findings highlight relevant organizational impacts of this model on nursing human resource indicators.

14610

RISK SCORES FOR PREDICTING MEDIASTINITIS IN CARDIAC SURGERY: AN INTEGRATIVE REVIEW

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Introduction/Background: Cardiovascular diseases are one of the leading causes of death in Brazil and often require cardiac surgery. In this context, mediastinitis is a serious postoperative complication associated with high mortality, despite its low incidence. It is related to risk factors such as obesity, diabetes, and advanced age. The use of predictive risk scores allows the identification of high-risk patients, supporting prevention and reducing clinical impacts and hospital costs. Objectives: To conduct an integrative review of risk scores used to predict mediastinitis in patients undergoing cardiac surgery, considering their accuracy and the methodological quality of the studies. Methods: An integrative literature review was carried out, with searches conducted between February and April 2025 in the PubMed, LILACS, SciELO, Cochrane, Scopus, Omnis PUCRS, Web of Science, and Epistemonikos databases. Original studies published between 2010 and 2025, in Portuguese, English, or Spanish, were included. Methodological quality was assessed using the Methodological Index for Non-Randomized Studies (MINORS) instrument. Resultados e Conclusions: Of the 54 studies identified, only four met the inclusion criteria. Obesity (BMI >30 kg/m²) was the only variable common to all analyzed scores. The studies demonstrated good methodological quality and accuracy, with Med-Score 24 showing the highest MINORS score. Mediastinitis prediction scores are useful tools for identifying high-risk patients, contributing to infection prevention and the promotion of safe care. Their application in nursing practice enables individualized, evidence-based interventions, strengthening the quality of postoperative care in cardiac surgery.

Características	Autores/ano			
	Cauley et al.[16] (2024)	Sá et al.[17] (2017)	Magedanz et al.[12] (2010)	Nieto-Cabrera et al.[15] (2018)
Nome do score	Beth Israel Deep Sternal Wound Dehiscence Risk Score	*	Magedanz Score	Med-Score 24
Amostra (n)	8403	1500	2809	4625
Período de coleta	2007 - 2019	2007 - 2016	1996 - 2007	2005 - 2011
Local de aplicação	Beth Israel Deaconess Medical Center (EUA)	Brasil	Hospital São Lucas da PUCRS (BR)	Hospital Clínico San Carlos (ESP)
Prevalência da mediastinite na amostra	1,6% (34)	4,8% (74)	3,3% (94)	2,36% (94)
Acurácia	p 0,76	p 0,729	p 0,72	p 0,80
Sensibilidade	*	*	*	77%

Variáveis	Autores			
	Cauley et al.[16]	Sá et al.[17]	Magedanz et al.[12]	Nieto-Cabrera et al.[15]
DPOC	—	—	2 pontos	OR 2.32
IMC > 30 kg/m²	1 a 4 pontos	3 pontos	2 pontos	OR 1.7
Politransfusão	—	—	1 ponto	—
Reintervenção cirúrgica	—	—	3 pontos	OR 2.01
Angina classe IV	—	—	1 ponto	—
Idade > 70 anos	—	—	—	OR 1.75
Antiplaquetários	—	—	—	OR 1.6
Tempo de isquemia prolongado	—	—	—	OR 2.08
Intubação prolongada	—	—	—	OR 2.08
Sexo feminino	2 pontos	—	—	—
Diabetes Mellitus	1 a 4 pontos	3 pontos	—	—
Tabagismo	2 pontos	2 pontos	—	—
Creatinina elevada	1 ponto	—	—	—
Artéria mamária	—	5 pontos	—	—
Tempo de CEC	—	2 pontos	—	—

14442

TRAINING NURSING STAFF IN INPATIENT UNITS FOR ELECTROCARDIOGRAM PERFORMANCE: AUTONOMY, AGILITY, AND QUALITY OF CARE

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Introduction/Background: Performing electrocardiograms (ECGs) in the hospital setting is essential for the early detection of cardiac alterations. In contexts where this activity is centralized in specialized laboratories, logistical challenges emerge due to high demand and the need for rapid response in critical situations. Training nursing staff for autonomous bedside ECG performance represents a promising strategy for improving care quality and operational decentralization, a topic still underreported in national literature. Objectives: To technically train the nursing staff of inpatient units for the autonomous performance of ECGs, promoting agility in care, qualification of clinical practice, and decentralization of operational workflows. Methods: A pilot educational intervention project structured in two stages. The theoretical stage was conducted by a nurse specialist in cardiology, covering the technical fundamentals of ECG, patient care, and primary electrocardiographic alterations. The practical stage took place under supervision in a cardiology laboratory. Participants included 42 nursing professionals (nurses and technicians), who were also prepared as knowledge multipliers within their teams. Technical-operational training with a representative from the ECG equipment manufacturer was also included. Resultados e Conclusions: Forty-two professionals were trained to perform ECGs directly in the inpatient units. The intervention resulted in greater agility in emergency care, reduced demand on the centralized cardiology laboratory, and optimization of the outpatient schedule. An improvement in clinical resolution and response time to clinical occurrences was observed, alongside the strengthening of permanent education as a strategy for professional qualification and the promotion of nursing leadership. Training the nursing staff to perform ECGs contributed to the technical autonomy of the units, optimizing workflows and strengthening multidisciplinary action. The decentralization of the process represented a significant advancement in care, combining safety, efficiency, and quality of care.

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VARIATIONS IN POSTOPERATIVE NURSING CARE AT THE ADMISSION AND DISCHARGE OF VASCULAR SURGERY PATIENTS IN BRAZIL AND CANADA

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Introduction/Background: The Nursing Activities Score (NAS) instrument measures the intensity of nursing care and can be used to identify variations in nursing care at admission and discharge of postoperative vascular surgery patients. The NAS enables nurses to meet patients' specific needs and to adjust staffing levels appropriately in order to improve the quality of care. Objectives: To compare the intensity of nursing care based the mean NAS at admission and discharge of postoperative vascular surgery patients. Methods: This prospective cohort study was conducted in vascular surgery units in Brazil and Canada from October to November 2025. The NAS is one of the most comprehensive tools for measuring nursing activities, and it was applied at both admission and discharge. McNemar's and Chi-square tests were used to compare NAS items at admission and discharge. A linear regression model was applied to assess the association between NAS admission and discharge with patients' clinical variables. The significance level was $p<0.05$. Resultados e Conclusions: This study included 91 patients from Brazil and 210 patients from Canada. In Brazil: The mean NAS at admission was lower than at discharge: 41.52 (SD9.12) and 58.14 (SD10.33), respectively. The comparison of NAS items at admission and discharge in Brazil showed an important increase in nursing care related to discharge protocols and multidisciplinary consultations (item 8.b), as well as organization to transport at discharge (item 23). NAS admission showed no significant association with patients variables, whereas NAS at discharge was associated with length of stay, number of adverse events and Charlson score. In Canada, the mean NAS at admission was higher than at discharge: 70.16 (SD10.63) and 55.86 (SD10.61), respectively. The comparison showed that nursing activities were intense in the first days of postoperative vascular surgery due to monitoring, drain care, mobilization, and bladder monitoring (items 1.b-1.c, 5, 6.b, and 17). NAS at admission was associated with length of stay and the number of adverse events, whereas NAS at discharge with length of stay. Thus, the mean NAS at admission was higher in Canada than in Brazil, whereas NAS at discharge was higher in Brazil than in Canada. Although social and cultural differences between these countries may have influenced the results, both settings highlight the importance of nurses' interventions in postoperative vascular surgery and the management of nursing care at admission and discharge to improve safety and outcomes.

Nutrition



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17728

CALF CIRCUMFERENCE AS A PREDICTOR OF APPENDICULAR SKELETAL MUSCLE MASS ASSESSED BY DUAL-ENERGY X-RAY ABSORPTIOMETRY (DXA) IN INDIVIDUALS WITH HEART FAILURE

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Introduction/Background: Sarcopenia, a disease characterized by the progressive and generalized loss of muscle strength and muscle mass (MM), is highly prevalent among individuals with heart failure (HF) and is associated with adverse outcomes. The diagnosis of sarcopenia requires costly equipment to assess MM, which is often not available in clinical practice. Thus, more cost-effective methods for measuring MM may enable early detection of sarcopenia. Although some studies suggest that calf circumference (CC) is a useful tool for estimating MM, evidence in patients with HF remains scarce. Objectives: To evaluate whether CC is a predictor of MM assessed by dual-energy X-ray absorptiometry (DXA) in patients with heart failure. Methods: A cross-sectional study including outpatients with HF with reduced ejection fraction (<40%) or mildly reduced ejection fraction (40–49%), aged ≥18 years, of both genders. Anthropometric assessment included body weight, height, and right CC. Low MM according to CC was defined as <34 cm for men (M) and <33 cm for women (W). MM was assessed by DXA (gold standard) based on appendicular skeletal muscle mass (ASMM) and the ASMM index (ASMI/height²). Low MM according to DXA was defined as ASMM <20 kg (M) and <15 kg (W), and ASMI <7.0 kg/m² (M) and <5.5 kg/m² (W). Pearson correlation analysis was used to evaluate the association between CC and ASMM and ASMI, and the Kappa test assessed the agreement for the diagnosis of low MM between CC and DXA. Resultados e Conclusions: A total of 157 individuals were evaluated, 68% (n=107) men, with mean of age of 60.1 ± 12 years and body mass index of 29.2 ± 6 kg/m², and the majority were physically inactive (75%). A strong association was observed between CC and ASMM ($r = 0.72$, $p < 0.001$) and ASMI ($r = 0.77$, $p < 0.001$). The frequency of low MM was 18% (n=28) according to CC, 19% (n=30) according to ASMM, and 13% (n=20) according to ASMI. The diagnosis of low MM based on CC showed moderate agreement of 86% (kappa = 0.53) with ASMM and reasonable agreement of 82.2% (kappa = 0.31) with ASMI. In conclusion, patients with HF with reduced or mildly reduced ejection fraction, CC shows a strong association with MM assessed by DXA and identifies low MM with moderate/reasonable agreement compared to ASMM, and may be useful for the screening of low MM in this population.

17972

CARDIOVASCULAR DISEASES ATTRIBUTABLE TO HIGH BODY MASS INDEX: A COMPARATIVE ANALYSIS OF GLOBAL, BRAZIL, AND UNITED STATES DATA IN 2013 AND 2023.

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Introduction/Background: The increasing prevalence of high body mass index (BMI) has contributed to the burden of cardiovascular diseases (CVD) worldwide, representing an important modifiable risk factor. Objectives: To analyze the impact of CVD attributable to high BMI in individuals aged 20 to 54 years, comparing global, Brazilian, and United States scenarios between 2013 and 2023. Methods: An ecological, descriptive, and comparative study was conducted using secondary population-based data from the Global Burden of Disease Study (GBD), developed by the Institute for Health Metrics and Evaluation. Disability-adjusted life years (DALYs) attributable to high BMI as a risk factor for CVD were analyzed using absolute numbers, percentages, and rates per 100,000 inhabitants. Analyses were stratified by sex, age group (20–54 years), location (global, Brazil, and the United States), and years (2013 and 2023). Resultados e Conclusions: An increase in the impact of high BMI on CVD was observed across all analyzed locations in 2013 and 2023. Globally, both DALY rates and the proportion of CVD attributable to high BMI increased, reaching 13.1% in males and 14.0% in females in 2023. In Brazil, values exceeded global levels, corresponding to 14.9% and 17.8%, respectively, indicating an intermediate burden compared to the United States. The United States presented the highest burden, with DALY rates exceeding 1000 per 100,000 inhabitants. Males consistently showed higher DALY rates across all regions, reflecting greater overall disease burden. However, the proportion of CVD attributable to high BMI was higher among females, highlighting the greater relative contribution of obesity in this group. These findings reinforce the importance of obesity control strategies as a key approach to reducing the global burden of CVD.

17382

CORRELATION BETWEEN HANDGRIP STRENGTH AND RESPIRATORY MUSCLE STRENGTH IN PATIENTS WITH HEART FAILURE

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Introduction/Background: Respiratory muscle strength is frequently reduced in individuals with heart failure (HF) due to disease-related pathophysiological changes. This decline is associated with reduced functional capacity and worse clinical outcomes. Despite its prognostic relevance, the assessment of respiratory muscle strength is not routinely available in clinical practice. In this context, handgrip strength (HGS) emerges as a simple and accessible measure of peripheral muscle strength, also associated with clinical outcomes. Nevertheless, evidence evaluating the association between these measures in individuals with HF remains scarce. Objectives: To evaluate the association between HGS and respiratory muscle strength in patients with HF. Methods: A cross-sectional study including outpatients with HF with reduced ejection fraction (HFrEF) or mildly reduced ejection fraction (HFmrEF), aged ≥18 years, of both genders. Exclusion criteria were individuals with body mass index (BMI) ≤18.5 kg/m², pregnant or lactating women and those with other chronic inflammatory diseases. Peripheral muscle strength was assessed using HGS with a dynamometer, and low muscle strength was defined as HGS <27 kg in men and <16 kg in women. Respiratory muscle strength was measured by manovacuometry (analog manovacuometer with a measurement range of −150 to +150 cmH□O), obtaining maximal inspiratory pressure (MIP) and maximal expiratory pressure (MEP). Three maneuvers were performed for both MIP and MEP, with a 15-second interval between measurements, and were considered valid if sustained for at least two seconds and performed without air leaks. Resultados e Conclusions: A total of 158 patients were evaluated: 68% (n=107) men, 58.2% (n=92) non-smokers and 39.2% (n=62) former smokers, with mean of age of 60 ± 13 years and BMI of 29.2 ± 6 kg/m². The majority had HFrEF (84%) and were classified as New York Heart Association functional class I (45%) or II (40%), and 75% were physically inactive. HGS showed a moderate positive correlation with MEP (r = 0.62; p < 0.001) and a weak negative correlation with MIP (r = −0.33; p < 0.001). Patients with low HGS had lower MEP values (65 ± 19 vs. 82 ± 29 cmH□O; p = 0.01). Conclusion: In outpatients with HFrEF or HFmrEF, HGS shows a moderate association with expiratory muscle strength. This finding suggests that low HGS may indicate impaired respiratory muscle strength.

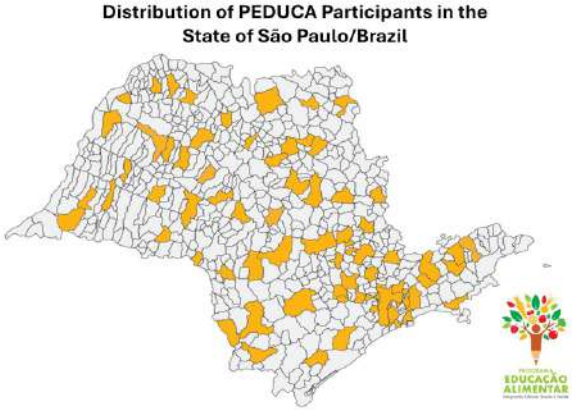
21813

FOOD AND NUTRITION EDUCATION PROGRAM TO COMBAT CARDIOVASCULAR RISK FACTORS IN PUBLIC SCHOOLS IN THE STATE OF SÃO PAULO, BRAZIL

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Introduction/Background: Inadequate nutrition is a major risk factor for obesity and cardiovascular diseases. Therefore, promoting healthy eating habits from childhood is essential. Schools and educators play a central role in individual development, acting as key allies in building knowledge, autonomy in food choices, and healthier food systems. Thus, the school environment stands out as a fundamental tool to encourage healthier choices aimed at preventing obesity and cardiovascular diseases. Objectives: To characterize participants of the "Food and Nutrition Education Program – Integrating Science, School, and Health" (PEDUCA) and its territorial coverage in order to strengthen cardiovascular disease prevention strategies in public schools in the State of São Paulo, Brazil. Methods: Through a Brazilian partnership among universities, a Cardiology Society, and the State Department of Education — responsible for more than 5,000 schools and 3 million students — a 100% online, 110-hour distance-learning course was developed to train public school educators, called PEDUCA. PEDUCA is a strategic tool designed to prepare educators to become multipliers of food and nutrition education aimed at reducing cardiovascular risk factors from childhood. The program covered topics related to nutrition and healthy eating. The study was approved by the Research Ethics Committee. Resultados e Conclusions: A total of 6,656 individuals enrolled in PEDUCA, including 5,310 (80%) women and 4,047 (61%) self-reported White participants. Approximately one quarter of participants were from schools located in the city of São Paulo (10%), while the remainder were from coastal and inland regions of the state (90%). See Figure 1. The median age of participants was 43.0 (37.0–49.8) years, and the median body mass index was 27.1 (24.1–30.9) kg/m². At the end of the program, all participants developed a healthy eating activity to be implemented in their schools, and the best activities were published in an e-book and widely disseminated through mass communication channels.It is expected that educator training will stimulate more effective pedagogical actions promoting healthy eating habits in schools, contributing to the prevention of obesity and cardiovascular diseases.



16015

VASCULAR HEALTH, NUTRITION, AND BODY COMPOSITION IN WOMEN ACROSS AGES

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Introduction/Background: Arterial stiffness is an important marker of vascular aging, associated with an increased risk of cardiovascular disease. In addition to age, anthropometric and dietary factors (especially sodium intake) are related to vascular dysfunction and cardiovascular risk. Objectives: To evaluate arterial stiffness and its association with anthropometric profile and dietary intake in women of different age groups. Methods: Cross-sectional analytical study (CAAE: 85730024.9.0000.5333) including women aged 18 to 59 years. Sociodemographic, clinical, and anthropometric data (body mass index [BMI], abdominal circumference [AC]) were collected. A 24-hour dietary recall (R24h) was used to assess dietary intake. Arterial stiffness was evaluated by pulse wave velocity (PWV; Arteris AOP device). Data normality was assessed, and descriptive analyses were performed using mean ± (SD) and absolute and relative frequencies. Independent samples t-tests and Pearson correlation were applied, with statistical significance set at $p \leq 0.05$ (JASP v0.96). Resultados e Conclusions: The sample consisted of 59 women divided into young (YG; n=31) and adults (AD; n=28). There was a difference in age (YG: 20.9 ± 2.2 vs AD: 38.3 ± 11.1 years; p=0.001). Most participants were white (88.1%) and had completed or incomplete higher education (83.1%). Regarding cardiovascular risk factors, 46% (n=23) were overweight/obese, 25.4% (n=15) were physically inactive, 11.9% (n=7) reported smoking, 25.6% (n=15) reported irregular menstrual cycles, and 59.3% (n=35) reported a family history of cardiovascular disease. No differences were observed in AC (p=0.275), total caloric intake (p=0.547), carbohydrate (p=0.350), protein (p=0.831), lipids (p=0.107), sodium (p=0.610), calcium (p=0.860), iron (p=0.150), vitamin C (p=0.299), vitamin B12 (p=0.686), unsaturated fatty acids (p=0.906), saturated fatty acids (p=0.828), fiber (p=0.122), and total cholesterol (p=0.140) between age groups. Similarly, no associations were identified between PWV and dietary parameters. There was a difference in PWV between groups (YG: 4.60 ± 0.45 vs AD: 5.84 ± 1.15 m/s; p=0.001). In adult women, there was an increase in arterial stiffness, indicating that changes in vascular function may occur early. However, there were no significant differences in dietary intake, anthropometric data, or the relationship between these factors and vascular function.

Pericardium / Endocardium / Valvular Heart Disease / Aortic Diseases



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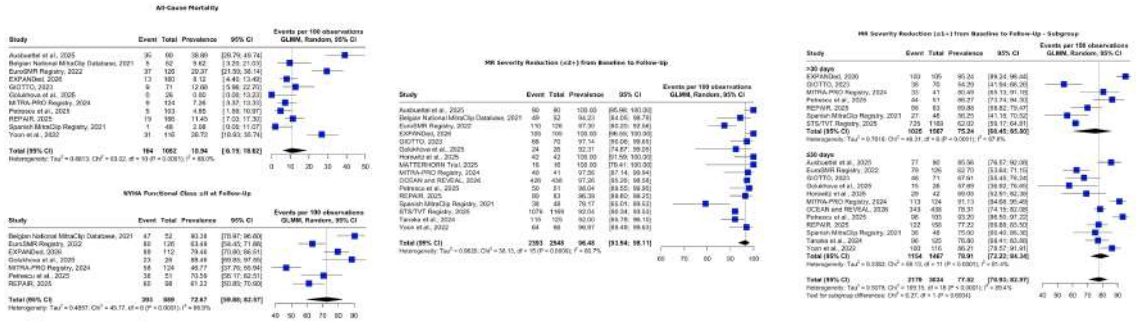
21967

CLINICAL AND ECHOCARDIOGRAPHIC OUTCOMES AFTER TRANSCATHETER EDGE-TO-EDGE REPAIR IN ATRIAL SECONDARY MITRAL REGURGITATION: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introduction/Background: Atrial secondary mitral regurgitation (aSMR) is a distinct phenotype of functional mitral regurgitation characterized by left atrial enlargement and mitral annular dilatation in the setting of structurally normal leaflets and preserved left ventricular function. Transcatheter edge-to-edge repair (TEER) may provide therapeutic benefit in this population, although high-quality evidence remains limited. Objectives: To evaluate clinical outcomes following TEER in adults with moderate-to-severe or severe aSMR through a systematic review and single-arm meta-analysis. Methods: PubMed, Embase, LILACS, Scopus, Cochrane Central, and ClinicalTrials.gov were systematically searched according to PRISMA guidelines, identifying observational studies, multicenter registries, and sub-analyses of randomized controlled trials reporting outcomes of TEER in adult patients with moderate-to-severe or severe aSMR. Studies using equivalent definitions, such as atrial functional mitral regurgitation, were also eligible when the atrial-driven mechanism was preserved. The primary outcome was all-cause mortality, mitral regurgitation (MR) reduction (≤2+ or ≤1+), and improvement in New York Heart Association (NYHA) functional class (≤II). Resultados e Conclusions: After screening 297 records, sixteen studies comprising 2,872 patients with aSMR undergoing TEER were included. All-cause mortality showed a pooled prevalence of 10.96 events per 100 patients (95% CI 6.21–18.64; I²=87.9%). Mitral regurgitation reduction to ≤2+ after intervention was achieved in 96.48% of patients at follow-up (95% CI 93.54–98.11%; I²=60.7%). For MR reduction to ≤1+, subgroup analyses demonstrated a pooled prevalence of 78.91% at 30-day follow-up (95% CI 72.22–84.34%; I²=81.4%) and 75.19% at longer-term follow-up (≥1 year) (95% CI 67.31–81.69%; I²=89.0%). Improvement to NYHA functional class ≤II at follow-up was achieved in 72.42% of patients (95% CI 61.63–81.04%; I²=86.3%). Considerable between-study heterogeneity was observed, likely related to differences in follow-up duration, variability in patient characteristics, and devices used. Transcatheter edge-to-edge repair in patients with ASMR demonstrates high procedural success, with sustained reduction in mitral regurgitation and functional improvement in the majority of patients. Although all-cause mortality remains notable, TEER appears to be a viable therapeutic option. Further randomized controlled trials are needed to confirm long-term efficacy and identify optimal patient selection criteria.



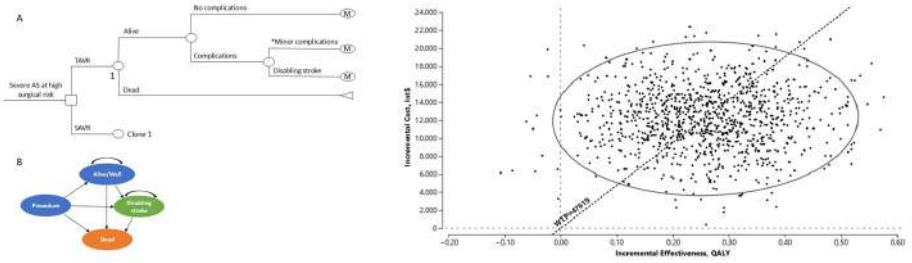
16301

COST-EFFECTIVENESS OF TRANSCATHETER AORTIC VALVE REPLACEMENT IN HIGH-SURGICAL-RISK PATIENTS WITH SEVERE AORTIC STENOSIS IN BRAZIL

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Introduction/Background: In patients with severe aortic stenosis at high surgical risk, randomized trials have demonstrated noninferiority of transcatheter aortic valve replacement (TAVR) compared with surgical aortic valve replacement (SAVR) for all-cause mortality at 5-year follow-up. However, TAVR continues to be a high-cost intervention, and its wider adoption may considerably increase the healthcare budget burden in middle-income countries such as Brazil Objectives: To conduct a cost-utility analysis comparing TAVR and SAVR in patients with severe aortic stenosis at high surgical risk, from the perspective of the Brazilian Unified Health System (Sistema Único de Saúde – SUS). Methods: A Markov model was developed to simulate a hypothetical cohort of patients with severe aortic stenosis over a lifetime horizon. A systematic review was performed to inform efficacy and effectiveness inputs. Cost data were derived from Brazilian patient cohorts who underwent TAVR or SAVR and were expressed in international dollars (Int$). A willingness-to-pay (WTP) threshold of three times Brazil's Gross Domestic Product per capita (Int$ 47,619) was adopted. Incremental-cost effectiveness ratios (ICERs) were calculated, and sensitivity analyses were performed. Resultados e Conclusions: The estimated lifetime cost was Int$ 29,897 for TAVR and Int$ 17,666 for SAVR. Lifetime quality-adjusted life-years (QALYs) were 4.70 and 4.44, respectively. The ICER for TAVR was Int$ 46,532 per QALY. The model results were most sensitive to variations in TAVR costs, followed by annual probability of disabling stroke after SAVR and TAVR, and SAVR costs. In probabilistic sensitivity analysis with 10,000 iterations, TAVR was associated with higher costs and greater QALY gains compared with SAVR. The ICER was below the WTP threshold in 52.2% of iterations and exceeded this threshold in 46.9%. In patients with severe aortic stenosis at high surgical risk, TAVR was cost-effective from the perspective of the Brazilian Unified Health System. However, probabilistic sensitivity analysis indicated that TAVR was cost-effective in 52.2% of simulations at Brazilian WTP threshold, reflecting substantial uncertainty in the base-case analysis. These results were mainly influenced by cost differentials between strategies, largely driven by device acquisition costs. Accordingly, reductions in prosthesis prices or alternative procurement strategies could substantially affect the economic value of TAVR.



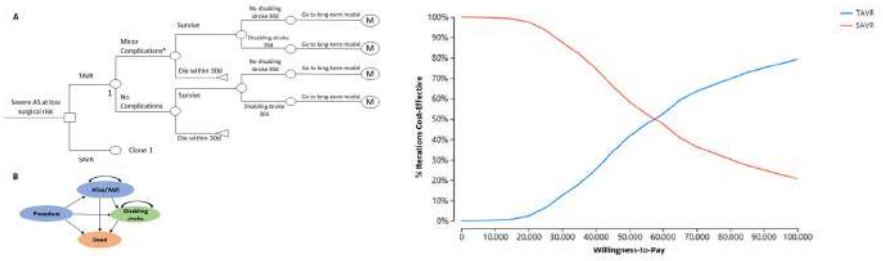
16091

COST-EFFECTIVENESS OF TRANSCATHETER AORTIC VALVE REPLACEMENT IN PATIENTS WITH SEVERE AORTIC STENOSIS AND LOW SURGICAL RISK: PERSPECTIVE OF THE BRAZILIAN PUBLIC HEALTH SYSTEM

GUILHERME AUGUSTO REISSIG PEREIRA1; CARISI ANNE POLANCZYK2; ANA PAULA BECK DA SILVA ETGES3; RODRIGO PETERSEN SAADI4; EDUARDO GEHLING BERTOLDI1;

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Introduction/Background: Randomized controlled trials comparing transcatheter aortic valve replacement (TAVR) with surgical aortic valve replacement (SAVR) in patients with severe aortic stenosis and low surgical risk have demonstrated noninferiority of TAVR regarding all-cause mortality and stroke outcomes in 6-, 7-, and 10-year follow-up. Nevertheless, TAVR remains a costly intervention, and its widescale adoption may affect healthcare expenditure in middle-income countries such as Brazil. Objectives: This study aimed to conduct a cost-utility analysis comparing TAVR and SAVR in patients with severe aortic stenosis at low surgical risk, from the perspective of the Brazilian Unified Health System (Sistema Único de Saúde – SUS). Methods: A Markov model was developed to simulate a hypothetical cohort of patients with severe aortic stenosis over a lifetime horizon. A systematic review was performed to inform efficacy and effectiveness inputs. Cost data were derived from Brazilian patient cohorts who underwent TAVR or SAVR and were expressed in international dollars (Int$). Incremental-cost effectiveness ratios (ICERs) were calculated and sensitivity analyses were performed. Resultados e Conclusions: The estimated lifetime cost was Int$ 32,189 for TAVR and Int$ 19,717 for SAVR. Lifetime quality-adjusted life-years (QALYs) were 10.03 and 9.81, respectively. The ICER for TAVR was Int$ 55,878 per QALY gained, exceeding the Brazilian willingness-to-pay threshold of Int$ 47,619 per QALY. In the one-way sensitivity analysis, model results were most sensitive to variations in costs of TAVR, followed by annual probability of disabling stroke after TAVR and SAVR, and by SAVR costs. In the threshold analysis of TAVR costs, TAVR became cost-effective when its cost decreased below Int$ 24,171, at which point the ICER crossed the predefined willingness-to-pay threshold. In probabilistic sensitivity analysis with 1,000 iterations, TAVR was cost-effective in 37% of simulations. In patients with severe aortic stenosis at low surgical risk, TAVR was not a cost-effective strategy compared with SAVR from the perspective of the Brazilian Unified Health System. Nevertheless, probabilistic sensitivity analysis showed that TAVR was cost-effective in 37% of simulations, indicating residual uncertainty around the base-case estimate. These findings were primarily driven by cost differences between strategies, largely attributable to device acquisition costs.



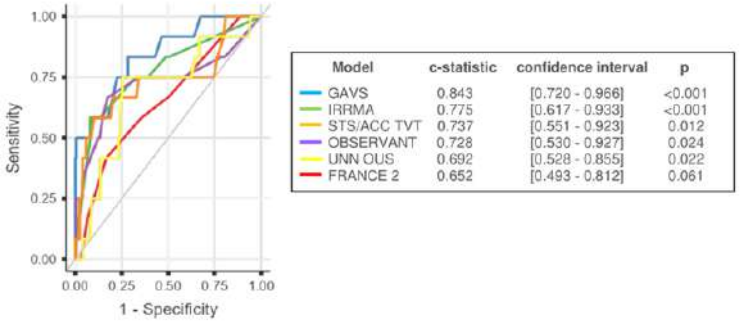
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Introduction/Background: Accurate risk stratification remains a key component of clinical decision-making in patients undergoing transcatheter aortic valve replacement (TAVR), supporting patient selection, procedural planning, and Heart Team discussions. Several TAVR-specific risk models have been developed to estimate early mortality risk, including STS/ACC TVT, FRANCE-2, OBSERVANT, IRRMA, UNN OUS, and GAVS. However, model performance may vary when applied to populations different from those in which they were originally derived, reinforcing the importance of external validation in contemporary real-world cohorts. Objectives: To evaluate the discriminatory performance of established TAVR-specific risk scores for predicting in-hospital mortality in a Brazilian cohort. Methods: Cross-sectional analysis of a longitudinal cohort including consecutive patients with severe symptomatic native fibrocalcific aortic stenosis undergoing TAVR between 2009 and 2023 at a tertiary referral center. Clinical and procedural data were prospectively collected in an institutional registry. The primary outcome was in-hospital mortality according to VARC definitions. Discriminatory performance of STS/ACC TVT, FRANCE-2, OBSERVANT, IRRMA, UNN OUS, and GAVS scores was assessed using the area under the receiver-operating characteristic curve (AUC). Resultados e Conclusions: A total of 270 patients were included, with an observed in-hospital mortality rate of 4.4%. Discriminatory performance varied across models (Figure 1). GAVS showed the highest discrimination (AUC 0.843), followed by IRRMA (0.775), STS/ACC TVT (0.737), OBSERVANT (0.728), UNN OUS (0.692), and FRANCE-2 (0.652). In this cohort, GAVS demonstrated the greatest ability to discriminate in-hospital mortality after TAVR, supporting its potential clinical usefulness for risk stratification and contributing to more informed decision-making in contemporary practice.

Figure 1. Receiver-operating characteristic curves of TAVR-specific risk scores for in-hospital mortality.



Model	c-statistic	confidence interval	p
GAVS	0.843	[0.720 - 0.966]	<0.001
IRRMA	0.775	[0.617 - 0.933]	<0.001
STS/ACC TVT	0.737	[0.551 - 0.923]	0.012
OBSERVANT	0.728	[0.530 - 0.927]	0.024
UNN OUS	0.692	[0.528 - 0.855]	0.022
FRANCE 2	0.652	[0.493 - 0.812]	0.061

20492

EPIDEMIOLOGY OF VALVE DISEASE IN BRAZIL FROM 1990 TO 2023: OPPOSITE TRENDS FOR RHEUMATIC AND DEGENERATIVE VALVE DISEASE.

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Introduction/Background: Valvular heart disease (VHD) in Brazil reflects an ongoing epidemiologic transition, with persistent rheumatic heart disease (RHD) coexisting with increasing non-rheumatic valvular disease (NRVD), particularly degenerative etiologies, in the context of population aging and regional socioeconomic disparities. Objectives: To evaluate temporal trends in the burden of RHD and NRVD in Brazil from 1990 to 2023. Methods: We conducted an ecological analysis using estimates from the Global Burden of Disease (GBD) 2023 study, which applies standardized modeling frameworks integrating multiple data sources, Bayesian meta-regression (DisMod-MR), and cause-of-death ensemble models to estimate prevalence and mortality with 95% uncertainty intervals (UI) across time. Analyses included age-standardized and all-age metrics. Resultados e Conclusions: From 1990 to 2023, RHD prevalence increased in absolute numbers from 928,994.8 (95% UI 759,829.0–1,091,063.6) to 1,425,985.8 (1,158,391.9–1,729,730.5), but the age-standardized prevalence rate remained stable (638.7 to 628.9 per 100,000; −1.5% [−4.1 to 1.0]). In contrast, NRVD prevalence rose markedly from 131,838.4 (114,152.5–152,244.1) to 492,109.7 (416,005.0–576,511.6), with an increase in age-standardized rates from 151.4 to 186.3 per 100,000 (+23.0% [18.5–27.6]) and consistent increases across age groups and sexes. This increase was driven primarily by degenerative aortic valve disease, which reached 378,347.6 cases (302,669.2–463,214.0) in 2023 (+34.7% [27.9–41.5]), while degenerative mitral valve disease showed relative stability (−4.4% [−6.0 to −2.7]). Mortality trends also diverged. RHD deaths increased slightly in absolute numbers (2,775.5 to 3,017.9), but age-standardized mortality rates declined substantially from 2.6 to 1.2 per 100,000 (−54.2% [−58.2 to −49.6]). NRVD deaths more than doubled (2,416.5 to 5,640.9), yet age-standardized mortality decreased modestly from 2.8 to 2.2 per 100,000 (−22.1% [−27.7 to −14.7]), largely driven by degenerative aortic valve disease and aging-related risk profiles. In conclusion, Brazil exhibits clear opposite trends in VHD epidemiology: declining age-standardized burden of RHD alongside rising prevalence of degenerative NRVD, particularly aortic stenosis, reflecting demographic transition. These findings reinforce the need for integrated strategies addressing both prevention of RHD and management of age-related valve disease.

20998

INFECTIVE ENDOCARDITIS: THE GREAT IMITATOR

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Introduction/Background: Infective endocarditis (IE) is a devastating disease that, if not properly treated, progresses inexorably to a fatal outcome. Even with appropriate therapy, its lethality remains high, with in-hospital mortality around 20%, reaching up to 41.3% in some centers in Brazil. In recent decades, there has been a significant increase not only in its incidence but also in its mortality. Its clinical relevance is further emphasized by its ability to present in highly variable ways, making it essential that physicians across multiple specialties are familiar with the disease. This variability has led IE to be compared to syphilis as a "great imitator." Nevertheless, this characteristic remains underexplored in the medical literature. Objectives: To describe the initial diagnostic hypotheses at hospital admission among patients with infective endocarditis in a university hospital, and to evaluate whether there are differences in mortality between patients diagnosed with IE at admission and those diagnosed later during hospitalization. Methods: This is a retrospective cohort study including episodes of infective endocarditis classified as definite according to the modified Duke criteria (2023), in patients treated at a public university hospital in Brazil between 2001 and 2024. Data were extracted from patient records included in the Infective Endocarditis Collaborative Study database, approved by the institutional Ethics Committee (CONEP No. 986/2001). A structured data collection form was used to obtain demographic data, clinical manifestations at admission and during hospitalization, laboratory results, microbiological cultures, imaging findings, clinical and surgical treatments, and outcomes. Data were entered into Microsoft Access, exported to Excel, and analyzed using SPSS. Resultados e Conclusions: Results: From 2004 to 2024, 176 episodes of definite infective endocarditis (IE) were identified in 165 adults admitted to a university hospital. IE was suspected at admission in 71 episodes, while 105 initially received alternative diagnoses. The most frequent were fever of unknown origin, bloodstream infection, respiratory infection, heart failure, tuberculosis, urinary tract infection, and anemia of unknown etiology. Conclusion: IE can mimic multiple diseases, reinforcing the need for a high index of clinical suspicion across diverse clinical presentations. Although no statistically significant mortality difference was demonstrated, delayed suspicion of IE was associated with a trend toward worse outcomes.

Table 1 – Main Initial Diagnostic Hypotheses at Admission in Patients with Infective Endocarditis Not Initially Suspected (n = 105)

Initial Diagnostic Hypothesis	Patients, n (%)
Fever of unknown origin	22 (21.0)
Bloodstream infection	15 (14.3)
Respiratory infection	14 (13.3)
Heart failure	13 (12.4)
Tuberculosis	13 (12.4)
Urinary tract infection	10 (9.5)
Anemia of unknown etiology	9 (8.6)
Other diagnoses	9 (8.6)
Total	**105 (100)**

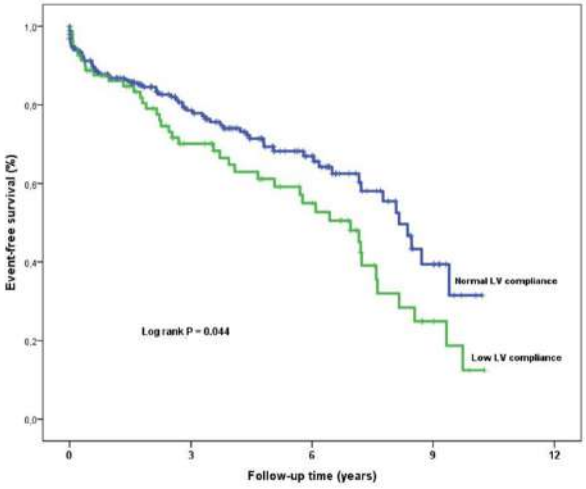
19394

LEFT VENTRICULAR DIASTOLIC DYSFUNCTION IN RHEUMATIC MITRAL STENOSIS: THE ROLE OF LEFT VENTRICULAR COMPLIANCE

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Introduction/Background: Assessment of left ventricular (LV) diastolic function in patients with rheumatic mitral stenosis (MS) remains challenging due to the limited applicability of conventional echocardiographic parameters in this population. With advances in MS management, patients are living longer, accumulating comorbidities, and frequently presenting with symptoms disproportionate to mitral valve area (MVA), raising suspicion of concomitant heart failure with preserved ejection fraction (HFpEF). Objectives: To identify clinical, echocardiographic, and laboratory determinants of LV diastolic dysfunction and evaluate its prognostic significance in patients with rheumatic MS. Methods: In this prospective study, consecutive patients with rheumatic MS referred for percutaneous balloon mitral valvuloplasty (PBMV) underwent comprehensive clinical, echocardiographic, and laboratory evaluation, including B-type natriuretic peptide (BNP). LV diastolic function was assessed invasively using LV compliance, calculated as stroke volume divided by LV diastolic pressure rise. Reduced LV compliance (lowest quartile) defined diastolic dysfunction. Determinants were assessed using logistic regression, and the association with outcomes, composite of atrial fibrillation, embolic events, need for mitral valve reintervention, and death, was evaluated using Cox models. Resultados e Conclusions: Results: Among 323 patients (age 46 ± 12 years; 86% women), median LV compliance was 5.7 mL/mmHg (IQR: 3.7–7.8), with 83 patients (21%) exhibiting reduced compliance. Reduced LV compliance was independently associated with hypertension (OR 1.99; 95% CI 1.01–3.92; p=0.047), atrial fibrillation (OR 2.09; 95% CI 1.06–4.13; p=0.034), higher BNP levels (OR 1.002 per unit; 95% CI 1.001–1.003; p=0.035), and increased mean pulmonary artery pressure (OR 1.04; 95% CI 1.01–1.07; p=0.004). The model demonstrated good discrimination (C-statistic 0.72). Over a mean follow-up of 3.6 years, 136 events occurred. Reduced LV compliance was associated with lower event-free survival (Figure 1), although this association was attenuated after adjustment for post-procedural variables. Conclusions: Reduced LV compliance identifies a distinct phenotype of diastolic dysfunction in rheumatic MS, associated with comorbidities, hemodynamic burden, and adverse clinical outcomes. However, its prognostic impact appears to be modulated by post-interventional hemodynamic status, underscoring the central role of mitral obstruction relief in determining long-term outcomes.



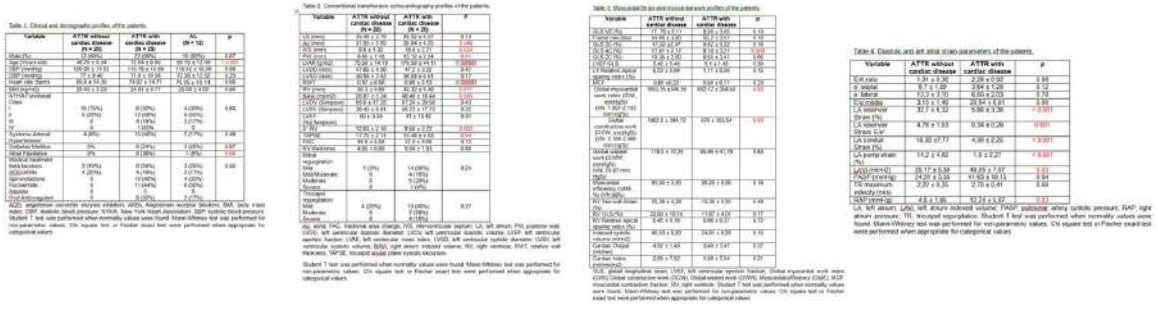
20288

MYOCARDIAL WORK AS AN EARLY MARKER OF CARDIAC ATTR AMYLOIDOSIS

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Introduction/Background: Background: Cardiac involvement by transthyretin amyloidosis (ATTR-CA) has been recognized as an important but under diagnosed cause of heart failure (HF). Myocardial work (MW) analysis by echocardiography incorporates load conditions data with advantages over solely strain curves and has been recognized as a promising variable for the analysis of myocardial dysfunction. Objectives: The aim of this study was to characterize parameters of cardiac mechanics and MW in patients with ATTR with without cardiac involvement. Methods: Methods: Single-center, prospective study of 42 patients with ATTR amyloidosis with (N = 22) and without cardiac involvement (N = 20). All patients were submitted to a clinical evaluation and transthoracic echocardiogram (TTE). Patients underwent conventional TTE, analysis of myocardial deformation and MW using the speckle tracking technique. The exams were performed on the Vivid E95 GE Vingmed, Norway and later evaluated offline using Echopac v203, GE Healthcare. Resultados e Conclusions: Results: Most patients in both groups were male. Patients ATTR without CA were younger (p < 0.001). In the ATTR-CA patients, most patients had atrial fibrillation and were on optimized medical therapy. Most patients had hereditary ATTR (ATTRh), with the majority (50%) carrying the Val142Ile variant. There were no differences between blood pressure, heart rate and body mass index between the groups. Patients with ATTR-CA presented greater values of interventricular septum (p=0.024) and posterior wall thickness (p=0.01), as well as left ventricular mass index (p<0.0001), relative wall thickness (p<0.0001) and lower values of LVEF. Indexed biatrial volumes and RA pressure (p=0.03) were greater in the ATTR-CA group (LA, p=0.03; RA, p=0.043). RV thickness was increased and RV systolic function were impaired in the ATTR-CA. Despite normal conventional TTE parameters values, patients in the group ATTR without CA had slightly reduced values of LV global longitudinal strain (GLS). Interestingly, global MW index, global constructive work and myocardial efficiency were reduced in these patients while global myocardial wasted work were increased. Conclusions: Despite normal clinical and conventional echocardiography parameters, patients with ATTR without CA present a slight reduction in LV GLS and significant abnormalities in myocardial work parameters suggesting a potential role of this tool in identifying ¬¬¬¬¬¬¬¬incipient myocardial dysfunction in these patients.



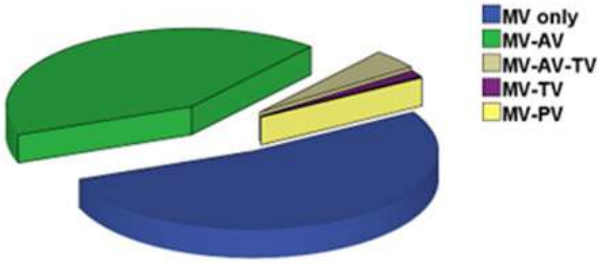
17043

PATTERNS OF VALVULAR INVOLVEMENT IN RHEUMATIC HEART DISEASE: INSIGHTS FROM A LARGE CONTEMPORARY COHORT

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Introduction/Background: Rheumatic heart disease (RHD) remains a leading cause of valvular morbidity worldwide, yet contemporary data on patterns of valve involvement in adults are limited. Objectives: To describe the spectrum and distribution of valvular involvement in a large cohort of patients with RHD. Methods: We analysed consecutive patients with echocardiographically confirmed RHD referred to our institution for valvular disease management between February 2011 and January 2026. Rheumatic involvement was defined by classical echocardiographic features, including leaflet tip thickening, commissural fusion, subvalvular thickening and fusion, restricted leaflet mobility, and the presence of valvular disfunction either regurgitation or stenosis. Resultados e Conclusions: A total of 903 patients were included (mean age 48.5 ± 12.4 years; 84% women). Most patients were symptomatic, with 38% in NYHA class II and 37% in class III–IV. The cohort was predominantly White (53%), followed by Black (28%) and other ethnic groups. Isolated mitral valve involvement was the most common pattern (469 patients, 52%), followed by combined mitral and aortic valve disease (379, 42%). Multivalvular involvement including mitral, aortic, and tricuspid valves was observed in 36 patients (4.1%), while mitral and tricuspid involvement occurred in 13 patients (1.4%). Pulmonary valve involvement was rare, identified in a single case associated with mitral stenosis (Figure 1). In this large contemporary RHD cohort, mitral valve involvement predominates, either in isolation or in combination with aortic disease, whereas right-sided and pulmonary valve involvement are uncommon. These findings reinforce the central role of mitral pathology in RHD and highlight the relative rarity of isolated right-sided disease, with potential implications for diagnostic strategies and management planning.



16542

PREDICTORS OF MITRAL RESTENOSIS FOLLOWING PERCUTANEOUS MITRAL COMISSUROTOMY IN PATIENTS WITH RHEUMATIC MITRAL STENOSIS

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Introduction/Background: Percutaneous mitral commissurotomy (PMC) is the primary choice of therapy for patients with rheumatic mitral stenosis (MS). However, restenosis can develop over time, becoming the main cause of functional deterioration after successful PMC. Objectives: This study aims to assess the incidence of mitral restenosis and identify the primary factors associated with its occurrence after a successful PMC in patients with rheumatic MS. Methods: This is a cohort of patients with rheumatic MS who have undergone PMC between January 1995 and May 2023, followed at the hospital. The primary outcome was the development of clinically significant mitral restenosis, defined as a reduction in mitral valve area (MVA) to less than 1.5 cm², resulting in cardiovascular death, the need for repeat PMC, or the indication for mitral valve replacement. Cox proportional hazards regression model was performed to identify pre and post procedural variables predictors of mitral restenosis. Resultados e Conclusions: A total of 379 patients were included in the study, with a mean age of 41.8 ± 12.1 years, and 321 patients were women (84.7%). The median follow-up time was 6.18 years (IQR 2.93-10.43). Restenosis occurred in 129 patients (34.3%). The 5- and 10-years rate of restenosis-free survival were 86.8 ± 1.9%, and 64.8 ± 3.3%, respectively. Variables independently associated with restenosis included age, right side heart failure, post-PMC MVA and mean mitral gradient (MMG), and brain natriuretic peptide (BNP) variation. Restenosis remains prevalent despite a successful PMC and can be predicted by age, valve morphology, post-procedural valve area, commissural opening, and the degree of BNP reduction.

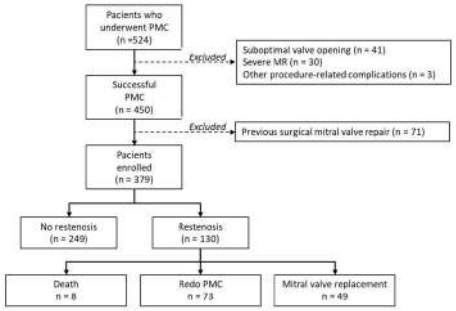


Figure 1: Flow chart of the studied population.
PMC = percutaneous mitral commissurotomy; MR = mitral regurgitation

Table 3: Independent predictors of restenosis after percutaneous mitral commissurotomy (multivariable Cox regression analysis)

Variable	Hazard ratio	95% CI	P-Value
Age	1.047	1.018-1.077	0.002
Right side HF	2.125	1.119-4.034	0.021
BNP variation*	0.631	0.436-0.912	0,014
MVA post-PMC	0.019	0.003-0.115	< 0.001
MMG post-PMC (mmHg)	1.132	1.043-1.228	0.003

BNP = brain natriuretic peptide; MMG = mean mitral gradient; MVA = mitral valve area; PMC = percutaneous mitral commissurotomy.
*BNP variation was calculated using this formula: (Pre-Post)/Pre

15743

REMODELING OVER SYMPTOMS: A STRONGER PREDICTOR OF MORTALITY AFTER VALVE REPLACEMENT AND TAVI

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Introduction/Background: In patients with severe aortic valve disease (AVD) undergoing surgical valve replacement (SVR) or transcatheter aortic valve implantation (TAVI), optimal pre-procedural risk stratification remains challenging. Although symptom status guides the timing of intervention, it may not accurately reflect the degree of underlying cardiac remodeling. Echocardiographic markers may therefore provide additional prognostic information beyond symptom burden. Objectives: To evaluate the impact of symptom burden on mortality among patients undergoing aortic valve interventions. Methods: This observational cohort included patients with severe AVD who underwent aortic valve intervention, either surgical valve replacement (SVR, n=209) or transcatheter aortic valve implantation (TAVI, n=131). Symptom burden was assessed pre-procedurally based on the number of reported symptoms. Baseline clinical and echocardiographic variables were collected, including left ventricular ejection fraction (LVEF), left atrial volume (LAV), left ventricular mass (LVM), and aortic valve area (AVA). Coronary artery disease (CAD) was defined as ≥50% luminal stenosis in at least one coronary artery. The primary outcome was all-cause mortality during follow-up. Independent predictors of mortality were assessed using the Cox proportional hazards model. Resultados e Conclusions: A total of 339 patients were included (mean age 73.5 ± 6.9 years; 48.7% women). During a mean follow-up of 3.43 ± 3.65 years, 76 deaths (22.4%) occurred: 42 (55.3%) in men and 34 (44.7%) in women. Symptom burden was not associated with mortality, and mortality rates did not differ across symptom categories ($\chi^2 = 4.07$, $p = 0.25$). Sex and the presence of CAD were not associated with mortality. In the Cox model, LVEF was an independent protective factor (HR 0.977, 95% CI 0.963–0.990, $p = 0.0009$), corresponding to a 2.3% reduction in mortality risk per 1% increase in LVEF. LAV was independently associated with higher mortality (HR 1.011, 95% CI 1.003–1.020, $p = 0.0069$), representing a 1.1% increase in risk per unit increase. Age and LVM were not significant in the multivariable model. The Cox model showed overall statistical significance (score and Wald tests, $p = 0.0006$). Conclusion: In patients undergoing SVR or TAVI, mortality was driven by cardiac structure and function rather than symptom burden. Lower LVEF and increased LAV independently predicted death, highlighting cardiac remodeling markers as key tools for risk stratification.

Perioperative Evaluation



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20904

PERIOPERATIVE IVABRADINE FOR PREVENTION OF MYOCARDIAL INJURY AFTER NON-CARDIAC SURGERY (MINS): A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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Introduction/Background: Myocardial Injury after Non-cardiac Surgery (MINS) is a major contributor to perioperative morbidity and mortality and is frequently associated with tachycardia-induced myocardial oxygen supply-demand imbalance. Although beta-blockers reduce heart rate (HR), their use may be limited by hemodynamic instability. Ivabradine, a selective If current inhibitor, has emerged as a potential alternative for perioperative HR control with a theoretically safer hemodynamic profile. Objectives: To evaluate the efficacy and safety of perioperative ivabradine in preventing MINS in adult patients undergoing non-cardiac surgery. Methods: A systematic review and meta-analysis of randomized controlled trials was conducted according to PRISMA recommendations (PROSPERO CRD420261343663). PubMed, Embase, and Cochrane CENTRAL were searched for studies comparing perioperative oral ivabradine versus placebo in adults undergoing non-cardiac surgery. The primary outcome was the incidence of MINS. Secondary outcomes included heart rate, mean arterial pressure (MAP), mortality, stroke, bradycardia, and visual symptoms. Pooled estimates were calculated using DerSimonian–Laird random-effects models. Risk of bias and certainty of evidence were assessed using RoB 2 and GRADE, respectively. Resultados e Conclusions: Eight randomized controlled trials involving 2,804 patients were included. Ivabradine significantly reduced HR compared with placebo (MD = –18.85 bpm; 95% CI –22.67 to –15.03; p < 0.0001), but did not reduce the incidence of MINS (RR = 1.05; 95% CI 0.69–1.62; p = 0.645). Ivabradine was associated with a significant reduction in MAP (MD = –15.05 mmHg; p < 0.0001). No significant differences were observed in mortality, stroke, or bradycardia risk, although a non-significant increase in visual symptoms was noted. Despite effectively controlling HR, perioperative ivabradine did not prevent MINS in non-cardiac surgery. The observed reduction in MAP suggests that impaired systemic hemodynamic stability may offset the potential benefits of HR reduction, reinforcing the importance of maintaining adequate perfusion pressure in high-risk surgical patients.

Figure 1: Forest plot of the effect of ivabradine versus placebo on heart rate (bpm) at different perioperative time points.

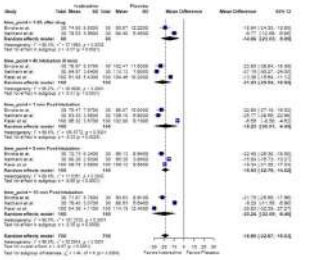


Figure 2: Forest plots of the effect of ivabradine on mean arterial pressure (MAP) across different perioperative time points

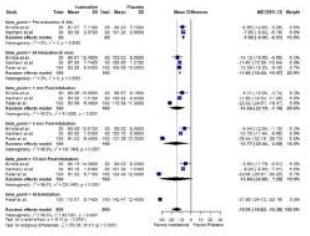


Figure 3: Forest plot of the safety and efficacy of ivabradine on Myocardial Injury after Non-cardiac Surgery (MINS)

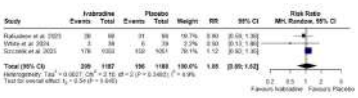
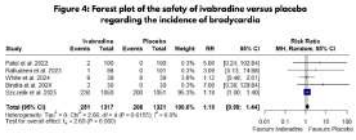


Figure 4: Forest plot of the safety of ivabradine versus placebo regarding the incidence of bradycardia



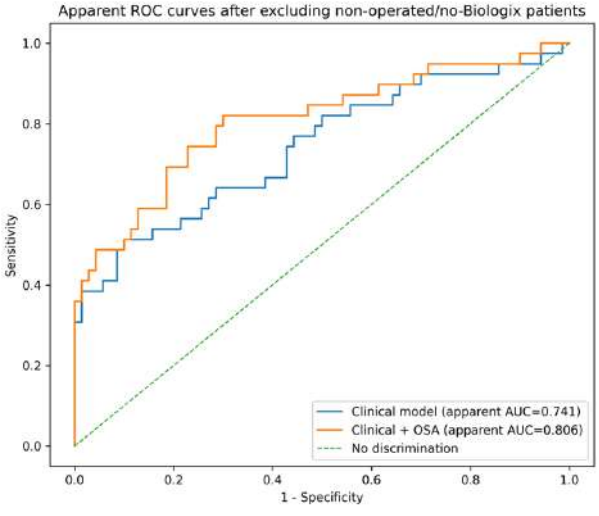
20344

PREOPERATIVE OBSTRUCTIVE SLEEP APNEA PREDICTS PERIOPERATIVE CARDIOVASCULAR COMPLICATIONS IN ARTERIAL VASCULAR SURGERY

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Introduction/Background: Obstructive sleep apnea (OSA) is highly prevalent in cardiovascular populations and frequently remains undiagnosed. Whether detection of OSA in the preoperative setting improves risk stratification in arterial vascular surgery is still insufficiently defined. Objectives: The main purpose of the present study was to investigate the association between preoperatively diagnosed OSA using portable monitoring and in hospital perioperative cardiovascular and cerebrovascular events, and to evaluate its incremental prognostic value beyond clinical variables. Methods: This prospective observational study included 119 consecutive patients older than 45 years undergoing arterial vascular surgery at a tertiary academic center. All participants should have underwent overnight preoperative evaluation with a portable oximetry-based monitoring device (Biologix). Patients with moderate to severe OSA defined by an oxygen desaturation index (ODI) ≥15 events/hour were identified. The primary endpoint was a blinded adjudicated hierarchical composite event (perioperative myocardial injury, myocardial infarction, stroke, transient ischemic attack, delirium, heart failure decompensation, cardiac or non-cardiac death, and clinically significant arrhythmia. Resultados e Conclusions: Ten patients did not ultimately undergo surgery and were excluded from the primary postoperative outcome analysis that involved 109 patients. Moderate to severe OSA was present in 54 of 119 patients (49.5%). The composite endpoint occurred in 39 patients (35.8%). Event rates were substantially higher in patients with moderate to severe OSA than is patients with no or mild OSA (51.9%, versus 20.0%; relative risk 2.59, 95% CI 1.44–4.67; p=0.0006). Moderate to severe OSA remained independently associated with perioperative events after multivariable adjustment (adjusted OR 5.29, 95% confidence interval 1.78-15.74, p = 0.002). The apparent AUC was 0.741 for the clinical model and 0.806 after addition of OSA (0.74, 95% CI 0.63-0.84 and 0.806, 95% CI 0.71-0.89, respectively showing moderate discrimination (AUC 0.65, 95% CI 0.54–0.77). OSA is common in arterial vascular surgery patients and was associated with a higher rate of perioperative cardiovascular complications. These findings support the clinical relevance of systematic OSA diagnosis in high-risk vascular surgical populations and suggest that portable monitoring may be a practical perioperative strategy.



Physical Education / Exercise Science



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19483

EFFECTS OF HIGH-INTENSITY INTERVAL TRAINING (HIIT) ON DIASTOLIC FUNCTION IN WOMEN WITH OBESITY

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Introduction/Background: Obesity is a major global contributor to heart failure and has been linked to diastolic disfunction. High-intensity interval training (HIIT) has been shown to improve body composition, inflammatory responses, and vascular function in individuals with obesity. However, the effects of HIIT on cardiac parameters, particularly diastolic function, remain unclear. Objectives: The objetive of this study was to investigate the effects of HIIT on diastolic function in women with obesity. Methods: Twenty-five young women with grade I and II obesity were randomized to perform eight weeks of HIIT (4 × 4 minutes of walking/running at an intensity between 85 and 95% of HRmax, interspersed with 3 minutes of active recovery at 65 to 75% of HRmax) or moderate-intensity continuous training (MICT) (41 minutes of walking/running at 65 to 75% of HRmax). Body composition, cardiorespiratory fitness, and diastolic function were assessed. Resultados e Conclusions: Eight weeks of HIIT or MICT were not able to significantly alter the early diastolic inflow velocity (E) to atrial diastolic inflow velocity (A) (E/A) (HIIT: 1.50 ± 0.45 vs 1.54 ± 0.43 and MICT: 1.56 ± 0.21 vs 1.62 ± 0.33, p = 0.409) or the ratio of early diastolic transmitral velocity (E) to early diastolic tissue velocity (E') (E/e') (HIIT: 6.19 ± 1.17 vs 5.79 ± 1.02 and MICT: 4.94 ± 0.85 vs 5.57 ± 1.89, p = 0.676) in women with obesity. Additionally, there was no significant change in left atrial volume index (LAVI) (19.09 ± 3.36 vs 18.74 ± 2.64 and 19.18 ± 3.74 vs 19.07 ± 2.70 mL/m², p = 0.604). Only HIIT reduced body fat and increased cardiorespiratory fitness in this population. Eight weeks of HIIT and MICT did not promote significant changes in diastolic function in young women with obesity. However, HIIT demonstrated additional benefits in reducing body fat and increasing cardiorespiratory fitness, without superiority over MICT regarding diastolic function parameters.

Physiotherapy / Physical Therapy

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18109

ANALYSIS OF HEART RATE VARIABILITY DURING HOSPITALIZATION IN PATIENTS WITH SPINAL CORD INJURY

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Introduction/Background: Spinal cord injury (SCI), especially at cervical and upper thoracic levels, impairs cardiovascular autonomic regulation, resulting in changes in heart rate (HR) and responses to postural stimuli. Heart rate variability (HRV) is a noninvasive method used to assess this modulation. Objectives: To analyze HRV in adult patients with spinal cord injury during hospital length of stay (LOS), comparing individuals with injuries above and below the T5 level in different body positions. Methods: This was a cross-sectional observational study conducted in the wards of an emergency hospital, including individuals aged ≥18 years of both sexes diagnosed with spinal cord injury. HRV was recorded using a Polar H10 heart rate monitor in the supine position at 0° and with head-of-bed elevation to 60°, for 5 minutes in each position. Data were analyzed using Kubios HRV software. The following parameters were assessed: mean RR interval, mean HR, RMSSD, SDNN, LF/HF ratio, and the non-linear index DFA α1. Participants were stratified according to the level of injury (above and below T5). Statistical analysis was performed using IBM SPSS Statistics 26, applying the Wilcoxon and Mann–Whitney U tests, with $p < 0.05$ considered statistically significant. Resultados e Conclusions: A total of 33 individuals participated in the study, predominantly male, with a mean age of 35 ± 14 years. In the supine position (0°), patients with injuries above T5 showed significantly reduced mean RR intervals ($p = 0.025$), higher mean HR ($p = 0.026$), and lower autonomic complexity assessed by DFA α1 ($p = 0.041$) compared with those injured below T5. During head-of-bed elevation to 60°, these differences persisted for mean RR ($p = 0.013$) and mean HR ($p = 0.014$), and were associated with a significant change in the LF/HF ratio ($p = 0.030$) and a more pronounced reduction in DFA α1 ($p = 0.005$), indicating lower autonomic adaptability in individuals with higher-level injuries. As conclusion, patients with spinal cord injury above T5 exhibit greater cardiac autonomic dysfunction and reduced adaptive capacity in response to postural changes during hospital LOS.

19431

ANALYSIS OF THE FUNCTIONAL PROFILE OF DIFFERENT HEART FAILURE PHENOTYPES IN PATIENTS TREATED AT A HEART FAILURE CLINIC

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Introduction/Background: Heart failure (HF) is a clinical syndrome characterized by the heart's inability to meet the body's metabolic demands, leading to symptoms such as dyspnea, fatigue, and exercise intolerance, which compromise quality of life. In Brazil, it is a major public health issue associated with high hospitalization rates, cardiovascular mortality, and elevated healthcare costs. It is classified into three main phenotypes according to the left ventricular ejection fraction (LVEF): reduced (HFrEF), preserved (HFpEF), and mildly reduced (HFmrEF); this differentiation guides therapeutic and prognostic approaches. In this context, functional assessment through cardiovascular tests such as the six-minute walk test (6MWT) and manovacuometry are simple, accessible, and effective tools to quantify physical capacity, stratify risks, and assist in the clinical management of these patients. Objectives: To evaluate and compare the functional capacity, measured by the distance walked in the six-minute walk test (6MWD), and respiratory muscle strength across the different HF phenotypes. Methods: A retrospective analysis of medical records was performed for HF patients who underwent the six-minute walk test and manovacuometry during the years 2023, 2024, and 2025. Statistical Analysis: Data were recorded in a systematic spreadsheet and then entered into the BioEstat 5.3 software. The Student's t-test was used to compare variables. Data were presented as mean and standard deviation, and a p-value ≤ 0.05 was considered significant. The research was submitted to and approved by the Research Ethics Committee. Resultados e Conclusions: The sample (n=136) revealed that HFpEF presented a distinct gender profile, with a female predominance (33F/24M), contrasting with the male predominance in the other phenotypes. In the functional assessments, there were no significant differences between the groups ($p>0.05$). However, all groups demonstrated functional impairment, with mean 6MWD values (405.6 to 444.8 m) and MIP values (−70.3 to −75.4 cm/H2O) lower than the predicted values. HFmrEF achieved the highest 6MWD (444.8 m), and HFpEF recorded the lowest mean MIP values (−75.4 cm/H2O). No significant differences were found when evaluating the functional profile of different heart failure phenotypes in patients treated at a specialized clinic.

17349

ASSOCIATION BETWEEN ACUTE MYOCARDIAL INFARCTION AND FUNCTIONAL DISABILITY IN INDIVIDUALS WITH CANCER

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Introduction/Background: Acute myocardial infarction (AMI) and cancer share common risk factors and a strong involvement of inflammatory processes. However, the impact of the coexistence of these conditions on functional mobility remains poorly investigated. Objectives: To evaluate the association between AMI and functional disability in Brazilian individuals with cancer. Methods: A cross-sectional study was conducted including 503 participants. This study was approved by the Ethics Committee (XXX.754). AMI and cancer diagnoses were self-reported through a chronic disease questionnaire. Participants were categorized into two groups: AMI and cancer (AMI+CAN; n=45) and cancer only (CAN; n=458). Functional disability was assessed for the following activities: running 1 km, walking 1 km, walking 100 m, climbing stairs, sitting, squatting, raising the arms, pushing or pulling objects, carrying 5 kg, and picking up a coin. Outcomes were dichotomized as “absence” or “presence of disability.” Group comparisons were performed using chi-square or Fisher’s exact tests, followed by binary logistic regression and odds ratio (OR) analysis, with a significance level set at 5%. Resultados e Conclusions: The groups were similar regarding age, sex, geographic region of Brazil, skin color, and marital status (p>0.05). The absence of AMI (CAN group) was associated with higher odds of preserved function across multiple domains. Statistically significant associations were observed for lower wheelchair use (OR=2.00; 95%CI: 1.01–3.96), reduced need for orthoses (OR=1.59; 95%CI: 1.02–2.48), greater ability to walk 1 km (OR=1.38; 95%CI: 1.01–1.89), walk 100 m (OR=1.47; 95%CI: 1.07–2.02), climb a flight of stairs (OR=1.64; 95%CI: 1.20–2.23), push or pull objects (OR=1.51; 95%CI: 1.10–2.06), and carry a 5 kg load (OR=1.49; 95%CI: 1.07–2.06). Thus, AMI is associated with greater functional disability in individuals with cancer, particularly in mobility-related activities, highlighting the importance of assessing comorbidities and implementing cardio-oncology rehabilitation strategies.

15809

CLINICAL FACTORS AND FUNCTIONAL CAPACITY AS PREDICTORS OF HOSPITAL LENGTH OF STAY AFTER CORONARY ARTERY BYPASS GRAFTING

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Introduction/Background: Background: Functional decline, assessed by the Short Physical Performance Battery (SPPB) and six-minute walk distance (6MWD), has been associated with worse outcomes after coronary artery bypass grafting (CABG). These measures are commonly analyzed in isolation, with limited integration into multivariable models that estimate their independent contribution. The one-minute sit-to-stand test (1MSTS) remains underexplored in this setting. Objectives: Objective: To evaluate the prognostic value of SPPB, 6MWD, and 1MSTS assessed preoperatively for predicting hospital length of stay (LOS) after CABG using clinical-functional models. Methods: Methods: Prospective cohort including 76 patients. A clinical model was constructed using variables previously associated with hospital LOS. Each functional test was then individually added as a dichotomized variable (SPPB ≤9 points; 1MSTS ≤17 repetitions; 6MWD ≤350 meters). NYHA class II–III was excluded due to potential collinearity and conceptual overlap. Negative binomial regression was applied, with results expressed as incidence rate ratios (IRR). Cutoffs for 1MSTS and 6MWD were defined based on the 25th percentile. Resultados e Conclusions: Results: Median hospital LOS was 9 (8–12) days. No variable from the clinical model showed an independent association. In adjusted models, only SPPB ≤9 (IRR 1.58; 95% CI 1.15–2.19) and 1MSTS ≤17 (IRR 1.76; 95% CI 1.27–2.45) were associated with higher LOS rates. 6MWD was not significant. Conclusion: In patients undergoing CABG, poorer performance in SPPB and 1MSTS was associated with 58% and 76% increases in hospital LOS rate, respectively. The 1MSTS emerges as a simple and sensitive functional marker for risk stratification.

Table 1. Predictive models of hospital length of stay.

Variables	Clinical Model	Clinical + SPPB	Clinical + 1MSTS	Clinical + 6MWD
	IRR (95% CI)	IRR (95% CI)	IRR (95% CI)	IRR (95% CI)
Age (years)	1.01 (0.98-1.03)	1.01 (0.99-1.04)	1.01 (0.99-1.04)	1.01 (0.99-1.04)
Sex (female)	0.91 (0.64-1.29)	0.79 (0.55-1.15)	0.78 (0.55-1.12)	0.79 (0.54-1.18)
BMI (kg/m²)	1.03 (1.00-1.07)	1.02 (0.99-1.06)	1.02 (0.99-1.06)	1.02 (0.98-1.06)
Diabetes mellitus	0.92 (0.68-1.24)	0.98 (0.72-1.34)	0.95 (0.70-1.29)	0.99 (0.72-1.37)
NYHA class II-III	0.96 (0.66-1.39)	-	-	-
LVEF (%)	1.00 (0.98-1.01)	1.00 (0.99-1.02)	1.00 (0.99-1.02)	1.00 (0.99-1.02)
EuroSCORE (points)	0.94 (0.85-1.06)	0.94 (0.84-1.06)	0.93 (0.83-1.05)	0.93 (0.83-1.06)
CPB time (minutes)	1.00 (1.00-1.01)	**1.01 (1.00-1.01)***	**1.01 (1.00-1.01)***	1.00 (1.00-1.00)
SPPB ≤ 9 (points)	-	**1.58 (1.15-2.19)***	-	-
1MSTS ≤ 17 (repetitions)	-	-	**1.76 (1.27-2.45)***	-
6MWTD ≤ 300 (meters)	-	-	-	1.19 (0.82-1.73)
AIC	437	421	449	458

* Bold values indicate p < 0.05. All variables in the model showed VIF < 1.5. LVEF: left ventricular ejection fraction; CPB: cardiopulmonary bypass; AIC: Akaike Information Criterion.

20512

EVALUATION OF SARCOPENIA IN HOSPITALIZED PATIENTS WITH HEART FAILURE WITH REDUCED EJECTION FRACTION: PARTIAL RESULTS

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Introduction/Background: Heart failure is a complex clinical syndrome associated with significant systemic changes, among which sarcopenia stands out as a condition characterized by the progressive loss of muscle mass and function, associated with poorer clinical prognosis. Objectives: To assess the occurrence of sarcopenia in hospitalized patients with heart failure with reduced ejection fraction (HFrEF). Methods: This is a cross-sectional, prospective, and inferential study with a non-probabilistic sample composed of adult patients with HFrEF (≤ 40%). The clinical profile of patients was determined using data collected from medical records. The assessment of sarcopenia was conducted based on the European Working Group on Sarcopenia in Older People through screening with the SARC-F questionnaire, measurement of muscle strength by handgrip dynamometry (HGD) and the five-times sit-to-stand test (STS), evaluation of muscle mass by quadriceps ultrasound and calf circumference (CC), as well as analysis of physical performance through standardized functional tests and clinical frailty. The study was submitted for ethical review and approved under CAAE 94960926.0.0000.5327. Resultados e Conclusions: This report presents preliminary results based on 17% of the expected sample. Twelve patients were evaluated, 83% of whom were male, with a mean age of 60 ± 11.89 years and a left ventricular ejection fraction of 26 ± 8.14%. Systemic arterial hypertension being the most prevalent comorbidity, present in 50% of patients. 33.3% of the sample screened positive for predictive signs of sarcopenia using the SARC-F. Of these, 16.6% showed loss of muscle strength by HGD and 25% by STS and were thus classified as sarcopenic. Among these, 66.6% were identified with severe sarcopenia. So far, preliminary data suggest a moderate significant positive correlation (r = 0.77; p = 0.006) between muscle mass assessed by CC and sarcopenia screening by SARC-F, that is, lower CC values tend to be correlated with the prediction of sarcopenia. Based on the partial results obtained, it is concluded that the assessment instruments appear to demonstrate methodological adequacy and feasibility for the assessment of hospitalized HFrEF patients.

16591

FUNCTIONAL MOBILITY AND MUSCLE STRENGTH IN HOSPITALIZED PATIENTS WITH CARDIAC COMORBIDITIES: A MULTICENTER COHORT STUDY

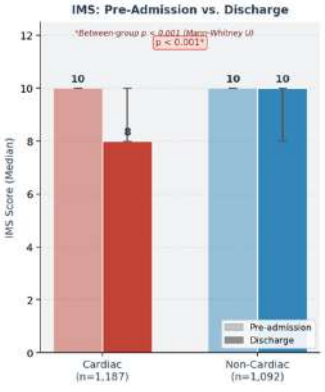
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Introduction/Background: Cardiac comorbidities are highly prevalent in hospitalized patients and may impair functional recovery during acute care. Functional mobility and peripheral muscle strength are critical determinants of discharge outcomes, yet their trajectories in patients with cardiac conditions remain poorly characterized in large multicenter cohorts. Objectives: To compare functional mobility (ICU Mobility Scale – IMS) and muscle strength (Medical Research Council – MRC) from pre-admission to discharge in patients with and without cardiac comorbidities. Methods: Retrospective multicenter cohort study with 2,283 patients from three hospitals, stratified by cardiac comorbidity (n=1,187; 52.0%) or absence (n=1,092; 48.0%). IMS (0–10) was assessed at pre-admission and discharge; MRC (0–60) at admission and discharge. Wilcoxon signed-rank test (paired comparisons), Mann-Whitney U test (between groups), and Spearman correlation (IMS×MRC) were applied (p<0.05). Resultados e Conclusions: Results: Mean age 54.4±20.4 years; 55.9% female. Cardiac patients were older (median 67 vs. 40 years; p<0.001) with longer stays (6 vs. 4 days; p<0.001). Overall IMS declined from pre-admission to discharge (median: 10→9; p<0.001); 41.4% worsened. Cardiac patients had lower discharge IMS (median 8 vs. 10; p<0.001) and higher deterioration rate (46.9% vs. 35.6%). MRC improved significantly in both groups (p<0.001); however, cardiac patients showed lower admission MRC (IQR: 48–60 vs. 58–60; p<0.001), lower discharge MRC (IQR: 54–60 vs. 60–60; p<0.001), and higher worsening rate (8.7% vs. 4.2%). Moderate IMS–MRC correlation at admission (ρ=0.41; p<0.001) and discharge (ρ=0.33; p<0.001). Conclusion: Cardiac comorbidities were associated with greater functional mobility decline and higher muscle strength impairment during hospitalization. These findings support the need for targeted early rehabilitation in cardiovascular patients.

Summary Statistics

Variable	Cardiac	Non-Cardiac	p-value
N	1,187	1,092	—
Age (median, years)	67	40	< 0.001
Female sex	50.5%	61.7%	< 0.001
IMS Pre-admission	10 (10–10)	10 (10–10)	< 0.001
IMS Discharge	8 (8–10)	10 (8–10)	< 0.001
IMS Worse at Discharge	46.9%	35.6%	—
MRC Admission	60 (48–60)	60 (58–60)	< 0.001
MRC Discharge	60 (54–60)	60 (60–60)	< 0.001
MRC Worse at Discharge	8.7%	4.2%	—
IMS×MRC ρ (admission)	0.41		< 0.001
IMS×MRC ρ (discharge)	0.33		< 0.001



16536

FUNCTIONAL PROFILE AND MUSCLE STRENGTH IN PATIENTS UNDER A CHEST PAIN PROTOCOL: IMPACT OF STRUCTURED PHYSICAL THERAPY

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Introduction/Background: Effective chest pain protocols are key to cardiovascular risk stratification in emergency and critical care setting. However, monitoring requirements and reduced mobility may contribute to functional decline and muscle weakness. Early physical therapy interventions may mitigate these effects by promoting mobility and preserving functional capacity. Objectives: To evaluate muscle strength, ambulation, and functional status at pre-discharge in patients managed under a chest pain protocol, and to identify independent predictors of functional outcomes. Methods: This retrospective observational study included patients aged ≥18 years admitted under a chest pain protocol between January 2023 and December 2025. Functional status was assessed using the ICU Mobility Scale (IMS), and muscle strength using the Medical Research Council (MRC) scale at admission and pre-discharge. ambulation was defined as the ability to walk, either independently or with assistance. Multivariable logistic regression was performed to identify independent predictors of preserved ambulation, with odds ratios (OR) and 95% confidence intervals (CI) reported. A two-sided p-value < 0.05 was considered statistically significant. Resultados e Conclusions: Among 12,863 protocol activations, 946 patients were admitted, of whom 771 met the inclusion criteria (66% male). The mean age was 63 years, and median hospital length of stay was 6 days. At pre-discharge, ambulation was preserved in 93.7% of patients, functional status in 93%, and muscle strength in 96.5%. Male sex was independently associated with preserved ambulation (OR 2.17; 95% CI 1.19–3.97; p = 0.011), whereas age (OR 1.01; 95% CI 0.98–1.03; p = 0.59) and length of stay (OR 1.05; 95% CI 0.97–1.14; p = 0.19) were not significantly associated with the outcome. Structured, protocol-driven physical therapy was associated with high rates of preserved functional status and muscle strength in patients managed under a chest pain protocol. Early mobilization may attenuate the impact of traditional risk factors for functional decline, underscoring the significant role of rehabilitation in acute cardiovascular care pathways.

16526

FUNCTIONAL RECONCILIATION AND AMBULATION IN THE CARDIAC ICU: THE ICU MOBILITY SCALE AS AN INDICATOR OF CONTINUITY OF CARE

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Introduction/Background: Admission to the Intensive Care Unit (ICU) is often associated with substantial functional decline. In the cardiac setting, early mobilization is a fundamental strategy to mitigate these effects; however, success depends on a systematized transition of care. Functional reconciliation, measured through the ICU Mobility Scale (IMS), emerges as an essential quality indicator to audit whether recovered functionality is preserved until discharge. Objectives: To evaluate the rate of ambulation and functional reconciliation using the IMS scale as a marker of continuity of care in a cardiac ICU. Methods: A retrospective observational study was conducted (January 2025 – March 2026) in a tertiary cardiac ICU. Patients ≥18 years were included. Functional rehabilitation (FR) and ambulation were daily monitored. Statistical analysis included descriptive statistics and 95% confidence intervals (CI) for the success rates. The association between structured physical therapy and the achievement of high mobility scores (IMS ≥ 4) was evaluated using Odds Ratio (OR). Resultados e Conclusions: A total of 1,196 patients were analyzed. Functional rehabilitation was successfully performed in 680 cases (97.3% of applicable patients). Ambulation was achieved in 730 patients, corresponding to a high success rate of 97.6% among eligible individuals (95% CI, 96.2%–98.5%) and only.18 patients failed to ambulate when clinical conditions allowed. The implementation of a protocolized physical therapy intervention was associated with an OR of 5.8 (95% CI: 3.2 – 10.4) for achieving independent functional reconciliation at discharge. These results indicate that structured monitoring significantly reduces the risk of functional stagnation during the ICU stay. Functional reconciliation through the IMS scale proved to be a sensitive and robust indicator for monitoring the transition of care. The high ambulation rate (97.6%) and the positive OR for functional gain suggest that structured physical therapy ensures that critical cardiac patients return to lower-complexity units with their motor capacity optimized, mitigating the risks associated with hospital immobility.

15878

IMPACT OF HIGH BLOOD PRESSURE ON FUNCTIONALITY IN OLDER ADULTS RECEIVING PRIMARY HEALTH CARE

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Introduction/Background: High blood pressure (HBP) is highly prevalent in older adults and is associated with functional decline and loss of autonomy. In Primary Health Care (PHC), adequate control of HBP and monitoring of functionality are essential to promote healthy aging and reduce complications. Objectives: To compare functionality between hypertensive (HT) and normotensive (NT) older adults using PHC services. Methods: Cross-sectional study included older adults followed in PHC in a city in southern Brazil (CAAE: 37125120.0.0000.5344). Anthropometric and clinical data were obtained by self-report or electronic medical records. Functionality was assessed using the 6-Minute Walk Test (6MWT), Five Times Sit-to-Stand Test (5TSST), quadriceps isometric strength, and dominant-handgrip strength. Comparisons between groups were made using Student's t-test with bootstrapping (1,000 resamples; 95% BCa CI). Analyses were conducted in SPSS 21.0, with $p \leq 0.05$. Resultados e Conclusions: The sample consisted of 165 older adults, 72.7% HT (n=120; 70.2±6.6 years; 73.3% women) and 27.3% NT (n=45; 69.9±6.0 years; 80% women). Of these, 77% (n=127) self-identified as White, 41.2% (n=68) were married, and 57.6% (n=95) had < 9 years of schooling. There was a difference in systolic blood pressure (HT: 133.3±14.7 vs NT: 125.9±13.2 mmHg; p=0.004; Hedge's G=0.51), diastolic blood pressure (HT: 83.8±12.9 vs NT: 78.6±9.4 mmHg; p=0.004; Hedge's G=0.42), distance covered in the 6MWT (HT: 368.41±113.7 vs NT: 413.82±117.2 m; p=0.029; Hedge's G=0.39), and BMI (HT: 29.1±5.0 vs NT: 26.4±5.1 kg/m²; p=0.011; Hedge's G=0.50) between groups. No differences were identified in the 5TSST (HT: 15.5±7.1 vs NT: 15.0±6.9 repetitions; p=0.66), isometric muscle strength of the right leg (HT: 18.9±8.3 vs NT: 18.4±7.3 kgf; p=0.74) and left leg (HT: 18.4±8.0 vs NT: 17.6±6.9 kgf; p=0.55), or dominant handgrip strength (HT: 22.0±9.1 vs NT: 22.2±9.2 kg; p=0.94). Hypertensive older adults showed worse cardiorespiratory performance and higher BMI than normotensive peers, suggesting a greater impact on functional capacity than on muscle strength. Funding: FAPERGS.

17308

INCREMENTAL SHUTTLE WALK TEST BETTER REFLECTS HEALTH-RELATED QUALITY OF LIFE THAN THE SIX-MINUTE WALK TEST IN PATIENTS WITH CHAGAS CARDIOMYOPATHY.

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Introduction/Background: Chagas disease remains a neglected condition, frequently associated with social stigma, socioeconomic vulnerability, limited access to healthcare, and impaired health-related quality of life (HRQoL). Chagas cardiomyopathy, its most severe clinical presentation, is characterized by early functional limitation and progressive reduction in exercise tolerance. Although field tests are widely used to assess submaximal functional capacity, it is still unclear to what extent their performance reflects patients' perceived health status and the daily-life impact of the disease. Objectives: To investigate the correlation of the Six-Minute Walk Test (6MWT) and the Incremental Shuttle Walk Test (ISWT) with HRQoL in patients with Chagas cardiomyopathy. Methods: Fifty patients with Chagas cardiomyopathy underwent clinical assessment, physical examination, echocardiography, 6MWT, and ISWT. HRQoL was assessed using the Short Form Health Survey (SF-36) and the Minnesota Living with Heart Failure Questionnaire (MLHFQ). Correlations were analyzed between walked distance on field tests and HRQoL domains and scores. Resultados e Conclusions: Distance walked on the 6MWT correlated only with the physical functioning domain of the SF-36 (r=0.326; p=0.021). In contrast, ISWT distance showed broader associations, correlating with physical functioning (r=0.484; p<0.001), vitality (r=0.335; p=0.029), general health perception (r=0.325; p=0.023), and the physical component summary score (r=0.373; p=0.009) of the SF-36. In addition, ISWT distance was inversely correlated with the MLHFQ score (r=-0.423; p<0.001), indicating that better functional performance was associated with better disease-specific quality of life. These findings suggest that field tests capture relevant aspects of HRQoL in patients with Chagas cardiomyopathy, with the ISWT showing stronger and more consistent associations than the 6MWT across both generic and disease-specific measures. The ISWT may therefore provide a more informative submaximal measure for functional and patient-centered assessment in this population and may be particularly useful when a broader perception of health status is clinically relevant.

20123

NEUROMUSCULAR ELECTRICAL STIMULATION IMPROVES THE EFFECTS OF COMBINED TRAINING ON QUADRICEPS MUSCLE ARCHITECTURE IN PATIENTS AFTER CORONARY ARTERY BYPASS GRAFT SURGERY: A RANDOMIZED CLINICAL TRIAL

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Introduction/Background: Background: Coronary artery bypass graft (CABG) surgery is known to induce significant muscle wasting and structural alterations in the quadriceps, specifically on the rectus femoris. In this sense, the effects of adding neuromuscular electrical stimulation (NMES) to short-term aerobic and resistance exercise (combined training [CT]) after CABG on quadriceps muscle architecture are not established. Objectives: Objective: To determine the effects of adding NMES to combined training on quadriceps muscle architecture, muscle quality, functional capacity, and quality of life in patients after CABG participating in a phase II cardiac rehabilitation program. Methods: Methods: This was a randomized, double blind controlled trial including 24 patients (59,5±9,44 years, 17 men) who were randomly assigned to either the NMES+CT group (n=13), which received NMES with CT or the sham-NMES+CT group (n=11). Patients completed two sessions per week for 12 weeks. The primary outcome was quadriceps muscle thickness measured by ultrasound before and after the intervention. Secondary outcomes included rectus femoris cross-sectional area, peripheral muscle strength (30-seconds sit-to-stand test), functional capacity (six-minute walk test), quality of life (MacNew HRQL questionnaire), rectus femoris echogenicity and vastus intermedius echogenicity (as an indicator of skeletal muscle quality). Resultados e Conclusions: Results: Compared with the sham NMES+CT group, the NMES+CT group showed significantly greater reduction in rectus femoris echogenicity (18.2; 95% CI: 2.5 to 34.0; p<0.05). However, no significant between-group differences were observed in quadriceps muscle thickness, rectus femoris cross-sectional area, vastus intermedius echogenicity, peripheral muscle strength, functional capacity, and quality of life. Conclusions: The addition of low frequency NMES to short-term combined training provided additional benefits in rectus femoris muscle quality in patients after CABG enrolled in a phase II cardiac rehabilitation program. The potential clinical practice implications of this study suggested the importance for the addition of NMES on cardiac rehabilitation programs to enhance rectus femoris quality and becoming an effective, simple and inexpensive strategy to improve muscle strength and functional status. Large trials are needed to investigate the beneficial effectiveness of this protocol in CABG patients enrolled in a phase II CR program.

21161

RELIABILITY AND SAFETY OF THE 2-MINUTE WALK TEST IN CARDIAC ICU PATIENTS

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Introduction/Background: Functional assessment in Cardiac Intensive Care Units (ICU) is clinically challenging. This study evaluated the metrological reliability, provocative capacity, and safety of the 2-Minute Stationary Walk Test (2MWT) as an alternative to the 6-Minute Walk Test (6MWT) in hospitalized cardiac patients through physiological response and vital sign recovery analysis. Objectives: To evaluate the metrological reliability, provocative nature, and safety of the 2-Minute Stationary Walk Test in patients admitted to a cardiac ICU, through a robust analysis of physiological response and vital sign recovery. Methods: An interventional, descriptive-analytical study was conducted with 218 cardiac ICU patients (55.4±14.1 years; 68.1% male). Vital signs—systolic blood pressure (SBP), diastolic blood pressure (DBP), heart rate (HR), respiratory rate (RR), and peripheral oxygen saturation (SpO□)—were monitored during pre-test (1 min rest), test (2 min stationary walk), and recovery (5 min rest) phases. Statistical analysis utilized Pearson correlation for intra-individual consistency and coefficient of variation (CV) for variability assessment. Resultados e Conclusions: The 2MWT proved to be highly provocative, with significant increases: HR +27.0 bpm (+35.2%; p<0.001), RR +9.6 breaths/min (+55.2%; p<0.001), SBP +18.6 mmHg (+15.2%; p<0.001), and DBP +5.6 mmHg (+7.2%; p<0.001). SpO□ remained stable (-0.2%; p>0.05). Reliability was confirmed by strong intra-individual correlations: SBP pre vs. recovery (r=0.672; p<0.001), HR pre vs. recovery (r=0.735; p<0.001). Variability was controlled with CV<18% for all vital signs. Safety was demonstrated by: rapid recovery of HR (85.9% in 5 minutes), RR (82.3% in 1 minute), absence of critical desaturation (SpO□<85%), absence of extreme tachycardia (HR>200 bpm), and absence of critical hypertension (SBP>220 mmHg). No adverse events were recorded during the test. The 2MWT is a reliable, provocative, and safe instrument for functional assessment in cardiac ICU patients. Its capacity to identify functional limitations, combined with a proven safety profile, establishes it as a viable alternative to the 6MWT for risk stratification and recovery monitoring in high-risk hospitalized populations.

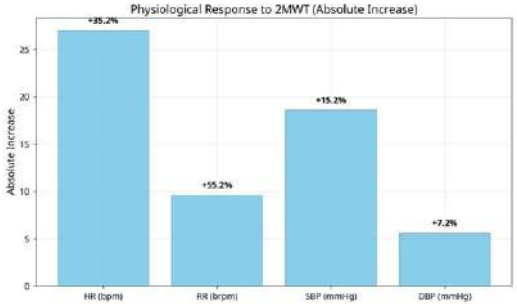


Tabela 3: Síntese dos Resultados de Confiabilidade e Caráter Provocativo do TME-2min

Aspecto	Indicador	Resultado Chave	Implicação Clínica
Confiabilidade	Correlação Intra-individual (PAS)	r=0,672 (p<0,001)	Consistência na resposta individual
	Correlação Intra-individual (FC)	r=0,735 (p<0,001)	Consistência na resposta individual
	Variabilidade (CV)	<18% para todos os SV	Baixa variabilidade, alta precisão
Caráter Provocativo	Aumento da FC	+27,0 bpm (+35,2%; p<0,001)	Induz resposta fisiológica significativa
	Aumento da FR	+9,6 irpm (+55,2%; p<0,001)	Induz resposta fisiológica significativa
	Aumento da PAS	+18,6 mmHg (+15,2%; p<0,001)	Induz resposta fisiológica significativa
	Aumento da PAD	+5,6 mmHg (+7,2%; p<0,001)	Induz resposta fisiológica significativa

17298

RESPIRATORY MUSCLE STRENGTH AS A PREDICTOR OF EVENTS IN DILATED CHAGAS CARDIOMYOPATHY: A PRELIMINARY STUDY

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Introduction/Background: In patients with heart failure, respiratory muscle strength is associated with exercise capacity and has also been explored as a predictor of mortality. In dilated Chagas cardiomyopathy, the most severe cardiac presentation of Chagas disease, evidence on the clinical and prognostic relevance of respiratory muscle dysfunction remains limited. Although functional impairment is common in this population, few studies have investigated whether respiratory muscle strength is associated with exercise performance and whether it can help identify patients at higher risk of adverse outcomes. Objectives: To evaluate the association between respiratory muscle strength and exercise capacity, as well as its predictive value for adverse cardiovascular events, in patients with dilated Chagas cardiomyopathy. Methods: Thirty-one patients with dilated Chagas cardiomyopathy (50 ± 7 years; left ventricular ejection fraction 37 ± 7%; NYHA class I–III) underwent respiratory muscle strength assessment by manovacuometry to determine maximal inspiratory pressure (MIP) and maximal expiratory pressure (MEP). All patients also underwent treadmill exercise testing and echocardiography and were subsequently followed for 40 ± 12 months. Study outcomes included cardiac death and adverse cardiovascular events. Associations between variables were analyzed using Spearman's test. Differences between patients with and without adverse events were assessed using the Mann-Whitney test. The accuracy of respiratory muscle strength in identifying patients with adverse outcomes was evaluated using receiver operating characteristic (ROC) curves. Resultados e Conclusions: At baseline, both MIP and MEP correlated with peak oxygen uptake (VO2peak) (r=0.360, p=0.047; r=0.423, p=0.018), indicating an association between respiratory muscle performance and exercise capacity. During follow-up, 13 patients had adverse cardiovascular events (8 cardiac deaths, 5 thromboembolic events). No significant differences were observed in MIP (p=0.211) or MEP (p=0.953) between patients with and without adverse events. ROC analysis showed poor discriminatory performance for MIP (AUC=0.365) and MEP (AUC=0.506). These findings suggest respiratory muscle strength relates to functional capacity in dilated Chagas cardiomyopathy, but its isolated prognostic value is limited. It may still offer complementary functional information, though larger studies are needed to confirm added prognostic value with established markers.

16075

SUCCESS RATE OF NON-INVASIVE VENTILATION IN A CARDIAC ICU: A CLINICAL INDICATOR OF CARE EFFECTIVENESS

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Introduction/Background: Acute respiratory failure (ARF) of cardiogenic etiology is a critical challenge in intensive care. Non-invasive ventilation (NIV) is a first-line intervention that optimizes lung compliance and reduces ventricular load. In high-complexity centers, the NIV success rate serves as a fundamental quality indicator, reflecting the team's ability to avoid invasive mechanical ventilation. Objectives: To evaluate the success rate and clinical profile of NIV application in patients admitted to a tertiary cardiac ICU. Methods: A retrospective observational study was conducted (from January 2025 to March 2026) via medical record analysis of patients aged ≥18 years. NIV (CPAP/Bilevel) was applied using total face masks and successful treatment was defined as the avoidance of orotracheal intubation (OTI) within 72 hours. Statistical analysis was performed using descriptive statistics, 95% confidence intervals (CI) for the success rate, and Fisher's Exact Test to compare curative versus prophylactic applications. Resultados e Conclusions: A total of 1,196 patients were analyzed, of whom 64.3% were male. Among them, 79 (6.6%) received NIV, including 44 (55.7%) for curative purposes and 35 (44.3%) for prophylaxis. A total of 1,196 patients were analyzed (64.3% male) among them, 79 (6.6%) received NIV: 44 for curative purposes (55.7%) and 35 for prophylaxis (44.3%). An overall success rate of 96.2% was achieved (95% CI: 89.3% – 99.2%), with a residual failure rate of only 3.8% (n=3). All recorded failures occurred within the curative group; however, no statistically significant difference in success was observed between the curative and prophylactic groups (p=0.25). These results reflect the precision in patient selection and the systematic choice of the total face interface, which optimizes adaptation and reduces iatrogenic risks.NIV demonstrated a high-resolution rate (96.2%), consolidating itself as a safe and effective strategy in cardiogenic ARF management. The low incidence of failure suggests that protocolized application and high-performance interfaces are determinants of therapeutic success. The results reinforce the strategic role of respiratory physical therapy in hemodynamic stabilization and the reduction of invasive support needs.

15000

THE KANSAS CITY CARDIOMYOPATHY QUESTIONNAIRE–12 <50 PREDICTS HOSPITALIZATION AND DEATH IN 12 MONTHS

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Introduction/Background: Introduction: Heart failure (HF) is one of the most challenging illnesses for current world health systems. To assess quality of life of patients with HF is highly recommended for clinical evaluations, illness monitoring, and comparisons between interventions as to help setting public health policies. The Kansas City Cardiomyopathy Questionnaire (KCCQ)-12 is a specific health-related quality of life questionnaire for patients with HF, with high levels of validity and reliability properties. Objectives: Purpose: To assess whether there is an association between the KCCQ-12 with clinical outcomes (hospitalization and death) in patients with HF. Methods: Methods: This study was approved by the local Ethics Committee (CAAE: 74659717.7.0000.0065). We administered KCCQ-12 and the New York Heart Association functional classification (NYHA) by telephone to 129 patients. We included patients of both sexes with left ventricular ejection fraction (LVEF) ≤ 45 %, and aged ≥ 18 years. Demographic and clinical data were collected from electronic medical records. We followed patients monthly over one year. Resultados e Conclusions: Results: From October 2020 to December 2022, 129 patients participated in the study. Among them, 64% were male, mean age: 58 years, mean LVEF: 28%, NYHA III-IV: 55%, and mean KCCQ-12: 51. Over one year, n=16 patients were hospitalized and n=3 died from cardiovascular causes. We compared two subgroups of patients: KCCQ<50 (n=63) with worse quality of life and KCCQ ≥50 (n=66) with better quality of life, with no significant differences between age (57 vs 60 years, p=0.112), males (64 vs 65%, respectively, p=0.844), and LVEF (29 vs 32%, respectively, p=0.056). However, KCCQ<50 group showed higher proportions of patients with NYHA III-IV in comparison with KCCQ≥50 (89 vs 23%, respectively, p<0.001) and higher occurrences of hospitalizations (21 vs 5%, respectively, p=0.006). We also found a significant moderate to high correlation between KCCQ-12 and NYHA (r=0.67, p<0.001). Conclusions: Worse quality of life assessed by the KCCQ-12 predicts worse clinical outcomes (hospitalizations) over 12 months.

Prevenção cardiovascular / Aterosclerose / Dislipidemia / Fatores de Risco Cardiovasculares / Imunoterapia e Vacina



81º CONGRESSO BRASILEIRO DE CARDIOLOGIA together with WORLD CONGRESS OF CARDIOLOGY





21179

APOC-III INHIBITION WITH OLEZARSEN IN MODERATE AND SEVERE HYPERTRIGLYCERIDEMIA: AN INTEGRATIVE REVIEW OF RANDOMIZED CLINICAL TRIALS

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Introduction/Background: Moderate and severe hypertriglyceridemia are associated with increased cardiovascular risk and acute pancreatitis, particularly in patients with diabetes and obesity. Despite conventional lipid-lowering therapies, many patients continue to have elevated triglyceride levels. Apolipoprotein C-III (ApoC-III) has emerged as an important therapeutic target because it inhibits lipoprotein lipase activity and reduces clearance of triglyceride-rich lipoproteins. Olezarsen is a GalNAc-conjugated antisense oligonucleotide designed to inhibit hepatic ApoC-III messenger RNA and reduce triglyceride levels. Objectives: This integrative review evaluated the efficacy and safety of olezarsen in adults with moderate or severe hypertriglyceridemia without familial chylomicronemia syndrome, compared with placebo. Methods: The review followed the PICOTT model and included only randomized clinical trials comparing olezarsen with placebo. Searches were conducted in PubMed, Embase, and Cochrane using terms related to hypertriglyceridemia, ApoC-III inhibition, and antisense oligonucleotides. Among 401 identified records, 112 duplicates were removed. After screening and eligibility assessment, four randomized, double-blind, placebo-controlled trials published between 2022 and 2025 were included: Tardif et al. (2022), Bergmark et al. (2024; 2025), and Marston et al. (2025). Resultados e Conclusions: The studies demonstrated consistent triglyceride reductions ranging from 49% to 60%, along with ApoC-III reductions of up to 74%. Olezarsen also reduced VLDL cholesterol, non-HDL cholesterol, and apolipoprotein B levels. In patients with severe hypertriglyceridemia and high pancreatitis risk, treatment was associated with an approximately 85% reduction in acute pancreatitis incidence. The safety profile was generally favorable, with low rates of serious adverse events and good tolerability. However, hepatic enzyme elevations and thrombocytopenia were more frequent with the 80 mg dose. Overall, ApoC-III inhibition with olezarsen appears to be a promising therapeutic strategy for moderate and severe hypertriglyceridemia, particularly in patients with persistent triglyceride elevation despite conventional therapies.

STUDY	DESIGN / POPULATION	INTERVENTION	MAIN RESULTS	SAFETY
Tardif et al. (2022)	Phase 2 randomized, double-blind, placebo-controlled clinical trial. Included 114 patients with moderate hypertriglyceridemia (200–500 mg/dL) and high cardiovascular risk or established atherosclerotic cardiovascular disease.	Subcutaneous olezarsen in different dosing regimens (10 mg every 4 weeks, 15 mg every 2 weeks, 10 mg weekly, and 50 mg every 4 weeks) versus placebo for 6–12 months.	Triglyceride reduction of up to 60% compared with placebo. ApoC-III reduction of up to 74%, in addition to significant decreases in VLDL-cholesterol, non-HDL cholesterol, and apolipoprotein B. Up to 91% of patients achieved TG <150 mg/dL with the 50 mg dose.	No clinically relevant changes in hepatic function, renal function, or platelet count were observed. The most frequent adverse event was mild injection-site erythema.
Bergmark et al. (2024) – Bridge–TIMI 73a	Phase 2b randomized, double-blind, placebo-controlled clinical trial. Included 154 patients with moderate hypertriglyceridemia (150–499 mg/dL) associated with high cardiovascular risk or severe hypertriglyceridemia (≥500 mg/dL).	Olezarsen 50 mg or 80 mg monthly versus placebo for 12 months.	Triglyceride reductions of 49.3% and 53.1% were observed with the 50 mg and 80 mg doses, respectively. Significant reductions in ApoC-III, apolipoprotein B, and non-HDL cholesterol were also reported, without relevant increases in LDL-cholesterol.	Adverse events and serious adverse events occurred at similar frequencies across groups. Clinically relevant hepatic, renal, and platelet abnormalities were uncommon.
Bergmark et al. (2025) – ESSENCE–TIMI 73b	Phase 3 randomized, double-blind, placebo-controlled clinical trial. Included 1349 patients with moderate hypertriglyceridemia (150–499 mg/dL) and high cardiovascular risk or severe hypertriglyceridemia (≥500 mg/dL).	Olezarsen 50 mg or 80 mg monthly versus placebo.	Demonstrated significant and sustained triglyceride reduction compared with placebo after 6 months of treatment, in addition to ApoC-III reduction. Confirmed the efficacy of olezarsen in a large multicenter population.	Safety profile was consistent with previous studies, with good overall tolerability and low incidence of serious adverse events.
Marston et al. (2025) – CORE-TIMI 72a / CORE2-TIMI 72b	Two randomized, double-blind, placebo-controlled clinical trials. Included 1061 patients with severe hypertriglyceridemia and high risk of acute pancreatitis.	Olezarsen 50 mg or 80 mg monthly versus placebo for 12 months.	Significant reductions in triglyceride levels were observed after 6 and 12 months of treatment. Important reductions in ApoC-III, remnant cholesterol, and non-HDL cholesterol were also reported. The incidence of acute pancreatitis was approximately 85% lower with olezarsen compared with placebo.	Overall adverse events were similar across groups. Elevation of liver enzymes, thrombocytopenia, and increased hepatic fat content occurred more frequently with the 80 mg dose.

19792

ARTIFICIAL INTELLIGENCE ENABLED RECOGNITION OF CORONARY ARTERY CALCIUM (ALERT-CAC): OPPORTUNISTIC SCREENING OF PRIOR NON-GATED CHEST CT TO INCREASE PREVENTIVE THERAPY

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Introduction/Background: Coronary artery calcium (CAC) on non-gated chest computed tomography (CT) is a strong marker of cardiovascular risk but is often underrecognized in routine care. Artificial intelligence (AI) can enable opportunistic CAC detection from existing imaging and translate incidental findings into preventive action. Objectives: We evaluated whether an AI-enabled CAC identification and notification workflow was associated with downstream clinical care and treatment changes. Methods: We conducted a quality improvement evaluation of adults aged ≥18 years who underwent non-gated chest CT between May 2024 and May 2025 and had not seen a cardiologist in the prior 2 years. Patients were excluded for known CAD, prior CABG or PCI, recent cardiovascular diagnostic testing, or poor-prognosis noncardiac conditions. A validated FDA-approved deep learning algorithm with physician confirmation identified CAC. Patients with CAC scores of 100–299 (moderate) or ≥300 (severe), based on SCCT/STR guidance, triggered clinician and patient notification. Outcomes included CAC-related care-seeking, cardiology and primary care follow-up, statin and aspirin changes, cardiovascular diagnostic testing, and revascularization. Groups were compared using Wilcoxon rank-sum and chi-square/Fisher exact tests, with multivariable logistic regression adjusted for age and sex. Resultados e Conclusions: Among 4,659 screened patients, 340 (7.3%) had CAC ≥100 and received notification; 171 had CAC 100–299 and 169 had CAC ≥300. Patients with severe CAC were older (median age 71 vs 68 years, p=0.006) and had higher baseline statin use (59% vs 38%, p<0.001), hypertension (87% vs 70%, p<0.001), and hyperlipidemia (80% vs 63%, p<0.001). After notification, 19% had CAC-related care-seeking, 27% cardiology follow-up, 48% primary care follow-up, 50% a statin change, 13% statin initiation, 33% an aspirin change, 18% cardiovascular diagnostic testing, and 2.6% cardiac intervention. Compared to moderate CAC, severe CAC was associated with higher care-seeking (25% vs 12%, p=0.002), cardiology follow-up (36% vs 19%, p<0.001), aspirin change (40% vs 26%, p=0.006), and diagnostic testing (24% vs 13%, p=0.010). In adjusted analysis, severe CAC remained associated with diagnostic testing (OR 2.01, 95% CI 1.13–3.65, p=0.02). An AI-enabled opportunistic CAC detection and notification pathway was associated with meaningful downstream clinical action, especially in patients with severe CAC, and may help close a gap in cardiovascular risk recognition using existing imaging

19425

ASSOCIATION OF ANEMIA WITH LIPID PROFILE ABNORMALITIES IN BRAZILIAN ADULTS

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Introduction/Background: Introduction: Anemia is a public health problem worldwide, and when related to lipid profile, it may be associated with metabolic alterations, such as reduced low-density lipoprotein (LDL). There are gaps regarding this relationship in the Brazilian adult population. Objectives: Objective: To analyze the association between anemia and lipid profile alterations in Brazilian adults. Methods: Methods: A cross-sectional study using data from the Brazilian National Health Survey (2014–2015), including 8,952 adults. Prevalence and 95% confidence intervals (95%CI) were estimated for anemia and lipid outcomes, according to sex, age, race/skin color, and region. Anemia was defined as hemoglobin < 13.0 g/dL in men and < 12.0 g/dL in women. Lipid profile cut-off points were: low HDL ≤ 40 mg/dL, high LDL ≥ 130 mg/dL, and high total cholesterol (TC) > 190 mg/dL. Differences were assessed using Pearson's chi-square test (p ≤ 0.05). Associations were examined using logistic regression models, with odds ratios (OR) and 95%CI adjusted for sex, age, and race/skin color. Resultados e Conclusions: Results: For high TC, prevalence was 43.0% (95%CI: 41.2–44.8) among adults without anemia and 34.4% (95%CI: 32.5–36.3) among those with anemia (p<0.05). For high LDL, prevalences were 19.2% (95%CI: 18.0–20.4) and 13.8% (95%CI: 12.7–15.0), respectively (p<0.05). For low HDL, prevalences were 35.1% (95%CI: 33.6–36.6) and 32.6% (95%CI: 31.1–34.1), respectively (p>0.05). Anemia was associated with lower odds of high TC (OR 0.6; 95%CI: 0.5–0.8), in men (OR 0.4; 95%CI: 0.3–0.6) and women (OR 0.8; 95%CI: 0.6–1.0), and in individuals aged ≥50 years (OR 0.5; 95%CI: 0.4–0.6). For high LDL, anemia was also associated with lower odds of the outcome (OR 0.7; 95%CI: 0.5–0.9), in women (OR 0.7; 95%CI: 0.6–1.0) and men (OR 0.5; 95%CI: 0.3–0.8), and among adults aged ≥50 years (OR 0.5; 95%CI: 0.4–0.6). A protective effect was observed in the North (OR 0.6; 95%CI: 0.3–0.9), Southeast (OR 0.5; 95%CI: 0.3–0.8), and South (OR 0.4; 95%CI: 0.2–1.0). White individuals with anemia had lower odds of high LDL (OR 0.6; 95%CI: 0.4–0.9). Conclusion: Anemia was associated with lipid profile alterations, particularly high total cholesterol and LDL, from age 50 onward, with greater magnitude in men and variation by region and race/skin color. The findings highlight the need to strengthen surveillance actions and public policies to prevent and manage anemia and cardiovascular risk factors, considering sociodemographic inequalities.

16967

ASSOCIATION OF TILT TABLE TEST FINDINGS WITH HEMODYNAMIC AND CLINICAL VARIABLES IN DOWN SYNDROME

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Introduction/Background: Down syndrome is the most common chromosomal disorder and is associated with a wide range of cardiovascular abnormalities. While structural heart disease has been extensively studied, less is known about functional vascular and autonomic alterations. Emerging evidence suggests that individuals with Down syndrome may exhibit reduced arterial stiffness and altered autonomic regulation. However, the interaction between vascular function, aging, and metabolic factors remains unclear. Objectives: This study aimed to characterize vascular, autonomic, and metabolic parameters in 100 individuals with Down syndrome. Methods: This cross-sectional study included 100 patients. Central blood pressure, pulse wave velocity (PWV) and metabolic parameters were analyzed. Resultados e Conclusions: Results: Central systolic pressure (CSP) and cardiac output (CO) were significantly lower in the abnormal tilt table test group than in the normal group (CSP: 85.2 ± 1.1 vs. 89.8 ± 1.6 mmHg, p=0.016; CO: 3.4 ± 0.0 vs. 3.6 ± 0.0 L/min, p=0.002), with no significant differences observed in central diastolic pressure, central pulse pressure, pulse wave velocity (PWV), or total vascular resistance. PWV was below the expected range in 62.5% of patients, with no cases of elevated values and showed a strong positive correlation with age (r = 0.77, p < 0.001). CSP and diastolic blood pressure (CDP) were low across the cohort. Obese patients had significantly higher triglyceride levels (p = 0.045) and a trend toward higher PWV (p = 0.056), while no differences were observed in LDL, HDL, or fasting glucose. Tilt table test and central hemodynamic variables are summarized in Table 1, while laboratory indices are presented in Table 2. Conclusion: This study demonstrates a distinct cardiovascular phenotype in individuals with Down syndrome. Patients with Down syndrome exhibited a high prevalence of abnormal tilt table test results. . The predominance of low PWV suggests increased arterial compliance, contrasting with the pattern observed in the general population. Metabolic findings revealed a selective alteration, with increased triglycerides in obese individuals but no changes in LDL, HDL, or glucose. This suggests a dissociation between obesity and classical atherogenic profiles. Together, these findings support the concept of a unique cardiometabolic profile in Down syndrome, characterized by vascular protection and selective metabolic modulation, with no association with vasovagal syncope.

Table 1 – Tilt Table Test and Central Hemodynamic Variables in 100 Adults with Down Syndrome

	Abnormal TT (n=61)		Normal TT (n=39)		
	Mean	DP	Mean	DP	p-value
CSP (mmHg)	85.2	1.1	89.8	1.6	**0.016**
CDP (mmHg)	62.9	1.0	63.9	1.2	0.563
CPP (mmHg)	21.9	0.8	23.6	1.1	0.218
CO (L/min)	3.4	0.0	3.6	0.0	**0.002**
TVR (mmHg/ml)	1.2	0.0	1.2	0.0	0.530
PWV (m/s)	4.4	0.1	4.7	0.1	0.185

Abbreviations: CSP = central systolic pressure; CDP = central diastolic pressure; CPP = central pulse pressure; CO = cardiac output; TVR = total vascular resistance; PWV = pulse wave velocity; p-value = statistical significance level

Table 2 – Tilt Table Teste and Clinical Variables in 100 Adults with Down Syndrome

	Abnormal TT (n=61)		Normal TT (n=39)		
	Mean	SD	Mean	SD	p-value
BMI (Kg/m²)	27.0	0.7	29.7	1.2	**0.049**
TC (mg/dL)	165.0	4.0	172.0	6.0	0.349
LDL (mg/dL)	102.0	4.0	105.0	6.0	0.599
HDL (mg/dL)	45	1	44	2	0.751
Triglicerides (mg/dL)	108	6	111	8	0.769
HbA1c (%)	5.3	0.1	6.0	0.0	**0.011**

Abbreviations: BMI = body mass index; TC = total cholesterol; LDL = LDL cholesterol; HDL = HDL cholesterol; HbA1c = glycated hemoglobin

20639

ASSOCIATION OF VERY HIGH LIPOPROTEIN(A) LEVELS WITH SIGNIFICANT CORONARY ARTERY CALCIFICATION IN A CARDIOVASCULAR PREVENTION CLINIC IN SOUTHERN BRAZIL

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Introduction/Background: Lipoprotein(a) [Lp(a)], particularly at very high levels, has emerged as an important genetic risk factor for coronary artery disease (CAD). Coronary artery calcium (CAC) score is a marker of subclinical atherosclerosis. Both are risk predictors that assist therapeutic decision-making in cardiovascular prevention. Recent studies have sought to clarify the association between these two factors. Objectives: To evaluate the association between very high Lp(a) levels and significant coronary artery calcification (CAC ≥ 100). Methods: This matched cross-sectional study included patients aged 45 to 70 years attending a cardiovascular prevention outpatient clinic, covered by private health insurance, in Southern Brazil, who had available Lp(a) and CAC measurements. To better assess the impact of Lp(a), two groups were included: very high Lp(a) (≥ 190 nmol/L or ≥ 85 mg/dL) and non-elevated Lp(a) (< 125 nmol/L or < 50 mg/dL). Groups were matched by sex and age (± 3 years). Significant coronary artery calcification was defined as CAC ≥ 100. The following baseline characteristics were evaluated: hypertension, diabetes, smoking, severe hypercholesterolemia (LDL-C ≥ 190 mg/dL), and family history of premature CAD (men < 55 years or women < 60 years). Resultados e Conclusions: A total of 160 patients were included (80 in each group); mean age was 57.9 ± 6.6 years; 65.0% were women; 46.9% had hypertension; 29.4% had severe hypercholesterolemia; 24.4% had a family history of premature CAD; 8.8% were smokers; and 4.4% had diabetes. There were no statistically significant differences in baseline characteristics between groups. Regarding coronary calcification, median CAC was 28.5 (0–134.5) in the very high Lp(a) group and 9.0 (0–77.8) in the non-elevated Lp(a) group (p = 0.013). CAC = 0 was observed in 33.8% of patients with very high Lp(a) compared with 40.0% of those with non-elevated Lp(a) (p = 0.511). Regarding the primary outcome, significant coronary artery calcification (CAC ≥ 100) was more prevalent in the very high Lp(a) group (33.8% vs. 17.5%; prevalence ratio 1.93 [1.10–3.40]; p = 0.015). In conclusion, patients with very high Lp(a) levels showed a higher prevalence of significant coronary artery calcification. These findings support the association between Lp(a) and CAD and suggest that individuals with very high Lp(a) may also be more susceptible to significant subclinical atherosclerosis.

15089

BEYOND TRADITIONAL RISK SCORES: A NOVEL COMMUNITY CARDIOVASCULAR VULNERABILITY INDEX INTEGRATING LIFESTYLE AND ACCESS DETERMINANTS IN TRIBAL POPULATIONS OF HIMACHAL PRADESH, INDIA

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Introduction/Background: Cardiovascular risk assessment in resource-limited and geographically isolated populations remains inadequate due to reliance on laboratory-based models and poor consideration of lifestyle and access-related vulnerabilities. Tribal populations represent a critical evidence gap requiring context-specific, scalable approaches. Objectives: To estimate cardiovascular risk using validated non-laboratory tools and to develop a novel Community Cardiovascular Vulnerability Index (CCVI) integrating lifestyle, dietary, and healthcare access factors in tribal regions of Himachal Pradesh, India. Methods: A community-based cross-sectional study was conducted among adults ≥18 years in tribal districts of Himachal Pradesh (Lahaul and Spiti, Kinnaur, and Chamba) using multistage sampling. Cardiovascular risk was assessed using non-laboratory WHO/ISH Risk Prediction Charts. A composite CCVI (0–100) was derived from four equally weighted domains: clinical risk, behavioral factors (physical activity via GPAQ, tobacco, alcohol), dietary exposure (salt, sugar, fat, fruit–vegetable intake), and healthcare access/awareness. Variables were assessed using structured questionnaires adapted from WHO STEPS. Internal consistency and multivariate analysis were performed. Resultados e Conclusions: A total of 452 participants (mean age 41.7 ± 15.1 years; 53% female) were included. Based on non-laboratory WHO/ISH Risk Prediction Charts, 24.1% were classified as moderate-to-high cardiovascular risk. However, the composite CCVI identified 42.3% as high vulnerability, indicating substantial underestimation by conventional risk models. Behavioral and dietary risk factors were highly prevalent: 61.2% of participants had low physical activity, 39.8% reported tobacco use, and 68.5% demonstrated high dietary risk (excess salt, sugar, and visible fat intake with inadequate fruit–vegetable consumption). Healthcare access challenges were prominent, with a significant proportion reporting seasonal inaccessibility and low awareness of cardiovascular risk. On multivariate analysis, low physical activity, high dietary exposure, and poor healthcare access were independently associated with elevated CCVI scores (p < 0.01). Notably, 31% of individuals categorized as low clinical risk were reclassified as high vulnerability after incorporating lifestyle and access factors. In Conclusion, the CCVI uncovers hidden cardiovascular risk and enables context-sensitive, scalable prevention in resource-limited settings.

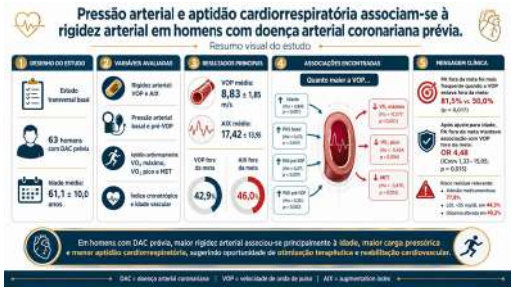
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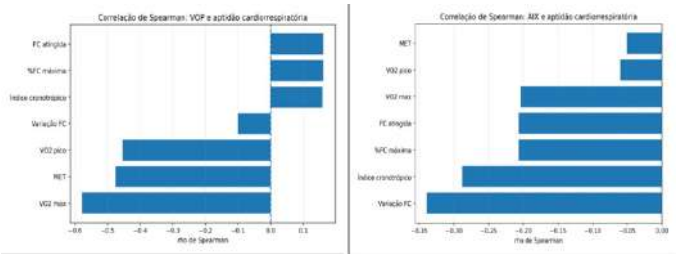
BLOOD PRESSURE AND CARDIORESPIRATORY FITNESS ARE ASSOCIATED WITH ARTERIAL STIFFNESS IN MEN WITH PREVIOUS CORONARY ARTERY DISEASE

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Introduction/Background: In patients with coronary artery disease (CAD), arterial stiffness may increase ventricular afterload, alter wave reflection, and contribute to a worse hemodynamic and functional profile. Pulse wave velocity (PWV) and augmentation index (AIX) are markers of arterial stiffness with potential utility in vascular risk stratification in secondary prevention patients Objectives: To evaluate, in men with previous CAD, the association between baseline arterial stiffness, blood pressure, and cardiorespiratory fitness in patients followed at a chronic coronary artery disease Methods: This was a cross-sectional baseline study including 63 men with previous CAD. The following variables were assessed: PWV, AIX, vascular age, baseline and pre-PWV blood pressure, VO□max, peak VO□, METs, and chronotropic index. Associations between continuous variables were analyzed using Spearman's correlation. A logistic regression model was used to evaluate factors associated with off-target PWV, adjusted for age Resultados e Conclusions: Mean age was 61.1±10.0 years. Mean PWV was 8.83±1.85 m/s and mean AIX was 17.42±13.95. PWV and AIX were above target values in 42.9% and 46.0% of participants, respectively. PWV was positively correlated with age (rho=0.848; p<0.001), baseline systolic blood pressure (rho=0.472; p<0.001), pre-PWV systolic blood pressure (rho=0.471; p<0.001), and pre-PWV diastolic blood pressure (rho=0.383; p=0.002). Inverse correlations were observed between PWV and VO□max (rho=-0.577; p<0.001), peak VO□ (rho=-0.454; p=0.004), and METs (rho=-0.476; p=0.002). Blood pressure above target was more frequent among patients with off-target PWV (81.5% vs. 50.0%; p=0.017). After adjustment for age, off-target blood pressure remained associated with higher odds of off-target PWV (OR 4.48; 95% CI 1.33–15.05; p=0.015). Self-reported medication adherence was 77.8%, whereas only 44.3% achieved LDL cholesterol <55 mg/dL. Altered glucose levels/prediabetes or values compatible with diabetes were observed in 49.2% of participants. Conclusions: In men with previous CAD, baseline arterial stiffness was mainly associated with age, blood pressure burden, and lower cardiorespiratory fitness. Blood pressure above target remained associated with a greater likelihood of off-target PWV even after adjustment for age. Despite good self-reported adherence, there was substantial residual blood pressure, lipid and glycemic risk, suggesting opportunities for therapeutic optimization and cardiovascular rehabilitation.





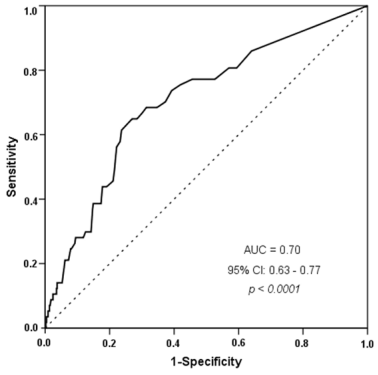
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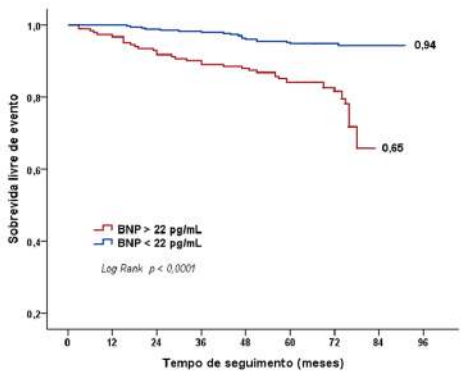
BNP AS A MARKER OF CARDIAC STRESS IN INDIVIDUALS WITHOUT HEART FAILURE: PREDICTING LONG-TERM OUTCOMES IN A POPULATION-BASED STUDY

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Introduction/Background: B-type natriuretic peptide (BNP) is a diagnostic and prognostic marker in heart failure (HF). However, its prognostic role in populations with cardiovascular risk factors but without baseline HF is not well established. Patients with risk factors, without HF may have elevated BNP, a condition named cardiac stress. Objectives: To evaluate the role of BNP in predicting long-term cardiovascular events in a population without baseline HF. Methods: Retrospective analysis of a population-based study in which 633 individuals aged >45 years were randomly selected from a primary health care program. In the present study, 527 individuals who completed at least 5 years of follow-up were included. Patients with HF or a history of heart disease, such as acute myocardial infarction (AMI), valvular heart disease, or asymptomatic left ventricular (LV) systolic dysfunction, were excluded. BNP was measured at baseline. The primary endpoint was time to cardiovascular death or hospitalization. Resultados e Conclusions: The mean age of the population was 59±9.9 years, and 191 (36.2%) were men. The mean LV ejection fraction was 62±5.7%, and the median BNP level was 15 (1st and 3rd quartiles = 10 and 28) pg/mL. Fifty-eight (11%) individuals experienced the endpoint. A BNP cutoff of 22 pg/mL showed a sensitivity of 68.4%, specificity of 68.6%, and a negative predictive value of 94.6% for the primary endpoint (area under the curve 0.70 [95% CI 0.63–0.77], p<0.0001). Event-free survival was lower among individuals with BNP >22 pg/mL (65% vs. 94%, log-rank p<0.0001). In multivariate analysis using the Cox proportional hazards model, variables independently associated with the endpoint were age (HR 1.05 [1.02–1.08], p=0.006), BNP (HR 1.01 [1.00–1.01], p=0.022), and creatinine (HR 2.61 [1.04–6.53], p=0.04) (HRs per 1-unit increase for all three continuous variables). Conclusions: BNP is an independent predictor of long-term events in individuals free of HF or other heart diseases at baseline and therefore represents a marker of cardiac stress.





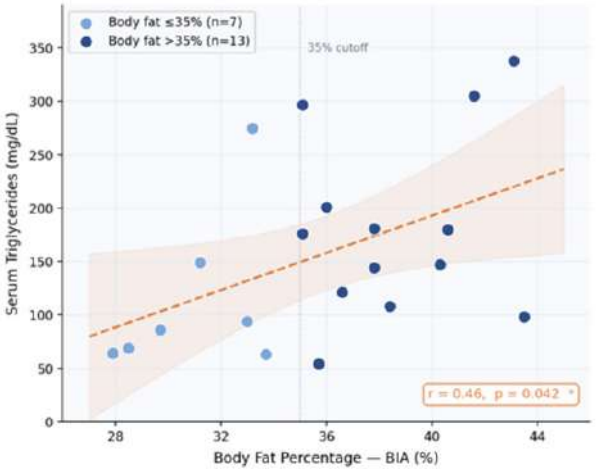
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BODY FAT PERCENTAGE AND TRIGLYCERIDES IN POSTMENOPAUSAL HOSPITAL WORKERS: A BIOIMPEDANCE-BASED CARDIOMETABOLIC ASSESSMENT

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Introduction/Background: Postmenopausal women experience estrogen-related shifts in fat distribution and lipid metabolism, increasing atherogenic dyslipidemia risk. Body mass index (BMI) fails to capture this adiposity remodelling, as it does not distinguish fat from lean mass. Bioimpedance analysis (BIA) enables direct quantification of body fat percentage (BF%), offering a more sensitive tool for cardiometabolic risk stratification in this population. Objectives: To evaluate the association between BF% measured by BIA and serum triglyceride (TG) levels in postmenopausal female hospital workers. Methods: Cross-sectional observational study of 20 postmenopausal women (age range 58–67 years, mean 62 years) undergoing institutional cardiovascular screening. All participants completed a 12-hour fast before collection of a fasting lipid panel and BIA using a Biodynamics BIA 450 single-frequency tetrapolar analyzer, following standardized protocols. Participants were stratified by BF% (≤35% vs. >35%). Serum triglycerides, total cholesterol, HDL-C, LDL-C, non-HDL-C, and TG/HDL ratio were assessed. Associations were evaluated by Pearson correlation; group differences by Mann-Whitney U test. Resultados e Conclusions: RESULTS Mean BF% was 35.9%. A statistically significant moderate positive correlation was observed between BF% and serum TG (r = 0.46, p = 0.042). Women with BF% >35% (n=13) showed higher mean TG compared with those with BF% ≤35% (n=7) (181 vs. 114 mg/dL; p = 0.056), with the difference approaching but not reaching conventional significance. The TG/HDL ratio — a proxy for insulin resistance — was numerically higher in the higher-adiposity group (3.2 vs. 2.1). Total cholesterol (mean 205 mg/dL), LDL-C (mean 111 mg/dL), and HDL-C (mean 63 mg/dL) were similar across strata. Four participants (20%) had TG/HDL ≥3.5, indicating elevated insulin resistance risk. CONCLUSIONS In postmenopausal hospital workers, BF% assessed by single-frequency tetrapolar BIA was significantly correlated with serum triglycerides, independently of BMI-based classification. These findings support the integration of direct body composition assessment into cardiometabolic risk stratification strategies for postmenopausal women, a population where adiposity-driven dyslipidaemia may go undetected by conventional anthropometric screening. Given the limited sample size, these exploratory findings require validation in larger cohorts.



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BREACHING THE GAP: POINT-OF-CARE CAROTID HAND-HELD ULTRASOUND FOR CARDIOVASCULAR RISK RE-STRATIFICATION

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Introduction/Background: Preventing cardiovascular disease (CVD) is a strategy to alleviate the burden of mortality, morbidity and healthcare costs that CVD represents. Risk stratification is made through various calculators that estimate individual risk of developing CVD. Risk modulating and modifying factors are fundamental for accurately establishing cardiovascular risk. Subclinical atherosclerosis is a major risk modifier. Point-of-care ultrasound (POCUS) represents a growing trend, with proven effectiveness in detecting subclinical carotid atherosclerosis. Handheld ultrasound (HHU) has reduced the costs for performing POCUS and opens an opportunity to generalize this practice. Its effectiveness needs to be demonstrated in different groups of patients. Objectives: Evaluate with HHU in a primary care setting the presence of subclinical carotid atheromatosis in patients after cardiovascular risk assessment using the Pan American Health Organization's HEARTS risk calculator, when the calculated risk is low or moderate. Methods: A cross-sectional observational study was conducted. Patients over 40 years of age who attended the obesity screening sessions and consented to participate were included. Cardiovascular risk was calculated using the PAHO risk calculator. Those with low or moderate cardiovascular risk and modulating risk factors underwent carotid ultrasound with a HHU performed by trained cardiologists to determine the presence of subclinical atherosclerosis. Resultados e Conclusions: 125 patients were included with a mean age of 60 years (SD 10.8), 80% women. 3% of the patients had a history of CAD, 1.5% of stroke, 6% of peripheral vascular disease, 2% of kidney disease, and 22% of diabetes. 70% of the patients did not know their cholesterol levels. 34% had a history of smoking. 45% had high blood pressure. Based on their BMI, 21% of the patients were overweight and 76% obese. According to the risk stratification, 24% of patients were at low risk, 30% at moderate risk and 46% at high risk or very high risk of developing CVD. 68 patients with low to moderate risk underwent carotid ultrasound at the time of the consultation, revealing carotid plaques in 35% of them. After the ultrasounds were performed, the percentage of patients at high and very high risk increased to 64.8%, representing an absolute increase of 18.8%. This study demonstrates the promising utility of point-of-care ultrasound with low-cost, handheld, portable ultrasound devices for the detection of subclinical atherosclerosis improving risk stratification.

	Low risk	Moderate risk	High risk	Very high risk
Age	49 (+-5)	61 (+-8)	65 (+-10)	68 (+-9)
Female	90%	78%	80%	0%
Diabetic	3%	3%	46%	50%
Smoker	22,50%	30%	42%	50%
High blood pressure	26%	43%	56%	100%
Coronary heart disease	0%	3%	4%	50%
Stroke	0%	0	4%	0%
Chronic renal disease	3%	0	0	50%
Peripheral vascular disease	6%	0	11%	0%
BMI	31 (+-9)	34 (+-7)	35.7 (+-7)	30 (+-9)
Obesity	77,50%	67%	83%	50%
Ultrasound positive	13%	54%	No	No
n	31	37	55	2

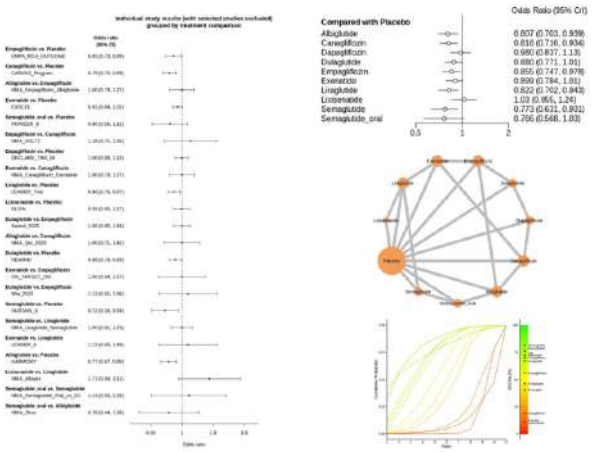
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COMPARATIVE CARDIOVASCULAR EFFICACY OF SGLT2 INHIBITORS AND GLP-1 RECEPTOR AGONISTS: A BAYESIAN NETWORK META-ANALYSIS OF 22 RANDOMIZED TRIALS

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Introduction/Background: Both SGLT2 inhibitors and GLP-1 receptor agonists reduce major adverse cardiovascular events (MACE) in patients with type 2 diabetes, yet no large-scale head-to-head trials directly compare the two classes. A network meta-analysis that jointly synthesizes evidence from both classes enables indirect comparisons and provides a probabilistic ranking of treatment efficacy. Objectives: To compare the cardiovascular efficacy of SGLT2 inhibitors and GLP-1 receptor agonists in reducing major adverse cardiovascular events (MACE) using a Bayesian network meta-analysis of randomized controlled trials, and to rank treatments according to their relative effectiveness. Methods: This Bayesian network meta-analysis included 22 two-arm randomized controlled trials (total N = 124,112 patients) derived from cardiovascular outcome trials. The network was fully connected, with no multi-arm trials. Eleven treatments were compared: three SGLT2 inhibitors (canagliflozin, dapagliflozin, empagliflozin), seven GLP-1 receptor agonists (albiglutide, dulaglutide, exenatide, liraglutide, lixisenatide, subcutaneous semaglutide, oral semaglutide), and placebo. The primary outcome was the composite of cardiovascular death, nonfatal myocardial infarction, or nonfatal stroke (MACE). A random-effects model was used to estimate odds ratios (ORs) with 95% credible intervals (CrIs). Treatment ranking was quantified using the Surface Under the Cumulative Ranking curve (SUCRA). Between-study heterogeneity was assessed by the between-study standard deviation (sd). Results: Compared with placebo, five treatments demonstrated Resultados e Conclusions: Compared with placebo, five therapies significantly reduced MACE: subcutaneous semaglutide (OR 0.773; 95% CrI 0.631–0.931), albiglutide (0.807; 0.703–0.939), canagliflozin (0.816; 0.716–0.934), liraglutide (0.822; 0.702–0.943), and empagliflozin (0.855; 0.747–0.978). Dulaglutide and exenatide showed non-significant trends, while dapagliflozin, lixisenatide, and oral semaglutide were not superior. Ranking favored subcutaneous semaglutide (SUCRA 81.4%), followed by oral semaglutide (76.1%) and albiglutide (71.9%). Although oral semaglutide had the highest probability of being best (40.7%), subcutaneous semaglutide showed the most consistent overall performance. Heterogeneity was low (sd = 0.05; 95% CrI 0.00–0.14). Overall, subcutaneous semaglutide ranked as the most effective therapy for MACE reduction.



20336

COMPARISONS BY SEX OF METABOLIC AND ANTHROPOMETRIC INDEXES IN ASYMPTOMATIC ADULTS

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Introduction/Background: Abdominal adiposity and the lipid and glycemic profile are important determinants of cardiometabolic risk and vary between men and women. Objectives: This study investigates whether body mass index alone is sufficient to identify these differences or whether measures of fat distribution, such as waist circumference and waist to hip ratio, are more informative. Methods: The Claude Code tool, based on Anthropic's Sonnet 4.6 model, was used as support for data analysis and table preparation. Data from men and women in the same educational environment were analyzed, including clinical and laboratory variables. After excluding extreme body mass index values, 336 women and 269 men remained. Comparisons of means and prevalences were performed, as well as regression analyses to evaluate the relationship between age, sex, adiposity, and metabolic markers. Resultados e Conclusions: Results As shown in Table 1, the mean body mass index was similar between sexes, with no significant difference. However, the distribution presented in Table 2 revealed a higher proportion of overweight among men and a higher frequency of more severe obesity among women. Central adiposity was higher in men, with greater waist circumference and waist to hip ratio, whereas women showed larger hip measurements. Men presented worse metabolic profiles, with higher levels of triglycerides, total cholesterol, uric acid, and blood glucose. Women had higher mean values of high density lipoprotein, but a greater proportion of low levels according to sex specific criteria. Age was the main predictor of blood glucose and triglycerides. Discussion Body mass index alone underestimates risk differences between sexes. Measures of fat distribution and metabolic markers are more effective for risk discrimination. Men show a pattern of higher cardiovascular risk, while women present a distinct profile with specific lipid vulnerability. Conclusion Despite similar body mass index values, men and women exhibit different metabolic profiles. The isolated use of this index is insufficient, and measures such as waist circumference, waist to hip ratio, triglycerides, and uric acid should be included for better assessment of cardiometabolic risk.

Table 1. Descriptive statistics (mean ± standard deviation; median when applicable).

Variable	Women (n=362)	Men (n=280)	p (Welch)
Age (years)	38,7 ± 7,4; 38	41,6 ± 7,9; 41	<0,001
Body mass index (kg/m²)*	26,6 ± 5,4; 26	25,9 ± 5,4; 26	0,098
Waist (cm)	86,3 ± 12,9; 84	92,0 ± 11,9; 91	<0,001
Hip (cm)	99,9 ± 10,6; 100	94,8 ± 8,0; 95	<0,001
Waist/Hip Index	0,86 ± 0,07	0,97 ± 0,07	<0,001
Systolic blood pressure (×10 mmHg)	11,9 ± 2,2	12,2 ± 1,6	0,034
Diastolic blood pressure (×10 mmHg)	7,6 ± 1,3	7,9 ± 1,1	0,002
Total cholesterol (mg/dL)	193,0 ± 41,2	202,5 ± 43,7	0,006
Low-density lipoprotein (mg/dL)	123,9 ± 33,5	125,7 ± 38,5	0,52
High-density lipoprotein (mg/dL)	46,9 ± 24,1	42,1 ± 11,7	<0,001
Triglycerides (mg/dL)	126,4 ± 77,3; 105	171,8 ± 122,4; 138	<0,001
Uric acid (mg/dL)	4,16 ± 0,99	5,51 ± 1,23	<0,001
Blood sugar (mg/dL)	90,3 ± 30,0; 86	96,5 ± 36,6; 89	0,023

*Body mass index with removal of two outliers (>60). Without timing, the average woman is inflated by an implausible body mass index of 312.

Table 2. Body mass index ranges (World Health Organization)

Body mass index range	Women (%)	Men (%)
Low weight (<18,5)	3,3	2,6
Eutrophy (18,5-24,9)	35,8	34,2
Overweight (25-29,9)	34,6	43,5
Obesity I (30-34,9)	16,0	13,4
Obesity II (35-39,9)	8,3	5,9
Obesity III (≥40)	2,1	0,4

17029

CORRELATION BETWEEN CLINICAL INDICES AND CAROTID ULTRASOUND FINDINGS IN ADULTS WITH DOWN SYNDROME

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Introduction/Background: Down syndrome (DS), caused by trisomy of chromosome 21, is the most common chromosomal disorder and is associated with increased life expectancy due to advances in medical care. Individuals with DS frequently present with metabolic abnormalities such as obesity, dyslipidemia, and insulin resistance. Despite these risk factors, several studies have reported a paradoxically low prevalence of atherosclerosis and coronary artery disease in this population. This phenomenon has been attributed to genetic and molecular mechanisms linked to chromosome 21. Carotid intima-media thickness (IMT) assessed by ultrasound is a well-established marker of subclinical atherosclerosis and cardiovascular risk. However, data on IMT and its determinants in adults with DS remain limited. Objectives: This study aimed to evaluate the association between clinical and laboratory variables and carotid ultrasound findings in adults with DS. Methods: This cross-sectional study included 110 adults with DS All participants underwent clinical evaluation, including measurement of body mass index (BMI). Laboratory tests included lipid profile (total cholesterol, LDL, HDL, triglycerides) and glycated hemoglobin (HbA1c). Carotid Doppler ultrasound was performed using a Philips Affiniti 70 system. IMT was measured according to standard protocols. Data were analyzed using the SPSS. Continuous variables are presented as mean ± standard deviation. Comparisons between groups were performed using appropriate statistical tests. Resultados e Conclusions: This study demonstrates that increased carotid IMT in adults with DS is associated with age and metabolic parameters, particularly dyslipidemia and glycemic control (Table 1) Interestingly, BMI was not associated with IMT, suggesting that obesity may not play the same role in cardiovascular risk in DS as in the general population. The absence of atherosclerotic plaques in our cohort reinforces this concept and supports the hypothesis of protective mechanisms related to trisomy 21, possibly involving differences in lipid metabolism, inflammation, and endothelial function. Conclusion: Despite the presence of cardiovascular risk factors, the absence of atherosclerotic plaques suggests a distinct vascular profile in this population. Routine vascular assessment using carotid ultrasound may be useful for early detection ofsubclinical changes and risk stratification in adults with DS.

Table 1 – Clinical Profile, Laboratory Parameters, and Carotid Duplex Ultrasound Findings in Trisomy 21 Patients

	Increased IMT		Not increased IMT		
	Mean	SD	Mean	SD	p
Age (years)	44.4	11.8	29.0	10.8	**0.000**
BMT (Kg/m²)	29.9	5.6	28.8	6.5	0.634
TC	212.2	41.6	166.0	30.6	**0.000**
LDL	138.0	37.6	102.4	28.1	**0.000**
HDL	49.8	15.0	43.3	10.8	0.085
Triglycerides	123.7	54.4	108.8	47.9	0.359
HbA1C	6.0	0.3	5.4	0.3	**0.030**

IMT = carotid intima media thickness ; SD = standard deviation; P= statistical significance ; BMT = body mass index ; TC = total cholesterol ; HBA1C = glycated hemoglobin

20979

COST-EFFECTIVENESS OF DYSLIPIDEMIA DIAGNOSIS AND TREATMENT IN THE BRAZILIAN SUS

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Introduction/Background: Dyslipidemia is associated with atherosclerotic cardiovascular disease (AVCD). In Brazil, events occur at least a decade earlier than in high-income countries. The LDL-C threshold and the age range above which diagnosis and treatment become cost-effective within the Brazilian Unified Health System (SUS) in unknown. Our objective was to estimate the net health benefit (NHB) of dyslipidemia diagnosis and treatment stratified by pre-treatment LDL-C, age at diagnosis, sex, and cardiovascular history. Objectives: We therefore aimed to estimate the net health benefit (NHB) of diagnosing and treating dyslipidemia from the SUS perspective, stratified by pre-treatment LDL-C level, age at diagnosis, sex, and prior cardiovascular history, against a willingness-to-pay threshold of R$55,000 per QALY Methods: A lifetime-horizon cohort Markov model was built in Open Markov (Markov Influence Diagram methodology), comprising four health states: healthy, acute cardiovascular event, stable post-event, and death. Hypothetical cohorts combined age at diagnosis (10, 30, 50, 70 years), pre-treatment LDL-C (80–320 mg/dL), sex, and prior cardiovascular history. Treatment reflected 2025 Brazilian Guidelines -recommended statin/ezetimibe regimens (mean LDL-C reduction: 33.4%, CPRD cohort). Primary outcome was NHB in QALYs against a willingness-to-pay threshold of BRL 55,000/QALY (one GDP per capita). Probabilistic sensitivity analysis used 5,000 Monte Carlo simulations. Resultados e Conclusions: NHB was positive with pre-treatment LDL-C ≥160 mg/dL, across all subpopulations regardless of age or cardiovascular history (range: 0.25–2.23 QALYs). In secondary prevention, cost-effectiveness extended to LDL-C ≥80 mg/dL (NHB: 0.19–0.26 QALYs). Diagnosis at age 10 with LDL-C = 320 mg/dL yielded 25.75 additional event-free years. Net SUS savings reached BRL 114,148/patient at LDL-C = 320 mg/dL diagnosed at age 10. In primary prevention, LDL-C ≥160 mg/dL constitutes the cost-effectiveness threshold for dyslipidemia treatment within the SUS. In secondary prevention, cost-effectiveness extends to LDL-C ≥80 mg/dL, reinforcing the economic justification for aggressive lipid control in established cardiovascular diseases. These findings support universal childhood lipid screening and family cascade testing and provide a quantitative basis for CONITEC health technology assessments.



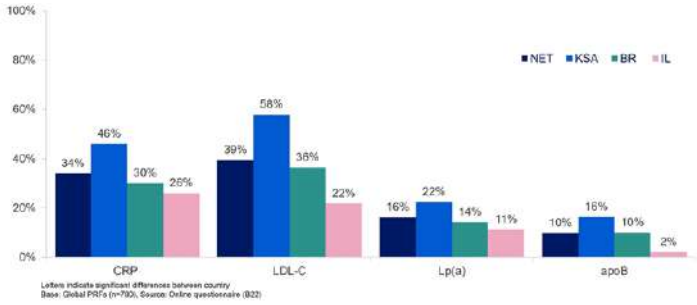
20375

DIAGNOSTIC PRACTICES AND EMERGING RISK BIOMARKERS IN ATHEROSCLEROTIC CARDIOVASCULAR DISEASE WITH STAGE 3-4 CHRONIC KIDNEY DISEASE: FINDINGS FROM BRAZIL, ISRAEL, AND SAUDI ARABIA

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Introduction/Background: Introduction: Diagnostic pathways for atherosclerotic cardiovascular disease (ASCVD) with stage 3–4 chronic kidney disease (CKD) are fragmented, with inconsistent use of inflammatory and lipid biomarkers including C-reactive protein (CRP; wide-range and high-sensitivity), LDL-C, apolipopro-tein B, and lipoprotein(a) [Lp(a)]. Objectives: Objectives: This study mapped real-world diagnostic approaches and quantified use of CRP, lipid testing, repeat testing, referral times, and barriers across Saudi Arabia, Israel, and Brazil. Methods: Methods: A web-based survey of 315 clinicians in Saudi Arabia (n=110), Israel (n=95), and Brazil (n=110) was conducted. Each submitted three patient record forms (total 945) sampled by diagnosis sequence: ASCVD then CKD, CKD then ASCVD, and a recent patient from either sequence. Resultados e Conclusions: Results: CRP tests were performed in 34% of patients despite 77% of clinicians reporting access; main barriers were lack of availability (41%), lack of insurance coverage (27%), and limited awareness of clinical relevance of test (26%). Advanced lipid testing beyond LDL-C was rare (Lp(a) 16%; apolipoprotein B 10%) (Figure). LDL-C was tested in 39% of cases overall, with higher rates in Saudi Arabia (58%) than Brazil (36%) and Israel (22%) (Figure). CRP use varied by country (Saudi Arabia 46%, Brazil 30%, Israel 26%) (Figure) and specialty (heart failure cardiologists 46%, internal medicine 39%, general cardiologists 34%, nephrologists 26%, primary care physicians 20%). Repeat biomarker testing occurred in 60% of ASCVD and 69% of CKD cases; mean referral time was 1.3±3.4 months. ASCVD was most often confirmed by general cardiologists (47%); common confirmation tests were electrocardiogram (62%), echocardiogram (60%), and blood tests (51%). Conclusion: ASCVD diagnostic practice is variable, with underuse of key biomarkers and delays to diagnosis. Standardised pathways, clinician education, and improved access to CRP and lipid tests may enhance risk stratification and enable more personalised care. Underuse of CRP and Lp(a) testing in patients with ASCVD and CKD limits risk stratification and ability to tailor management. Broader adoption of these biomarkers supported by standardised diagnostic pathways, clinician education, and easier access could enable earlier identification of high-risk patients, support personalised treatment, and align practice with 2025 ESC dyslipidaemia guidelines, which recognise CRP and Lp(a) as key risk modifiers in addition to LDL-C.



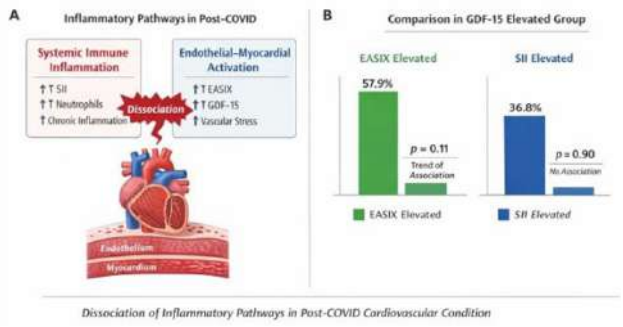
16084

DIFFERENTIATION OF THE INFLAMMATORY SUBSTRATE IN THE POST-COVID CONDITION: ENDOTHELIAL ACTIVATION (EASIX) VERSUS SYSTEMIC IMMUNE INFLAMMATION (SII) IN THE GDF-15 PHENOTYPE

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Introduction/Background: EASIX and the Systemic Immune-Inflammation Index (SII) capture distinct inflammatory dimensions in post-COVID cardiovascular condition. EASIX reflects persistent endothelial dysfunction associated with late vascular biomarkers, whereas SII expresses systemic inflammation that is only weakly related to post-COVID cardiovascular manifestations. The phenotype defined by elevated GDF-15 has been widely associated in the literature with cardiovascular cellular stress, endothelial dysfunction, and myocardial involvement, indicating a predominantly inflammatory-vascular axis rather than diffuse systemic inflammation. Objectives: To compare the association of EASIX and SII with the inflammatory–myocardial phenotype defined by elevated GDF-15 in patients with post-COVID condition. Methods: Exploratory observational study derived from a cardiovascular sub-study of a cohort of individuals with post-COVID condition and GDF-15 measurement (n=77), integrated into a project approved by an institutional Research Ethics Committee. Elevated GDF-15 was defined using a cutoff derived from ROC analysis of the cohort itself (~300 pg/mL). EASIX was calculated as LDH × creatinine / platelets (elevated >1), and SII as (platelets × neutrophils) / lymphocytes. A single laboratory observation per individual was used. The indices were compared between individuals with elevated and normal GDF-15 using chi-square and Mann–Whitney tests. Resultados e Conclusions: : A higher prevalence of elevated EASIX was observed among individuals with elevated GDF-15 (57.9% vs. 36.8%), indicating a trend toward association (p=0.11). In contrast, SII showed a similar distribution between groups (medians 542 vs. 498; p=0.90), with no apparent association with the analyzed phenotype. These findings indicate dissociation between endothelial activation and systemic inflammation in post-COVID (Figure 1 **Conclusions** In the post-COVID condition, the phenotype characterized by elevated GDF-15 showed a trend toward association with endothelial activation, but not with systemic immune inflammation. These findings suggest the post-COVID cardiovascular inflammatory substrate may be predominantly endothelial–myocardial, with EASIX potentially being more sensitive in capturing late vascular involvement.



Dissociation of Inflammatory Pathways in Post-COVID Cardiovascular Condition

20890

DISPARITIES IN SECONDARY PREVENTION ACROSS VASCULAR TERRITORIES: INSIGHTS FROM A NATIONAL REGISTRY

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Introduction/Background: Intensive lipid-lowering and antithrombotic therapies are cornerstone, guideline-recommended strategies for secondary prevention in atherosclerotic cardiovascular disease. However, real-world differences in their implementation across vascular territories remain poorly characterized. Objectives: To evaluate differences in the use of evidence-based secondary prevention therapies between patients with coronary artery disease (CAD) and those with cerebrovascular disease. Methods: We conducted a prospective, multicenter registry including patients from 30 cardiology centers in Argentina between April 2023 and October 2024. Among 2937 patients hospitalized for cardiovascular conditions, those in secondary prevention were included. Secondary prevention was defined as prior CAD or prior cerebrovascular disease; patients with overlapping conditions were classified within the CAD group. We assessed the use of statins, high-intensity statins, ezetimibe, aspirin, and any antithrombotic therapy. Multivariable logistic regression analyses were performed adjusting for age, sex, hypertension, diabetes, smoking status, and dyslipidemia. Resultados e Conclusions: A total of 1,151 patients were classified as secondary prevention, of whom 83.3% had CAD and 16.7% cerebrovascular disease. Mean age was 70.5 ± 10.3 years and 26.2% were women. Compared with CAD, patients with cerebrovascular disease were significantly less likely to receive statins (66.1% vs 81.5%; p<0.001), high-intensity statins (31.2% vs 53.2%; p<0.001), and any antithrombotic therapy (70.3% vs 86.4%; p<0.001). Use of ezetimibe was low overall (8.0%) and similar between groups. After adjustment, CAD remained independently associated with higher use of statins (OR 1.91, 95% CI 1.33–2.75; p=0.001), high-intensity statins (OR 2.34, 95% CI 1.67–3.28; p<0.001), and any antithrombotic therapy (OR 2.60, 95% CI 1.70–3.99; p<0.001) (Table 1 and 2). Despite frequent healthcare contact, patients with cerebrovascular disease consistently received less intensive secondary prevention. These findings highlight a clinically relevant implementation gap that may contribute to residual cardiovascular risk in this population.

Table 1. Baseline characteristics by vascular territory

Variable / Intervention	Total (n=1151)	CAD (n=959)	Cerebrovasc. (n=192)	p-value
Age (years)	70.0 ± 10.5	69.7 ± 10.4	71.4 ± 10.8	0.048
Body mass index (kg/m²)	28.4 ± 4.9	28.5 ± 4.9	27.6 ± 4.7	0.014
Female sex	26.2%	22.9%	42.2%	<0.001
Hypertension	84.1%	83.9%	84.9%	0.743
Diabetes mellitus	36.8%	37.9%	31.8%	0.108
Dyslipidemia	66.5%	68.9%	54.2%	<0.001
Obesity (BMI ≥30)	28.4%	28.8%	26.6%	0.527
Current smoker	20.0%	20.4%	17.7%	0.392
Former smoker	37.3%	38.4%	31.8%	0.081
COPD	9.6%	10.4%	5.7%	0.044
Atrial fibrillation	19.8%	19.6%	20.8%	0.696

CAD: coronary artery disease; COPD: chronic obstructive pulmonary disease.

Table 2. Secondary prevention strategies by vascular territory

Variable / Intervention	Total (n=1151)	CAD (n=959)	Cerebrovasc. (n=192)	p-value
Aspirin	79.6%	82.5%	65.1%	<0.001
Any antithrombotic*	83.8%	86.5%	70.3%	<0.001
Statins	78.8%	81.3%	66.1%	<0.001
High-intensity statins	49.3%	53.0%	31.2%	<0.001
Ezetimibe	8.0%	8.2%	6.8%	0.494
Statin + antiplatelet	71.2%	74.6%	54.7%	<0.001
Influenza vaccine	54.7%	54.6%	55.2%	0.885
Pneumococcal vaccine	54.3%	54.6%	52.6%	0.605

**Includes aspirin, P2Y12 inhibitors, or oral anticoagulants.*

16764

DYSLIPIDEMIA IN CHILDREN AND ADOLESCENTS: PREVALENCE AND ASSOCIATION WITH NUTRITIONAL STATUS IN A BRAZILIAN PEDIATRIC POPULATION

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Introduction/Background: Introduction/ Background: Dyslipidemias are a primary risk factor for cardiovascular diseases, whoseatherosclerotic process begins in childhood. Childhood obesity drives atherogenic lipid profilesfrom early ages and represents a growing public health challenge. In Brazil, cardiovascular diseases account for approximately 30% of annual deaths. Objectives: Objective: To investigate the prevalence of dyslipidemias and their association with nutritional status in children and adolescents attending pediatric reference outpatient clinics. Methods: Methods: Observational, crosssectional, and descriptive-comparative study with 169 participants aged 2 to 19 years with a mean age of 11.3 years (SD = 4.6; median = 11.2; IQR: 7.8–15.1), divided into a normal weight group (n=70) and an overweight group (n=99), according to World Health Organization criteria. Anthropometric, blood pressure, and complete lipid profile data were collected and classified according to the Brazilian Society of Pediatrics guidelines. ShapiroWilk, Mann- Whitney, chi-square, Spearman correlation, logistic regression, and receiver operatingcharacteristic curve analyses were used, with a significance level of 5%. Resultados e Conclusions: Results: The overall prevalence of dyslipidemia was 59.2% (100/169), being 44.3% in the normal weight group and 69.7% in the overweight group (p=0.002). The overweight group showed significantly higher total cholesterol, low-density lipoprotein, with lower highdensity lipoprotein (all p≤0.002). Body mass index correlated with all lipid fractions (p<0.001). The receiver operating characteristic curve showed an area under the curve of 0.717 for elevated low-density lipoprotein, with an optimal cutoff body mass index of 23.3 kilograms per square meter. The number needed to screen was 3.9 and the population attributable fraction for excess weight was 36.5%. Regular physical activity was associated with higher highdensity lipoprotein levels (p=0.032). Conclusion: Dyslipidemia prevalence is high and strongly associated with excess weight in childhood. Universal lipid screening in overweight or obese children is a cost-effective strategy. Early lifestyle interventions, especially promotion of regular physical activity, are priorities for reducing future cardiovascular morbidity and mortality.

16709

EFFECT OF GLP-1 RECEPTOR AGONISTS ON MORTALITY AND CARDIOVASCULAR OUTCOMES IN PATIENTS WITH OBESITY: A SYSTEMATIC REVIEW

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Introduction/Background: Obesity is a major global public health challenge and is strongly associated with increased risk of cardiovascular diseases. Glucagon-like peptide-1 receptor agonists have emerged as a therapeutic strategy for obesity management, demonstrating weight reduction, improved glycemic control, and modulation of cardiovascular risk factors. Objectives: To analyze the effects of GLP-1 receptor agonists on mortality and cardiovascular outcomes in patients with obesity through a systematic review of the literature. Methods: This systematic review was conducted based on a PICO-structured question. The search in MEDLINE and LILACS identified 445 studies, of which 83 were screened after applying inclusion criteria. Following independent title and abstract screening, nine studies underwent full-text assessment, and four were ultimately included in the qualitative synthesis. Resultados e Conclusions: The included studies showed methodological heterogeneity, comprising three randomized clinical trials and one prospective non-randomized study, with follow-up ranging from 36 weeks to approximately four years and sample sizes from 105 to 17,604 participants. Mean age ranged from 54 to 64 years, with 27.7% to 60% female participants and body mass index between 32.6 and 37.9 kg/m². Different GLP-1 receptor agonists were evaluated, including semaglutide, dulaglutide, liraglutide, exenatide, orforglipron, and tirzepatide. Three studies compared active agents, while one used placebo. One study demonstrated a 20% reduction in the composite cardiovascular outcome, while another showed non-inferiority without superiority. The remaining studies assessed surrogate outcomes, showing reductions in blood pressure and improvements in lipid profile. Inflammatory markers were evaluated in one study, with reductions in high-sensitivity C-reactive protein and changes in interleukin-6 and NT-proBNP. One study also reported a reduction in estimated cardiovascular risk. All studies demonstrated weight reduction, with greater effects observed with subcutaneous semaglutide and tirzepatide. Additional improvements in fasting glucose, waist circumference, and lipid profile were reported. GLP-1 receptor agonists improve metabolic parameters and reduce markers associated with cardiovascular risk in individuals with obesity. Further studies assessing robust clinical outcomes are needed to clarify their impact on cardiovascular morbidity and mortality.

19699

EFFECTIVENESS OF DATA-DRIVEN QUALITY IMPROVEMENT ON HOSPITALIZATIONS AND HEALTH OUTCOMES FOR PEOPLE WITH CORONARY HEART DISEASE IN PRIMARY CARE (QUEL): A CLUSTER RANDOMISED CONTROLLED TRIAL WITH 24-MONTH FOLLOW-UP

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Introduction/Background: Cardiovascular disease (CVD), including coronary heart disease (CHD), remains the leading cause of death and hospital admissions globally. Optimising use of routinely collected data combined with collaborative quality improvement has been evaluated in variety of healthcare settings but evidence for effectiveness has focussed on surrogate endpoints with very few having robust study designs. Objectives: To test the effectiveness of a data-driven quality improvement program in primary care on cardiovascular hospitalizations, major adverse cardiovascular events (MACE), risk factor profiles and medication prescriptions at 24 months in people with CHD compared to standard care. Methods: A single-blind, cluster randomised controlled trial recruiting Australian primary care practices was conducted. Practices using compliant data extraction software and having ≥200 adult patients annually with CHD were the units of randomization and adults with CHD (visited their general practitioner in the past 12 months) were the units of analysis. Practices were randomised to intervention (12-month data-driven quality improvement including benchmarking, monthly reporting, workshops) or control (usual care). The primary outcome was proportion of participants who had unplanned CVD hospitalizations at 24-months. Secondary outcomes were MACE, medication prescriptions, risk factor targets, and primary care management planning. Outcome data were extracted from electronic records linked to administrative data. Resultados e Conclusions: 51 practices participated resulting in a patient cohort of 7,864 people with CHD. Mean age of the patient cohort was 72±12 years, 68% were male, 24% had a prior myocardial infarction. At 24-months, there was no significant difference between the groups for unplanned CVD hospitalizations (RR:0·91; 95%CI 0·75,1·10, see also Figure 1 for cumulative incidence curve); MACE (0.81; 95%CI 0·61,1·07); prescription of antiplatelet (0·94; 95% CI 0·79,1·13), stain (1·03; 95%CI 0·97,1·09), ACE/ARB (1·00; 95%CI 0·93,1·07); achieved targets for LDL-cholesterol (0·99; 95%CI 0·86,1·13), systolic blood pressure (0·97; 95%CI 0·87,1·09), smoking (0·96; 95%CI 0·57,1·59); or care planning (1·02; 95%CI:0·64,1·63). In conclusion, a primary care, data-driven quality improvement program did not reduce unplanned hospitalizations, MACE, medication prescriptions, risk factor targets or care planning. Robust evidence for a data-driven and collaborative approach to improving care for people with CHD in primary care remains elusive.

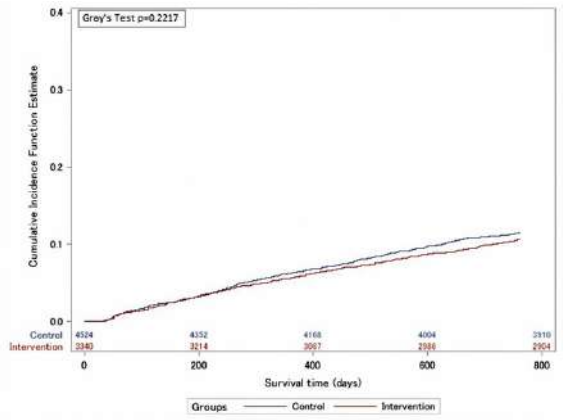


Figure 1: Cumulative incidence curve of unplanned 2-year cardiovascular disease admission by control and intervention

16103

EFFECTIVENESS OF HIGH-DOSE VERSUS STANDARD-DOSE INFLUENZA VACCINE IN OLDER ADULTS WITH CARDIOVASCULAR DISEASE: A SYSTEMATIC REVIEW.

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Introduction/Background: Influenza infection is a major determinant of morbidity and mortality in older adults, whose immune response is limited by immunosenescence when receiving standard-dose (SD) vaccines. In individuals with cardiovascular disease (CVD), the virus acts as an inflammatory trigger for acute cardiovascular events, including myocardial infarction and heart failure (HF) decompensation. The high-dose (HD) vaccine aims to optimize immunogenicity in this population; however, whether its superior clinical benefit is maintained in the presence of established chronic heart disease requires rigorous scientific validation. Objectives: To evaluate whether chronic CVD modifies the relative effectiveness of HD versus SD influenza vaccines in reducing hospitalizations and severe clinical outcomes in older adults. Methods: A systematic review was conducted in accordance with PRISMA guidelines. Original human clinical trials published in English within the last 5 years were analyzed using MEDLINE (PubMed) and SciELO databases. The search strategy employed Medical Subject Headings (MeSH) descriptors. Studies with insufficient methodological quality were excluded. Resultados e Conclusions: Initially, 5 studies were identified; after deduplication and eligibility screening, 3 were included, totaling 811,235 individuals aged ≥65 years. HD vaccination showed superior effectiveness over SD in reducing hospitalizations for influenza or pneumonia and cardiorespiratory complications. This benefit remained consistent regardless of baseline cardiovascular comorbidities (p > 0.05). In the HF subgroup, HD was associated with reduced hospitalizations for cardiovascular events and decompensation, with similar effectiveness to patients without HF (p > 0.05). HD also reduced all-cause mortality and severe respiratory hospitalizations. However, its effect on all-cause hospitalizations was less pronounced in individuals with established CVD. Overall, chronic CVD does not diminish the superiority of HD vaccination, supporting its use as a key strategy in secondary prevention of severe outcomes in older adults with cardiovascular disease.

16176

EFFECTS OF VITAMIN K2 MK-7 WHEN COMBINED WITH VITAMIN D ON ENDOTHELIAL FUNCTION

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Introduction/Background: Randomized trials have been inconsistent in demonstrating beneficial cardiovascular effects of vitamin D supplementation. Objectives: To evaluate the effects of vitamin K2 MK-7 supplementation combined with vitamin D on endothelial function in overweight/obese individuals. Methods: Prospective, randomized, double-blind, placebo-controlled clinical trial in adults with a body mass index between 25 and 40 kg/m² and serum vitamin D (25(OH)D)< 30ng/mL. Vascular assessment included: endothelial function by microvascular reactivity (Pericam®), arterial stiffness by oscillometry (Mobil-O-Graph®), and autonomic tone by heart rate variability (Polar® and Kubios HRV). Volunteers (n=90) were randomized into 3 groups and received daily for 16 weeks: placebo (P, n=28), vitamin-D3 7mIU (D, n=30) or vitamin D3-7mIU+vitamin-K2MK-7 180mcg (DK, n=32). Statistical significance was considered when p<0.05. Resultados e Conclusions: The groups were homogeneous according to age (51±7; 52±6; 53±7 years, p=0.739), predominantly women (75 vs 67 vs 63%, p=0.579) and presented non-normal distribution of serum 25(OH)D [22.7 (17.3-27.5) vs 22.8 (18.5-25.6) vs 22.4 (17.4-26.0), p=0.688]. After 16 weeks, there was an increase in 25(OH)D in both the D and DK groups [39.1(32.7-44.7) and 36.2(31.7-41.7), p<0.001], an increase in pulse wave velocity in the D group (7.45±0.97 vs 7.60±1.03, p=0.025), but not significant in the DK group. A significant increase in post-occlusion reactive hyperemia [44(30-69) vs 60(37-86) UAP, p=0.028] and a reduction in the instantaneous/global heart rate variability ratio (SD2/SD1) [1.92(1.40-2.48) vs 1.67(1.25-2.05), p=0.036] were observed only in the DK group. In this sample, improvements in endothelial function and greater autonomic balance were observed when vitamin K2 MK-7 was used in combination with vitamin D3, and a possible protection against increased arterial stiffness that was observed with vitamin D supplementation alone.

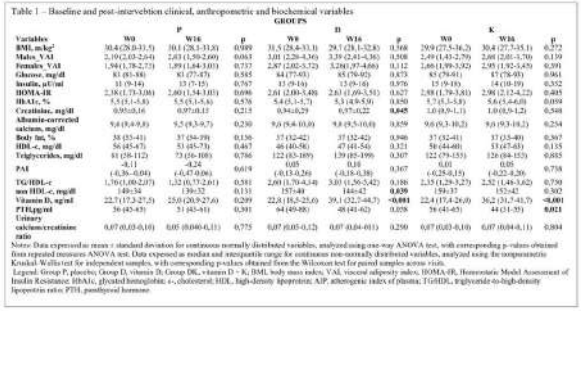


Table 1 – Baseline and post-intervention clinical, anthropometric and biochemical variables

	GROUPS									
	P			D			K			
Variables	W0	W16	p	W0	W16	p	W0	W16	p
BMI, mKg²	30.4 (28.0-31.5)	30.1 (28.1-33.0)	0.989	31.5 (28.4-33.1)	29.7 (28.1-32.8)	0.168	29.9 (27.5-36.2)	30.4 (27.7-35.1)	0.272
Males_VAI	2,10 (2,03-2,64)	2,03 (1,59-2,60)	0.063	3,01 (2,28-4,36)	3,39 (2,41-4,36)	0.308	2,49 (1,43-2,79)	2,60 (2,01-3,70)	0.139
Females_VAI	1,94 (1,78-2,73)	1,89 (1,64-3,03)	0.737	2,87 (2,02-3,72)	3,28(1,97-4,66)	0,112	2,66 (1,99-3,92)	2,95 (1,92-3,45)	0,591
Glucose_mg/dl	81 (85-88)	81 (77-87)	0.585	84 (77-93)	85 (79-92)	0.873	85 (79-91)	87 (79-93)	0.961
Insulin, µU/ml	11 (9-14)	13 (7-15)	0.767	13 (9-16)	13 (9-16)	0.976	15 (9-18)	14 (10-19)	0,352
HOMA-IR	2,18 (1,73-3,08)	2,60 (1,34-3,03)	0.698	2,61 (2,03-3,48)	2,63 (1,69-3,51)	0,627	2,88 (1,78-3,81)	2,96 (2,12-4,22)	0,405
HbA1c, %	5,5 (5,1-5,8)	5,5 (5,1-5,6)	0,578	5,4 (5,1-5,7)	5,3 (4,9-5,9)	0,850	5,7 (5,1-5,8)	5,6 (5,4-6,0)	0,059
Creatinine, mg/dl	0,93±0,16	0,97±0,13	0,215	0,94±0,29	0,97±0,22	**0,045**	1,0 (0,9-1,1)	1,0 (0,9-1,2)	0,548
Albumin-corrected calcium, mg/dl	9,6 (9,4-9,8)	9,5 (9,3-9,7)	0,230	9,6 (9,4-10,0)	9,8 (9,5-10,0)	0,859	9,6 (9,3-10,2)	9,6 (9,3-10,2)	0,254
Body fat, %	38 (33-41)	37 (34-39)	0,136	37 (32-42)	37 (32-42)	0,946	37 (32-41)	37 (33-40)	0,367
HDL-c, mg/dl	56 (45-67)	53 (45-73)	0,467	46 (40-58)	47 (41-54)	0,321	50 (44-60)	53 (47-63)	0,135
Triglycerides, mg/dl	81 (58-112)	73 (56-108)	0,786	122 (83-189)	139 (85-199)	0,307	122 (79-153)	128 (84-152)	0,885
PAI	-8,11 (-8,39- -0,04)	-8,24 (-6,47-0,06)	0,619	0,05 (-0,13-0,28)	0,10 (-0,18-0,38)	0,367	0,01 (-0,25-0,15)	0,05 (-0,22-0,20)	0,758
TG/HDL-c	1,76 (1,00-2,07)	1,32 (0,73-2,01)	0,581	2,60 (1,70-4,14)	3,03 (1,56-5,42)	0,188	2,35 (1,28-3,27)	2,52 (1,48-3,62)	0,750
non HDL-c, mg/dl	149±34	139±32	0,131	157±**41**	144±42	**0,039**	159±37	152±42	0,302
Vitamin D, ng/ml	22,7 (17,2-27,5)	25,0 (20,9-27,6)	0,299	22,8 (18,5-25,6)	39,1 (32,7-44,7)	**<0,001**	22,4 (17,4-26,0)	36,2 (31,7-41,7)	**<0,001**
PTH,pg/ml	36 (45-63)	51 (43-61)	0,301	64 (49-88)	48 (41-62)	0,058	58 (41-63)	44 (31-55)	**0,021**
Urinary calcium/creatinine ratio	0,07 (0,03-0,16)	0,05 (0,040-0,11)	0,775	0,07 (0,05-0,12)	0,07 (0,04-0,01)	0,250	0,07 (0,03-0,10)	0,07 (0,04-0,11)	0,804

Notes: Data expressed as mean ± standard deviation for continuous normally distributed variables, analyzed using one-way ANOVA test, with corresponding p-values obtained from repeated measures ANOVA test. Data expressed as median and interquartile range for continuous non-normally distributed variables, analyzed using the nonparametric Kruskal-Wallis test for independent samples, with corresponding p-values obtained from the Wilcoxon test for paired samples across visits.
Legend: Group P, placebo; Group D, vitamin D; Group DK, vitamin D + K; BMI, body mass index; VAI, visceral adiposity index; HOMA-IR, Homeostatic Model Assessment of Insulin Resistance; HbA1c, glycated hemoglobin; e-, cholesterol; HDL, high-density lipoprotein; AIP, atherogenic index of plasma; TG/HDL, triglyceride-to-high-density lipoprotein ratio; PTH, parathyroid hormone.

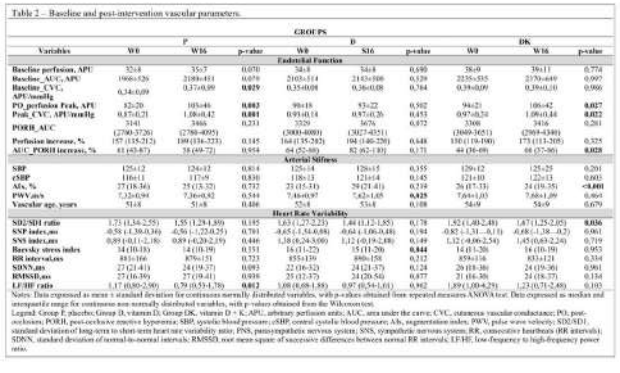


Table 2 – Baseline and post-intervention vascular parameters.

	GROUPS								
	P			D			DK		
Variables	W0	W16	p-value	W0	S16	p-value	W0	W16	p-value
Endothelial Function									
Baseline perfusion, APU	32±8	35±7	0,070	34±8	34±8	0,680	38±9	39±11	0,774
Baseline_AUC, APU	1960±520	2100±451	0,070	2103±314	2143±1008	0,329	2235±535	2170±449	0,997
Baseline_CVC, APU/mmHg	0,34±0,09	0,37±0,09	**0,029**	0,35±0,08	0,36±0,08	0,764	0,39±0,09	0,39±0,10	0,986
PO_perfusion Peak, APU	82±20	103±46	**0,002**	90±18	93±22	0,502	94±21	106±42	**0,027**
Peak_CVC, APU/mmHg	0,37±0,21	1,00±0,42	**0,001**	0,91±0,14	0,87±0,26	0,453	0,97±0,24	1,09±0,44	**0,022**
POHR_AUC	3141 (2790-3726)	3466 (2780-4095)	0,233	3329 (3000-4000)	3676 (3827-4551)	0,072	3308 (2669-3651)	3416 (2969-4389)	0,201
Perfusion increase, %	157 (155-215)	189 (136-223)	0,145	164 (135-202)	194 (140-220)	0,648	130 (119-190)	173 (113-205)	0,325
AUC_POHR increase, %	81 (43-87)	58 (49-72)	0,954	64 (52-88)	82 (62-130)	0,171	44 (36-68)	68 (57-86)	**0,028**
Arterial Stiffness									
SBP	125±12	124±12	0,814	125±14	126±15	0,355	129±12	125±25	0,201
cSBP	116±11	117±9	0,830	118±13	121±14	0,145	121±10	122±13	0,603
AIx, %	27 (18-34)	25 (15-32)	0,737	25 (15-33)	29 (21-41)	0,719	26 (17-33)	24 (19-35)	**<0,001**
PWV,m/s	7,32±0,94	7,36±0,82	0,544	7,46±0,97	7,62±1,05	**0,025**	7,64±1,03	7,68±1,09	0,464
Vascular age, years	51±8	51±8	0,486	52±8	53±8	0,108	54±9	54±9	0,679
Heart Rate Variability									
SD2/SD1 ratio	1,73 (1,34-2,55)	1,55 (1,29-1,89)	0,195	1,63 (1,27-2,23)	1,44 (1,12-1,85)	0,178	1,92 (1,40-2,48)	1,67 (1,25-2,05)	**0,036**
SNP index,ms	-0,58 (-1,30-0,34)	-0,56 (-1,22-0,25)	0,781	-0,65 (-1,54-0,88)	-0,64 (-1,06-0,48)	0,198	-0,82 (-1,31 - -0,1)	-0,68 (-1,38 - -0,2)	0,861
SNS index,ms	0,89 (-0,1 (-1,18)	0,89 (-0,20-2,19)	0,446	1,38 (0,24-3,00)	1,12 (-0,19-2,88)	0,149	1,12 (-0,66-2,54)	1,45 (0,63-2,24)	0,719
Baevsky stress index	14 (10-18)	14 (10-19)	0,151	16 (11-22)	15 (11-20)	**0,044**	14 (11-20)	14 (10-19)	0,953
RR intervals,ms	881±166	879±131	0,723	855±139	890±158	0,212	859±116	853±121	0,354
SDNN,ms	27 (21-41)	24 (19-37)	0,093	22 (16-32)	24 (21-37)	0,124	26 (18-38)	24 (19-36)	0,901
RMSSD,ms	27 (16-39)	27 (19-41)	0,936	25 (12-37)	24 (20-34)	0,877	21 (16-38)	24 (18-37)	0,134
LF/HF ratio	1,17 (0,90-2,90)	0,79 (0,53-1,78)	**0,012**	1,08 (0,68-1,88)	0,97 (0,54-1,61)	0,942	1,89 (1,00-4,29)	1,23 (0,71-2,48)	0,103

Notes: Data expressed as mean ± standard deviation for continuous normally distributed variables, with p-values obtained from repeated measures ANOVA test. Data expressed as median and interquartile range for continuous non-normally distributed variables, with p-values obtained from the Wilcoxon test.
Legend: Group P, placebo; Group D, vitamin D; Group DK, vitamin D + K; APU, arbitrary perfusion units; AUC, area under the curve; CVC, cutaneous vascular conductance; PO, post-occlusion; POHR, post-occlusive reactive hyperemia; SBP, systolic blood pressure; cSBP, central systolic blood pressure; AIx, augmentation index; PWV, pulse wave velocity; SD2/SD1, standard deviation of long-term to short-term heart rate variability ratio; PNS, parasympathetic nervous system; SNS, sympathetic nervous system; RR, consecutive heartbeats (RR intervals); SDNN, standard deviation of normal-to-normal intervals; RMSSD, root mean square of successive differences between normal RR intervals; LF/HF, low-frequency to high-frequency power ratio.

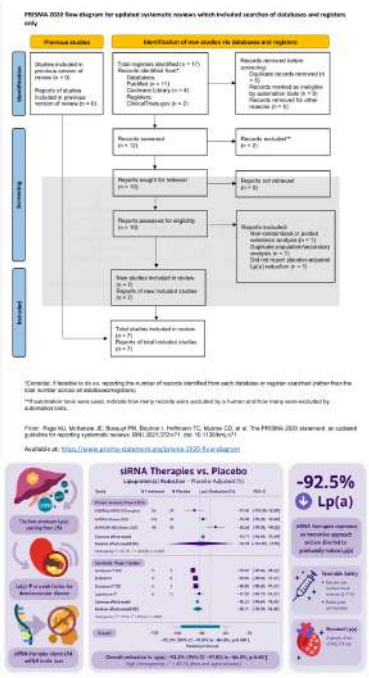
18106

EFFICACY AND SAFETY OF SIRNA THERAPIES TARGETING LIPOPROTEIN(A): A META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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Introduction/Background: Lipoprotein(a) [Lp(a)] is a genetically determined causal risk factor for atherosclerotic cardiovascular disease with no approved targeted therapies. Small interfering RNA (siRNA) agents targeting hepatic LPA mRNA have demonstrated marked reductions in circulating Lp(a) levels. Objectives: To evaluate the efficacy and safety of siRNA therapies for Lp(a) reduction versus placebo. Methods: PubMed, Clinical Trials.gov and Cochrane Library were searched through March 2026 for phase 2 randomized controlled trials evaluating siRNA therapies targeting LPA in adults with elevated Lp(a). For each trial, the prespecified regimen selected for phase 3 development and its concurrent placebo comparator were analyzed to enhance clinical relevance and avoid multiple comparisons. The primary outcome was placebo-adjusted percent change in Lp(a). A secondary pooled analysis combining phase 2 trials and phase 1 randomized dose-escalation studies was performed to evaluate the consistency of treatment effect across all available randomized evidence. Random-effects meta-analysis was performed; heterogeneity was assessed using I^2 statistics Statistical analyses were performed using R version 4.5.3. Resultados e Conclusions: Three phase 2 randomized controlled trials were included: OCEAN(a)-DOSE (olpasiran; n=56 vs placebo n=54), ALPACA (lepodisiran; n=142 vs placebo n=36), and ALPACAR-360 (zerlasiran; n=40 vs placebo n=40), totaling 238 siRNA-treated and 130 placebo participants. Pooled analysis demonstrated a marked reduction in Lp(a) levels (−92.5%; 95% CI −107.1% to −78.0%; p<0.001). Statistical heterogeneity was high (I^2=82.7%), likely reflecting differences in molecular agents and dosing regimens, although all trials showed consistent directional benefit. Pooled phase 1–2 analysis (n=436) showed consistent Lp(a) reduction: −92.3% (95% CI −97.8 to −86.8; p<0.001). No major safety signals were identified; injection-site reactions were the most common adverse events (2–17%), predominantly mild and transient. The siRNA therapies were associated with substantial reductions in Lp(a) levels and a favorable short-term safety profile in phase 2 trials. These findings suggest a potential role as targeted therapies for elevated Lp(a), although results should be interpreted in the context of between-study heterogeneity and selection of specific dosing regimens. Ongoing phase 3 trials will determine their impact on cardiovascular outcomes and long-term safety.



15491

ENDOTHELIAL DYSFUNCTION AND INCIDENT CHRONIC KIDNEY DISEASE IN BRAZILIAN ADULTS: THE ELSA-BRASIL COHORT STUDY (ELSA-BRASIL)

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Introduction/Background: Cardiovascular–metabolic–renal syndrome is characterized by interactions among metabolic risk factors, chronic kidney disease (CKD), and cardiovascular dysfunction, leading to high rates of adverse outcomes. The endothelium plays a key role in renal physiology, including podocyte support, tubular reabsorption, and antithrombotic and anti-inflammatory regulation. Endothelial dysfunction may therefore contribute to CKD development. Objectives: Evaluate the association between endothelial function and incident CKD in Brazilian adults. Methods: Participants from the ELSA-Brasil cohort free of CKD at baseline were followed for a mean of 8.0 years (SD=0.3). Endothelial function was assessed by peripheral arterial tonometry (PAT), using mean basal pulse amplitude (BPA), reflecting basal vascular tone, and PAT ratio, reflecting vasodilatory capacity. Higher BPA and lower PAT ratio indicate worse endothelial function. Sex-adjusted quartiles were analyzed. Incident CKD was defined as estimated glomerular filtration rate <60 ml/min/1.73 m^2 and/or albumin-to-creatinine ratio ≥30 mg/g. Multivariable models were adjusted for sociodemographic factors, lifestyle, cardiometabolic risk factors, and lipid profile. Resultados e Conclusions: Among 1,336 participants (mean age 51±8 years; 44% women; mean BMI 26.6±4.5 kg/m^2), 297 developed CKD. Neither the quartile representing worse endothelial function—defined as the fourth quartile for BPA (OR 0.82, 95% CI 0.52–1.30) and the first quartile for PAT ratio (OR 1.09, 95% CI 0.71–1.67)—was significantly associated with incident CKD after multivariable adjustment. We concluded that baseline endothelial dysfunction was not associated with incident CKD over 8 years in Brazilian adults. These findings contribute to a better understanding of the role of endothelial dysfunction in CKD pathophysiology.

20525

FAMILIAL CHYLOMICRONEMIA SYNDROME IS NOT ASSOCIATED WITH SUBCLINICAL CORONARY ATHEROSCLEROSIS

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Introduction/Background: Familial chylomicronemia syndrome (FCS) is a rare autosomal recessive disorder caused by pathogenic variants in genes of the lipoprotein lipase pathway. These defects lead to disorder of chylomicron metabolism, causing severe hypertriglyceridemia and increased risk of pancreatitis. However, the association between FCS and atherosclerotic cardiovascular disease remains uncertain. Objectives: To evaluate subclinical atherosclerosis in a Brazilian cohort with FCS. Methods: This Cross-sectional study included 81 individuals (12 homozygous for GPIHBP1 variants, 33 heterozygous for GPIHBP1 and LPL variants, and 36 no genetic variants group) from 9 families across 7 municipalities in Northeastern Brazil. All participants underwent clinical, anthropometric, laboratory, and coronary CT angiography evaluation. Subclinical atherosclerosis was defined as CAC >0 or the presence of luminal plaques. Univariate and multivariate logistic regression analyses were performed. Resultados e Conclusions: The mean age was 42 ± 15 years, with a predominance of females. FCS homozygotes were significantly younger (38 ± 13 years) than heterozygotes (54 ± 12) and no genetic variants group (52 ± 12; p=0.0006), with similar sex distributions across groups (p=0.8686). Body mass index (kg/m²) was lower in homozygotes (24 ± 3) than in heterozygotes (28 ± 4) and no genetic variants group (30 ± 5; p<0.0001). Triglyceride levels (median [p25-p75] mg/dL) were markedly higher in homozygotes (2025 [1260-2584]) compared to heterozygotes (235 [128-448]) and no genetic variants group (312 [193-1158]); p<0.0001), HDL-C was significantly lower (22 [18-43]) vs. (42[37-48]) vs. (44 [35-53]); p=0.0034), respectively. Apo B (mg/dL) levels were substantially reduced in homozygotes (40 [30-49]) vs.heterozygotes (106 [87-118]) vs. no genetic variants group (109 [78-130]); p<0.0001 . No significant differences were observed in subclinical atherosclerosis markers, including plaque presence (8.3% vs. 30% vs. 22%; p=0.3688), CAC=0 prevalence (92% vs. 70% vs. 78%; p=0.7326), and stenosis >50% (0% vs. 10% vs. 0%; p=0.2821). In multivariate analysis, only age at diagnosis remained independently associated (OR 1.172; p=0.0017), while genotype and lipid parameters were not associated with increased atherosclerosis risk. In this study, severe hypertriglyceridemia, as seen in FCS, does not translate into increased atherosclerotic burden.

15981

FASUS PROJECT PHASE 2: RANDOMIZED CLINICAL TRIAL FOR SCREENING OF NON-VALVULAR ATRIAL FIBRILLATION IN THE UNIFIED HEALTH SYSTEM

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Introduction/Background: Atrial fibrillation (AF) and stroke are major age-related public health issues, with AF increasing stroke risk fivefold and often remaining asymptomatic until events occur. Despite effective anticoagulation, gaps in detection and treatment persist. Improving screening and prevention, as in the FASUS Project, may reduce morbidity, mortality, and costs. Objectives: The primary objective of this study is to determine the frequency of new diagnoses of asymptomatic atrial fibrillation (AF) through screening using radial pulse palpation (Arm A) or automated oscillometric devices (Arm B) among older adults in primary care units. Secondary objectives include estimating the number of individuals needed to detect one new AF case in each arm, describing the clinical and epidemiological profile of newly diagnosed patients, evaluating indications for and rates of oral anticoagulation, and estimating the number of cardioembolic ischemic strokes prevented through screening based on historical data, as well as the potential impact on morbidity, mortality, and healthcare costs. Methods: The FASUS project evaluates AF screening in primary care. After a pilot phase using pulse palpation, Phase 2 implemented a cluster-randomized study comparing pulse palpation and oscillometric devices, with telemedicine ECG, anticoagulation management, and statistical analysis to assess outcomes. Resultados e Conclusions: During Phase 2 of the FASUS study (2023), 12,055 patients were screened across 56 primary care units, with 1,761 individuals ≥60 years included after exclusions. A total of 182 AF cases were confirmed by ECG, yielding a prevalence of 10.3% among those with irregular rhythm (1.51% overall). Detection was higher with oscillometric devices (11.5%) versus pulse palpation (8.5%) (p=0.0446). Patients with AF were older and more frequently male, with high prevalence of hypertension (94%), diabetes (41.8%), and prior cardiovascular disease. Most (94.4%) had high thromboembolic risk (CHA□DS□-VASc ≥2), and 76.8% initiated anticoagulation. Among non-AF patients, 55.7% had ECG abnormalities, with ~20% showing risk markers for AF, with no difference between groups.

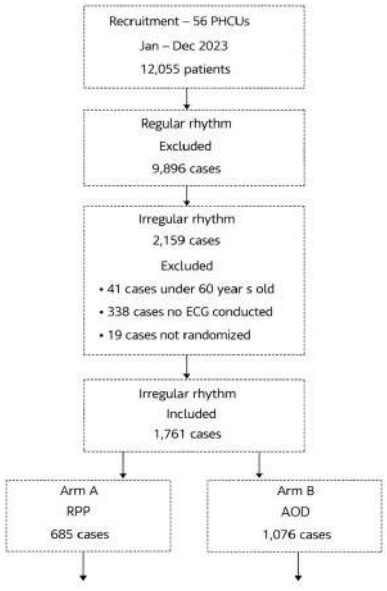


Figure 1 – Flowchart of the Final Sample Composition

20323

HIGH BURDEN OF CARDIOMETABOLIC RISK IN YOUNG ADULTS: ASSOCIATIONS WITH ADIPOSITY, BLOOD PRESSURE AND OBSTRUCTIVE SLEEP APNEA

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Introduction/Background: Cardiovascular diseases are the leading cause of mortality worldwide and are strongly associated with modifiable risk factors that may begin early in life. In young adults, the presence of adiposity, elevated blood pressure, and sleep-related disorders such as obstructive sleep apnea (OSA) may contribute to early cardiovascular alterations and increased long-term risk. Identifying the clustering of these factors in apparently healthy individuals is essential for guiding preventive strategies. Objectives: To evaluate the burden of cardiometabolic risk factors and analyze their association with anthropometric and hemodynamic variables in young adults. Methods: This cross-sectional study included 199 young adults (65.8% female; mean age 25.6 ± 10.0 years). Anthropometric measures (body mass index [BMI], waist-to-hip ratio [WHR], and neck circumference) and blood pressure were assessed using standardized procedures. Risk of OSA was evaluated using the Berlin Questionnaire. Mean BMI was 25.54 ± 4.96 kg/m². Cardiometabolic risk was defined as the presence of two or more risk factors. Descriptive statistics (mean ± standard deviation), Pearson correlation, and Fisher's exact test were performed ($p<0.05$). The study was approved by the institutional ethics committee (CAAE: 91482125.1.0000.0336). Resultados e Conclusions: A high burden of cardiometabolic risk was observed, with 41.7% of participants presenting two or more risk factors. Risk distribution showed 55.2% low risk, 30.2% moderate risk, and 14.6% high risk, indicating substantial accumulation of risk factors even in a young population. BMI demonstrated a moderate positive correlation with systolic blood pressure ($r=0.42$; $p<0.0001$), whereas WHR showed a weaker correlation ($r=0.25$; $p=0.0004$). Individuals at risk for OSA had a significantly higher prevalence of hypertension compared to those without risk (43.5% vs. 11.6%; $p=0.0005$). These findings highlight early cardiometabolic risk clustering and reinforce the importance of screening and preventive strategies in young adults to reduce future cardiovascular burden.

21729

HIGH PREVALENCE OF ELEVATED LIPOPROTEIN(A) LEVELS IN A TERTIARY CARDIOVASCULAR REFERRAL CENTER IN SOUTHERN BRAZIL

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Introduction/Background: Lipoprotein(a) [Lp(a)] is an independent risk factor for atherosclerotic cardiovascular disease, with predominantly genetic determination. Its measurement may improve cardiovascular risk stratification. Previous studies have reported a prevalence of elevated Lp(a) levels of approximately 18–20% in the general population. Objectives: To describe the distribution of Lp(a) levels in individuals treated at a tertiary referral cardiovascular center in Southern Brazil and to compare levels between men and women. Methods: Lp(a) levels were measured using a nephelometric assay in a private laboratory and expressed in nmol/L. Biochemical measurements were performed between October 2021 and April 2026. Lp(a) levels were categorized as normal (<75 nmol/L), intermediate (75–125 nmol/L), and elevated (>125 nmol/L), according to clinically relevant thresholds. Descriptive analyses included mean ± SD, median (25th–75th percentile), and frequencies (n, %). Comparisons between groups were performed using the chi-square test. Statistical analyses were conducted using SPSS (v21.0). Resultados e Conclusions: A total of 271 individuals were included, with a mean age of 58.65 ± 14.03 years, of whom 160 (59%) were female. In the overall sample, Lp(a) levels were 42 (12–156) nmol/L. Overall, 159 (58.7%) individuals had normal Lp(a) levels, whereas 82 (30.3%) presented elevated levels (>125 nmol/L). Among men, 63 (56.8%) had normal levels, 11 (9.9%) intermediate levels, and 37 (33.3%) elevated levels. Among women, these proportions were 96 (60.0%), 19 (11.9%), and 45 (28.1%), respectively. No significant association was observed between sex and Lp(a) categories (Pearson's chi-square test, $p = 0.627$). We highlight that a considerable prevalence of elevated Lp(a) levels was observed in this cohort, exceeding that reported in previous population-based studies. This finding is likely related to the study setting, a tertiary referral cardiovascular center in Southern Brazil. Another possible explanation is that individuals from this region may present higher Lp(a) concentrations; however, currently available data are insufficient to support this hypothesis. The high prevalence of elevated Lp(a) levels in this referral cardiovascular setting is consistent with the recognized association between Lp(a) and cardiovascular disease.

20561

HIGH PREVALENCE OF MARKEDLY ELEVATED LIPOPROTEIN(A) AND SEVERE HYPERCHOLESTEROLEMIA IN YOUNG PATIENTS WITH CORONARY ARTERY CALCIFICATION

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Introduction/Background: Subclinical atherosclerosis is uncommon in young individuals and may indicate an increased risk of future coronary events. Data on risk factors (RFs) for coronary artery calcification in this population remain scarce. Objectives: To assess the prevalence of RFs in patients < 55 years with coronary artery calcification. Methods: Cross-sectional study including patients from a cardiovascular prevention outpatient clinic in southern Brazil, with private health insurance coverage, aged ≤55 years and with coronary artery calcification, defined as a coronary artery calcium (CAC) score >1 Agatston. Evaluated RFs included hypertension, diabetes, smoking, obesity (BMI ≥30 kg/m²), severe hypercholesterolemia (LDL-C ≥190 mg/dL), markedly elevated Lipoprotein(a) [Lp(a)] (≥190 nmol/L or ≥85 mg/dL), and family history of premature coronary artery disease (CAD) (myocardial infarction, percutaneous or surgical revascularization, or sudden death in men <55 years or women <60 years). Resultados e Conclusions: A total of 129 Caucasian patients aged 34–55 years were included (mean age 49.6 ± 4.6 years; 68% male). Regarding CAC distribution, 32.6% had CAC <10 Agatston, 41.1% had CAC 10–99 Agatston, and 26.3% had CAC ≥100 Agatston. The prevalence of RFs was as follows: hypertension 45.7%; severe hypercholesterolemia 24.0%; family history of premature CAD 20.2%; markedly elevated Lp(a) 19.4%; obesity 15.5%; smoking 8.5%; and diabetes 7.0%. Severe dyslipidemia, defined as markedly elevated LDL-C and/or Lp(a), was observed in 37.2% of patients. Regarding the number of RFs, 20.1% of patients had no RFs, 39.5% had one risk factor, 24.8% had two RFs, and 15.5% had three or more RFs. Among patients with markedly elevated Lp(a), 32.0% had Lp(a) as the only identified risk factor. In conclusion, this study provides novel insights into RFs associated with coronary artery calcification in young patients. A high prevalence of severe dyslipidemia, characterized by markedly elevated LDL-C and/or Lp(a), was observed. Notably, approximately one-fifth of patients had no traditional RFs, underscoring the importance of investigating nontraditional RFs for coronary artery disease in this population.

20324

IMPACT OF A STRUCTURED MULTIDISCIPLINARY INTERVENTION ON CARDIOMETABOLIC RISK FACTORS IN HIGH-RISK PATIENTS: A SIX-MONTH COHORT STUDY

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Introduction/Background: Cardiometabolic risk is the synergistic potential for cardiovascular damage from clustered metabolic issues: visceral adiposity, dyslipidemia, hypertension, and insulin resistance. Driven by chronic inflammation, these factors cause cardiovascular disease. While drugs are standard, integrated multidisciplinary interventions are essential to optimizing clinical outcomes. Objectives: To evaluates the impact of a comprehensive multidisciplinary care program on the modulation of cardiometabolic risk factors among a cohort characterized by a high cardiovascular risk profile. Methods: This prospective cohort study was conducted at a multidisciplinary outpatient clinic involving cardiologists, endocrinologists, nutritionists, and exercise physiologists. At baseline, patients underwent comprehensive clinical phenotyping: biochemical profiling, cardiovascular imaging, and bioimpedance analysis. Dietary patterns, metabolic status, and comorbidities were assessed. The protocol integrated a calorie-restricted diet, protein supplements, resistance training, and titrated pharmacological therapy. After assessment, a personalized intervention plan was implemented. Patient engagement was maintained via structured feedback and 90-day follow-up cycles, using a dedicated app for communication with the clinical team. Reassessments and adjustments occurred over 6 months. Statistical analysis used one-way ANOVA (p≤0.05) with Post hoc Scheffé's test, when necessary. Resultados e Conclusions: 174 patients (age: 50.0±12.2 years, 54.0% male, weight: 99.2±18.3 kg) were followed. Initial risks: coronary artery disease 30.9%, diabetes 15.4%, hypertension 41.9%, dyslipidemia 85.3%, obesity 81.5%, and sedentary lifestyle 70.9%. At six months, BMI decreased (pre: 33.8±4.9 vs. post: 30.3±7.1 kg/m², p=0.00). Bioimpedance showed lower fat mass (pre: 37.3±8.5% vs. post: 33.1±8.6%) and higher lean mass (pre: 35.3±5.3% vs. post: 37.2±5.2%; p=0.00). Abdominal circumference dropped (pre: 110.1±13.3 vs. post: 103.3±11.1 cm, p=0.00). LDL (111.6±45.9 vs. 77.5±43.2 mg/dL) and triglycerides (140.6±88.1 vs. 95.3±49.0 mg/dL) decreased (p=0.00). Glycated hemoglobin fell (pre: 5.7±0.9% vs. post: 5.3±0.5%, p=0.00). HDL had no significant changes. Statins were used in 71.9%. Oral and injectable GLP-1 agonists were used by 35.6% and 36.3% of the cohort, respectively. In this subgroup, non-adherence was 20.2%. As a conclusion, the multidisciplinary care improved cardiometabolic risk. Long-term studies are needed to confirm sustainability of this approach.

14376

IMPACT OF ANABOLIC-ANDROGENIC STEROID USE ON CARDIOVASCULAR HEALTH: A SYSTEMATIC REVIEW.

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Introduction/Background: Anabolic-androgenic steroids (AAS), synthetic derivatives of testosterone, are widely used to increase strength and promote muscle hypertrophy. Their use is prevalent among athletes and has been increasing in the general population. In this context, the growing use of AAS, along with their potential adverse health effects, represents a significant public health concern and an important focus for scientific investigation. Objectives: To investigate, through a systematic review, the association between AAS use and the increased incidence of cardiovascular diseases. Methods: A literature review was conducted including original clinical studies performed in humans, published within the last two years, in English, and available in full text. The search was carried out using the National Library of Medicine (MEDLINE), Scientific Electronic Library Online (SciELO), and Cochrane Library databases, employing the MeSH descriptors “Anabolic Steroids” and “Coronary Disease,” combined using Boolean operators. The included studies analyzed the association between AAS use and increased cardiovascular risk. Poorly described studies, abstract-only publications, animal studies, and literature reviews were excluded. The PRISMA guidelines were followed to systematize the review process. Resultados e Conclusions: Initially, 8 studies were identified; after deduplication and application of eligibility criteria, 4 studies were included in the final analysis. A total of 60,980 participants were evaluated, predominantly young adults with a mean age of 35.5 years, among whom cumulative AAS use varied across studies. A significant association was observed between AAS use and adverse cardiovascular outcomes, including left ventricular hypertrophy, heart failure, and acute myocardial infarction, in both current and former users compared to the control group ($p < 0.05$). Additionally, Buhl et al. demonstrated more severe cardiovascular outcomes in individuals with more than 5 years of AAS use ($p < 0.05$). Overall, the findings suggest that AAS use is a significant cardiovascular risk factor, with the potential to cause persistent damage to cardiovascular health even after discontinuation.

21307

IMPACT OF RSV VACCINATION ON HOSPITALIZATION AND MORTALITY IN INFLUENZA-VACCINATED PATIENTS WITH HEART FAILURE: A MULTICENTER DATABASE ANALYSIS

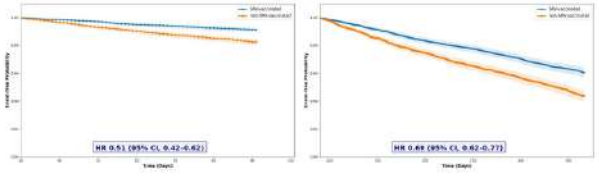
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Introduction/Background: Respiratory syncytial virus (RSV) poses a significant public health burden, disproportionately affecting patients with heart failure (HF), who face an 8-fold increased risk of RSV-related hospitalization and frequent acute cardiac events during infection. Although three RSV vaccines have been approved for older adults and high-risk groups including HF, their impact on severe clinical outcomes in this population remains uncertain, with randomized trials showing no significant reduction in cardiovascular hospitalization or mortality. Objectives: To assess the impact of RSV vaccination on emergency department (ED) visits, hospitalization, acute respiratory failure, ICU admission, and mortality in HF patients already vaccinated against influenza. Methods: Retrospective observational analysis using the TriNetX Global Collaborative Network (>110 healthcare organizations, ~140 million patients). Adults (≥18 years) with HF and prior influenza vaccination, without chronic lung disease, were stratified by RSV vaccination status. After 1:1 propensity score matching for age, comorbidities, and HF medications, we analyzed risk differences (RD), risk ratios (RR) and, further, Cox proportional hazards models to estimate hazard ratios (HR) at 1-year follow-up. Resultados e Conclusions: Our analyses included a total of 17,782 patients each cohort (75± 9 years, 53% male). At 1 year, RSV vaccination was consistently associated with significant reductions in all outcomes: ED visits (RD -2.70%; RR 0.90; HR 0.81; p<0.0001), acute respiratory failure (RD -0.89%; RR 0.84; HR 0.67; p<0.0001), hospitalization (RD -2.60%; RR 0.85; HR 0.61; p<0.0001), ICU admission (RD -0.87%; RR 0.84; HR 0.57; p=0.0001), and mortality (RD -2.00%; RR 0.65; HR 0.48; p<0.0001). RSV vaccination consistently reduces, at 1 year, ED visits, hospitalization, respiratory failure, ICU admission, and mortality in influenza-vaccinated HF patients. To date, our study is the first evidence of mortality risk reduction of SRV vaccine, reinforcing its recommendation in this high-risk population.

Outcome	SRV-vaccinated events	Non-SRV events	Risk difference (95% CI)	Risk ratio (95% CI)	p-value
at 1-year					
ED visit	4652	5156	-2.70% (-3.59% to -1.81%)	0.90 (0.87–0.93)	< 0.0001
Acute respiratory failure	862	1029	-0.89% (-1.34% to -0.45%)	0.84 (0.77–0.92)	< 0.0001
Hospital admission	2760	3245	-2.60% (-3.34% to -1.85%)	0.85 (0.81–0.89)	< 0.0001
ICU admission	879	1041	-0.87% (-1.32% to -0.42%)	0.84 (0.77–0.92)	0.0001
Death	707	1081	-2.00% (-2.44% to -1.57%)	0.65 (0.60–0.72)	< 0.0001
30-90 days					
ED visit	1536	1936	-2.14% (-2.73% to -1.55%)	0.79 (0.74–0.85)	< 0.0001
Acute respiratory failure	300	374	-0.40% (-0.67% to -0.13%)	0.82 (0.69–0.93)	0.004
Hospital admission	923	1169	-1.32% (-1.78% to -0.85%)	0.79 (0.73–0.86)	< 0.0001
ICU admission	255	339	-0.45% (-0.70% to -0.20%)	0.75 (0.64–0.88)	0.0005
Death	151	306	-0.83% (-1.05% to -0.61%)	0.49 (0.41–0.60)	< 0.0001
90-360 days					
ED visit	3791	4135	-1.84% (-2.67% to -1.01%)	0.92 (0.88–0.95)	< 0.0001
Acute respiratory failure	666	757	-0.49% (-0.88% to -0.10%)	0.88 (0.79–0.97)	0.0139
Hospital admission	2156	2494	-1.81% (-2.48% to -1.14%)	0.86 (0.82–0.91)	< 0.0001
ICU admission	658	766	-0.58% (-0.97% to -0.19%)	0.86 (0.78–0.95)	0.0035
Death	557	782	-1.21% (-1.58% to -0.83%)	0.71 (0.64–0.79)	< 0.0001

Kaplan-Meier curves for all-cause mortality stratified by RSV vaccination status



20411

MAIN DETERMINANTS OF ADHERENCE TO LIFESTYLE RECOMMENDATIONS IN PATIENTS WITH CORONARY HEART DISEASE: A CROSS-SECTIONAL, TWO-CENTER STUDY

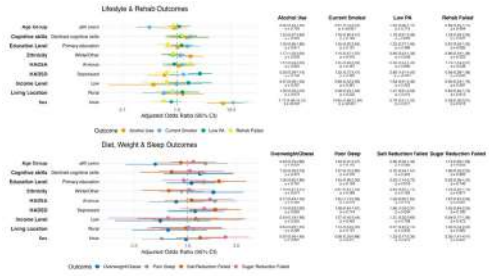
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Table 1	N = 402[†]	Continuation	N = 402[†]
Age Group		**Sleep Status**	
<60 years	118 (29.4%)	Good sleep	251 (63.1%)
≥60 years	284 (70.6%)	Poor sleep	147 (36.9%)
Sex		**Alcohol Consumption**	
Female	146 (36.3%)	No	310 (77.1%)
Male	256 (63.7%)	Yes	92 (22.9%)
Living Location		**Smoking Status**	
Rural	37 (9.2%)	Non smoker	247 (61.4%)
Urban/ suburban	365 (90.8%)	Smoker	155 (38.6%)
Income Level		**PA Level**	
Low	19 (4.7%)	Low PA	152 (37.8%)
Middle/High	383 (95.3%)	MVPA	250 (62.2%)
Education Level		**Attended Rehabilitation**	
Higher education	139 (34.6%)	Don't Know/Unsure	5 (1.2%)
Primary education	263 (65.4%)	No	237 (59.0%)
Ethnicity		Yes	160 (39.8%)
Any other Asian background	298 (74.1%)	**Overweight/Obese**	
White/Other	104 (25.9%)	No	78 (19.4%)
Anxiety (HADS-A)		Yes	324 (80.6%)
Anxious	100 (24.9%)	**Less Salt In Diet**	
Normal	302 (75.1%)	No	87 (21.6%)
Depression (HADS-D)		Unknown	17 (4.2%)
Depressed	93 (23.1%)	Yes	298 (74.1%)
Normal	309 (76.9%)	**Less Sugar in Diet**	
Cognitive skills		No	113 (28.1%)
Declined cognitive skills	355 (88.5%)	Unknown	13 (3.2%)
Normal cognitive skills	46 (11.5%)	Yes	276 (68.7%)

[†] n (%)

Introduction/Background: Background. Lifestyle modifications are considered as a concurrent intervention among with pharmacological treatment for secondary prevention in patients with coronary heart disease (CHD). Adherence to recommended behavioral changes remains a significant clinical challenge in everyday life. Objectives: Objectives. To evaluate if ESC lifestyle recommendations in patients with CHD are reached and what risk factors associate with failure. Methods: Methods. This cross-sectional study was conducted in two-centers across the country. Patients with a history of CHD hospitalization in the last 6-24 months were randomly recruited to participate in this study. We collected age, sex, living location, income level, education level, ethnicity, anxiety, depression, cognitive function as independent variables and sleep status, alcohol consumption, smoking status, physical activity (PA) level, rehabilitation attendance, overweight/obesity status, salt and sugar in diet as dependent variables. Pittsburgh Sleep Quality Index (PSQI) was used for sleep status, International Physical Activity Questionnaire - Short Form (IPAQ-SF) was used for PA level, BMI for overweight/obesity status and Hospital Anxiety & Depression Scale (HADS) was used for anxiety and depression assessment. Handheld carbon monoxide monitor was used additionally to detect smoking. Multivariable logistic regression models were employed to estimate adjustedodds ratios (OR) to evaluate the independent associations between participant characteristics and each outcome while controlling for relevant confounders. Resultados e Conclusions: Results and conclusion. Of 402 participants the majority were male, aged ≥60 years, and of Central Asian background. Prevalence was high for obesity, cognitive impairment and rehabilitation ignorance. Male sex was strongly associated with smoking, alcohol use, and failure to reduce sugar. While females were more likely to experience poor sleep or miss rehabilitation. Older age was inversely associated with smoking and overweight/obesity. Patients missing university level education failed to achieve salt reduction. White/other ethnicities presented more chance of alcohol consumption. Depression was a strong predictor of low PA and failure to reduce salt, while anxiety predicted poor sleep and rehabilitation. These findings underscore the necessity of targeted interventions for specific subgroups of patients to improve secondary prevention in patients with CHD.

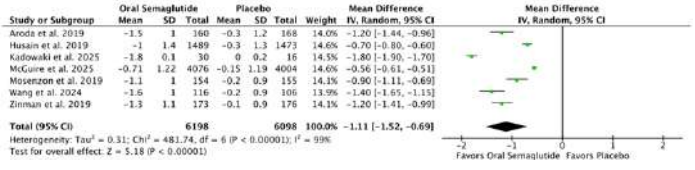


21510

METABOLIC AND CARDIOVASCULAR OUTCOMES WITH ORAL SEMAGLUTIDE IN HIGH-RISK PATIENTS WITH TYPE 2 DIABETES MELLITUS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introduction/Background: Patients with Type 2 Diabetes at high cardiovascular risk remain susceptible to adverse metabolic and cardiovascular events despite contemporary therapies. Oral semaglutide, the first oral glucagon-like peptide-1 receptor agonist, has shown promising cardiometabolic benefits in this population. Objectives: To evaluate the metabolic and cardiovascular outcomes of oral semaglutide versus placebo in high-risk patients with type 2 diabetes mellitus (T2DM). Methods: This systematic review and meta-analysis was conducted according to Cochrane recommendations. PubMed, Embase, and Cochrane Library databases were searched from inception through May 2026. Randomized controlled trials comparing oral semaglutide with placebo in adults with high-risk T2DM were included after duplicate removal and full-text screening. Outcomes included glycated hemoglobin (HbA1c), body mass index (BMI), major adverse cardiovascular events (MACE), and all-cause mortality. Statistical analyses were performed using Review Manager version 5.4 with random-effects models, reporting mean differences (MD) and risk ratios (RR) with 95% confidence intervals (CI). Resultados e Conclusions: A total of 1,311 records were identified. Seven studies evaluating metabolic outcomes and four assessing cardiovascular outcomes were included. Oral semaglutide significantly reduced HbA1c compared with placebo (MD −1.11%; 95% CI −1.52 to −0.69; p<0.001 - FIGURE 1). BMI reduction favored oral semaglutide, although without statistical significance (MD −1.60 kg/m²; 95% CI −3.41 to 0.20; p=0.08). Cardiovascular analysis demonstrated a significant reduction in MACE (RR 0.86; 95% CI 0.78–0.95; p=0.003 - FIGURE 2), whereas no significant difference was observed in all-cause mortality (RR 0.79; 95% CI 0.48–1.29; p=0.34). Oral semaglutide was associated with significant glycemic improvement and favorable cardiovascular outcomes, supporting its role as an effective therapeutic option in high-risk T2DM patients.

18209

MULTIDIMENSIONAL INTERVENTION FOR THE MANAGEMENT OF HYPERTENSION AND DIABETES IN LOW-INCOME MUNICIPALITIES: A QUALITATIVE RE-AIM PERSPECTIVE

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(1) TELEHEALTH CENTER, UNIVERSITY HOSPITAL, UNIVERSIDADE FEDERAL DE MINAS GERAIS - BELO HORIZONTE - MG - BRASIL;

Introduction/Background: Control of hypertension and diabetes challenge health systems and demand continuous and longitudinal care. Primary health care centers have a central role to promote health and prevent complications of these non-communicable diseases. Strengthening primary care with hard and soft technologies can improve health outcomes. Objectives: To understand healthcare professionals' perceptions of the implementation of a multidimensional intervention for the management of hypertension and diabetes in low-income municipalities, using the RE-AIM framework. Methods: This is a substudy of a randomised clinical trial with 35 primary care centers involving a multifaceted intervention for the management of hypertension and diabetes during a year in municipalities with a low resources, including telehealth tools (web based computer decision support system [CDSS] to support patient monitoring by physicians and nurses; a CDSS installed in tablets for home visits by community health workers [CHW] to support early recognition of uncompensated disease, to prioritise for consultation ; asynchronous teleconsultations; telediagnosis with electrocardiogram; text message and educational groups to promote patient education, adherence to treatment and lifestyle modification); continuing education for health professionals. At the end, 13 focus groups were conducted with professionals from primary care centers randomized to the intervention group. Transcripts were analyzed using Bardin's content analysis with ATLAS.ti software guided by the RE-AIM (Reach, Effectiveness, Adoption, Implementation, Maintenance) framework. Resultados e Conclusions: Focus groups included 111 professionals (80% women; mean age 40·6 years; mean primary care experience 11·3 years). Reach was affected by geographic distances, access, staff shortages and duplicated data-entry systems. Group activities were a strategy for expanding reach. Effectiveness was marked by strengthened clinical decision-making and broader access to exams. Adoption varied across municipalities showing a potential relation to vulnerable settings. Implementation was threatened by high turnover of professionals and structural constraints, but was facilitated by team support and feedback. Maintenance may be supported by incorporation of multidimensional interventions into institutional workflows adapting to local realities. Success of digital health interventions in underserved settings depends on technology, but also on integration into local workflows and health system capacity.

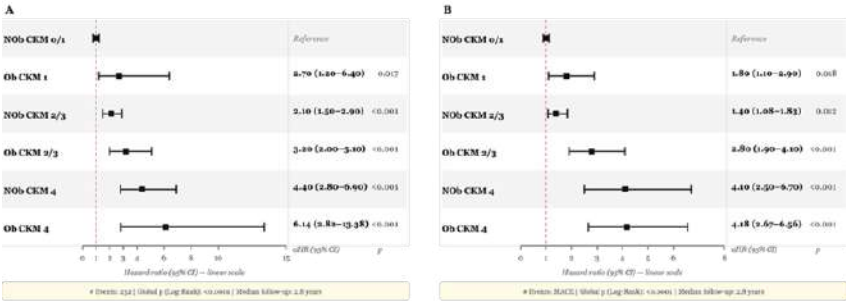
20812

OBESITY AS A VERTICAL RISK AMPLIFIER IN STEMI ACROSS CKM SYNDROME STAGES: ACCELERATED ONSET AND IMPAIRED MYOCARDIAL REPERFUSION DESPITE TIMELY INTERVENTION

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Introduction/Background: Obesity is intrinsically linked to the development and progression of cardiovascular disease (CVD) and metabolic dysfunction [1,2]. To address this interaction, the American Heart Association (AHA) guideline formalized the Cardiovascular-Kidney-Metabolic (CKM) syndrome in 2023, a framework that integrates cardiovascular, renal, and metabolic risk factors to stratify risk [3]. Adiposity is a central factor in the CKM spectrum, inducing chronic systemic inflammation through pro-inflammatory cytokines and atherogenesis [1,4]. However, it is unclear whether the proposed CKM stages capture the independent prognostic impact of obesity among individuals with ST-segment elevation myocardial infarction (STEMI) [5,6]. Objectives: The Cardiovascular-Kidney-Metabolic (CKM) syndrome framework provides a meaningful risk stratification strategy, yet obesity's independent prognostic role in ST-elevation myocardial infarction (STEMI) remains debated. We investigated the association of obesity with clinical outcomes across CKM syndrome stages within the Brazilian B-Care cohort. Methods: Method: This study evaluated 4,004 consecutive individuals hospitalized for STEMI in the Federal District, Brazil (2009–2019). Patients were stratified into CKM stages (0/1,2/3,and 4) and compared by the presence of obesity. Primary outcomes included all-cause mortality and major adverse cardiovascular events (MACE). Resultados e Conclusions: Results: Obesity (31% of the cohort) accelerated STEMI onset by approximately 4.2 years across all CKM stages. Despite comparable reperfusion process times (p>0.05), obese patients achieved significantly poorer myocardial reperfusion quality, with lower rates of TIMI3 flow and myocardial blush grade3 (TIMI3 in CKM4: 74.5%vs.82.1%;p<0.05). Obesity consistently amplified mortality risk, ranging from aHR2.7 (CKM1) to 6.14 (CKM4). Notably, obese patients in intermediate CKM stages (2/3) faced mortality risks comparable to non-obese patients with overt disease (CKM4). Conclusion: Obesity functions as a vertical risk amplifier across the CKM spectrum, accelerating disease onset and significantly worsening long-term prognosis. The dissociation between adequate procedural timing and inferior tissue-level reperfusion highlights a heightened ischemic vulnerability in obese patients. Therefore, obesity must be prioritized as a primary, independent driver of cardiovascular risk that necessitates targeted microvascular protection strategies beyond conventional risk scores



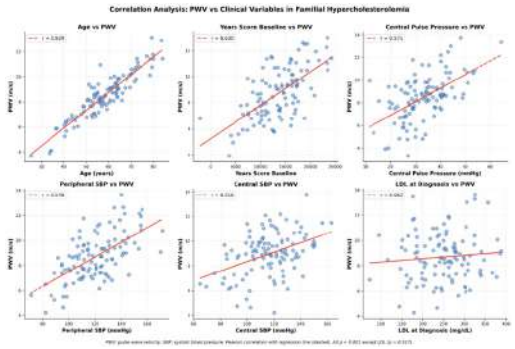
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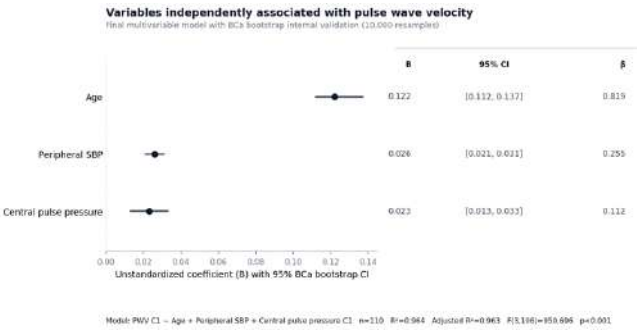
PREVALENCE AND ASSOCIATED FACTORS WITH ARTERIAL STIFFNESS IN FAMILIAL HYPERCHOLESTEROLEMIA

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(1) UNIFESP - UNIVERSIDADE FEDERAL DE SAO PAULO - SÃO PAULO - SP - BRASIL;

Introduction/Background: Familial hypercholesterolemia (FH) is associated with severe and premature atherosclerosis, and pulse wave velocity (PWV) is considered a marker of arterial stiffness. Identifying variables associated with increased PWV can guide cardiovascular prevention strategies in this high-risk population. Objectives: To evaluate variables independently associated with arterial stiffness in patients with FH. Methods: Cross-sectional study with a priori sample size calculation of 110 FH patients on lipid-lowering therapy, attending a university service. Arterial stiffness was assessed by oscillometric method measuring PWV. Statistical analysis: The outcome variable was PWV and its correlation with clinical and laboratory determinants, including age, sex, systemic arterial hypertension (HTN), diabetes mellitus (DM), peripheral and central systolic blood pressure (SBP), and baseline and treated YEARS scores (LDL-c × age). Multiple linear regression, regularization with cross-validation, mixed linear models with random effects by age group, and non-parametric bootstrap (10,000 replications) were performed. The adopted significance level was 5% in two-tailed analysis. Resultados e Conclusions: Mean age was 59.9±13.0 years; 74.5% were women, 76.5% had hypertension, and 44.8% had diabetes. Mean PWV was 8.59±1.95 m/s. Age showed the strongest correlation with PWV (r=0.929, p<0.001), followed by baseline YEARS score (r=0.630, p<0.001), whereas LDL-c at diagnosis and at enrollment were not associated with PWV. In the adjusted linear regression model, PWV was independently associated with age (B=0.122, 95% BCa CI 0.112-0.137; β=0.819; p<0.001), peripheral SBP (B=0.026, 95% BCa CI 0.021-0.031; β=0.255; p<0.001), and central pulse pressure (B=0.023, 95% BCa CI 0.013-0.033; β=0.112; p<0.001). Bootstrap validation did not confirm YEARS score as independently associated with PWV. PWV tertile stratification identified a high-risk phenotype with PWV >9.30 m/s, older age (72±6 years), 100% hypertension prevalence, and 37% higher cumulative LDL burden versus the low tertile (all p<0.001). Conclusion: Age, peripheral SBP, and central pulse pressure were independently associated with PWV, highlighting the combined contribution of aging and hemodynamic load to arterial stiffness in FH.





16687

PREVALENCE OF ELEVATED LIPOPROTEIN(A) LEVELS IN CHILDREN AND ADOLESCENTS: IMPACT ON EARLY IDENTIFICATION OF CARDIOVASCULAR RISK FACTORS

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(1) INSTITUTO DE CARDIOLOGIA / FUNDAÇÃO UNIVERSITARIA DE CARDIOLOGIA - PORTO ALEGRE - RS - BRASIL;

Introduction/Background: Introduction/Background: Cardiovascular diseases are the leading cause of global mortality, with evidence that the atherosclerotic process begins in childhood and adolescence. Lipoprotein(a) is a cardiovascular risk biomarker with predominantly genetic determination, whose levels remain stable from birth regardless of environmental factors and nutritional status. Data on its prevalence in Brazilian pediatric populations are scarce. Objectives: Objective: To determine the prevalence of elevated lipoprotein(a) levels and their association with conventional cardiovascular risk factors in children and adolescents attending a reference center. Methods: Methods: Observational, cross-sectional, and descriptive study involving 94 patients aged 2 to 19 yearswith a mean age of 11.7 years (SD = 5,08; median = 11.5), stratified into an overweight group (n=56; 59.6%) and a normal weight group (n=38; 40.4%). Anthropometric data, blood pressure, complete lipid profile, and plasma lipoprotein(a) by turbidimetric immunoassay were collected. Statistical analysis used parametric and nonparametric tests according to data distribution, with a significance level of 5%. Resultados e Conclusions: Results: The prevalence of elevated lipoprotein(a) was 45.7% at the 30 milligrams per deciliter threshold and 25.5% at the 50 milligrams per deciliter threshold, the high-risk cutoff of the European Atherosclerosis Society. No significant difference in lipoprotein(a) levels was found between groups by nutritional status (p=0.911), sex (p=0.551), or age group (p=0.964), confirming its genetic independence. The overweight group showed significantly higher systolic blood pressure (p<0.001), diastolic blood pressure (p<0.001), low-density lipoprotein (p=0.002), and total cholesterol (p=0.006). Combined cardiovascular risk, defined as coexistence of dyslipidemia and lipoprotein(a) at or above 30 milligrams per deciliter, was identified in 31.9% of the sample. Conclusion: Approximately one quarter of the evaluated children and adolescents present lipoprotein(a) levels compatible with high cardiovascular risk, independently of nutritional status, sex, and age group. These findings reinforce the need to include lipoprotein(a) measurement in routine pediatric cardiovascular assessment as an early screening and prevention strategy.

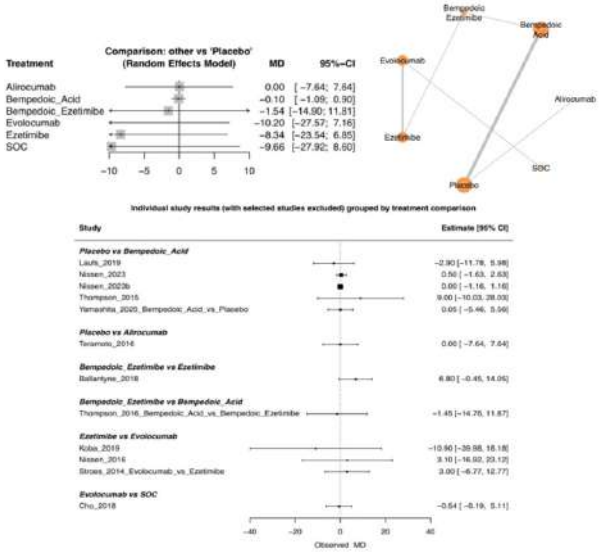
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REDEFINING LDL-C REDUCTION STRATEGIES IN STATIN-INTOLERANT PATIENTS: A CONTEMPORARY NETWORK META-ANALYSIS OF NON-STATIN THERAPIES

MARCÍLIO MARCÍLIO DE OLIVEIRA FILHO1; SUELEN QUEIROZ2; MARINA AZEVEDO AMARAL1; ANISIO UCHOA LEITE SANTANA3; MIGUEL CHAVES LENZI4; EDUARDO BELLO MARTINS5; ANTONIO ESCAMILLA GARCIA6;

(1) FACULDADE DE MEDICINA DE BARBACENA - BARBACENA - MG - BRASIL; (2) UNIVERSIDADE FEDERAL DE PONTA GROSSA - PONTA GROSSA - PR - BRASIL; (3) FACULDADE DE MEDICINA DA UNIVERSIDADE DE SAO PAULO - SÃO PAULO - SP - BRASIL; (4) UNIVERSIDADE ESTADUAL DO RIO GRANDE DO NORTE - MOSSORÓ - RN - BRASIL; (5) INCOR - INSTITUTO DO CORACAO DA UNIVERSIDADE DE SAO PAULO - SAO PAULO - SP - BRASIL; (6) HOSPITAL DAS CLINICAS USP - SÃO PAULO - SP - BRASIL;

Introduction/Background: Statin intolerance remains a major challenge in lipid management. Alternative therapies such as bempedoic acid, ezetimibe, PCSK9 inhibitors, and combination regimens are increasingly used, yet their relative efficacy has not been fully clarified. This study aimed to assess the comparative efficacy of non-statin lipid-lowering therapies in statin-intolerant patients through a frequentist network meta-analysis Objectives: To compare the efficacy of non-statin lipid-lowering therapies—including Evolocumab, Alirocumab, Ezetimibe, and Bempedoic acid (alone or in combination)—versus placebo or standard of care in reducing LDL-C levels among statin-intolerant patients, and to assess the consistency and comparative performance of these strategies within a network meta-analysis framework. Methods: We systematically identified 12 randomized trials (n=21,115) including 7 interventions: bempedoic acid, ezetimibe, evolocumab, alirocumab, bempedoic acid– ezetimibe, standard of care (SOC), and placebo. Direct and indirect evidence were synthesized using randomeffects models. Mean difference (MD) in LDL-C reduction was the primary outcome. Inconsistency was evaluated by node-splitting and global tests. Resultados e Conclusions: Compared with placebo, Evolocumab (MD –10.20 mg/dL; 95% CI –27.6 to 7.2), Ezetimibe (–8.34; –23.5 to 6.9), and standard of care (–9.66; –27.9 to 8.6) achieved the greatest LDL-C reductions, whereas Bempedoic acid alone showed a modest effect (–0.10; –1.1 to 0.9). The fixed-dose bempedoic acid–ezetimibe combination demonstrated improved efficacy (–1.54; –14.9 to 11.8), and Alirocumab also reduced LDL-C, although with imprecise estimates (0.00; –7.6 to 7.6). Inconsistency testing showed no significant disagreement between direct and indirect evidence, and the network was well connected (21 possible comparisons, 6 with direct data). Overall, in statin-intolerant patients, PCSK9 inhibitors and ezetimibe-based strategies provide the most consistent LDL-C reductions, while bempedoic acid has modest efficacy that may be enhanced when combined with ezetimibe, supporting a tailored approach to lipid-lowering therapy when statins are not tolerated.



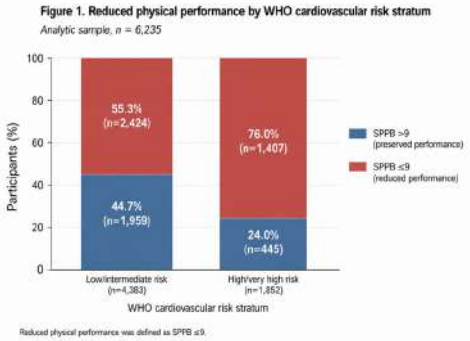
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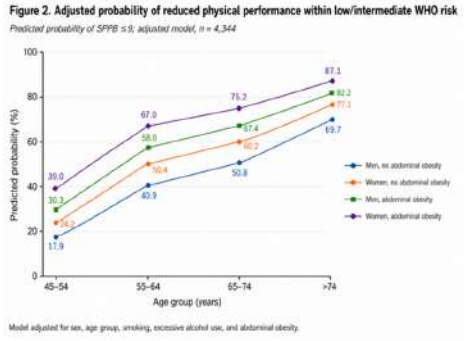
REDUCED PHYSICAL PERFORMANCE DESPITE LOW OR INTERMEDIATE WHO CARDIOVASCULAR RISK IN A BRAZILIAN COHORT

ALINE CRISTINA D'ÁVILA SOUZA1; LIDIANE APARECIDA PEREIRA SOUSA2; ROSA WEISS TELLES1; RICARDO PAROLI FERREIRA SANTOS3; DÉBORA VITÓRIA SILVA MOREIRA3; BRENO FERRARI MACIEL3; SANDHI MARIA BARRETO1; ANTÔNIO LUIZ PINHO RIBEIRO1;

(1) UNIVERSIDADE FEDERAL DE MINAS GERAIS - BELO HORIZONTE - MG - BRASIL; (2) HOSPITAL DAS CLINICAS DA UFMG - BELO HORIZONTE - MG - BRASIL; (3) FACULDADE DE MEDICINA UNIVERSIDADE PROFESSOR EDSON ANTONIO VELANO - UNIFENAS - BELO HORIZONTE - MG - BRASIL;

Introduction/Background: Traditional cardiovascular risk scores can underestimate clinically relevant vulnerabilities, particularly functional impairment. The Short Physical Performance Battery (SPPB) might help identify frailty even among individuals without a formal high cardiovascular risk classification. Objectives: To investigate the frequency of reduced physical performance, measured by the SPPB, across WHO cardiovascular risk strata and to identify, among individuals at low or intermediate risk, the profiles with the highest probability of functional impairment. Methods: We did a cross-sectional study nested within a large Brazilian population-based cohort. Reduced physical performance was defined as an SPPB score of 9 points or lower. In the main analytic sample (n=6235), participants were classified as low/intermediate or high/very high cardiovascular risk according to WHO criteria. We did descriptive analyses, constructed risk-performance phenotypes, and fitted logistic regression models. In analyses restricted to the low/intermediate-risk stratum, models were adjusted for sex, age, smoking, excessive alcohol use, and abdominal obesity (n=4344). Resultados e Conclusions: In the analytic sample, 55.3% of participants at low or intermediate cardiovascular risk already had an SPPB score of 9 or lower, and this proportion reached 76.0% among those at high or very high risk. The phenotype of low/intermediate risk plus reduced SPPB was the most frequent (38.9%) and was more common in women. Among low/intermediate-risk individuals, the odds of reduced physical performance were higher in women (OR=1.47, 95% CI 1.28-1.69), participants older than 74 years (OR=2.23, 1.46-3.42), and those with abdominal obesity (OR=2.01, 1.76-2.29). Smoking was also associated with the outcome (OR=1.15, 1.01-1.32). Adjusted probabilities of an SPPB score of 9 or lower increased progressively with age and reached 87.1% in women older than 74 years with abdominal obesity. The SPPB identified functional vulnerability not fully captured by formal cardiovascular risk classification, particularly in women, older adults, and individuals with abdominal obesity.





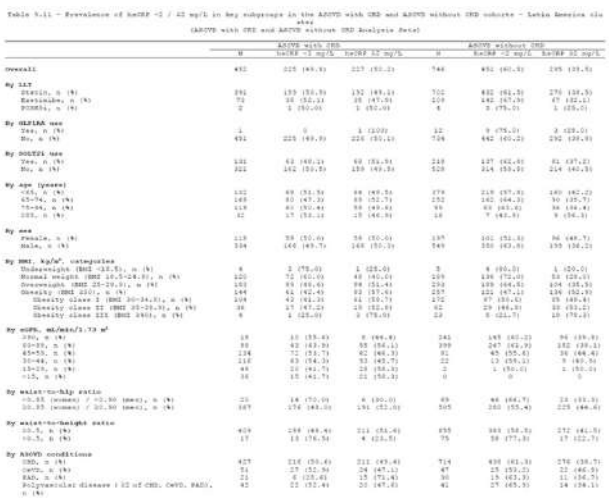
17419

RESIDUAL INFLAMMATORY RISK IN LATIN AMERICAN PATIENTS WITH ASCVD: INSIGHTS FROM THE POSEIDON STUDY

NANCY TOLEDO COELHO1; FRANCISCO ANTONIO HELFENSTEIN FONSECA2; AGUINALDO FIGUEIREDO DE FREITAS JUNIOR3; ALBERTO J LORENZATTI4; ALBERTO FERNANDEZ5; ERNESTO DURONTO6; DIEGO ABELLA7; NATHALIA LIBERATOSCIOLI MENEZES ANDRADE8;

(1) NOVO NORDISK - SÃO PAULO - SP - BRASIL; (2) UNIFESP - UNIVERSIDADE FEDERAL DE SAO PAULO - SÃO PAULO - SP - BRASIL; (3) FACULDADE DE MEDICINA DA UNIVERSIDADE FEDERAL DE GOIAS - GOIÂNIA - GO - BRASIL; (4) INSTITUTO MEDICO DAMIC - ARGENTINA; (5) INSTITUTO DE INVESTIGACIONES CLINICAS QUILMES - ARGENTINA; (6) FUNDACION FAVALORO - ARGENTINA; (7) NOVO NORDISK - PANAMA; (8) NOVO NORDISK - SAO PAULO - SP - BRASIL;

Introduction/Background: Inflammatory risk is an independent and key risk factor to recurrent cardiovascular events in patients with atherosclerotic cardiovascular disease (ASCVD). Its prevalence and clinical correlates in Latin American populations remains poorly characterized. Chronic kidney disease (CKD) brings cardiovascular risk through both traditional and inflammation-mediated pathways, creating a high-risk cardiorenal phenotype that warrants dedicated investigation. This inflammatory burden persists despite contemporary standard-of-care therapies. Objectives: Real world study with the main objective of investigating the prevalence of inflammation, defined by hsCRP>=2. Methods: Cross-sectional, global, real-world study adults with ASCVD during a single study visit over a 17-month enrollment period. Latin America Cluster data (Brazil and Argentina). Resultados e Conclusions: A total of 1,214 patients were included in the LATAM Cluster: 456 with ASCVD+CKD and 758 with ASCVD without CKD. Overall prevalence of hsCRP≥2 in patients with ASCVD and CKD was 50.2% compared with 39.5% in patients without CKD. Of the 1214 included patients, 72% were from the Brazilian population and 28% from Argentina. The median age was 70.0 years (63.0–77.0) in the ASCVD+CKD cohort and 64.0 years (58.0–71.0) in the ASCVD without CKD cohort (p<0.001). Median hsCRP was significantly higher in the ASCVD+CKD cohort (2.02 mg/L [0.86–5.09]) versus ASCVD without CKD (1.29 mg/L [0.70–3.37]; p<0.001), as was IL-6 (3.86 vs. 2.99 pg/mL; p<0.001). Residual inflammation persisted even under statin therapy: 49.1% and 38.5% of statin-treated patients in the ASCVD+CKD and ASCVD without CKD cohorts, respectively, had hsCRP ≥2 mg/L. Systemic inflammation is highly prevalent in Latin American patients with established ASCVD, affecting one in two patients with concomitant CKD despite guideline-directed therapy. . Nearly half of statin-treated patients exhibited residual inflammatory risk. Inflammation is central and underrecognized component of residual cardiovascular risk in Latin America and underscore the need for improved strategies to identify and address inflammatory risk in this population. The high overall prevalence of cardiovascular inflammation in this population should encourage clinicians to a wide screening of hsCRP levels. Moreover, the present study gives us more insights on which patient profiles should be prioritized.



21924

RNA-TARGETING THERAPIES FOR ELEVATED LIPOPROTEIN(A) IN PATIENTS WITH ESTABLISHED ATHEROSCLEROTIC CARDIOVASCULAR DISEASE: A SYSTEMATIC REVIEW OF CLINICAL EVIDENCE AND IMPLICATIONS FOR PRACTICE

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Introduction/Background: Lipoprotein(a) [Lp(a)] is a genetically determined cardiovascular risk factor strongly associated with atherosclerotic cardiovascular disease (ASCVD), yet no approved therapy currently exists. RNA-targeting therapies, including small interfering RNA (siRNA) and antisense oligonucleotide (ASO) agents, have demonstrated substantial Lp(a) reductions in early-phase trials. However, their impact on cardiovascular outcomes remains unclear. Objectives: To systematically review the evidence on RNA-targeting therapies for elevated Lp(a) in patients with established ASCVD, focusing on efficacy, durability, safety, and the relationship between biomarker reduction and cardiovascular outcomes. Methods: A systematic search of PubMed/MEDLINE, Embase, Cochrane CENTRAL, Web of Science, Scopus, and LILACS was conducted. Eligible studies included phase I–III clinical trials evaluating RNA-targeting anti-LPA therapies in adults with elevated Lp(a). PRISMA 2020 guidelines and the Cochrane Handbook were followed. Risk of bias was assessed using the Cochrane RoB 2 framework adapted for dose-escalation studies. Resultados e Conclusions: Among 765 identified records, 427 remained after deduplication. Eighteen full-text studies were assessed, and 15 were included in the final qualitative synthesis. Six siRNA agents were evaluated: olpasiran (4 studies + 2 sub-analyses), zerlasiran (2 studies), and lepodisiran (2 studies); and two ASO agents: pelacarsen (2 studies + 1 sub-analysis) and IONIS-APO(a)Rx/LRx (1 study reporting two trials). Placebo-adjusted Lp(a) reductions ranged from 35% with pelacarsen 20 mg Q4W to 101% with olpasiran 225 mg Q12W. siRNA therapies demonstrated superior pharmacodynamic durability compared with ASOs. Olpasiran maintained ~28–36% suppression nearly two years after treatment discontinuation, while a single 608 mg dose of lepodisiran sustained >90% suppression for 337 days. Safety profiles were generally favorable, with injection-site reactions being the most common adverse event and no serious drug-related adverse events identified. None of the included studies evaluated major adverse cardiovascular events (MACE) as primary endpoints. Heterogeneity precluded meta-analysis. RNA-targeting therapies achieve profound and durable reductions in Lp(a), particularly siRNA agents. Whether these reductions translate into lower cardiovascular event rates remains uncertain and depends on ongoing outcome trials, including OCEAN(a)-OUTCOMES, Lp(a)HORIZON, and the lepodisiran phase 3 program.



Table 2. Comparative Pharmacodynamic Profile of RNA-Targeting Lp(a)-Lowering Agents

Drug	Class	Peak Lp(a) Reduction	Time to Max Effect	Duration >50% Suppression After Last Dose	Dose for Near-Maximal Effect	Proposed Dosing Interval
Olpasiran	siRNA (GalNAc)	97–103% (in placebo)	Day 29–57 (single dose)	~48–50 wk at 225 mg (Q12W); ~18–24 wk at 75 mg (Q12W)	75–225 mg Q12W	Every 12 weeks (Q12W)
Zerlasiran (SLN360)	siRNA (GalNAc)	97–99%	Day 30–90 (multiple dose)	~28–30 wk after 2nd dose (300–450 mg Q8W)	300–450 mg Q8–16W	Every 28–24 weeks
Lepodisiran	Dicer-substrate siRNA (GalNAc)	93–97%	Day 29–85 (600 mg single)	>90% from day 22–337 (608 mg phase 1); >93.9% through day 180 (600 mg phase 2)	400 mg (phase 2)	Every 6–12 months (expected)
Pelacarsen (TQJ230)	ASO (GalNAc3)	72–85%	4–10 weeks	20 weeks off-Tx; returns to baseline; Half-life ~1 month	60 mg Q4W or 20 mg Q8W	Every 4 weeks (monthly)
IONIS-APO(a)-LRx (early pelacarsen)	ASO (GalNAc3)	Up to 92%	Day 29–36 (multiple doses)	~43–58% at 113 d after last dose	40 mg (MAD schedule)	Potential monthly or quarterly
IONIS-APO(a)Rx	ASO (unconjugated)	Up to ~72%	Return toward baseline by day 238	Returns toward baseline by day 238	300 mg QW×4 wk→2 (escalating)	Weekly (lower potency)

Values represent clinically observed data from included studies. *Off-treatment data from OCEAN(a)-DOSE extension (O'Donoghue 2024). ASO, antisense oligonucleotide; GalNAc, N-acetylgalactosamine; Q4W/Q8W/Q12W/Q24W, every 4/8/12/24 weeks; RISC, RNA-induced silencing complex; siRNA, small interfering RNA.

17616

ROLE OF POLYGENIC RISK SCORES (PRS) IN PREDICTING CORONARY ARTERY DISEASE (CAD)

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Introduction/Background: Polygenic Risk Scores (PRS) integrate multiple genetic variants to estimate individual cardiovascular risk. They enhance conventional risk assessment, particularly in younger individuals and those at intermediate risk, enabling earlier identification of high-risk patients and supporting targeted preventive strategies, including statin therapy. Objectives: To evaluate the role of PRS in predicting the development of CAD. Methods: A systematic search was conducted in PubMed, LILACS, Cochrane Library, Embase, Web of Science, and SciELO in April 2026 using ("Polygenic risk scores" OR "Genetic risk scores") AND ("Coronary artery disease" OR "CAD"). Clinical and observational studies published between 2016 and 2026 in English, Portuguese, or Spanish were included. Reviews, case reports, studies older than 10 years, and those without full-text access were excluded. Two independent reviewers screened studies using Rayyan. Of 136 records identified, 16 met inclusion criteria. Resultados e Conclusions: PRS were consistently associated with the presence and overall burden of coronary atherosclerosis. Individuals with higher genetic risk exhibited up to 78% higher coronary calcium scores and greater plaque prevalence (63% vs 36%), indicating a strong association with total disease burden. PRS were also linked to cardiovascular events, particularly myocardial infarction, with an estimated 60% increase in risk per standard deviation and stronger effects in individuals under 50–55 years, in whom genetic factors may account for up to 40% of events. When integrated with clinical scores, PRS improved risk stratification, reducing misclassification from 10.4% to 4.4% and achieving overall reclassification gains of 5.9%, reaching 13.5% in younger individuals. Predictive performance varied across populations, with improvements of 9.3% in individuals of European ancestry but minimal impact in African populations. PRS are robust markers of coronary atherosclerotic burden and provide clinically meaningful information for early identification of high-risk individuals, particularly at younger ages. Their integration with traditional risk models enhances risk prediction and may improve primary prevention strategies. However, broader clinical implementation requires more inclusive and ethnically diverse models to ensure equitable and accurate cardiovascular risk assessment.

17374

SMALL DENSE LDL AND REDUCED LDL PARTICLE SIZE ARE ASSOCIATED WITH PRIOR MYOCARDIAL INFARCTION IN FAMILIAL HYPERCHOLESTEROLEMIA

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Introduction/Background: Introduction: In familial hypercholesterolemia (FH), the risk of myocardial infarction (MI) remains high even under intensive lipid-lowering therapy, suggesting persistent residual cardiovascular risk. Since LDL-cholesterol levels alone may not fully capture this risk, comparing individuals with and without prior MI may help identify more atherogenic lipoprotein profiles associated with clinical events. Objectives: Objective: To evaluate the association between the size and density of atherogenic lipoprotein subfractions and prior MI in individuals with probable or definite FH. Methods: Methods: Cross-sectional analysis of baseline data from a national multicenter randomized trial (DICA-FH) including individuals with probable or definite FH according to the Dutch MEDPED criteria. Sociodemographic, clinical, and lifestyle data, as well as LDL-cholesterol concentrations (mg/dL), were obtained at participating sites. LDL particle size (peak particle diameter, nm) and density were determined using the Lipoprint® System; LDL3–LDL7 were classified as small dense LDL (sdLDL). Data were log-transformed prior to analysis, and ANOVA was used for group comparisons (with vs. without MI). ANCOVA models assessed associations between atherogenic particles and MI independently of confounders. Resultados e Conclusions: Results: Among 58 participants (mean age 54.5 ± 13.7 years; 53.8% men; BMI 29.3 ± 4.3 kg/m²), the mean Dutch MEDPED score was 8.9 ± 3.6, 66.7% had prior MI, 56.9% low physical activity levels, and 79% were on high-intensity lipid-lowering therapy. LDL-cholesterol did not differ by prior MI status (no MI: 142 ± 60.4 mg/dL; MI: 135.4 ± 56.1 mg/dL; p=0.7). Individuals with prior MI had smaller LDL particle size (26.5 ± 0.6 vs. 26.9 ± 0.5 nm; p=0.03) and higher sdLDL percentage (6.3 ± 6.1% vs. 3.0 ± 4.7%; p=0.048). After adjustment for age, sex, physical activity (METs), and lipid-lowering treatment intensity, LDL particle size remained smaller (26.3 vs. 27.0 nm; p=0.004) and sdLDL percentage remained higher (8.4% vs. 2.0%; p=0.007) in those with prior MI. Additionally, LDL3 percentage was higher in individuals with MI (5.5% vs. 1.9%; p=0.01). Conclusion: Despite similar LDL-cholesterol levels, individuals with prior MI exhibited a more atherogenic LDL profile, with higher sdLDL and smaller particle size, supporting the role of lipoprotein subfractions in assessing residual cardiovascular risk in FH. Funding: PROADI-SUS

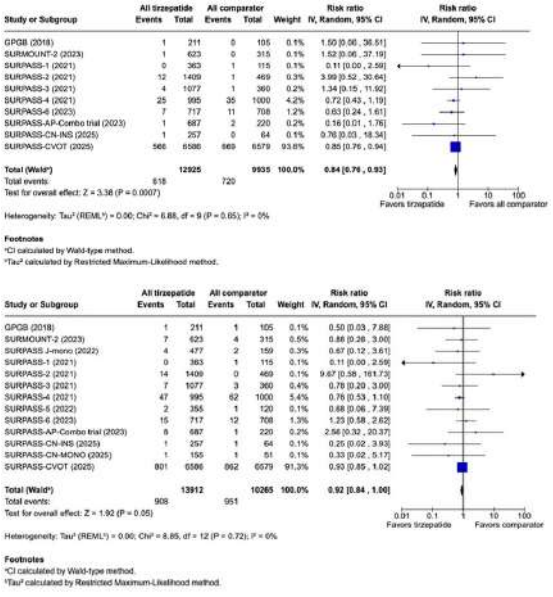
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TIRZEPATIDE REDUCES ALL-CAUSE MORTALITY IN TYPE 2 DIABETES MELLITUS: A SYSTEMATIC REVIEW AND META-ANALYSIS OF 24,177 PATIENTS FROM 13 RANDOMIZED CONTROLLED TRIALS

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Introduction/Background: The efficacy tirzepatide, a dual glucose-dependent insulinotropic polypeptide (GIP) and glucagon-like peptide-1 (GLP-1) receptor agonist, has demonstrated robust improvements in glycemic control and body weight in patients with type 2 diabetes mellitus (T2DM). However, despite its rapidly growing clinical adoption, whether tirzepatide confers meaningful cardiovascular protection beyond its metabolic benefits remains to be established. Objectives: To assess the effects of tirzepatide on major adverse cardiovascular events (MACE) and all-cause mortality in adults with T2DM, compared with placebo or active glucose-lowering therapies. Methods: We performed a systematic review and meta-analysis of randomized controlled trials (RCTs) comparing tirzepatide versus placebo or active glucose-lowering agents in adults with T2DM. PubMed, Embase, and Cochrane Library were searched from inception through February 2026. Risk ratios (RRs) with 95% confidence intervals (CIs) were pooled using random-effects models. Analyses were performed using Review Manager 10.0.1. This study was registered with PROSPERO (CRD420261297683). Resultados e Conclusions: Thirteen RCTs comprising 24,177 patients were included; 13,912 participants (57.5%) received tirzepatide, while controls received placebo (3.2%), long-acting insulin (9.5%), or GLP-1 receptor agonists (29.8%). Tirzepatide was associated with a significant reduction in all-cause mortality compared with control therapies (RR 0.84; 95% CI 0.76–0.93; p=0.0007; I²=0%; Figure 1). No statistically significant difference was observed in MACE (RR 0.92; 95% CI 0.84–1.00; p=0.05; I²=0%; Figure 2), with a point estimate consistently favoring tirzepatide. In this meta-analysis of RCTs, tirzepatide was associated with a significant reduction in all-cause mortality in adults with type 2 diabetes compared with control therapies. No statistically significant difference was observed in MACE.



14486

TRIGLYCERIDE-GLUCOSE INDEX AND ATHEROGENIC INDEX OF PLASMA AS PREDICTORS OF CARDIOVASCULAR RISK: A SYSTEMATIC REVIEW AND QUANTITATIVE SYNTHESIS

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Introduction/Background: The triglyceride-glucose (TyG) index and the atherogenic index of plasma (AIP, log TG/HDL-C) have emerged as low-cost markers integrating insulin resistance and atherogenic dyslipidemia. Their role in cardiovascular risk stratification has gained increasing attention in large population studies. Objectives: To evaluate the association of TyG and AIP with incident and prevalent atherosclerotic cardiovascular disease. Methods: A systematic review was conducted according to PRISMA 2020 and Cochrane recommendations for prognostic factor research. PubMed/MEDLINE was searched from inception to 2025 for cohort studies and meta-analyses evaluating TyG and AIP. Eligible studies included adult populations with reported cardiovascular outcomes and adjusted effect estimates. Study selection and data extraction were performed independently by two reviewers. Pooled estimates were derived from hazard ratios (HR) and risk ratios (RR) using random-effects models. Heterogeneity was assessed using I² statistics, and certainty of evidence was evaluated using GRADE. Resultados e Conclusions: Evidence was derived from large population-based cohorts, including the Atherosclerosis Risk in Communities (ARIC) Study, UK Biobank analyses, Framingham Offspring Study, and the Kailuan cohort, encompassing over 6 million participants. The TyG index showed strong associations with incident coronary artery disease and composite cardiovascular outcomes (n=6,354,990; HR 2.01, 95% CI 1.68–2.40; I²=0%), with consistent effects across populations and follow-up durations. AIP, defined as log(TG/HDL-C), was associated with coronary artery disease (RR per SD 2.10, 95% CI 1.51–2.93; I²=90%) and major adverse cardiovascular events in established disease (RR 1.63, 95% CI 1.44–1.85). Despite heterogeneity in AIP analyses, directionality remained consistent. Certainty of evidence was moderate to high for TyG and moderate for AIP. These indices reflect underlying metabolic dysfunction and provide complementary risk stratification beyond conventional lipid parameters. Their low cost and accessibility support potential integration into clinical practice, although standardization and prospective validation remain necessary.

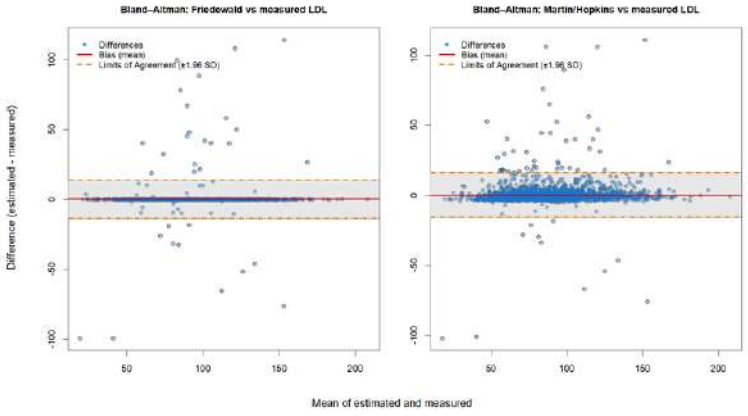
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VALIDATION OF THE FRIEDEWALD AND MARTIN-HOPKINS EQUATIONS AGAINST DIRECT LDL-C MEASUREMENT IN BRAZILIAN ADOLESCENTS

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Introduction/Background: Dyslipidemia in adolescents poses significant cardiovascular risks. Direct measurement is optimal, yet cost-effective alternatives are necessary for broader application. Standard predictive formulas, such as the Friedewald formula, frequently underestimate LDL-C in patients with high triglycerides. The Martin-Hopkins equation provides greater accuracy across a range of triglyceride levels. Nonetheless, research on lipid outcomes in children and adolescents remains limited. Objectives: We aimed to validate LDL-C estimation using the Friedewald and Martin–Hopkins formulas in a large cohort of Brazilian adolescents. Methods: We used data from the São Luís birth cohort, initiated in 1997–1998, with a systematic hospital-based sample (1 in 7 births), totaling 2,493 live births across 10 maternity services. At ages 18–19 (2016–2017), 687 participants from the original cohort were evaluated, and a retrospective expansion added 1,828 adolescents born in 1997 (randomly sampled from the Brazilian National Birth Registry System and also recruited via schools/universities and social media), yielding 2,515 participants overall. Lipid profile parameters were assessed, and LDL-C was estimated using the Friedewald and Martin–Hopkins formulas. These indirect estimates were validated against direct LDL-C measurements, and incorrect and missed dyslipidemia diagnoses were quantified. Agreement between methods was evaluated using Bland–Altman analysis.



Linear association was assessed with Pearson correlation. Mean differences between directly measured and estimated LDL-C were assessed using two-sided paired Student's t-tests with a 95% confidence interval (95%CI). Diagnostic performance for high LDL-C (≥110 mg/dL) was evaluated by calculating sensitivity, specificity, and accuracy for LDL-C classification. Resultados e Conclusions: After excluding 238 adolescents with missing lipid profile data, 2,277 participants aged 18–19 years were analyzed, 51.93% male. Mean directly measured LDL-C was 89.71 ± 26.27 mg/dL, compared with 89.96 ± 26.61 mg/dL by Friedewald and 90.00 ± 26.84 mg/dL by Martin–Hopkins. Mean differences versus direct LDL-C were 0.22 mg/dL (95% CI: −0.07 to 0.51) and 0.26 mg/dL (95% CI: −0.07 to 0.59), respectively. Friedewald showed 98.77% accuracy, 96.92% sensitivity, and 99.23% specificity; Martin–Hopkins showed 96.75%, 94.50%, and 97.31%. Neither differed significantly from direct LDL-C. Both were reliable and cost-effective for adolescent screening.

Psychology



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20949

BEYOND ABSTINENCE: THE ROLE OF A CLINICAL CARE PROGRAM IN SMOKING CESSATION AFTER MYOCARDIAL INFARCTION

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Introduction/Background: Introduction: Smoking is a modifiable risk factor for cardiovascular diseases, such as stroke and acute myocardial infarction (AMI). National data demonstrate an increase in smoking prevalence, reinforcing the need for smoking cessation and secondary prevention strategies. In this context, the role of healthcare institutions in implementing care practices aimed at promoting lifestyle changes is highlighted. This study describes the performance of a multidisciplinary program dedicated to smoking cessation in patients hospitalized after AMI. During hospitalization, patients receive educational guidance, psychological support, and joint evaluation by the medical team regarding supportive pharmacological therapy. After discharge, the program maintains structured telephone follow-up for clinical monitoring and longitudinal support. Objectives: Objective: To describe the outcomes of a multidisciplinary program focused on smoking cessation in patients after acute myocardial infarction. Methods: Methods: Retrospective cohort study conducted at a private hospital in the city of São Paulo, Brazil, between 2024 and February 2026. Data from smoking patients followed during hospitalization and after hospital discharge were analyzed. Resultados e Conclusions: Results: During the study period, 52 smoking patients were followed, corresponding to 20% of the patients monitored by the program. Seven days after discharge, 82.8% were abstinent; at 30 days, 74%; at 180 days, 80%; and after 365 days, 85.7% remained smoke-free. Overall, 79.5% achieved smoking cessation without relapse during follow-up. Among patients who continued smoking, only one did not demonstrate a reduction in tobacco consumption, while all others reduced cigarette use by at least 50%. Regarding supportive resources, 54% did not use adjunctive methods, 38% used pharmacological therapy, 6% underwent psychotherapeutic follow-up, and 1.5% accepted psychological support after discharge. Conclusion: The multidisciplinary program demonstrated favorable outcomes in smoking cessation among post-AMI patients, reinforcing the importance of longitudinal follow-up after hospital discharge. In addition to the high abstinence rate observed over one year, there was also a significant reduction in tobacco consumption among patients who continued smoking. These findings highlight how structured multidisciplinary actions focused on promoting self-care and therapeutic adherence may support sustainable lifestyle changes after myocardial infarction

Sleep Medicine



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18279

ASSOCIATION BETWEEN SLEEP QUALITY AND CARDIOVASCULAR RISK IN UNIVERSITY STUDENTS: A SYSTEMATIC REVIEW OF RECENT EVIDENCE

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Introduction/Background: Sleep quality is a key determinant of cardiovascular health. Growing evidence indicates that sleep deprivation and sleep disorders are associated with metabolic, inflammatory, and hemodynamic alterations, including elevated blood pressure, weight gain, and autonomic dysfunction. Among university students, factors such as academic stress and unhealthy lifestyle behaviors contribute to a high prevalence of poor sleep quality, thereby increasing cardiovascular risk. Objectives: To assess the association between sleep quality and cardiovascular risk in university students through a systematic review of recent evidence. Methods: A systematic review was conducted in accordance with PRISMA guidelines using PubMed, Scopus, and SciELO databases. The search strategy included the descriptors “sleep quality”, “cardiovascular risk”, and “university students”, combined using Boolean operators. Observational studies published between 2023 and 2025, in Portuguese, were included. Eligible studies assessed the association between sleep quality and cardiovascular risk factors, such as blood pressure, body mass index, and metabolic parameters. Following screening of titles, abstracts, and full texts, studies meeting the inclusion criteria were selected for qualitative synthesis. Resultados e Conclusions: The included studies consistently demonstrate a high prevalence of poor sleep quality among university students, which is associated with increased blood pressure, higher body mass index, metabolic disturbances, and elevated stress levels. Sleep deprivation was also linked to autonomic dysfunction, inflammatory processes, and unhealthy lifestyle behaviors. These findings underscore the role of sleep as a relevant modifiable factor in cardiovascular prevention and highlight the need for targeted health promotion strategies aimed at improving sleep quality in this population.

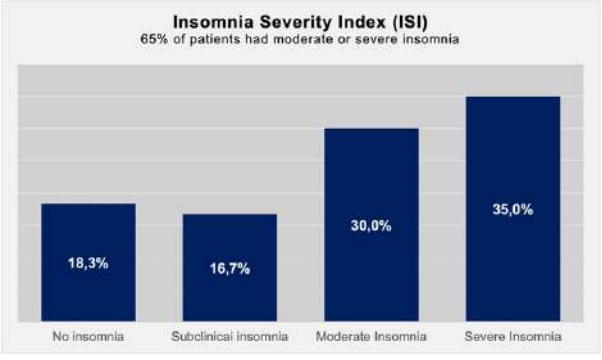
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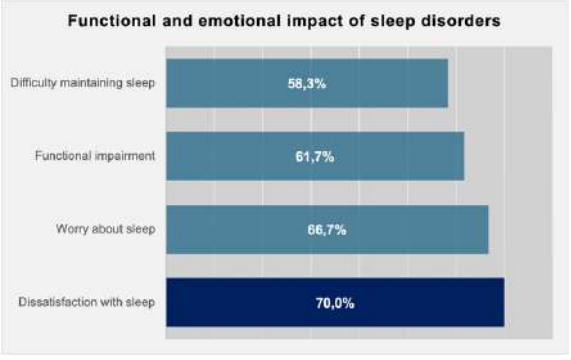
SLEEP DISORDERS IN PATIENTS WITH HEART FAILURE: HIGH FREQUENCY AND CLINICAL UNDERESTIMATION

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Introduction/Background: Sleep disorders are common in patients with heart failure (HF) and are associated with persistent sympathetic nervous system activation, systemic inflammation, poor quality of life, and adverse cardiovascular outcomes. Insomnia and sleep fragmentation may contribute to relevant neurohormonal changes, impacting symptoms, functionality, and clinical prognosis. Despite their cardiovascular relevance, sleep disturbances remain poorly recognized in the routine follow-up of these patients. Objectives: To evaluate the frequency and characteristics of sleep disorders in patients with heart failure. Methods: An observational, descriptive study conducted with outpatients suffering from chronic advanced heart failure. Sleep disorders were assessed using the Insomnia Severity Index, a validated instrument for evaluating insomnia severity and its clinical impacts. The analysis included difficulty initiating and maintaining sleep, early morning awakenings, satisfaction with sleep pattern, functional interference, and concerns related to sleep disturbances. Data were subjected to descriptive analysis. Resultados e Conclusions: A total of 60 patients with HF were evaluated. It was observed that 65% of patients presented moderate or severe insomnia. Severe or very severe difficulty initiating and maintaining sleep occurred in 55% and 58.3% of the sample, respectively, while 73.3% presented moderate to very severe early morning awakenings. Furthermore, 70% reported significant dissatisfaction with their sleep pattern, 61.7% reported significant functional interference related to sleep, and 66.6% were very or extremely concerned about their sleep problems. Sleep disorders are highly prevalent in patients with heart failure, accompanied by significant functional impact and subjective distress. The findings suggest that sleep disturbances represent a frequently underestimated component in the clinical management of this population, potentially contributing to poorer quality of life and cardiovascular dysregulation.





Spirituality and Cardiovascular Medicine



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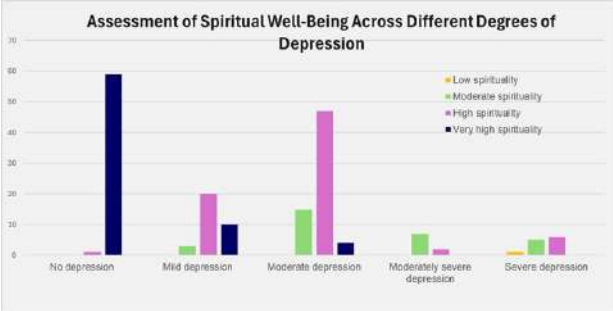
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ELEVATED SPIRITUAL WELL-BEING AND ABSENCE OF DEPRESSIVE SYMPTOMS IN PATIENTS WITH HEART FAILURE: COMPARISON BETWEEN CLINICAL GROUPS

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Introduction/Background: Depressive symptoms are highly prevalent among patients with heart failure and are associated with poorer quality of life, functional limitation, and unfavorable clinical outcomes. Spiritual well-being has been recognized as an important emotional coping resource, particularly in chronic disabling conditions. Dimensions related to hope, inner peace, and meaning in life have been associated with better psychological adaptation and lower emotional distress in this population. Objectives: To evaluate the association between depressive symptoms and spiritual well-being in patients with heart failure. Methods: Observational descriptive study conducted in outpatients with chronic heart failure. Depressive symptoms were assessed using the PHQ-9, and spiritual well-being was evaluated using the WHOQOL-SRPB. Spirituality levels were classified as low, moderate, moderate-high, and high/very high. Domains related to hope, inner peace, and inner spiritual strength were analyzed. Data were submitted to descriptive analysis. Resultados e Conclusions: Sixty patients with heart failure were evaluated. Mild, moderate, or severe depressive symptoms were observed in 66.7% of the sample, with predominance of moderate depression (36.7%). Patients without depressive symptoms presented higher spiritual well-being scores, particularly in domains related to hope and optimism, inner peace, and inner spiritual strength. High scores were observed for hope and optimism (100%), inner spiritual strength (100%), and inner peace (95%) among patients without depressive symptoms. In contrast, patients with depressive symptoms showed predominantly intermediate spiritual well-being scores. In conclusion, patients with heart failure without depressive symptoms presented elevated levels of spiritual well-being, especially in domains related to hope, inner peace, and inner spiritual strength. The findings reinforce the association between positive spiritual resources and better emotional adaptation, highlighting spirituality as a potentially important dimension in clinical management and quality of life in this population.



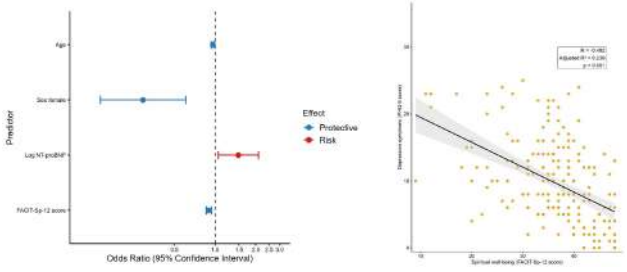
15002

SPIRITUAL WELL-BEING AND DEPRESSION IN PATIENTS WITH DECOMPENSATED HEART FAILURE

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Introduction/Background: Depression is highly prevalent among patients hospitalized with decompensated heart failure and is associated with worse clinical and prognostic outcomes. Although spiritual well-being has been associated with lower depression in chronic cardiovascular conditions, its independent role during acute heart failure hospitalization remains unclear. Particularly it is unknown whether specific spiritual dimensions differentially contribute to depression in this clinical context. Objectives: This study aimed to (1) evaluate whether spiritual well-being independently predicts the presence of depression in patients hospitalized with decompensated heart failure after adjustment for demographic and clinical variables; (2) examine the association between overall spiritual well-being levels and depression severity; and (3) determine the relative contribution of the spiritual well-being dimensions (peace, meaning, and faith) to depression. Methods: This cross-sectional study included 200 patients hospitalized with decompensated heart failure. Depression was assessed using the Patient Health Questionnaire-9 (PHQ-9), and SWB was measured with the Functional Assessment of Chronic Illness Therapy–Spiritual Well-Being scale (FACIT-Sp-12). Multivariable binary logistic regression identified independent predictors of depression, including age, sex, N-terminal pro B-type natriuretic peptide levels, and spiritual well-being. Linear regression examined the association between spiritual well-being and depression severity. A second logistic regression model evaluated the independent contribution of each spiritual well-being dimension. Resultados e Conclusions: The logistic model was statistically significant ($\chi^2(4)= 41.12$; $p < 0.001$), and correctly classifying 77% of cases. Higher spiritual well-being scores were independently associated with lower odds of depression (OR= 0.904; 95%CI:0.863–0.946; $p < 0.001$). Older age was protective, whereas female sex and higher log NT-proBNP levels were associated with increased odds. Spiritual well-being was inversely associated with depression severity ($F(1,198)= 63.33$; $p < 0.001$; adjusted $R^2= 0.239$). Among dimensions, peace and meaning remained significant, whereas faith was not. Conclusions: Spiritual well-being was independently associated with both the presence and severity of depression in patients hospitalized with decompensated heart failure. The dimensions of peace and meaning demonstrated the strongest associations.



21471

SPIRITUALITY, LATENT PSYCHOSOCIAL PROFILES, AND MORBIMORTALITY AMONG HOSPITALIZED ADULTS

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Introduction/Background: Associations between spirituality and clinical outcomes are heterogeneous, often paradoxical, suggesting that spiritual variables may acquire distinct clinical meanings depending on broader psychosocial organization. While spirituality, personality, and mood have traditionally been investigated as isolated domains, theory-based models of subjectivity suggest these dimensions may interact as integrated configurations shaping clinical experience. Objectives: To investigate whether latent psychosocial profiles integrating spirituality, personality traits, and mood states are associated with clinically relevant outcomes in hospitalized adults. Methods: This mixed-methods study included consecutive adults admitted to internal medicine and cardiology wards of a tertiary referral center between December 2018 and August 2019. Participants completed validated measures of spirituality, mood, and personality traits. Latent class analysis was used to identify psychosocial profiles. Medical records were reviewed through July 2021 for intensive care unit (ICU) transfer, in-hospital mortality, and 30-day readmission or mortality. Multivariable models adjusted for sociodemographic variables, comorbidities, functional status, and health-related behaviors. Qualitative–quantitative triangulation explored correspondence between latent profiles and narrative-based subjective positions derived from semi-structured interviews. Resultados e Conclusions: Among 289 participants, three latent psychosocial profiles emerged: spiritualized (60%), characterized by higher spirituality, lower affective distress, and low neuroticism; skeptic (24%), characterized by lower spirituality and intermediate psychological measures; and neurotic (16%), characterized by markedly depressive mood and elevated neuroticism despite average-to-high spirituality. In fully adjusted analyses, the neurotic profile was independently associated with a three-fold increase in morbimortality (OR 2.97; 95% CI 1.0–8.3; p<0.05). Significant correspondence was observed between latent profiles and narrative-based subjective positions. Integrated psychosocial profiling combining spirituality, personality, and mood was independently associated with clinically meaningful outcomes in hospitalized patients. These findings support the relevance of multidimensional psychosocial assessment for patient-centered risk stratification and suggest that distinct subjective organizations may influence clinical trajectories.

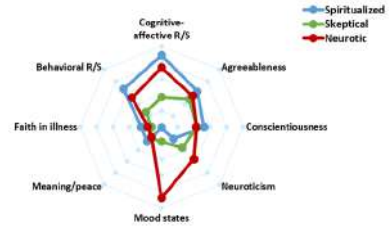


Figure 1. *Radar (spider) chart of the mean scales' scores by psychological traits*

Abbreviations: R/S – religion and/or spirituality

Table 2. *Hierarchical Logistic Regression predicting morbimortality.*

	Block1 OR (95%CI)	Block2 OR (95%CI)	Block3 OR (95%CI)	Block4 OR (95%CI)
Latent traits				
Spiritualized				
Skeptical	.70 (.3-1.5)	1.07 (.5-2.5)	1.16 (.4-3.0)	1.21 (.4-3.4)
Neurotic	1.31 (.6-2.8)	**2.56* (1.1-6.0)**	**3.01* (1.1-8.2)**	**2.97* (1.0-8.3)**
Sociodemographics				
Age		**1.04* (1.0-1.1)**	1.02 (.9-1.1)	1.00 (1.0-1.0)
Women				
(1) Men		1.64 (.8-3.1)	1.01 (.5-2.1)	.98 (.4-2.1)
White				
Mixed race (1)		**2.21* (1.1-4.6)**	2.09* (.9-4.7)	2.35* (1.0-5.6)
Black (2)		2.17 (.8-5.4)	1.86 (.6-5.5)	2.28 (.7-7.1)
Catholic				
No religion (1)		.47 (.2-1.4)	.39 (.1-1.5)	.35 (.1-1.5)
Other (2)		.78 (.3-2.4)	.63 (.2-2.2)	.50 (.1-1.9)
Protestant (3)		1.13 (.5-2.3)	.81 (.4-1.8)	.92 (.4-2.2)
Schooling <12yrs				
Schooling >12yrs (1)		.94 (.5-1.8)	1.06 (.5-2.3)	1.25 (.5-2.9)
Married				
Single (1)		.85 (.3-2.2)	.48 (.2-1.5)	.41 (.1-1.3)
Other (2)		.59 (.5-1.9)	.93 (.4-2.1)	.89 (.4-2.1)
Number of children		.88 (.7-1.1)	.84 (.6-1.1)	.83 (.6-1.1)
Clinical characteristics				
Other diseases				
Cancer (1)			**4.57* (1.5-14.3)**	**4.99* (1.5-16.4)**
CVD (2)			**5.39* (1.6-17.6)**	**6.42* (1.9-21.8)**
Rheumatic (3)			1.36 (.3-5.6)	1.29 (.3-5.6)
Charlson Comorbidity Index			**1.37* (1.1-1.7)**	**1.43* (1.2-1.7)**
Katz functionality Index			.93 (.7-1.2)	.84 (.6-1.1)
Time of diagnosis			.92 (.8-1.0)	.90 (.8-1.0)
Length of hospital stay			**1.03* (1.0-1.1)**	**1.03* (1.0-1.0)**
Hypertension			.79 (.4-1.8)	.91 (.4-2.1)
Health-risk behaviors				
Never smoker				
Former smoker (1)				**3.00* (1.2-7.7)**
Current smoker (2)				1.08 (.3-4.2)
Never/rarely				
Abstinent >1yr (1)				1.15 (.4-3.3)
Alcohol >1mo (2)				**2.59* (1.0-6.4)**
Regular exercise				
Active (1)				1.35 (.5-3.8)
Sedentary (2)				1.41 (.5-3.9)
Sleep 6h or more				
Sleep less than 6h				1.37 (.6-2.9)

Sports Cardiology, Exercise, Ergometry and Cardiovascular Rehabilitation



81º CONGRESSO BRASILEIRO DE CARDIOLOGIA together with WORLD CONGRESS OF CARDIOLOGY





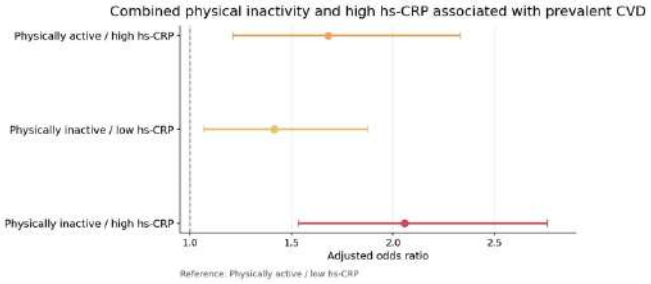
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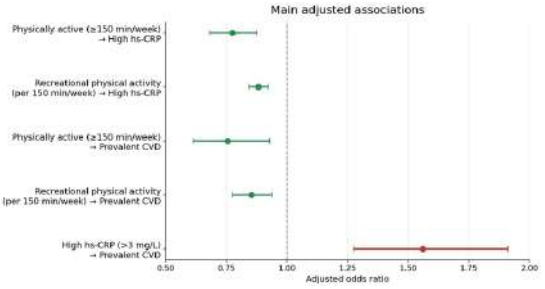
COMBINED PHENOTYPE OF PHYSICAL INACTIVITY AND SUBCLINICAL INFLAMMATION IS ASSOCIATED WITH A HIGHER PREVALENCE OF CARDIOVASCULAR DISEASE: AN ANALYSIS OF NHANES 2015–2016

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Introduction/Background: Subclinical inflammation and low physical activity are both associated with a greater cardiovascular risk. However, the combination of these factors as a marker of a greater burden of cardiovascular disease (CVD) in the general population remains underexplored. Objectives: To evaluate the association between physical activity, high-sensitivity C-reactive protein (hs-CRP), and the prevalence of CVD among adults participating in National Health and Nutrition Examination Survey (NHANES) 2015–2016, with emphasis on the combined phenotype of physical inactivity and elevated hs-CRP. Methods: Cross-sectional study using data from the NHANES 2015–2016. The demographic, blood pressure, physical activity, medical conditions, and hs-CRP components were integrated. Weekly physical activity was estimated from the physical activity questionnaire, and both total moderate-to-vigorous physical activity (MVPA) volume and a binary variable for physically active ≥150 min/week were calculated. Elevated hs-CRP was defined as >3 mg/L. The primary outcome was prevalent composite CVD, defined by self-reported heart failure, coronary artery disease, angina, myocardial infarction, or stroke. Adjusted logistic regression models were used, controlling for age, sex, race, and educational level; in the models assessing CVD, additional adjustment was made for hypertension measured during the examination. Resultados e Conclusions: A total of 9,971 participants were analyzed; mean age was 33.2 years, 50.9% were women, 14.5% had hypertension (≥140/90 mmHg), 28.8% had hs-CRP >3 mg/L, and 11.1% had prevalent composite CVD. Physically active ≥150 min/week was associated with lower odds of elevated hs-CRP (OR 0.773; 95% CI 0.682–0.877; p<0.001) and prevalent CVD (OR 0.754; 95% CI 0.612–0.928; p=0.0078). Recreational physical activity was likewise associated with lower odds of elevated hs-CRP (OR 0.881 per 150 min/week; 95% CI 0.841–0.923; p<0.001) and prevalent CVD (OR 0.852; 95% CI 0.775–0.937; p<0.001). Elevated hs-CRP was independently associated with higher CVD prevalence (OR 1.561; 95% CI 1.275–1.911; p<0.001), and the inactive/elevated hs-CRP group had the highest odds of prevalent CVD compared with the active/low hs-CRP group (OR 2.057; 95% CI 1.533–2.761; p<0.001). Overall, lower physical activity and elevated hs-CRP were independently associated with higher CVD prevalence, and the combined phenotype identified the subgroup with the greatest cardiovascular burden, with potential utility for population-level risk stratification.





19782

Deep learning-estimated electrocardiographic age in athletes: no evidence of training-related acceleration of cardiovascular aging

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Introduction/Background: Artificial intelligence–derived electrocardiographic age (AI-ECG age) has emerged as a biomarker of biological cardiovascular aging, with divergence from chronological age associated with morbidity and mortality. However, whether long-term high-intensity athletic training modifies this relationship remains unclear, particularly in highly trained populations representing extreme physiological adaptation. Objectives: To assess the association between AI-ECG age and chronological age in competitive athletes and to evaluate the influence of training load, cumulative exposure, sleep, and psychological distress on this relationship. Methods: This cross-sectional study included competitive athletes recruited from multiple training centers in Brazil. Participants completed standardized questionnaires assessing demographics, training history, lifestyle factors, and psychological distress (DASS-21). Resting 12-lead ECGs were recorded under standardized conditions and analyzed using a validated deep learning model to estimate biological cardiovascular age. The primary outcome was the ECG age gap (ΔECG-age: predicted minus chronological age). Linear regression models were used to assess associations, with multivariable adjustment for age, sex, weekly training volume, cumulative training years, sleep duration, and DASS-21 scores. Standardized beta coefficients were reported. Resultados e Conclusions: A total of 574 athletes were included (median age 26 years [IQR 22–31]; 62.9% male). Median ΔECG-age was 2.5 years [IQR 2.0–6.4]. In univariable analysis, cumulative years of training were associated with a lower ΔECG-age (β=–0.28, p<0.001). However, after multivariable adjustment, only chronological age remained independently associated with ΔECG-age (β=–0.59, p<0.001). Training load, cumulative exposure, sleep duration, and psychological distress were not independently associated with ECG age acceleration. These findings indicate that deep learning–estimated ECG age is primarily determined by chronological age, with no independent influence of training-related factors, psychological distress, or sleep duration. In competitive athletes, long-term high-intensity training does not appear to be associated with accelerated electrical cardiovascular aging.

17375

ECG INTERPRETATION IN MALE BRAZILIAN FOOTBALL PLAYERS: 2017 VERSUS 2025 INTERNATIONAL CRITERIA

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Introduction/Background: Accurate electrocardiogram (ECG) interpretation in athletes is essential to detect underlying cardiac disease while minimizing false-positive findings. The 2017 International Criteria (IC) improved specificity, but challenges remain, particularly in the interpretation of repolarization alterations. The 2025 IC introduce refinements aimed at further reducing false-positive rates; however, their real-world impact has not been well established. Objectives: To compare the 2017 and 2025 IC for athlete ECG interpretation in a large sample of male Brazilian football players, evaluating their impact on ECG reclassification and the subsequent false-positive rate. Methods: This multicenter, observational study analyzed ECGs from male Brazilian football players undergoing mandatory pre-participation evaluations (February 2002–February 2026). Data were collected from 86 professional clubs across 19 states. All ECGs were initially interpreted using the 2017 IC and then re-evaluated with the 2025 IC. Resultados e Conclusions: A total of 6,866 athletes were included (median [IQR] age, 19 [16–24] years); 2,680 were white, 2,216 mixed-race, and 1,970 black. The 2025 IC reduced abnormal ECG classifications from 260 (3.8%) to 176 (2.6%), representing a relative reduction of 32.3%. This was driven mainly by reclassification of isolated inferior T-wave inversion from abnormal to borderline and of anterior T-wave inversion preceded by J-point elevation and convex ST-segment elevation as normal in non-black athletes. The apparent false-positive rate decreased from 3.6% to 2.4%. No structural cardiac abnormalities were found on echocardiography in reclassified athletes. At a mean follow-up of 5.4 ± 3.3 years, no deaths were reported. The 2025 IC significantly reduce abnormal ECG classifications and false-positive rates in male Brazilian football players compared to the 2017 IC, without missing underlying structural heart disease. These findings support implementing the updated criteria to improve screening efficiency

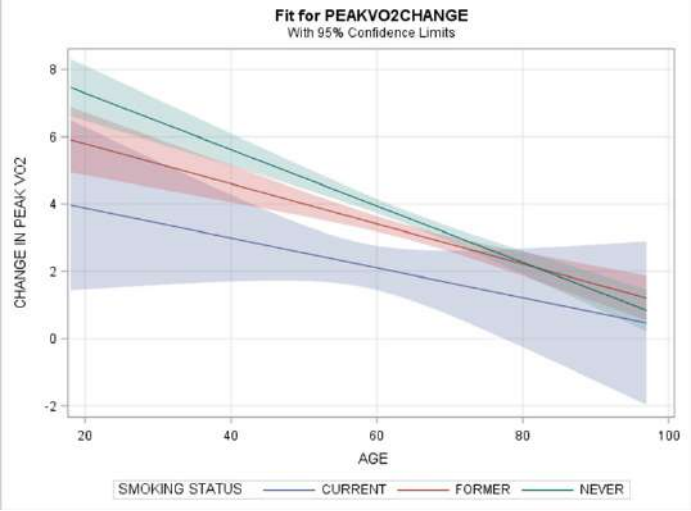
16690

EFFECT OF SMOKING STATUS ON IMPROVEMENT IN CARDIORESPIRATORY FITNESS DURING CARDIAC REHABILITATION

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Introduction/Background: Patients who smoke have high-risk cardiovascular profiles. However, the influence of smoking on gains made during cardiac rehabilitation (CR), such as improvements in cardiorespiratory fitness (CRF), is less understood. Accordingly, we examined improvement in CRF by smoking status within a clinical sample, hypothesizing that current smoking impedes improvement in CRF during CR. Objectives: To examine improvements in cardiorespiratory fitness (CRF) made during cardiac rehabilitation (CR) by smoking status, hypothesizing current smoking impedes improvement in CRF during CR. Methods: Data were obtained from a prospectively collected clinical database at an academic medical center. Individuals were included if data were available on entry and exit peak oxygen uptake (VO2peak, measured during symptom-limited treadmill test) and self-reported smoking status (current, former, or never). Data were extracted on sex, age, body mass index, comorbidity score (severity of exercise-limiting comorbidities) and number of CR sessions completed. Analyses of variance and linear regressions were used to test for associations with changes in VO2peak. Variables with significant associations were entered into multivariable general linear models predicting change in VO2peak. Resultados e Conclusions: The cohort included 2390 individuals (111 currently, 1114 formerly, 1165 never smoking) enrolled January/1996 to December/2023. The current smoking group (compared to former/never) was significantly younger (58.3±10.8 vs. 65.4±10.2 and 64.2±11.2), had higher comorbidity scores (0.8±1.4 vs. 0.6±1.2 and 0.5±1.0), and attended fewer CR sessions (25.3±11.1 vs. 29.5±9.2 and 29.1±9.6). All variables examined, excepting sessions attended, were significantly associated with change in VO2peak, remaining significant in multivariable models. Estimated mean absolute improvement in VO2peak was [LSmean(SE)] 1.6(0.3), 2.8(0.1), and 3.2(0.1) mLO2*kg-1*min-1 in current, former, and never smoking, respectively. By absolute and relative measure, improvement in the current smoking group was significantly less than in former/never (ps<.05, all comparisons). In conclusion, current smoking at CR entry was significantly, independently associated with less improvement in VO2peak during CR.



20791

EFFECTIVENESS, SAFETY, COSTS, AND DELIVERY CONSIDERATIONS OF EXERCISE-BASED CARDIAC REHABILITATION IN LOW- AND MIDDLE-INCOME COUNTRIES: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMISED CONTROLLED TRIALS

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Introduction/Background: Cardiovascular disease, particularly heart disease, remains a leading cause of global mortality and disability, with low- and middle-income countries (LMICs) bearing a disproportionate burden. By 2030. Cardiac rehabilitation (CR) is a cornerstone of heart disease management; however, its availability and supporting evidence in low- and middle-income countries (LMICs) remain limited. Objectives: To conduct an contemporary systematic review and meta-analysis of randomised controlled trials (RCTs) evaluating exercise-based CR undertaken in LMICs in terms mortality, hospitalisation, exercise capacity, health-related quality of life (HRQoL), and mental health outcomes. Methods: We updated a prior systematic review by searching bibliographic databases from May 2020 to June 2025. RCTs of exercise-based CR conducted in LMICs were included. Study quality was assessed using the Cochrane risk of bias tool. Outcomes including mortality, hospitalisation, exercise capacity, HRQoL, and mental health were pooled using random-effects meta-analyses. Safety, cost, and cost-effectiveness data were narratively synthesized. Meta-regression was performed to explore potential effect modifiers, and certainty of evidence was assessed using the GRADE framework. Resultados e Conclusions: Twenty-nine RCTs involving 6,682 participants from central Asia, South Asia, Africa, and South America were included, with majority of studies judged to be at moderate-to-high risk of bias. Compared to exercise control. exercise-based CR significantly improved exercise capacity (SMD 0.71; 95% CI 0.47–0.96; I² = 72%) and was associated with better HRQoL and mental health outcomes. Despite substantial statistical heterogeneity, no evidence of effect modification was observed across trial-level factors, including CR delivery model, exercise dose, follow-up duration, or risk of bias. Only a small amount of data was available for mortality, hospitalisation cost and cost-effectiveness. Gains in exercise functional capacity and HRQoL with exercise-based CR in the LMICs setting appear similar in magnitude to those seen in high income countries. However, need for further high-quality evidence of the impact of CR on clinical events and health economic outcomes in LMICs.

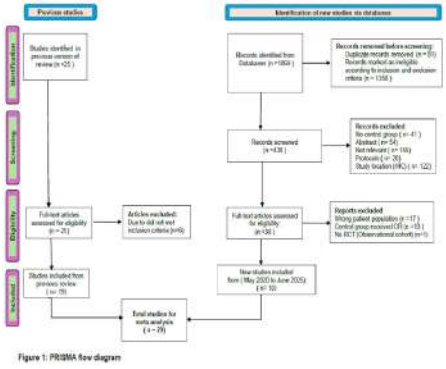


Figure 1: PRISMA flow diagram

Table 1. Summary of study, population, intervention, and control characteristics

	Number of studies (%) or median of study means (range)
Trial characteristics	
Continent	
Central Asia	12 (41%)
South Asia	8 (28%)
Africa	3 (10%)
South America	6 (21%)
Publication date	
2001-2010	5 (17%)
2011-2020	20 (71%)
2021-2025	4 (13%)
Single centre	25 (89%)
Sample size	71 (26 to 3,959)
Follow up (months)	6 (1.5 to 36)
Participant characteristics	
Sex (female)	1369/6489 (21%)
Age (years)	58.8 (50 to 65.2)
Diagnoses	
CHD only	17 (59%)
HF only	8 (28%)
Both CHD and HF	5 (17%)
CR programme characteristics	
Type	
Exercise only	10 (35%)
Comprehensive	19 (65%)
Core Components	
Structured training programme	29 (100%)
Risk factor management	16 (57%)
Psychological counselling	14 (50%)
Setting	
Centre-based	14 (48%)
Home-based	10 (35%)
Hybrid	5 (17%)
Programme length (weeks)	4 to 104
Exercise sessions	
Total number	4 to 104
Duration (min/session)	15 to 75
Frequency (sessions/week)	3 to 7
Length (weeks)	2 to 104
Intensity	
% HRmax	55 to 85%
% VO_2peak	Not consistently reported
RPE	3-7 (0-10)/11-16 (6-20)
Programme funding	
Government/public	10 (33%)
Research	11 (37%)
Private	0 (0%)
Not stated	9 (30%)
Control	
Usual care	25 (88%)
Usual care plus	1 (4%)
No exercise	2 (8%)

RPE: Rate of Perceived Exertion ; VO_2 peak: peak oxygen consumption

17288

ENGAGING CLINICIANS IN DATA-DRIVEN QUALITY IMPROVEMENT: QUALITATIVE INSIGHTS FROM THE QUICR TRIAL

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Introduction/Background: The Quality Improvement in Cardiac Rehabilitation (QUICR) trial implemented a collaborative model to strengthen data use and quality improvement across cardiac rehabilitation services. Objectives: To examine clinician engagement with and perceptions of the QUICR intervention. Methods: Five focus group discussions were conducted with clinicians (n=22) from participating intervention sites. Transcripts were transcribed verbatim and thematically analysed using the COM-B model (Capability, Opportunity, Motivation–Behaviour) to identify the mechanisms influencing engagement. The target behaviour was clinicians' ability to understand and use data to implement small, iterative changes aimed at improving service quality. Resultados e Conclusions: Clinicians reported increased capability to interpret and use data meaningfully. QUICR helped shift data entry from an administrative task to a clinical and reflective activity, with outcome measures supporting patient conversations and identifying service gaps. Many adapted local workflows including modifying forms, adjusting clinic processes, or involving administrative staff to sustain data collection. Opportunity was shaped by strong leadership support, shared workload, and facilitation that provided timely problem solving and encouragement. In-person workshops fostered connection and peer learning. Barriers included time pressure, staffing constraints, and the burden of double data entry across existing systems and REDCap, which competed with clinical priorities. Motivation was reinforced by professional pride, a belief in the value having access to their local data, and ability to collaborate and network with other sites. Motivation declined when organisational recognition was limited, or competing demands underestimated quality improvement efforts. Engagement in data-driven quality improvement was strongest when capability, opportunity, and motivation aligned. Structural barriers most often constrained participation.

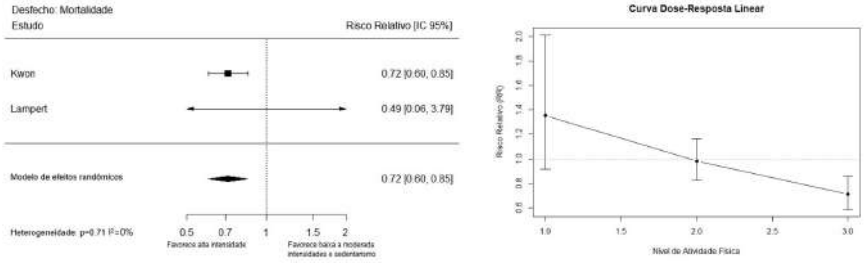
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HIGHER PHYSICAL ACTIVITY IS ASSOCIATED WITH LOWER MORTALITY IN HYPERTROPHIC CARDIOMYOPATHY: A META-ANALYSIS OF OBSERVATIONAL STUDIES

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Introduction/Background: Hypertrophic cardiomyopathy (HCM) affects approximately 1:200–1:500 adults and historically led to exercise restriction due to fear of sudden cardiac death (SCD). Randomized controlled trials (RCTs) evaluating exercise in HCM have generally been small, heterogeneous in design and population, and focused primarily on demonstrating exercise safety—without events of mortality. Although RCTs suggest exercise safety in HCM, they were underpowered to detect mortality differences across exercise intensities. Observational studies with larger samples may better capture real-world outcomes across exercise intensity strata. Objectives: To evaluate the association between exercise intensity and mortality in adults with HCM through a systematic review and meta-analysis of observational studies. Methods: Systematic review registered in PROSPERO (CRD420251005992). PubMed/Medline, Embase, and Cochrane Library were searched from inception to December 2024. Observational studies comparing mortality across different exercise intensity levels in adults with HCM were eligible. Study selection, data extraction, and quality assessment were performed independently by two researchers, with disagreements resolved by consensus. Risk of bias was assessed using ROBINS-I; evidence certainty was graded using GRADE. Resultados e Conclusions: Two observational studies (n=9,326 participants) were included in the meta-analysis. ROBINS-I rated Kwon et al. as low and Lampert et al. as moderate risk of bias. High-intensity exercise was associated with significantly lower mortality compared to low-intensity or sedentary behavior (RR: 0.72; 95% CI: 0.60–0.85; I^2=0%; p heterogeneity=0.71). Across three physical activity strata (low/sedentary, moderate, and high/vigorous intensity), a statistically significant linear dose-response relationship was observed: greater exercise intensity was associated with progressively greater mortality reduction—a finding that, per GRADE criteria, upgraded the certainty of evidence to MODERATE. These findings suggest that, in adults with HCM without high-risk disease features, greater habitual physical activity, compared with low-intensity activity or sedentary behavior, is not associated with excess mortality and may be linked to improved survival. To our knowledge, this is the first meta-analysis on this topic, supporting individualized exercise counseling rather than routine restriction; however, further studies are needed to corroborate these findings.



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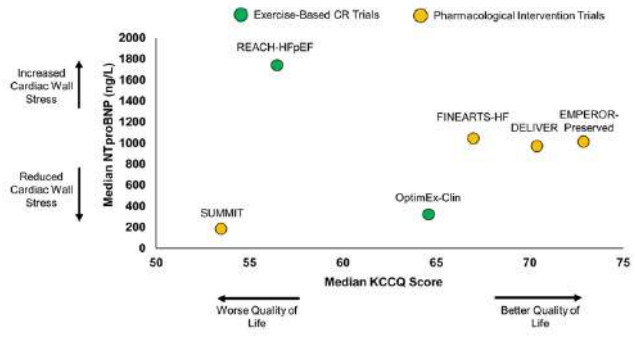
Home-Based Cardiac Rehabilitation in Heart Failure with Preserved Ejection Fraction: The Rehabilitation EnAblement in CHronic HF (REACH-HFpEF) Trial

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Introduction/Background: Exercise intolerance and impaired health-related quality of life (HRQoL) are defining features of heart failure with preserved ejection fraction (HFpEF), which may be improved through exercise-based cardiac rehabilitation (ExCR). REACH-HFpEF (ISRCTN47894539) is a pragmatic randomised controlled trial evaluating the clinical and cost effectiveness of ExCR in patients with HFpEF. Objectives: This late-breaking presentation seeks to provide a report of the primary and secondary outcomes of the REACH-HFpEF trial. Methods: Participants were randomised (1:1) to a home-based REACH-HF ExCR programme plus usual care or to usual care alone across 20 centres in the United Kingdom. The primary outcome is disease-specific HRQoL at 12 months, assessed using the Minnesota Living with Heart Failure Questionnaire (MLwHFQ). Key secondary outcomes include exercise capacity, generic HRQoL, hospitalisations, and mortality. Resultados e Conclusions: Recruitment and randomisation of 392 participants were completed in June 2025. The median age was 79 years, 53% were women, median body mass index was 29.7 kg/m², median left ventricular ejection fraction was 55%, and median plasma N-terminal pro–B-type natriuretic peptide (NT-proBNP) was 1,738 pg/mL. Overall, 65% of participants were in New York Heart Association class II and 35% in class III. The median baseline MLwHFQ total score was 40.0, and the EQ-5D-5L utility score was 0.65. Compared with participants in recent HFpEF trials, those enrolled in REACH-HFpEF were older, had higher NT-proBNP levels, poorer HRQoL, and lower exercise capacity. REACH-HFpEF has enrolled one of the largest and most clinically representative HFpEF populations evaluated in an ExCR trial to date. Participants demonstrate more advanced disease and greater functional impairment than those in previous HFpEF trials, enhancing the clinical relevance and external validity of the findings. This late-breaking presentation will provide the first international report of the primary and secondary outcomes of the REACH-HFpEF trial.





20822

HORMONAL DETERMINANTS OF PHYSICAL PERFORMANCE AND CARDIAC ADAPTATION IN PROFESSIONAL ATHLETES: A CYCLE ERGOMETRY STUDY

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Introduction/Background: Hormonal status (testosterone, cortisol, prolactin) determines the metabolic response to physical stress. Objectives: The aim was to find out the relationship between hormonal status and performance allows for an objective assessment of adaptation depth and maladaptation risk in professional sports. Methods: We analyzed 174 medical records of athletes (75 females, 43%; 99 males, 57%). Statistical analysis of hormonal levels, bioimpedance, cycle ergometry, and echocardiography was performed in R (v. 4.x.x) using Spearman's correlation and regression modeling. Statistical significance was set at $p < 0.05$. Resultados e Conclusions: Mean age was 19.3±2.6 years; athletic career 9.7±3.3 years. Within physiological norms, increased cortisol significantly correlated with lower Peak HR and higher Wmax and VO2max ($p < 0.05$). In males, testosterone showed a significant positive correlation ($r=0.40$, $p < 0.05$) with Peak HR, SV, LVESD, LVEDD, LVEDV, and left ventricular mass index (MMI/BSA). Furthermore, male testosterone positively correlated with total body water and active cell mass ($r=0.41$, $p < 0.05$). In females, testosterone showed no significant correlations; however, prolactin levels were significantly positively correlated ($r=0.45$, $p < 0.05$) with Peak HR, body water, and active cell mass. The testosterone/cortisol (T/C) ratio in males revealed a significant positive correlation ($r=0.48$, $p < 0.05$) with lean body mass, total water, SV, and integral performance, while showing a negative correlation ($r=-0.39$, $p < 0.05$) with heart rate recovery post-exercise. Conclusion: Elevated cortisol within normal ranges enhances cardiac efficiency. Testosterone in males plays a key role in "athlete's heart" formation and physiological hypertrophy, increasing stroke efficiency. In female athletes, prolactin primarily performs the anabolic role. The T/C ratio serves as an integral marker of anabolic/catabolic balance and stress resistance, providing an assessment of the energy supply for athletic performance.

16055

INTRADIALYTIC RESISTANCE TRAINING IMPROVES QUADRICEPS MUSCLE STRENGTH AND FUNCTIONAL CAPACITY IN PATIENTS WITH CHRONIC KIDNEY DISEASE: A SINGLE-CENTER QUASI-EXPERIMENTAL STUDY

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Introduction/Background: Patients with chronic kidney disease (CKD) undergoing hemodialysis (HD) often present musculoskeletal impairments that lead to reduced functionality. Intradialytic exercise may be a strategy to improve functional performance. Objectives: To evaluate the effect of intradialytic resistance training on the functionality of patients with CKD on HD. Methods: This quasi-experimental study (Brazilian Registry of Clinical Trials, RBR-46kd834) where patients were allocated by convenience (one shift was selected for protocol implementation) to a training group (TG) and a control group (CG). The TG completed an 8-week protocol (3 times/week) during the first hour of hemodialysis, using ankle weights, elastic bands, and a overball. The CG received no intervention. Outcomes were assessed before (pre) and after (post) the protocol using the 6-Minute Walk Test (6MWT), the 30-Second Sit-to-Stand Test (30s-STS), and dominant lower-limb isometric dynamometry. Data are presented as mean±standard deviation and absolute and relative frequencies. Generalized estimating equations (GEE) were used on analysis with $p \leq 0.05$ (SPSS v21.0). Resultados e Conclusions: Twenty-four patients participated, 12 in the TG (58.3% men; 59±13 years) and 12 in the CG (58.3% men; 52.5±15 years). Regarding medication use, all patients in both groups were using erythropoietin. Only the TG showed improvement after the protocol in 6MWT distance ($\Delta=46.8$ m; $p=0.01$), number of repetitions in the 30s-STS ($\Delta=2.8$ repetitions; $p=0.05$), and dominant quadriceps isometric strength ($\Delta=1.9$ kgf; $p=0.04$). The CG showed no post-study changes in functional capacity ($\Delta=-26.8$ m; $p=0.15$), 30s-STS ($\Delta=-0.4$ repetitions; $p=1.00$), or dominant quadriceps isometric strength ($\Delta=-2.3$ kgf; $p=0.57$). No differences were identified between groups at the end (post) of the study for the analyzed functional variables. Eight weeks of intradialytic resistance training improved lower-limb muscle strength and functional capacity in patients with CKD undergoing hemodialysis.

20238

LEFT VENTRICULAR REMODELLING IN ADOLESCENT ATHLETES OF DIFFERENT SPECIALISATIONS

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Introduction/Background: The larger left ventricular dimensions in athletes, compared to the general population, have long been well established among sports physicians. However, the wide variety of sports with different types of physical loads makes it difficult to understand the adequacy of cardiac remodelling in each individual case — especially in adolescents actively engaged in sports. Objectives: We examined 5650 athletes aged 12–18 years (mean age 16.62 ± 1.83 years). Anthropometric data: height 172.01 ± 11.52 cm, weight 63.02 ± 14.61 kg, body surface area (BSA) 1.74 ± 0.24 m². All athletes had been training for at least 3 years, with a frequency of 4–5 times per week for 2–3 hours per session. All participants were members of national or regional teams. The cohort included 2 429 females (42.9 %) and 3 221 males (57.0 %). Methods: Echocardiography was performed using a Vivid E90 ultrasound system. Types of LV remodelling were classified according to the guidelines by Lang R.M. (2015). Resultados e Conclusions: Among the 5 650 athletes under 18 years: 96.56 % (5 456 athletes) showed no LV remodelling, and 3.43 % (194 athletes) had LV remodelling: 62 females (32.9 %) and 132 males (68.1 %). These groups did not differ significantly in age (p=0.92), height (p=0.85), or weight (p=0.86). Types of remodelling identified: Concentric remodelling group (53.1%, 103 athletes) aged 12–18. Eccentric hypertrophy (46.9 %, 91 athletes) aged 14–18. Athletes with remodelling were divided into 4 groups according to the classification by Pelliccia A. et al. (2018), which includes four main categories of sports discipline: skills, strength , mixed qualities, endurance. Concentric remodelling distribution: strength training: 32 % (33 athletes); skill training: 28 % (29 athletes); endurance training: 21 athletes (20.4 %); mixed qualities: 20 athletes (19.4 %). The distribution of concentric remodelling across groups showed no statistically significant differences (x^2=4,61). Eccentric hypertrophy distribution: endurance sports 55 % (50 athletes); mixed qualities 25 % (23 athletes); strength: 14 % (13 athletes); skills: 6 % (5 athletes). Conclusion: The overall frequency of left ventricular remodelling among adolescent athletes was 3.8 %. Concentric remodelling occurred in athletes as young as 12 years and was observed across all sports specialisations. In contrast, eccentric hypertrophy was more common in athletes older than 14 years, particularly those engaged in high intensity endurance training.

19740

MAPPING THE ATHLETE'S HEART: A SYSTEMATIC REVIEW AND META-ANALYSIS OF ELECTROCARDIOGRAPHIC FINDINGS IN 224,606 ATHLETES

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Introduction/Background: The 12-lead electrocardiogram (ECG) is central to pre-participation cardiovascular screening in athletes. Although contemporary interpretation criteria have improved diagnostic accuracy, distinguishing physiological adaptations from pathological findings associated with sudden cardiac death (SCD) remains complex in specific scenarios. Robust, large-scale estimates of ECG findings in competitive athletes are still lacking. Objectives: To estimate the pooled prevalence of ECG findings in competitive athletes through a systematic review and meta-analysis. Methods: A systematic literature search was conducted in January/2026 across Medline, Embase, Web of Science, Cochrane, and 57 additional databases. Studies reporting 12-lead resting ECG data in competitive athletes were included. Two reviewers independently screened the records and extracted data, and a third author resolved any discrepancies. Pooled prevalence estimates were calculated using random-effects models. Statistical analysis was conducted using R software version 3.6.2 (R Foundation for Statistical Computing, Vienna, Austria) with the "metafor" package. Resultados e Conclusions: A total of 175 studies including 224,606 athletes (mean age 21.5 ± 4.3 years; 48.8% men) were analyzed. Physiological ECG patterns predominated. The most frequent findings were sinus bradycardia (37.2% [95% CI 30.9–43.9]), early repolarization abnormalities (31.6% [95% CI 24.2–40.0]), sinus arrhythmia (22.2% [95% CI 14.3–32.7]), left ventricular hypertrophy (19.9% [95% CI 15.8–24.7]), and incomplete right bundle branch block (13.1% [95% CI 10.6–16.1]). In contrast, ECG findings associated with inherited arrhythmia syndromes or cardiomyopathies were rare, including long QT interval (0.5% [95% CI 0.3-0.7]), ventricular pre-excitation (0.3% [95% CI 0.2-0.4]), Brugada type 1 pattern (0.2% [95% CI 0.1-0.4]), and pathological Q waves (0.5% [95% CI 0.3-0.7]). ECG findings in competitive athletes are predominantly physiological, with low prevalence of abnormalities associated with SCD. These results provide the most comprehensive prevalence estimates to date and reinforce the importance of athlete-specific ECG interpretation criteria to improve screening accuracy.

18459

STRUCTURAL CARDIOTOXICITY IN ANABOLIC-ANDROGENIC STEROID USERS: A CASE SERIES FROM A TERTIARY OUTPATIENT CLINIC

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Introduction/Background: Indiscriminate use of anabolic-androgenic steroids (AAS) is associated with potentially irreversible deleterious effects on the cardiovascular system. Data from specialized outpatient settings in Brazil remain scarce. Objectives: : To describe the clinical profile and structural cardiac abnormalities in a cohort of AAS users followed at a specialized tertiary outpatient clinic. Methods: Descriptive case series of patients followed at a specialized tertiary outpatient clinic from 2023 to 2026. Assessments included demographic data, comorbidities, substances used, gonadal axis evaluation, transthoracic echocardiography (TTE), and cardiac magnetic resonance (CMR) when clinically indicated. Data expressed as means ± SD and proportions. Resultados e Conclusions: Fifty-one AAS users were evaluated (50 male, 1 female), mean age 42.5 ± 10.1 years (range 22–67). Active users: 36/51 (70,6%); former users: 15/51 (29.4%). Trenbolone use: 16/51 (31.4%). Gonadal axis suppression: 23/33 evaluated (69.7%). TTE was abnormal in 15/32 evaluated patients (46.9%); left ventricular ejection fraction (LVEF) below 50% in 5/33 (15.2%); mean interventricular septum 10.0 ± 1.9 mm (n=31). CMR was performed in 20 patients and was abnormal in 18 (90.0%); late gadolinium enhancement (LGE) indicating myocardial fibrosis was detected in 14/20 (70.0%) and T1 mapping abnormalities in 10/20 (50.0%). Systemic hypertension: 9/51 (17.6%); renal disease: 7/44 evaluated (15.9%). These findings demonstrate a high burden of structural cardiotoxicity in a young cohort (mean 42.5 years), with CMR detecting myocardial fibrosis in 70% of evaluated patients. AAS use is associated with significant structural cardiac damage, and systematic cardiovascular screening including CMR should be considered in this population.



TABLE 1

Baseline characteristics and cardiovascular assessment of AAS us

Data expressed as mean ± standard deviation or n/N evaluated (%). AAS = an
ejection fraction; IVS = interventricular septum; CMR = cardiac magnetic reson

Variable
DEMOGRAPHICS
Age, years †
Age range, years
Sex (male)
AAS USE PATTERN
Active users
Former users
Trenbolone use
HORMONAL AXIS
Gonadal suppression
ECHOCARDIOGRAPHY
Abnormal TTE
LVEF < 50%



17286

THE INTERNATIONAL COUNCIL OF CARDIOVASCULAR PREVENTION AND REHABILITATION (ICCPR'S) 2025 GLOBAL CARDIAC REHABILITATION AUDIT UPDATE: SERVICE COVERAGE AND DELIVERY

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Introduction/Background: Cardiac rehabilitation (CR) is a guideline-recommended model of secondary prevention, yet it remains under-used. In 2016, the International Council of Cardiovascular Prevention and Rehabilitation (ICCPR) conducted a first-of-its-kind global Audit to characterize the availability and delivery of CR worldwide. Objectives: To provide an updated assessment of global CR since ICCPR's 2016 Audit, examining service availability, coverage, and shortfalls; referral; staffing; program dose; core components; and alternative delivery models. Methods: Cross-sectional, observational Audit update. Program-level data were collected from May-September 2025 via REDCap. CR need was estimated using annual ischemic heart disease incidence (Global Burden of Disease Study; 2023), with adjustment for early morbidity. CR service coverage (capacity/need%) and shortfall (capacity-need) and were computed. Resultados e Conclusions: Of 7,025 programs in 113/195 (57%) countries with CR globally, coverage was 2.5% of need globally (lowest in Africa and Western Pacific). The annual CR service shortfall was 7,476,390 patients/year (median=4,936 patients/country), being the greatest in UMICs (India, China). CR availability increased most in Africa (17%-32% of countries) and the Western Pacific (43%-61%), but increased only 2% globally since 2016. 1,505 (62% median program response rate/country) programs initiated a survey from 90 (80%) countries with CR. Of programs with an inpatient cardiology service, 62% referred patients before discharge, with a bedside discussion. Programs were comprehensive, offering a median of 8 core components (P25-P75=6-10), with UMICs offering significantly more (p<.001). CR continued to be delivered by a multidisciplinary team of 7 (median, P25-P75=5-8; cardiology, nursing, physiotherapy, dietetics most common); physician specialty varied. Centre-based programs prescribed a median of 20 hours/patient/program (IQR 12-30; mean=2 sessions/week over 8 weeks). Globally, in 65 (72%) countries with CR, programs prescribed a median ≥12 sessions/program. 285 (31.1%) programs in 57 countries reported alternative/hybrid models were available. Major gaps in CR availability and access persist globally. Coordinated strategies to scale and resource delivery are needed.

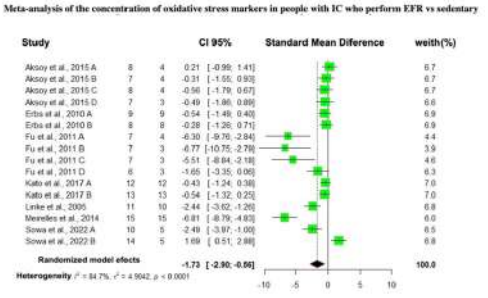
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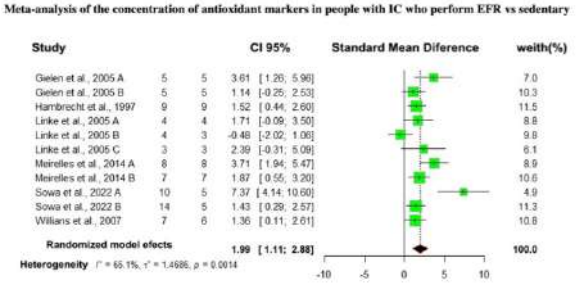
THE REGULAR PRACTICE OF PHYSICAL EXERCISE AS AN INFLUENCING FACTOR ON SERUM CONCENTRATIONS OF OXIDATIVE STRESS AND ANTIOXIDANT MARKERS: A SYSTEMATIC REVIEW WITH META-ANALYSIS OF RANDOMIZED CLINICAL TRIALS

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Introduction/Background: Heart failure (HF) is a major public health issue in Brazil, marked by high prevalence, incidence, and mortality. Regular physical exercise (RPE), a key non-pharmacological therapy, improves clinical outcomes. Because oxidative stress contributes to cardiac remodeling and exercise enhances antioxidant defenses, this meta-analysis examined the association between RPE and oxidative/antioxidant markers in HF. Objectives: To evaluate whether regular physical exercise (RPE) demonstrates positive functional and structural effects in the management of heart failure (HF), as well as in the modulation of free radicals and antioxidants, given that tissue injury is an important factor in the pathophysiology of HF and oxidative stress (OS) is a key component. This study aims to assess whether RPE in HF conditions is associated with changes in oxidative and antioxidant markers. Methods: A systematic review with meta-analysis of randomized clinical trials was conducted, including an intervention group of adults with HF who practiced RPE (n = 225), compared with a control group of sedentary patients with HF (n = 166). Six databases were searched: Excerpta Medica Database (Embase), US National Library of Medicine (PubMed), Virtual Health Library (VHL), Register of Controlled Trials (Cochrane), Scientific Electronic Library Online (SciELO), and Latin American and Caribbean Health Sciences Literature (LILACS), up to January 31 of 2026, totaling 1,321 records. Resultados e Conclusions: This review included randomized trials comprising a total of 391 patients from 10 randomized controlled clinical trials. The meta-analysis demonstrated that RPE potentially reduces oxidative markers such as IL-6, MPO, TNF-α, LPO, TBARS, ICAM-1, VCAM-1, MDA-LDL, and ROS, with a weighted mean difference (WMD) of -1.73 (-2.9; -0.56), as well as increases antioxidant markers such as SOD, CAT, CcO, COX, GPX, Pon1, and MAPR, with a WMD of 1.99 (1.11; 2.88). However, most studies included in the meta-analysis had a high risk of bias, mainly due to unreported randomization methods, resulting in a “very low” certainty of evidence according to the GRADEPro system. This suggests the need for further studies with clearly explained randomization criteria and better-established intention-to-treat analyses. Patients with HF who participated in RPE programs may potentially show a reduction in oxidative markers and an increase in antioxidant markers, although the certainty of the evidence remains “very low.”





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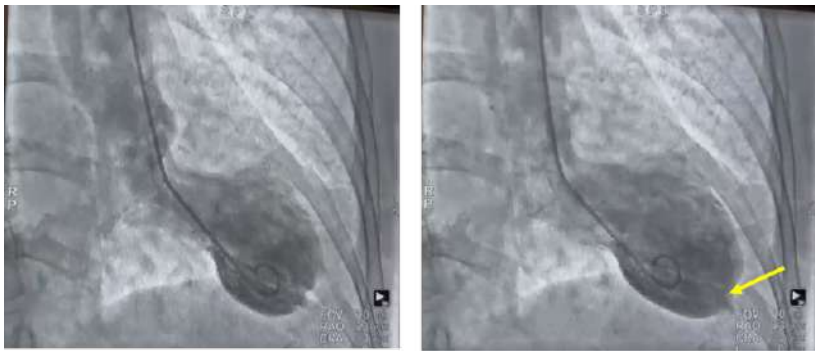
15916

ACLS COURSE AS AN UNUSUAL TRIGGER FOR TAKOTSUBO SYNDROME – A CASE REPORT

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Introduction/Background: Takotsubo cardiomyopathy is an acute cardiac syndrome characterized by transient left ventricular (LV) dysfunction. It occurs in the absence of obstructive coronary artery disease, and predominantly affects postmenopausal women. It is mostly precipitated by emotional or physical stress. Its occurrence in the context of medical stress related simulation, like the ACLS course, remains underreported. Objectives: The aim of this case report is to highlight the potential of ACLS training as a trigger for Takotsubo Syndrome. Methods: CASE REPORT A 68-year-old asymptomatic female physician, with no prior cardiovascular history, presented with chest pain and presyncope during ACLS session. Hemodynamically stable, baseline EKG showing ST segment elevation in the anterior leads. A coronary angiography showed normal epicardial coronary arteries, however ventriculography changes raised suspicion of Takotsubo Syndrome. High levels of Troponin (6.191 ng/ml) and NT Pro BNP (1.750 pg/ml); hypokinesis of the mid-apical region of the LV, moderate global LV dysfunction, EF of 44%, and reduced LGS, at -12 in the echocardiogram. Cardiac magnetic resonance revealed moderate global systolic dysfunction and segmental contractile deficit. Myocardial edema and late gadolinium enhancement of a non-ischemic pattern were observed in the anterior, anteroseptal, anterolateral segments and at the apex of the LV, consistent with the suspected diagnosis. Resultados e Conclusions: Inpatient treatment for acute heart failure was instituted. She remained asymptomatic after discharge, continuing with Dapagliflozin 10 mg, Enalapril Maleate 5 mg, and Bisoprolol 2,5 mg, under outpatient follow-up, with improvement and regression to normal clinical, laboratory, and functional parameters after 6 month Heart dysfunction in this syndrome causes the affected LV to take on a shape similar to a “Takotsubo - octopus fishing pot”. The pathophysiology comprises the excess of catecholamines released in stressful situations, triggering coronary vasospasm, direct myocardial toxicity, and temporary reversible myocardial dysfunction. Clinical presentation includes chest pain, acute heart failure, electrocardiographic changes, elevated enzymes, and abnormalities in imaging studies.



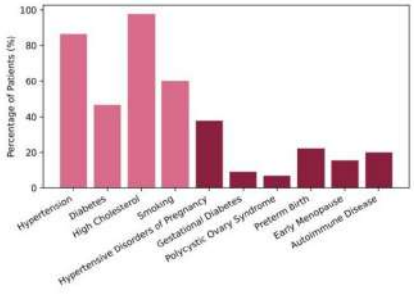
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ASSOCIATION OF NON-CLASSICAL AND PSYCHOSOCIAL RISK FACTORS IN WOMEN WITH CORONARY ARTERY DISEASE: DESCRIPTIVE ANALYSIS

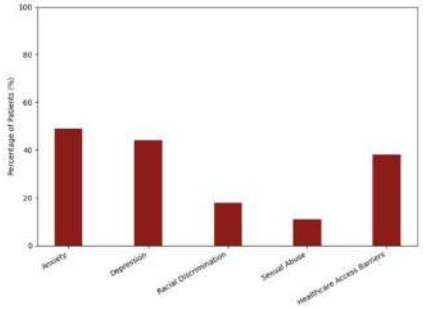
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Introduction/Background: Coronary artery disease (CAD) remains one of the leading causes of cardiovascular morbidity and mortality in women. While classical risk factors like hypertension, hyperlipidemia, and smoking are well-documented, emerging evidence highlights the significant role of non-classical risk factors, especially those unique to women, in elevating lifetime cardiovascular risk. Notably, hypertensive disorders of pregnancy (HDP), gestational diabetes mellitus (GDM), and autoimmune diseases are key contributors to the increased risk of CAD in women. Additionally, mental health disorders, particularly anxiety and depression, have been closely linked to a higher risk of cardiovascular events, underscoring the role of psychosocial factors in heart disease not included in traditional scores. Objectives: To determine the prevalence of non-classical cardiovascular risk factors, female-specific conditions, and psychosocial determinants in women with a prior diagnosis of CAD. Methods: Observational, cross-sectional study with descriptive analysis including 45 women aged over 18 years with a prior diagnosis of CAD, defined as ≥50% atherosclerotic coronary stenosis confirmed by invasive coronary angiography or coronary computed tomography angiography in the evaluation of stable angina. Data were collected through structured questionnaires assessing non-classical cardiovascular risk factors, female-specific conditions, and under-recognized psychosocial determinants. Resultados e Conclusions: Among the 45 women with a prior diagnosis of CAD, psychosocial risk factors were highly prevalent, including anxiety (48.9%), depression (44.4%), and barriers to healthcare access (37.8%). Racial discrimination and sexual abuse were reported by 17.8% and 11.1%, respectively. Among female-specific factors, hypertensive disorders of pregnancy were the most common (37.8%), followed by preterm birth (22.2%) and autoimmune diseases (20.0%). Other conditions included early menopause (15.6%), gestational diabetes mellitus (8.9%), and polycystic ovary syndrome (6.7%). Moreover, traditional cardiovascular risk factors were also highly prevalent, particularly high cholesterol (97.8%), hypertension (86.7%), smoking (64.4%), and diabetes (46.7%). In conclusion, these findings suggest that cardiovascular risk assessment in women should be broadened beyond traditional factors, supporting a more comprehensive and sex-specific approach to risk stratification and prevention.



Graphic 1: Typical and atypical risk factors in patients with CAD



Graphic 2: Psychosocial factors in patients with CAD

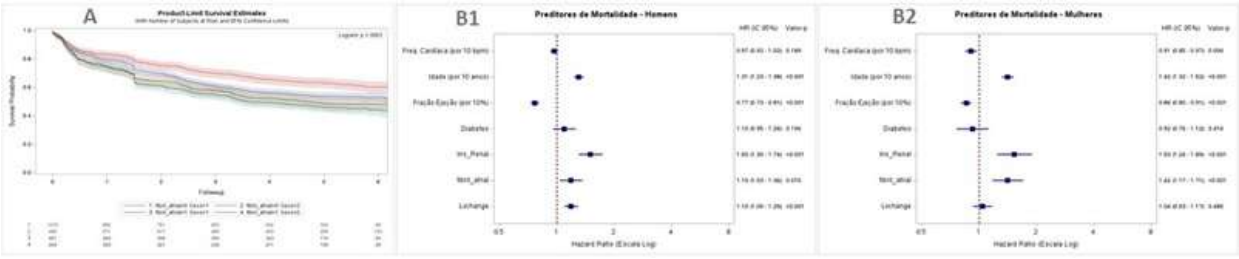
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ATRIAL FIBRILLATION ABOLISHES THE FEMALE SURVIVAL ADVANTAGE IN HEART FAILURE

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Introduction/Background: Heart failure (HF) is associated with high morbidity and mortality. Persistent atrial fibrillation (AF) adds further risk in these patients. However, sex differences in prognosis remain limited. Objectives: To analyze sex differences in the prognosis of HF with and without AF. Methods: We analyzed, from February 2017 to January 2024, mortality and predictors of all-cause death in 2,817 patients with HF, 61% men, and 38% had AF. Baseline data included clinical features and echocardiographic findings, which included left ventricular ejection fraction (LVEF) change. We used the Kaplan-Meier (K-M) and Cox proportional hazards models to analyze mortality rates. The model's validity was verified using the Schoenfeld residual test (Supremum Test). Resultados e Conclusions: Mortality was higher in presence of AF (53% vs. 47%; p < 0.001). The K-M curve showed a significant difference in 6-year survival by AF status and sex (p < 0.0001). Among patients without AF, survival was higher in women (61% vs. 53%; p = 0.032), but the presence of AF equalized mortality between sexes (women: 48% vs. men: 44%; p = 0.272) (Figure A). In men, multivariate Cox analysis revealed that kidney disease (KD), age, AF, and worsening LVEF were associated with worse prognosis. In women, predictors of mortality were age, KD, and AF. LVEF exhibited a time-dependent effect; although initially protective (HR: 0.78 at baseline), temporal interaction (p = 0.005) indicates that this benefit progressively attenuates over the follow-up period (Figure B1, men; B2, women). Conclusion: Atrial fibrillation markedly worsens prognosis in patients with heart failure and appears to abolish the survival advantage observed in women without AF. These findings highlight AF as a key modifier of sex-related HF prognosis.



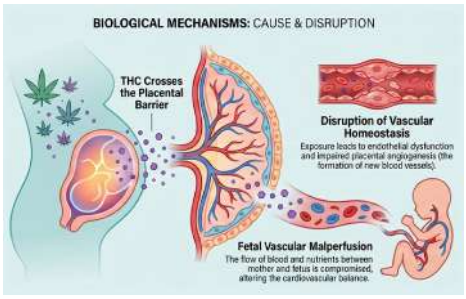
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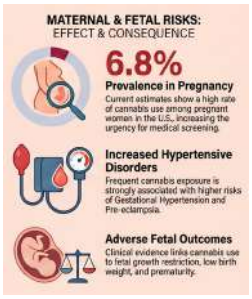
CANNABIS USE DURING PREGNANCY AND RISK OF HYPERTENSIVE DISORDERS: ASSOCIATION WITH GESTATIONAL HYPERTENSION AND PRE-ECLAMPSIA

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(1) UNIVERSIDADE FEDERAL DA GRANDE DOURADOS - DOURADOS - MS - BRASIL; (2) UNIVERSIDADE FEDERAL DE MATO GROSSO DO SUL - CAMPO GRANDE - MS - BRASIL;

Introduction/Background: Cannabis use during pregnancy is increasingly common and represents the most frequently used psychoactive substance during gestation, with an estimated prevalence of 6.8% (95% CI 4.9–9.3) among pregnant women in the United States. Delta-9-tetrahydrocannabinol (THC) crosses the placental barrier and may impair maternal–fetal vascular homeostasis through mechanisms including endothelial dysfunction, impaired placental angiogenesis, and fetal vascular malperfusion. These alterations may contribute to hypertensive disorders of pregnancy. Objectives: To systematically evaluate the association between cannabis exposure during pregnancy and hypertensive disorders of pregnancy, particularly gestational hypertension and pre-eclampsia, emphasizing placental vascular dysfunction and maternal–fetal cardiovascular outcomes. Methods: This systematic review was conducted according to PRISMA Statement 2020 guidelines and guided by a PECO framework. A systematic search of the PubMed/MEDLINE database was performed using the descriptors "Cannabis," "Marijuana Use," "Pregnancy," "Gestational Hypertension," and "Pre-eclampsia," combined with Boolean operators AND/OR. Observational studies evaluating cannabis exposure during pregnancy and hypertensive disorders of pregnancy were considered eligible. Two independent reviewers performed study screening and data extraction, with disagreements resolved by consensus. Methodological quality was assessed using the Newcastle–Ottawa Scale. A total of 204 studies were initially identified; after screening and eligibility assessment, 20 studies were included, comprising cohort studies, meta-analyses, and placental histopathological investigations. Resultados e Conclusions: The reviewed evidence demonstrated an association between cannabis exposure during pregnancy and increased risk of gestational hypertension and pre-eclampsia. Frequent exposure was associated with greater maternal vascular risk. Placental abnormalities, fetal vascular malperfusion, prematurity, fetal growth restriction, and low birth weight were also observed. Conclusions: Cannabis exposure during pregnancy may represent a maternal cardiovascular risk factor associated with hypertensive disorders and adverse maternal–fetal outcomes. Prenatal screening, counseling, and cessation interventions should be incorporated into prenatal care.





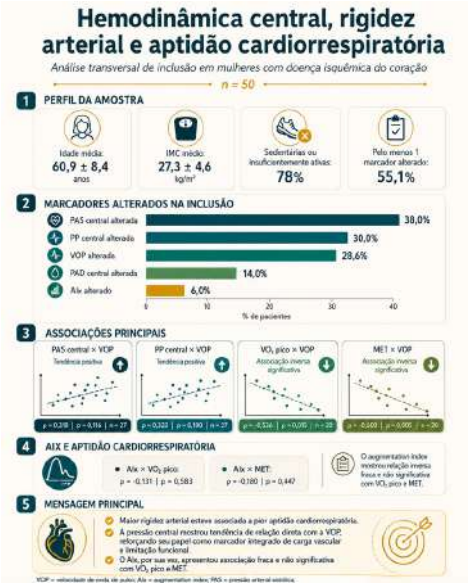
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CENTRAL HEMODYNAMICS, ARTERIAL STIFFNESS AND CARDIORESPIRATORY FITNESS IN WOMEN WITH ISCHEMIC HEART DISEASE: A BASELINE CROSS-SECTIONAL ANALYSIS

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Introduction/Background: Central blood pressure, pulse wave velocity (PWV) and augmentation index (AIx) may provide additional information beyond peripheral blood pressure in women with ischemic heart disease. However, the relationship between these vascular markers and cardiorespiratory fitness remains to be better defined Objectives: To evaluate the baseline association between central hemodynamic parameters, arterial stiffness and cardiorespiratory fitness in women with ischemic heart disease enrolled in a cardiac rehabilitation study Methods: This was a baseline cross-sectional analysis including 50 women with ischemic heart disease. Central systolic blood pressure, central diastolic blood pressure, central pulse pressure, PWV and AIx were obtained by oscillometric pulse wave analysis. Cardiorespiratory fitness was assessed by peak oxygen uptake (VO_2 peak) and metabolic equivalents (METs) during exercise testing. PWV, AIx and central blood pressure were classified according to age- and sex-specific reference values, using the 90th percentile as the upper limit of normality. Associations were assessed using Spearman correlation Resultados e Conclusions: Mean age was 60.9 ± 8.4 years and mean body mass index was 27.3 ± 4.6 kg/m². At baseline, 30.0% of participants had abnormal PWV, 38.0% had elevated central systolic blood pressure, 30.0% had elevated central pulse pressure and 56.0% had at least one abnormal central hemodynamic or arterial stiffness marker. PWV was positively correlated with age (ρ = 0.689; p < 0.001), central systolic blood pressure (ρ = 0.449; p = 0.001) and central pulse pressure (ρ = 0.529; p < 0.001). Conversely, PWV was inversely correlated with VO_2 peak (ρ = -0.360; p = 0.024) and METs (ρ = -0.394; p = 0.013). AIx showed weak and non-significant inverse correlations with VO_2 peak (ρ = -0.131; p = 0.583) and METs (ρ = -0.180; p = 0.447). Conclusions: In women with ischemic heart disease, greater arterial stiffness, expressed by PWV, was associated with higher central hemodynamic load and lower cardiorespiratory fitness. Although AIx showed a numerical trend toward lower VO_2 peak and METs, this association was not statistically significant. These findings suggest that PWV may be a more robust marker than AIx for integrating vascular aging, central hemodynamic burden and functional limitation in this population.



14523

CLINICAL AND EPIDEMIOLOGICAL PROFILE OF PATIENTS WITH PREGNANCY HYPERTENSIVE EMERGENCIES AT A MATERNITY HOSPITAL IN LUANDA, ANGOLA.

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Introduction/Background: Hypertensive disorders of pregnancy remain one of the leading causes of maternal morbidity and mortality worldwide, particularly in Sub-Saharan Africa, where prevalence rates exceed global averages and are frequently associated with severe maternal complications. Objectives: To study the clinical and epidemiological profile of pregnant women presenting with hypertensive emergencies admitted to a tertiary maternal hospital in Luanda, Angola. Methods: An observational study was carried out, including 116 pregnant women diagnosed with hypertensive emergencies admitted to a tertiary maternal hospital in Luanda, Angola, during the second semester of 2025. Continuous variables were tested for normality using the Kolmogorov–Smirnov test. Normally distributed variables were expressed as mean ± standard deviation, whereas non-normally distributed variables were presented as median and range. Categorical variables were summarized using absolute and relative frequencies. Resultados e Conclusions: The mean age of patients was 31 ± 6 years, and most were married (73.3%). The mean educational level was 11 ± 4 years, and 43.1% were employed. A personal history of chronic hypertension was reported in 13.8% of patients, while 32.8% reported previous pre-eclampsia or eclampsia in prior pregnancies. Family history of hypertension was present in 61.2% of cases, and family history of pre-eclampsia in 18.9%. The most frequent symptoms were headache (56.9%), dizziness (30.2%), and blurred vision (30.2%). At hospital admission, 67.2% of patients presented systolic blood pressure ≥160 mmHg and 46.6% diastolic blood pressure ≥110 mmHg. The most common complications were HELLP syndrome, followed by acute kidney injury and placental abruption. Hypertensive emergencies in pregnancy predominantly affected young adult women and were characterized by markedly elevated blood pressure and neurological symptoms. HELLP syndrome, acute kidney injury, and placental abruption were the most frequent maternal complications, highlighting the need for early detection and timely management to reduce adverse maternal outcomes.

16400

COMPARATIVE ANALYSIS OF RISK FACTORS AND SHORT-TERM OUTCOMES AFTER PRIMARY PCI IN PRE- AND POST-MENOPAUSAL WOMEN WITH STEMI.

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Introduction/Background: Coronary artery disease (CAD) is a leading global cause of mortality and a major burden in Pakistan, increasingly affecting premenopausal women, suggesting limited estrogen protection. We conducted a cross-sectional study among women with STEMI at a tertiary cardiac center in Karachi.Pakistan Objectives: comparing the prevalence of conventional and non-conventional risk factors of atherosclerotic cardiovascular disease (ASCVD) between pre- and post-menopausal women. Methods: This cohort study was conducted at the National Institute of Cardiovascular Disease (NICVD), Karachi, Pakistan, between May and October 2025. We have recruited two independent cohorts of women diagnosed with STEMI. The first cohort consisted of consequently selected pre-menopausal women, while, second cohort consisted of consequently selected post-menopausal women. The two cohorts were compared in terms of clinical and demographic characteristics (e.g., age), clinical presentation (e.g., presenting symptoms), medical history (e.g., co-morbid conditions), triggering factors, angiographic characteristics (e.g., involved vessels), and in-hospital outcomes using appropriate independent sample t-test or chi-squared test at 5% level of significance. Resultados e Conclusions: Among 210 female STEMI patients, 27.6% were premenopausal and 72.4% postmenopausal. Premenopausal women were younger (41 vs. 55.8 years), with similar baseline characteristics. Diabetes was higher in postmenopausal women, while preeclampsia and gestational diabetes were more common in premenopausal women. Premenopausal patients more often had shortness of breath and higher smoking/substance use, whereas a sedentary lifestyle was more common post menopause. Single-vessel disease predominated in premenopausal women, and three-vessel disease in postmenopausal. RCA was most commonly involved. TIMI III flow and in-hospital outcomes were similar, with no complications or mortality. Conclusion Premenopausal women showed unique pregnancy-related and behavioral risk factors, while metabolic risks, especially diabetes, were more prominent postmenopause. Despite differing profiles, procedural and in-hospital outcomes were comparable. Preventive strategies should include screening for pregnancy-related cardiovascular risks, promoting lifestyle modification in younger women, and strict metabolic control in postmenopausal women. Further research on early-onset CAD in South Asian women is recommended

16523

COMPARATIVE EFFECTS OF VASOPRESSORS ON MATERNAL CARDIOVASCULAR STABILITY DURING NEURAXIAL ANESTHESIA FOR CESAREAN DELIVERY: A SYSTEMATIC REVIEW

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Introduction/Background: Hypotension following neuraxial anesthesia during cesarean delivery is a frequent and clinically relevant complication caused by sympathetic blockade, leading to impaired uteroplacental perfusion and adverse maternal and fetal outcomes. Vasopressors are essential to maintain hemodynamic stability; however, different agents have distinct effects on vascular resistance and heart rate, directly influencing cardiovascular stability. Despite widespread use of phenylephrine and norepinephrine, uncertainties remain regarding the optimal choice. Objectives: To compare the impact of vasopressors on maternal hemodynamic stability during neuraxial anesthesia, focusing on their effectiveness in preventing and treating hypotension and on maternal outcomes. Methods: A comprehensive literature search was conducted in PubMed, SciELO, Cochrane Library, and LILACS to identify randomized and comparative studies addressing vasopressor use during cesarean delivery under neuraxial anesthesia. Studies published from database inception to 2025 were included. Selection followed PRISMA guidelines and PICO strategy. Outcomes included incidence of post-spinal hypotension, systolic and mean arterial pressure, heart rate, and overall hemodynamic stability. Resultados e Conclusions: Five randomized trials (n=546) showed similar efficacy among norepinephrine, phenylephrine, and metaraminol in preventing hypotension and maintaining systolic blood pressure. Norepinephrine demonstrated a more favorable hemodynamic profile, with higher heart rate, better preservation of cardiac output, and lower incidence of bradycardia compared to phenylephrine. Neonatal outcomes were comparable across groups. The small number of included studies and potential heterogeneity should be considered when interpreting the results. Overall, although vasopressors provide similar blood pressure control, their cardiovascular effects differ. Norepinephrine may be considered a preferred option for maintaining maternal hemodynamic stability during neuraxial anesthesia for cesarean delivery.

16453

EARLY MENOPAUSE AS A CARDIOVASCULAR RISK FACTOR: A SYSTEMATIC REVIEW.

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(1) FACULDADE DE CIENCIAS MEDICAS E DA SAUDE DE JUIZ DE FORA - JUIZ DE FORA - MG - BRASIL;

Introduction/Background: Cardiovascular diseases (CVD) represent the leading cause of death among women, accounting for approximately 50% of all fatalities. Although the incidence of acute myocardial infarction typically occurs 7–10 years later in women compared to men, there is a gradual increase in cardiovascular risk following menopause. In this context, early menopause is associated with a profile of higher cardiovascular vulnerability, as the premature reduction of estrogen—which exerts a cardioprotective effect—promotes metabolic and vascular alterations that favor the development of coronary diseases. Objectives: To investigate, through a systematic review, the association between early menopause and a higher incidence of cardiovascular diseases. Methods: A literature review was conducted including original human clinical studies published within the last four years, originally in English, and available in full text. The search referenced the National Library of Medicine (MedLine), Scientific Electronic Library Online (SciELO), and Cochrane Library databases, using the MeSH descriptors “Premature Menopause” and “Coronary Diseases”, combined by Boolean operators. Studies analyzed the association between early menopause and increased cardiovascular risk. Poorly described studies, abstract-only publications, animal models, and literature reviews were excluded. The PRISMA statement was used for the systematization of the review process. Resultados e Conclusions: Initially, 8 studies were identified; after deduplication and application of eligibility criteria, 4 were included in the final analysis. A total of 13,366 participants were evaluated, among whom the prevalence of early menopause varied across studies. The selected publications demonstrated a significant increase in cardiovascular outcomes in women with early menopause compared to those with normal menopause timing ($p < 0.05$). Furthermore, Yamanouchi et al. observed a higher frequency of cardiovascular diseases in women with premature menopause associated with low BMI and high parity ($p < 0.05$). Overall, the evidence supports early menopause as a relevant cardiovascular risk factor, highlighting the importance of targeted preventive strategies in this population.

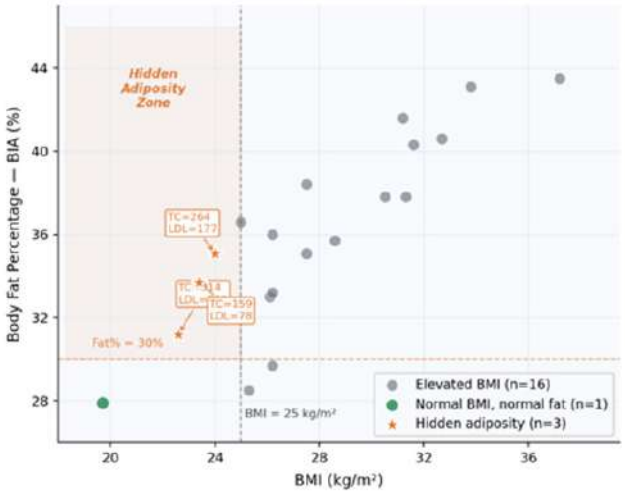
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HIDDEN ADIPOSITY IN NORMAL-BMI POSTMENOPAUSAL WOMEN: LIPID RISK MISCLASSIFICATION REVEALED BY BIOIMPEDANCE

LEONARDO ANDRADE FERNANDES DE LUCA1; LUIS FILIPE AZEVEDO DE CARVALHO1; RODRIGO VASCONCELLOS TAVARES BRAVO1; FLAVIO ANDRADE CAMACHO2;

(1) HOSPITAL QUINTA D´OR - RIO DE JANEIRO - RJ - BRASIL; (2) UNIVERSIDADE FEDERAL FLUMINENSE - NITEROI - RJ - BRASIL;

Introduction/Background: Postmenopausal estrogen deficiency promotes visceral fat redistribution, potentially creating a phenotype of normal BMI coexisting with excess adiposity — termed hidden adiposity or normal-weight obesity. This phenotype may carry cardiometabolic risk comparable to overt obesity while evading standard BMI-based screening, representing a diagnostic gap of particular clinical relevance in postmenopausal women. Objectives: To determine the prevalence of hidden adiposity and characterize its lipid profile among postmenopausal hospital workers. Methods: Cross-sectional study of 20 postmenopausal women (58–67 years) assessed by anthropometry and BIA (Biodynamics BIA 450 single-frequency tetrapolar analyzer) following a 12-hour fast. Hidden adiposity was operationally defined as BMI 18.5–24.9 kg/m² combined with body fat ≥30% by BIA. Fasting lipid profiles were obtained for all participants. Descriptive comparisons were performed across groups; formal statistical testing was not applied given the small subgroup size. Resultados e Conclusions: RESULTS Four women (20%) had normal BMI; among them, three (15% of the total sample) met criteria for hidden adiposity. Despite a mean BMI of 23.3 kg/m², this subgroup exhibited markedly elevated total cholesterol (individual values: 159, 264, and 314 mg/dL; mean 246 vs. 198 mg/dL in those without hidden adiposity) and LDL-C (individual values: 78, 177, and 202 mg/dL; mean 152 vs. 103 mg/dL). None of the three women were receiving lipid-lowering therapy, suggesting that their lipid risk was undetected by BMI-based screening. Mean triglycerides were 129 mg/dL in this subgroup, consistent with a predominantly hypercholesterolaemic rather than hypertriglyceridaemic pattern. CONCLUSIONS Hidden adiposity was identified in 15% of postmenopausal workers with normal BMI and was associated with substantially elevated total cholesterol and LDL-C in the absence of treatment. Reliance on BMI alone may systematically underestimate lipid-related cardiometabolic risk in postmenopausal women. Given the small subgroup size (n=3), these findings are hypothesis-generating and require confirmation in larger prospective cohorts, but the clinical signal warrants early attention in occupational cardiovascular prevention programmes.



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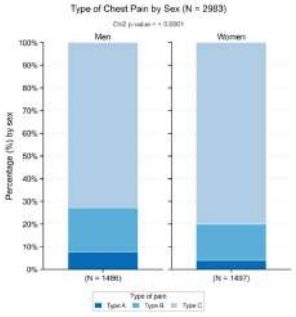
HIGHER PREVALENCE OF NON-ANGINAL CHEST PAIN IN WOMEN PRESENTING TO THE EMERGENCY DEPARTMENT

LARISSA FRANCO DE ANDRADE1; EDUARDO PIETRE1; BERNARDO BARCELOS FERNANDES FUMAGALLI SILVA2; BIANCA FERREIRA BRITO3; FABIOLA LUCIO CARDAO1; ISABELA DA COSTA FURTADO3; JEORGIANE DE ASSUMPÇÃO COSTA3; MARIANA CRISTINA MAYWORN3; MARIA DE FATIMA MARTINS GIL DIAS3; VAGNER DA SILVA MEIRA3; LUIS FILIPE AZEVEDO DE CARVALHO4; LEONARDO ANDRADE FERNANDES DE LUCA3;

(1) HOSPITAL QUINTA D' OR - RIO DE JANEIRO - RJ - BRASIL; (2) HOSPITAL QUINTA D'OR - RIO DE JANEIRO - RJ - BRASIL; (3) HOSPITAL QUINTA D'OR - RIO DE JANEIRO - RJ - BRASIL; (4) HOSOITAL QUINTA D'OR - RIO DE JANEIRO - RJ - BRASIL;

Introduction/Background: Acute chest pain is one of the most common reasons for presentation to the emergency department (ED) and requires rapid risk stratification to identify patients with suspected ischemic heart disease. Although sex-based differences in symptom presentation have been described, contemporary data from the Brazilian population remain limited. Objectives: To evaluate sex-based differences in chest pain presentation and clinical characteristics among patients presenting to a tertiary care ED. Methods: This retrospective observational study included patients presenting with acute chest pain to the ED to a tertiary hospital. Clinical data, cardiovascular risk factors, and prior cardiovascular history were collected. Chest pain was categorized as Type A (definitively anginal), Type B (probably anginal), or Type C (probably non-anginal). Continuous variables are presented as mean ± standard deviation and compared using Welch's t-test, while categorical variables were compared using the chi-square test. A p-value < 0,05 was considered statistically significant. Resultados e Conclusions: A total of 2,983 patients were included, of whom 1,497 were women. Women were older than men (53 ± 17 vs. 50 ± 16, p < 0.001). Men had a higher prevalence of hypertension (46.9% vs. 41.0%, p = 0.001), dyslipidemia (23.1% vs 17.9%, p<0.001), prior myocardial infarction and previous percutaneous coronary intervention (p < 0.001). Significant differences were observed in symptom presentation. Women were more likely to present with probably non-anginal chest pain (Type C: 80.1% vs 72.8%), whereas men more frequently presented with definitively anginal (Type A: 7.7% vs 4.0%) and probably anginal chest pain (Type B: 19.4 vs 15.9), overall p < 0.001. These findings raise concern that the clinical presentation of women may be less readily recognized as cardiac in origin, potentially leading to underestimation of cardiovascular risk, delays in diagnosis, and lower likelihood of appropriate investigation or treatment. They highlight the limitations of relying on symptom typicality alone and reinforce the need for a more sex-specific approach to the evaluation of chest pain in the ED.

Label	Overall	Men	Women	p value	Test
Count	2983	1486	1497		
Age, mean ± SD	51 ± 17	50 ± 16	53 ± 17	<0.001	Welch's T-test
Diabetes, n (%)	581 (19.5)	302 (20.3)	279 (18.6)	0.264	Chi-squared
Hypertension, n (%)	1311 (43.9)	697 (46.9)	614 (41.0)	0.001	Chi-squared
Sedentarism, n (%)	603 (20.2)	305 (20.5)	298 (19.9)	0.708	Chi-squared
Obesity, n (%)	565 (18.9)	273 (18.4)	292 (19.5)	0.457	Chi-squared
Dyslipidemia, n (%)	611 (20.5)	343 (23.1)	268 (17.9)	<0.001	Chi-squared
Cancer, n (%)	39 (1.3)	21 (1.4)	18 (1.2)	0.730	Chi-squared
Myocardial Infarction, n (%)	190 (6.4)	116 (7.8)	74 (4.9)	0.002	Chi-squared
Prior PCI, n (%)	192 (6.4)	135 (9.1)	57 (3.8)	<0.001	Chi-squared
Chronic Kidney Disease, n (%)	35 (1.2)	21 (1.4)	14 (0.9)	0.297	Chi-squared
Atrial fibrillation, n (%)	43 (1.4)	21 (1.4)	22 (1.5)	1.000	Chi-squared
Heart Failure, n (%)	36 (1.2)	19 (1.3)	17 (1.1)	0.849	Chi-squared
Peripheral arterial disease, n (%)	12 (0.4)	7 (0.5)	5 (0.3)	0.763	Chi-squared
Type of pain, n (%)				<0.001	Chi-squared
Type A pain	175 (5.9)	115 (7.7)	60 (4.0)		
Type B pain	527 (17.7)	289 (19.4)	238 (15.9)		
Type C pain	2281 (76.5)	1082 (72.8)	1199 (80.1)		
Length of hospital stay (days), mean ± SD	1.6 ± 4.8	1.9 ± 5.2	1.3 ± 4.4	0.004	Welch's T-test



19442

ORAL HORMONAL CONTRACEPTION AND FEMALE CARDIOVASCULAR RISK: EVIDENCE AND CLINICAL IMPLICATIONS

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Introduction/Background: Female cardiovascular health is influenced throughout the reproductive lifespan, with hormones playing a significant role in the development of cardiovascular disease (CVD). The use of oral contraceptives (OCs) containing estrogen may exert procoagulant effects, increase blood pressure, and elevate the risk of thrombosis, predisposing to acute myocardial infarction (AMI) and stroke. Objectives: To analyze the association between combined oral contraceptives and cardiovascular events in women of reproductive age. Methods: This systematic review followed PRISMA guidelines. The descriptors "Oral Contraceptives," "Hormonal Contraception," "Cardiovascular Risk," "Stroke," "Myocardial Infarction," and "Women of Reproductive Age" were used in Portuguese and English. PICO criteria included: women of reproductive age (P), combined OCs use (I), non-use or progestin-only methods (C), and cardiovascular risk (O). PubMed and SciELO searches yielded 214 studies (2020–2026). After independent screening, Newcastle-Ottawa quality assessment, and removal of duplicates, 6 studies were included. Resultados e Conclusions: Ethinyl estradiol (EE) increases procoagulant factors, reduces natural anticoagulants, and activates the renin-angiotensin-aldosterone system, thereby elevating blood pressure and thrombotic risk. Cameron et al. (2023) reported that combined OCs increased blood pressure (0.7 mmHg systolic and 0.4 mmHg diastolic) with hypertension risk ranging from 1% to 8.5%. Regarding lipid profile, Fabunmi et al. (2023) found higher total cholesterol among OC users (Standardized Mean Difference – SMD = 0.94) and increased LDL levels (SMD = 0.79). In terms of cardiovascular outcomes, Yonis et al. (2025) demonstrated a twofold increased in the risk of ischemic stroke and AMI compared to non-use, with approximately 21 additional stroke cases and 10 AMI cases per 100,000 women per year. Higher EE doses (30–40 µg) were associated with a twofold increase in stroke and AMI compared to formulations containing 20 µg. In contrast, progestin-only contraceptives showed a lower impact on blood pressure and a weaker association with thrombotic risk (Relative Risk – RR of 1.6 for stroke and 1.5 for AMI). Combined OCs are associated with increased cardiovascular risk in reproductive-age women (RR ≈ 2.0 for stroke and AMI) and elevated blood pressure. This effect appears to be dose-dependent, with higher risk in formulations containing 30–40 µg EE. Contraceptive choice should be individualized based on clinical history and risk profile.

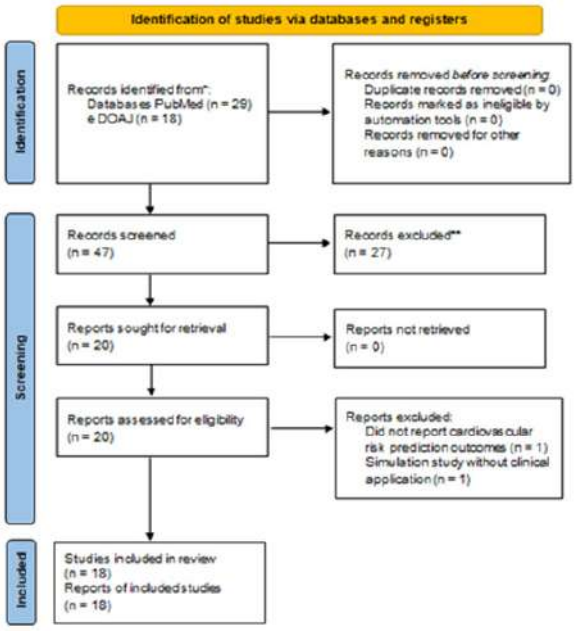
18086

PERFORMANCE OF ARTIFICIAL INTELLIGENCE IN PREDICTING CARDIOVASCULAR RISK IN WOMEN: A SYSTEMATIC REVIEW

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Introduction/Background: Cardiovascular diseases (CVD) are the leading cause of death worldwide, with greater impact on women. Factors such as menopause and hormonal changes increase cardiovascular risk (CVR) in this population. Although essential, current risk tools generally still do not consider these particularities, and studies rarely perform sex-stratified analysis. In this context, AI emerges as a promising strategy for more personalized assessment. This study, therefore, synthesizes evidence on its use in predicting CVR in women. Objectives: Synthesize evidence on the accuracy of AI models in predicting cardiovascular risk in women, evaluating their performance metrics. Methods: Systematic review following PRISMA, with searches in PubMed and DOAJ (2021–2026, no language restriction) and descriptors on AI and prediction of CVR in women. Selection was performed by two independent reviewers, in two stages (titles/abstracts and full text), with consensus. Of 47 studies, 18 met the criteria (quantitative data, sex-based analysis, and full text), with studies outside the topic, reviews, and unavailable ones excluded. Data were extracted on AI type, number of women, outcomes, and metrics (AUC, sensitivity, and specificity), with quality assessed by PROBAST and descriptive analysis. Resultados e Conclusions: Eighteen studies were included, mostly using machine learning models to predict CVR, assessing cardiovascular events, mortality, and risk stratification. Only one study analyzed women exclusively (n=458, postmenopausal), using Random Forest, XGBoost, Gradient Boosting, SVM, Neural Network, Logistic Regression, and Gaussian Naive Bayes models, with high performance (AUC ~1.00; sensitivity 0.92; no specificity data), with Random Forest, XGBoost, and Ensemble standing out. In studies with mixed populations, results were aggregated without sex-based analysis, with predominance of algorithms such as Random Forest, XGBoost, Naive Bayes, logistic regression, and neural networks, showing AUC from 0.61 to 1.00, sensitivity from 0.47 to 1, and specificity from 0.51 to 0.99 (rarely reported), with overall better performance for XGBoost. Despite the high performance, the scarcity of women-specific analyses limits the assessment of applicability. Thus, although AI shows great potential in CVR prediction, its implementation depends on validation in female cohorts and the development of more inclusive models, aiming at greater accuracy and equity in cardiovascular care.



18780

PREECLAMPSIA: A RISK FACTOR FOR HEART FAILURE DECADES AFTER DELIVERY

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Introduction/Background: Preeclampsia (PE) is a multisystemic gestational syndrome characterized by hypertension and endothelial dysfunction. Although considered transient, evidence demonstrates persistent cardiovascular risk, including increased incidence of heart failure (HF) decades after delivery. Objectives: To evaluate the association between a history of PE and the incidence of HF in the decades following delivery. Methods: Systematic review according to PRISMA guidelines. Search conducted in March 2026 in PubMed and LILACS databases (2017-2026) using MeSH/DeCS descriptors: “Pre-Eclampsia” AND “Heart Failure” AND (“Incidence” OR “Long-term”). Meta-analyses and observational studies with follow-up ≥1 year postpartum comparing women with PE to normotensive controls were included. Independent selection by two reviewers. Quality assessed using the Newcastle-Ottawa Scale (NOS). Certainty of evidence classified by the GRADE system. Of 18 articles identified, 4 studies were included after applying eligibility criteria. Resultados e Conclusions: Women with a history of PE have a relative risk (RR) of future HF of 4.19 (95% CI: 2.09–8.38), in addition to higher relative risk of coronary artery disease (RR 2.5) and cardiovascular death (RR 2.2). These associations are independent of age, BMI, smoking, or diabetes. A dose-response effect was observed: mild PE is associated with RR ~2.0, while severe PE elevates the risk to levels >5.0. Recurrence of the syndrome potentiates the outcome, with HF risk 2.9 times higher than with a single episode. Magnetic resonance imaging and stress testing reveal persistent subclinical alterations, such as diastolic dysfunction, concentric left ventricular hypertrophy, and reduced chronotropic reserve. The association is more robust for HF with preserved ejection fraction, suggesting a phenotype of chronic endothelial dysfunction and myocardial remodeling. The certainty of evidence was moderate (GRADE), with upgrade for magnitude of effect and biological plausibility. The LILACS search did not return long-term cohorts, highlighting a gap in Latin American populations. Women with a history of PE have a significantly higher incidence of postpartum HF (MODERATE evidence). PE is a chronic sex-specific cardiovascular risk factor. Integration of gestational history into routine risk stratification is recommended to implement early prevention strategies.

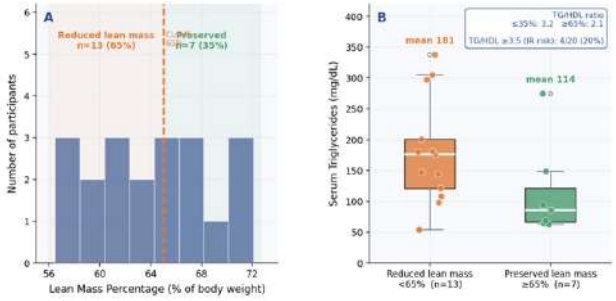
17239

REDUCED LEAN MASS PHENOTYPE DETECTED BY BIOIMPEDANCE SCREENING IN POSTMENOPAUSAL HOSPITAL WORKERS: CARDIOMETABOLIC IMPLICATIONS

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Introduction/Background: Postmenopausal estrogen deficiency accelerates lean mass loss and promotes fat redistribution, creating a relative fat-to-muscle imbalance that may precede clinical sarcopenia. Detectable by bioimpedance as a reduced lean mass percentage, this phenotype has been associated with adverse cardiometabolic profiles and may be identifiable in occupational screening settings before functional impairment develops. Objectives: To characterize lean mass phenotypes using BIA-derived lean mass percentage and explore their association with cardiometabolic risk markers in postmenopausal hospital workers. Methods: Cross-sectional study of 20 postmenopausal women (58–67 years) undergoing BIA (Biodynamics BIA 450 single-frequency tetrapolar analyzer) and fasting lipid assessment after a 12-hour fast. Lean mass percentage (lean%) was the primary classification criterion: reduced lean mass (lean% <65%, n=13) vs. preserved lean mass (lean% ≥65%, n=7). Lean mass index (LMI = lean kg/m²) was calculated as a complementary descriptive metric only; its strong collinearity with BMI (r=0.93) precluded its use as primary classifier. ASMI was not calculable, as the BIA 450 does not yield segmental limb measurements. Lipid markers were compared descriptively. Resultados e Conclusions: RESULTS Mean lean mass percentage was 64.1% (range 56.5–72.1%); mean LMI was 17.7 kg/m² (descriptive). Thirteen women (65%) met criteria for reduced lean mass (lean% <65%). This group showed higher mean triglycerides (181 vs. 114 mg/dL) and TG/HDL ratio (3.2 vs. 2.1) compared with the preserved lean mass group, suggesting clustering of relative muscle deficit with atherogenic dyslipidaemia. Four participants (20%) had TG/HDL ≥3.5, a proxy threshold for elevated insulin resistance risk. No participant met criteria for clinical sarcopenia, as muscle strength and functional performance data were not collected. CONCLUSIONS Reduced lean mass percentage was present in 65% of postmenopausal workers and associated with higher triglycerides and TG/HDL ratio. These are screening-level findings; definitive sarcopenia classification requires strength and functional testing. The collinearity between LMI and BMI (r=0.93) confirms lean mass percentage as a more appropriate classifier than absolute lean mass indices in total-body BIA studies. Integrating lean mass phenotyping into occupational prevention programmes may enhance early cardiometabolic risk identification in postmenopausal women.



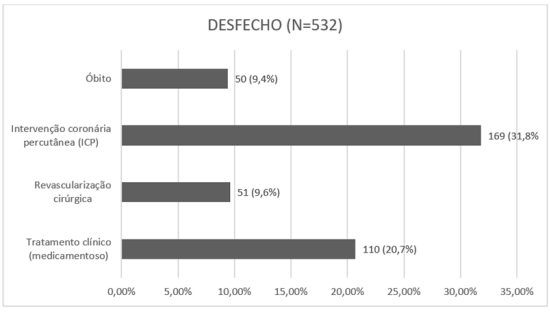
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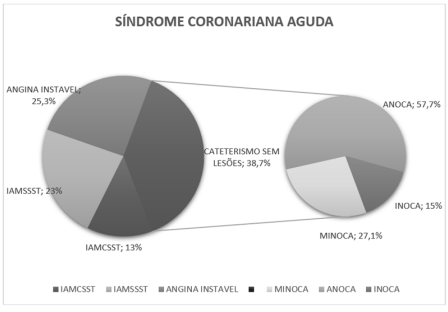
RETROSPECTIVE ANALYSIS OF THE EPIDEMIOLOGICAL AND CLINICAL CHARACTERISTICS OF ACUTE CORONARY SYNDROME IN A TERTIARY HOSPITAL IN CURITIBA IN 2024.

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Introduction/Background: Coronary artery disease represents the leading cause of death among postmenopausal women, surpassing breast cancer and other gynecological malignancies. Globally, acute coronary syndrome is responsible for 7.4 million deaths annually. The incidence of acute myocardial infarction increases substantially in the postmenopausal period supported by the hypothesis of estrogen's protective. Objectives: In light of the increasing recognition of the distinct characteristics of acute coronary syndrome (ACS) in women, particularly in the postmenopausal period, together with the persistent undertreatment and under-recognition of female-specific risk factors, the present study proposes to undertake a retrospective epidemiological analysis of ACS cases in women aged 55 years or older admited at a public hospital in Curitiba during the year of 2024, with the aim of further elucidating disease patterns and improving the clinical management of ACS in this population. Methods: A retrospective observational study analyzed anonymized medical records of female patients admitted to the hemodinamics unit over 2024, aged ≥55 years, yielding a final sample of 532 patients, treated at a tertiary public hospital in Curitiba, Paraná, Brazil. Data were anonymized; variables were summarized descriptively, and significant associations assessed using chi-square (p<0.05). Resultados e Conclusions: Mean age was 70.9 years. Hypertension (77.6%) and type 2 diabetes (43.6%) were the most prevalent risk factors. Chest pain predominated, with dyspnea (43.2%) as the main associated symptom. Unstable angina was most frequent (25.3%), followed by NSTEMI (23%) and STEMI (13%). Non-obstructive coronary findings occurred in 38.7%, mainly ANOCA (57.7%), MINOCA (27.1%), and INOCA (15%). PCI was the most common treatment (31.8%). Mortality was 9.4%, associated with advanced age and diabetes (60% of deaths). LAD involvement (42.7%) and multivessel disease (26.7%) were frequent; LAD lesions were present in 72% of deaths. NSTEMI showed greater metabolic and anatomical complexity, STEMI was linked to severe acute complications, and unstable angina had lower obstructive burden. Findings support complete revascularization and highlight the impact of postmenopausal status on atherosclerotic progression.





21116

SAFETY OF STATIN EXPOSURE DURING PREGNANCY: AN INTEGRATIVE REVIEW OF CONGENITAL MALFORMATIONS AND PERINATAL OUTCOMES

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Introduction/Background: Statins are widely used for primary and secondary prevention of atherosclerotic cardiovascular disease. However, their use during pregnancy remains controversial because of historical concerns regarding teratogenicity and the increasing number of women of reproductive age receiving lipid-lowering therapy. Rising rates of obesity, diabetes mellitus, metabolic syndrome, and familial hypercholesterolemia have increased the likelihood of inadvertent first-trimester exposure, a critical period for fetal organogenesis. Although early studies suggested possible associations between statin exposure and congenital anomalies, recent observational studies have shown conflicting results. Objectives: To evaluate the safety of statin exposure during pregnancy, particularly during the first trimester, focusing on congenital malformations, spontaneous abortion, preterm birth, and low birth weight. Methods: This integrative review was structured according to the PICOTT model. Pregnant women exposed to statins during pregnancy were compared with non-exposed pregnant women. Searches were conducted in PubMed, Embase, and Cochrane using terms related to pregnancy, statins, and drug exposure. A total of 149 records were identified. After duplicate removal and screening, eight observational cohort studies based on national population registries from the United States, Norway, Taiwan, Japan, South Korea, and the United Kingdom were included. Resultados e Conclusions: Overall, the studies demonstrated that first-trimester statin exposure was not significantly associated with an increased overall risk of major congenital malformations after adjustment for confounding factors, especially pre-existing diabetes and maternal comorbidities. Large nationwide cohorts consistently showed no robust teratogenic effect associated with statin use during pregnancy. However, some studies identified possible associations with adverse perinatal outcomes, including preterm birth, low birth weight, spontaneous pregnancy loss, and ventricular septal defect. High-intensity statins also demonstrated possible increased risk in subgroup analyses. Current evidence does not support a strong independent association between first-trimester statin exposure and major congenital malformations, although caution remains necessary regarding specific adverse perinatal outcomes, reinforcing the need for individualized therapeutic decisions during pregnancy.

STUDY	COUNTRY / DATABASE	DESIGN	POPULATION	MAIN OUTCOMES EVALUATED	MAIN FINDINGS
Bateman et al. (2015)	USA / Medicaid Analytic eXtract	Observational cohort	886,996 pregnancies	Major congenital malformations	The crude increase in malformations lost significance after adjustment for confounders, especially pre-existing diabetes. No significant teratogenic effect associated with statins was observed.
Chang et al. (2021)	Taiwan / NHIRD	Nationwide retrospective cohort	1,443,657 pregnant women	Congenital malformations, prematurity, low birth weight, Apgar score	No increase in congenital malformations was observed. Higher risks of prematurity, low birth weight, and lower Apgar scores were identified.
McGrogan et al. (2017)	United Kingdom / GPRD	Retrospective cohort	281 exposed vs 2,643 unexposed	Spontaneous pregnancy loss	Statin exposure was associated with increased risk of spontaneous abortion/pregnancy loss (adjusted HR 1.64).
Lee et al. (2018)	USA / Kaiser Permanente	Retrospective cohort	379,238 pregnancies	Fetal cardiac malformations	First-trimester statin exposure was associated with increased risk of fetal ventricular septal defect (adjusted OR 3.3).
Christensen et al. (2026)	Norway / National registries	Nationwide cohort	805,368 pregnancies	Major and minor congenital malformations	No significant association between statin exposure and congenital malformations after adjustment. Updated meta-analysis also showed no significant increase in risk.
Fujioka et al. (2026)	Japan / JDIIP	Nationwide cohort	968 pregnant women	Congenital malformations, prematurity, low birth weight	No increase in congenital malformations was observed. Weighted analyses suggested higher risks of prematurity and low birth weight.
Kay et al. (2025)	South Korea / NHIS	Nationwide cohort	218,296 pregnant women with dyslipidemia	Congenital malformations and neurodevelopmental outcomes	No overall increase in malformations after adjustment. High-intensity statins were associated with increased risk of congenital malformations in subgroup analyses.
Svendsen et al. (2025)	Norway / National registry	Observational cohort	3,869 pregnancies in women with FH	Preeclampsia, low birth weight, prematurity	No overall increase in adverse neonatal outcomes. Possible association between statin use and low birth weight in some subgroups.

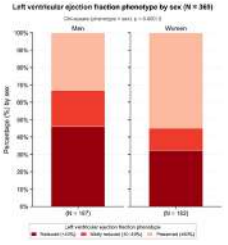
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SEX DIFFERENCES IN LEFT VENTRICULAR EJECTION FRACTION PHENOTYPE AND CLINICAL PROFILE IN PATIENTS HOSPITALIZED WITH DECOMPENSATED HEART FAILURE

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Introduction/Background: Heart failure (HF) is highly prevalent, with significant morbidity and mortality. Sex-related differences in clinical presentation, comorbidities, and outcomes are increasingly recognized, yet women remain underrepresented in landmark HF trials, limiting evidence-based recommendations. Objectives: To evaluate sex differences in clinical characteristics, laboratory findings, and LVEF phenotype in patients hospitalized with decompensated HF. Methods: This cross-sectional study included 369 patients hospitalized with decompensated HF at a tertiary care center. Comorbidities, laboratory markers, and LVEF phenotype were assessed. Continuous variables were compared using Mann–Whitney U test and categorical variables using Chi-square or Fisher's exact test, with $p < 0.05$ considered significant. Resultados e Conclusions: A total of 369 patients included, of whom 187 (50.7%) men and 182 (49.3%) women. Women were significantly older than men (80.38 ± 12.95 vs. 73.20 ± 14.38 years, p<0.001), whereas body mass index was similar between groups. Hypertension and dyslipidemia were highly prevalent, with no significant differences between sexes. Diabetes mellitus was more frequent in men (61.0% vs. 47.3%, p=0.011), while atrial fibrillation showed a non-significant trend in women. Women presented higher LVEF than men (50.65 ± 17.80% vs. 44.12 ± 16.81%, p<0.001). Accordingly, LVEF phenotypes differed significantly: preserved ejection fraction (HFpEF) was predominant in women (54.9%), whereas reduced ejection fraction was more frequent in men (46.0%), p<0.001. At admission, women had significantly lower hemoglobin (11.50 ± 2.09 vs. 12.58 ± 2.35 g/dL) and ferritin levels (170.56 ± 250.59 vs. 220.60 ± 191.60 ng/mL) than men (p<0.001). NT-proBNP levels did not differ significantly between groups. Men had higher creatinine levels; however, creatinine clearance did not differ significantly across groups. In conclusion, women hospitalized with decompensated HF present a distinct clinical profile compared to men. They were older, more frequently exhibited preserved ejection fraction, and had lower hemoglobin and ferritin levels, suggesting a higher burden of anemia. In contrast, diabetes mellitus was more prevalent in men. These findings highlight clinically relevant sex-specific differences and support the need for gender-sensitive approaches in HF management, particularly in patients with HFpEF, a phenotype with limited therapeutic options



Variable	Overall	Men	Women	p-value
Count	369	187	182	
Age (mean ± SD)	76.75 ± 14.14	73.20 ± 14.38	80.38 ± 12.95	<0.001
BMI (kg/m²) (mean ± SD)	28.29 ± 6.45	28.07 ± 5.77	28.54 ± 7.12	0.912
Hypertension (%)	318 (86.2%)	161 (86.1%)	157 (86.3%)	1.000
Dyslipidemia (%)	219 (59.3%)	118 (63.1%)	101 (55.5%)	0.167
Diabetes mellitus (%)	200 (54.2%)	114 (61.0%)	86 (47.3%)	0.011
Atrial fibrillation (%)	141 (38.2%)	63 (33.7%)	78 (42.9%)	0.088
NT-proBNP (admission) (mean ± SD)	10784.84 ± 20653.52	9458.95 ± 9399.36	12126.07 ± 27705.64	0.507
LVEF (mean ± SD)	47.34 ± 17.59	44.12 ± 16.81	50.65 ± 17.80	<0.001
LVEF phenotype (%)				<0.001
Reduced (<40%)	145 (39.3%)	86 (46.0%)	59 (32.4%)	
Mildly reduced (40–49%)	62 (16.8%)	39 (20.9%)	23 (12.6%)	
Preserved (≥50%)	162 (43.9%)	62 (33.2%)	100 (54.9%)	
Creatinine (admission) (mean ± SD)	1.64 ± 2.73	1.92 ± 3.71	1.36 ± 0.92	<0.001
Creatinine clearance (mL/min/1.73 m²) (mean ± SD)	54.22 ± 25.65	56.73 ± 26.93	51.65 ± 24.08	0.076
Hemoglobin (admission) (mean ± SD)	12.05 ± 2.28	12.58 ± 2.35	11.50 ± 2.09	<0.001
Ferritin (admission) (mean ± SD)	197.01 ± 222.38	220.60 ± 191.60	170.56 ± 250.59	<0.001

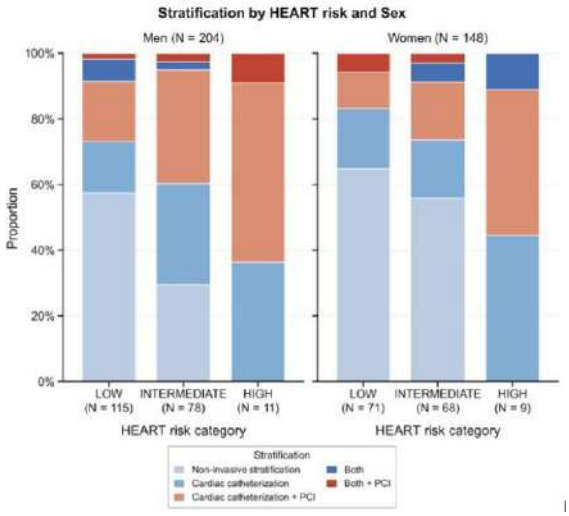
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SEX-BASED DIFFERENCES IN CLINICAL MANAGEMENT ACCORDING TO HEART SCORE IN PATIENTS PRESENTING WITH CHEST PAIN TO THE EMERGENCY DEPARTMENT OF A TERTIARY CENTER

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Introduction/Background: The HEART Score is widely used for risk stratification in patients presenting with chest pain to the emergency department (ED), guiding decisions regarding early discharge and diagnostic strategies. However, potential sex-based differences in management across categories remain insufficiently explored. Objectives: To evaluate the association between HEART Score risk categories and management strategies, stratified by sex. Methods: This retrospective observational study included patients presenting with chest pain, categorized into low (1-3), intermediate (4-6), and high (7-10) risk groups according to the HEART Score. Management strategies were classified as non-invasive testing, cardiac catheterization, percutaneous coronary intervention (PCI), and combined strategies. Associations were assessed using the Fisher–Freeman–Halton exact test. Resultados e Conclusions: A total of 352 patients were included (204 men and 148 women). Management differed across HEART risk categories ($p < 0.001$). In the low-risk group, most patients were managed non-invasively, with a higher proportion among women compared to men (64.8% vs. 57.4%). Fewer underwent cardiac catheterization or revascularization. In the intermediate-risk group, marked sex-based differences were observed. Women were more often managed non-invasively than men (55.9% vs. 29.5%), whereas men more frequently underwent invasive evaluation, with higher rates of catheterization (30.8% vs. 17.6%) and PCI (34.6% vs. 17.6%), indicating a more aggressive approach despite similar risk classification. In the high-risk group, all patients underwent invasive evaluation. However, although women underwent catheterization at rates comparable to men, they were less likely to proceed to PCI. Approximately, 45% of women were managed with catheterization alone, while a similar proportion underwent PCI. In contrast, among men, PCI following catheterization predominated (54.5%), indicating a higher likelihood to revascularization after invasive assessment. Management was consistent with HEART Score categories but differed by sex. Differences were most evident in intermediate-risk patients, where women were more often managed conservatively and men more invasively. In high-risk patients, women were less likely to undergo PCI despite undergoing catheterization. These findings suggest potential disparities in clinical decision-making and warrant further investigation into sex-specific management of acute chest pain.



15330

TRENDS IN MORTALITY FROM ISCHEMIC HEART DISEASE AND CEREBROVASCULAR DISEASE IN BRAZILIAN WOMEN: A TIME-SERIES STUDY, 1990–2023

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Introduction/Background: Cardiovascular disease remains the leading cause of death among women in Brazil. Although overall declines in cardiovascular mortality have been observed, recent patterns indicate uneven progress across causes and age groups. Objectives: To characterize temporal patterns in cardiovascular mortality among Brazilian women, examining age-related differences and geographic variation between IHD and cerebrovascular diseases (CBVD). Methods: An ecological time-series analysis was conducted using national mortality data from DATASUS (1990–2023). Age-standardized mortality rates were calculated using 2022 Brazilian population as reference. Temporal patterns were assessed using moving averages and regression models. Analyses focused on premature mortality (<50 years), including proportional contribution and regional variation across federative units. Resultados e Conclusions: Between 1990 and 2023, mortality rates declined for both causes, with greater reduction observed for CBVD than for IHD. CBVD mortality decreased from 106.9 to 47.3 per 100,000 (−56%), whereas IHD declined from 81.9 to 44.3 per 100,000 (−46%). Among women under 50 years, CBVD mortality showed a marked decline of approximately 65% (APC −3.58%), whereas IHD decreased 38% (APC −1.53%). This divergence was accompanied by an increase in the proportional contribution of IHD (from 11.3% to 15.0%) and a reduction in CBVD (from 26.1% to 18.1%). Despite declining rates, absolute IHD deaths in this group increased by 33%, while CBVD deaths decreased by 31%. Nearly half of premature cardiovascular deaths occurred in women aged 40–49 years. In contrast, among women aged 50 years or older, both causes exhibited substantial and more parallel declines, with reductions of approximately 58% for CBVD and 49% for IHD. Regional analyses showed heterogeneous patterns for IHD, with reductions of 57% in the South and 41% in the Southeast, contrasted by stable or increasing trends in parts of the North and Northeast. In contrast, CBVD mortality declined more uniformly across the country. Despite overall declines in cardiovascular mortality among Brazilian women the persistence of slower declines in IHD, together with its increasing relative contribution among younger women, suggests a shift in the cardiovascular mortality profile. These findings highlight the need to reassess current prevention strategies, with greater attention to early detection and management of IHD n women, particularly in regions with less favorable trends.

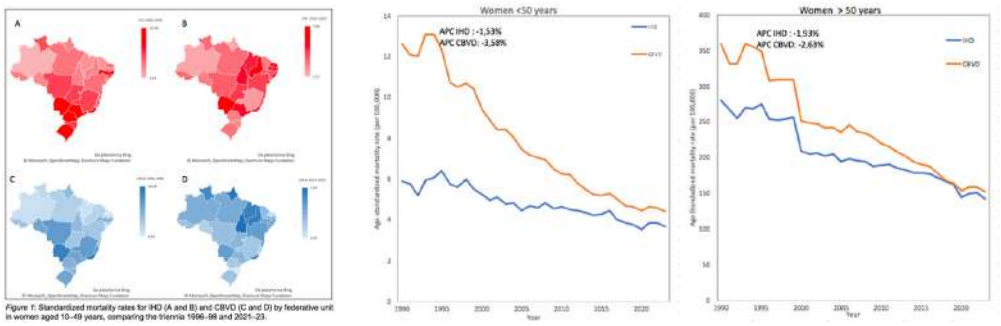


Figure 1: Standardized mortality rates for IHD (A and B) and CBVD (C and D) by federative unit in women aged 10–49 years, comparing the triennia 1990–98 and 2021–23.

RESEARCHER POSTER – CASE REPORT



81º CONGRESSO BRASILEIRO DE CARDIOLOGIA together with WORLD CONGRESS OF CARDIOLOGY





Acute and Chronic Coronary Syndrome / Thrombolysis



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16791

ACUTE MYOCARDIAL INFARCTION AND ISCHEMIC STROKE IN A PATIENT WITH HYPERHOMOCYSTEINEMIA

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Introduction: Atherosclerotic cardiovascular disease is a chronic multifactorial inflammatory disease, with endothelial dysfunction being one of its components. Mutations in the methylenetetrahydrofolate reductase (MTHFR) gene and the resulting hyperhomocysteinemia are risk factors for thromboembolic phenomena. Elevated homocysteine levels promote endothelial injury, smooth muscle cell proliferation, and activation of the coagulation cascade, increasing the risk of recurrent arterial and venous events. Case Description: A 44-year-old male with hypertension presented with typical exertional chest pain. Initial ECG revealed an extensive anterior STEMI. After dual antiplatelet therapy (DAPT) and tenecteplase fibrinolysis, he met reperfusion criteria with resolution of pain and ST-segment improvement. Transferred to a tertiary center in Killip class I, angiography showed a 90% proximal LAD stenosis and 50% circumflex artery stenosis. A successful PCI was performed on the LAD. On post-procedure day 2, the patient developed right hemiparesis and aphasia. Brain CTA demonstrated a subacute left parietal ischemic stroke; intra-arterial thrombolysis led to partial clinical improvement. Shortly after, he developed recurrent chest pain and new ST-segment elevation in leads V1-V6. Emergency angiography confirmed acute in-stent thrombosis, treated with aspiration thrombectomy, balloon angioplasty, new stent placement, and IABP support. Echocardiography showed an LVEF of 35% with anterior, septal, and apical akinesia, and an apical mural thrombus (7x5 mm). Thrombophilia screening revealed markedly elevated homocysteine (66.3 µmol/L; ref: 5.5–16.2) and a homozygous MTHFR C677T mutation. Protein C, S, Factor V Leiden, and antithrombin III were within normal limits. The patient was treated with tirofiban and therapeutic anticoagulation; hemodynamic support was successfully weaned. Conclusions: This case illustrates the clinical severity of severe hyperhomocysteinemia as a trigger for catastrophic thrombotic events (both coronary and cerebral). The acute in-stent thrombosis developed while the patient was on dual antiplatelet therapy and immediately following intra-arterial thrombolysis for his ischemic stroke. Homozygous MTHFR mutations should be considered in young patients presenting with multivessel or multisystemic thromboembolic events, as they may portend a significantly higher risk of recurrent, life-threatening complications.

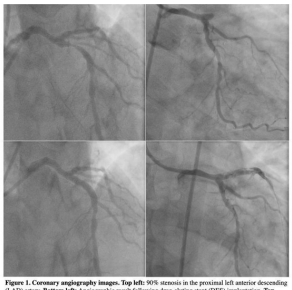


Figure 1. Coronary angiography images. Top left: 90% stenosis in the proximal left anterior descending (LAD) artery. **Bottom left:** Angiographic result following drug-eluting stent (DES) implantation. **Top right:** Acute in-stent occlusion shown in a different projection. **Bottom right:** Evidence of thrombus formation within the previously stented LAD segment.

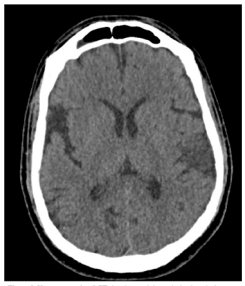


Figure 2. Non-contrast head CT showing a subtle cortical-subcortical hypoattenuating area in the left parietal lobe, representing a subacute ischemic infarct.

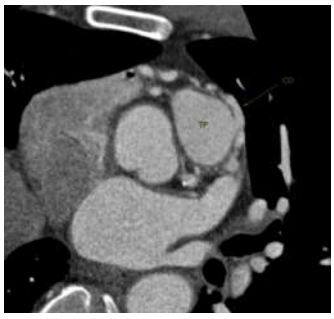
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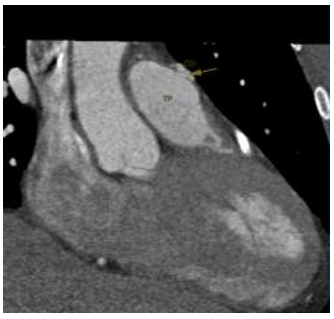
ACUTE MYOCARDIAL INFARCTION WITH ST-SEGMENT ELEVATION IN A PATIENT WITH BILATERAL CORONARY FISTULAS TO THE PULMONARY ARTERY TRUNK: CASE REPORT

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Introduction: Coronary arteriovenous fistulas (CAFs) are anomalous vascular communications that divert blood flow from the conventional myocardial capillary bed. Although rare, they represent the most frequent coronary arteriovenous malformation with the potential for hemodynamic repercussions. Although most young patients remain asymptomatic, the incidence of complications increases with age. The clinical spectrum is variable and depends on the caliber, origin, and drainage site of the fistula. For symptomatic cases, surgical ligation or percutaneous occlusion are the interventions frequently recommended. Case Description: Male patient, 50 years old, with a family history of coronary artery disease (CAD). In September 2020, the patient presented with an inferior wall STEMI (Delta-T 4h, Killip I). Coronary angiography revealed an 80% obstructive lesion in the proximal left anterior descending artery (LAD), 70% in the right coronary artery (RCA) – the culprit vessel – and 50% in the diagonal branch (Dg2). A large fistula from the RCA to the pulmonary artery trunk was also identified. Primary angioplasty with a drug-eluting stent was performed in the RCA. During hospitalization, computed tomography angiography confirmed the RCA fistula and showed thin fistulous tracts from the LAD to the pulmonary trunk as well. Eight days after the acute event, elective angioplasty of the LAD with two drug-eluting stents and a balloon pump was performed in Dg2. The initial echocardiogram demonstrated septal hypokinesis and moderate systolic dysfunction (LVEF 34%). In outpatient follow-up under optimized medical therapy, the patient progressed to NYHA functional class I, with sporadic atypical precordialgia and progressive improvement in ventricular function (LVEF 65% in February 2025). Conclusions: This report highlights the therapeutic challenge in the coexistence of bilateral coronary fistulas and severe obstructive CAD. Differentiation between atherosclerotic ischemia and the “coronary steal” phenomenon is essential for management. The favorable evolution under conservative treatment of the fistulas reinforces the safety of this strategy in asymptomatic patients, reserving invasive interventions for cases of persistent ischemia or documented hemodynamic overload.





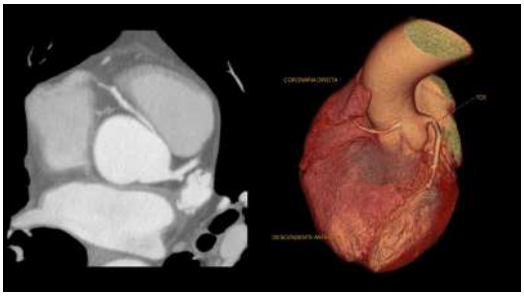
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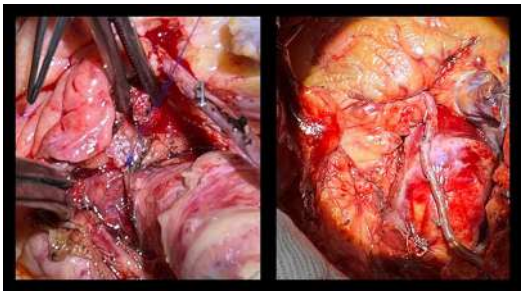
ANGINAL CHEST PAIN DUE TO AN ANOMALOUS RIGHT CORONARY ARTERY IN A PATIENT WITH A CARDIAC PACEMAKER: A DIAGNOSTIC CHALLENGE

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Introduction: Coronary artery anomalies are rare conditions and are generally asymptomatic; however, certain anatomical variations have a significant potential to cause myocardial ischemia, myocardial infarction, and sudden death. Case Description: A 77-year-old male with heart failure with improved ejection fraction (HFimpEF) secondary to tachycardia-induced cardiomyopathy, with a permanent pacemaker implanted due to atrial fibrillation (AF) refractory to rate and/or rhythm control requiring atrioventricular (AV) node ablation for symptomatic control. The patient presented with typical anginal chest pain (retrosternal, pressure-like, radiating to the left upper limb, worsened by exertion and relieved by rest). Coronary angiography was performed and showed no evidence of significant obstructive lesions. Coronary computed tomography angiography (CCTA) was subsequently performed for anatomical evaluation, revealing an anomalous right coronary artery (RCA) originating from the left coronary sinus with a malignant interarterial course between the aorta and the pulmonary artery. Due to prior AV node ablation and pacemaker dependence, the patient was unable to achieve the target heart rate during dobutamine stress echocardiography, resulting in a negative test for ischemia. Therefore, the examination was repeated with pacemaker reprogramming to increase the heart rate, allowing detection of progressive anginal pain with increasing heart rate, along with hypokinesia of the inferior wall at heart rates above 120 bpm. Based on these findings, angina secondary to the anomalous course of the right coronary artery was diagnosed. The patient was referred for surgical revascularization and underwent coronary artery bypass grafting (CABG) using the internal mammary artery to the RCA, along with ligation of the proximal segment of the RCA. After an uneventful recovery, the patient was discharged. At follow-up, he reported significantly improved symptoms and no chest pain. Conclusions: When identifying anomalous coronaries with non-significant lesions in a patient with angina, functional tests must determine the cause. However, the presence of a pacemaker may prevent the patient from achieving maximal heart rate with conventional pharmacological protocols, potentially leading to false-negative results. Increasing the heart rate through device reprogramming during functional testing is a strategy that can be used to achieve optimal conditions for the assessment of myocardial ischemia under stress.





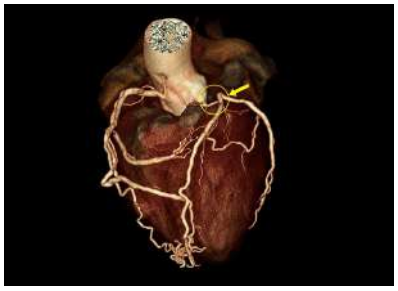
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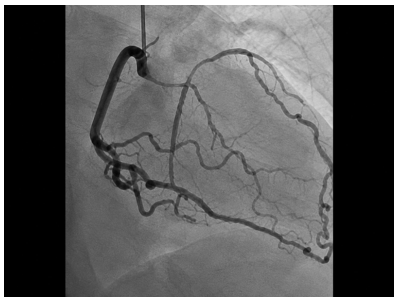
CONGENITAL ATRESIA OF THE LEFT CORONARY ARTERY (CALM): CASE REPORT

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Introduction: CALM is an extremely rare coronary anomaly, characterized by the absence of the ostium and/or trunk of the left coronary artery, with myocardial perfusion dependent on collateral circulation from the right coronary artery (RCA). Clinical presentation ranges from asymptomatic individuals to severe conditions including angina, heart failure, arrhythmias, and sudden death. Diagnosis is based on imaging methods, particularly coronary angiography, which demonstrates absence of the left ostium and retrograde flow through collaterals. Myocardial revascularization is usually recommended in symptomatic patients, but remains controversial in asymptomatic individuals without inducible ischemia. Case Description: A 53-year-old female with dyslipidemia and prediabetes, previously active, developed exertional chest pain over the past two months. Electrocardiography was normal. Echocardiogram (ECO) showed an ejection fraction of 65% with basal septal and inferior hypokinesia. The first exercise stress test achieved 10.34 METs and showed 0.25 mV horizontal ST depression at peak exercise. A second test, performed after four weeks of beta-blocker therapy, achieved 7.6 METs with no criteria for ischemia. Four weeks later, the patient suffered intense chest pain and was diagnosed with non-ST elevation myocardial infarction. Cardiac catheterization revealed occlusion of the left coronary artery trunk at its origin, with distal bed filling via grade 3 heterocollaterals. ECO showed no new alterations. Computed tomography coronary angiogram showed agenesis of the left coronary artery trunk, with the left anterior descending and circumflex arteries ending in a blind pouch and perfused by moderate-to-large caliber heterocollaterals from the RCA. No atherosclerotic disease was identified. Stress myocardial perfusion imaging after optimization of medical therapy showed 8.4 METs with no inducible ischemia. Conclusions: CALM is a rare anomaly with heterogeneous presentation and potentially serious outcomes, and its diagnosis can be challenging. This case highlights the importance of imaging modalities in diagnostic clarification and anatomical characterization, enabling appropriate risk stratification. In selected patients without inducible ischemia and with adequate collateral compensation, medical management may be a safe strategy. Therapeutic approach should be individualized aiming to optimize prognosis and reduce adverse events.





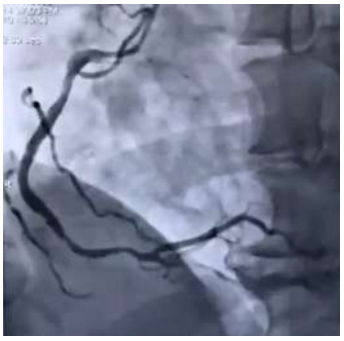
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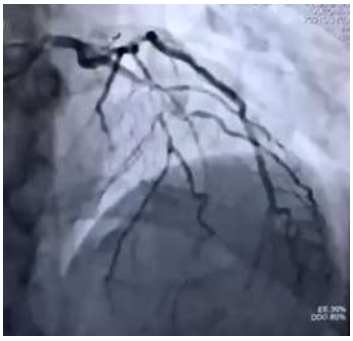
CORONARY ARTERY BYPASS GRAFTING IN A PATIENT WITH SEVERE MULTIVESSEL CORONARY ARTERY DISEASE AND HEMOPHILIA A: A MULTIDISCIPLINARY MANAGEMENT CASE REPORT

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(1) REDE DOR - RIO DE JANEIRO - RJ - BRASIL;

Introduction: Patients with hemophilia A undergoing cardiac surgery represent a major clinical challenge due to the high risk of perioperative bleeding and thrombotic complications. The coexistence of complex coronary artery disease (CAD) requires careful multidisciplinary planning involving cardiology, cardiac surgery, and hematology teams. Case Description: A 42 year-old male with type 2 diabetes, dyslipidemia, and hemophilia A (factor VIII deficiency) was admitted due to unstable angina. Echocardiography demonstrated preserved left ventricular ejection fraction (LVEF 68%) with mild mitral and tricuspid regurgitation. Coronary CT angiography revealed a calcium score of 67.8 (Agatston) and suggested severe triple-vessel CAD. Coronary angiography confirmed complex multivessel disease with surgical anatomy, including occluded left anterior descending artery with collateral filling, severe marginal branch lesions, and critical distal right coronary artery stenosis. Factor VIII replacement therapy was optimized under hematology supervision, including preprocedural and perioperative infusions. The patient underwent complete coronary artery bypass grafting (CABG) using left internal mammary artery and saphenous vein grafts under cardiopulmonary bypass (CPB time 145 min; aortic cross-clamp time 125 min). The postoperative period was complicated by mild bleeding requiring plasma transfusion and coagulation factor support. Electrocardiographic changes suggested postoperative pericarditis. Peak postoperative troponin I reached 4407 ng/L. Follow-up echocardiography demonstrated preserved ventricular function without significant pericardial effusion. Cardiac MRI showed minimal subepicardial late enhancement (4%) with preserved biventricular function. Factor VIII replacement was maintained for 14 days postoperatively according to hematology protocol. The patient progressed with stable hemodynamics, early mobilization, and no further complications. At discharge, he was asymptomatic and presented preserved cardiac function with mild residual pericardial effusion. Conclusions: This case highlights that CABG can be safely performed in patients with hemophilia A and complex CAD when guided by strict perioperative coagulation management and multidisciplinary collaboration. Individualized factor VIII replacement protocols are essential to balance bleeding and thrombotic risks, enabling favorable surgical outcomes.





22039

MINOCA ASSOCIATED WITH PERIPHERAL ARTERIAL THROMBOSIS IN A YOUNG PATIENT USING ELTROMBOPAG FOR IMMUNE THROMBOCYTOPENIC PURPURA: CASE REPORT

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Introduction: Acute coronary syndrome with non-obstructive coronary arteries (MINOCA) represents a challenging diagnosis, requiring integration of clinical, laboratory, and imaging data to define etiology. Thrombopoietin receptor agonists, such as Eltrombopag, used in the treatment of immune thrombocytopenic purpura (ITP), are associated with increased risk of arterial and venous thrombotic events, even in young patients without traditional cardiovascular risk factors. Case Description: A 34-year-old female with refractory ITP on Eltrombopag presented with sudden resting chest pain. Electrocardiogram showed T wave inversion in V1–V5, associated with elevated high-sensitivity troponin. Coronary angiography revealed epicardial coronaries without significant obstructive lesions. Twenty-four hours post-procedure, the patient developed severe pain, cyanosis, and signs of digital ischemia in the right upper limb distal to the radial puncture site. Vascular ultrasonography confirmed right radial artery thrombosis. During hospitalization, platelet counts ranged from 391,000 to 450,000/µL. Due to the pro-thrombotic state related to Eltrombopag, the drug was suspended and therapeutic anticoagulation initiated. Cardiac magnetic resonance imaging revealed transmural late gadolinium enhancement in the anterior wall, confirming ischemic myocardial injury and establishing the diagnosis of MINOCA likely of thrombotic etiology. This case illustrates the temporal association between Eltrombopag use and arterial thrombotic events in different vascular territories. Although rare, thrombopoietin receptor agonists can induce a pro-thrombotic state independent of marked thrombocytosis. The etiological investigation of MINOCA requires exclusion of obstructive coronary disease and diagnostic complement with cardiac magnetic resonance, crucial for confirmation of myocardial necrosis and definition of the underlying pathophysiological mechanism. Conclusions: MINOCA represents a complex and potentially serious clinical condition, particularly in young patients without evident obstructive coronary disease. Etiological investigation is essential for diagnostic confirmation and therapeutic guidance. Early recognition of the thrombotic mechanism allows targeted management and reinforces the importance of a multimodal approach in these patients.

16169

MULTIMODAL APPROACH IN HIGH-RISK CTEPH AND CRITICAL LEFT MAIN CORONARY ARTERY DISEASE: A CASE REPORT

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Introduction: Chronic thromboembolic pulmonary hypertension (CTEPH) is a potentially treatable condition, yet frequently underdiagnosed and associated with high morbidity and mortality. Its nonspecific presentation often delays early diagnosis. The coexistence of complex coronary artery disease further increases therapeutic complexity, requiring a multidisciplinary approach. We report an illustrative case of this scenario. Case Description: A 59-year-old male patient with hypertension, diabetes, and a history of smoking, had been diagnosed with Group 4 pulmonary hypertension—CTEPH—4 years earlier. He progressed with limiting angina and dyspnea (CCS/NYHA IV), as well as syncope preceded by chest pain. Hemodynamic assessment revealed a critical condition: right ventricular systolic pressure of 103 mmHg (echocardiography), mean pulmonary artery pressure of 58 mmHg, cardiac index of 1.6 L/min/m², and pulmonary vascular resistance of 15.5 Wood units (right heart catheterization). NT-proBNP was 2424 pg/mL. Coronary angiography demonstrated a 70% distal left main coronary artery (LMCA) lesion (trifurcation) and a 70% proximal left anterior descending (LAD) lesion. Discussion and Management: Due to low cardiac output and the severity of pulmonary hypertension, the risk of coronary artery bypass grafting (CABG) and pulmonary endarterectomy (PEA) was considered prohibitive. The Heart-Pulmonary Team opted for percutaneous coronary intervention (PCI) of the LMCA and LAD with drug-eluting stent implantation as a myocardial protection strategy and clinical "bridge." After stabilization, balloon pulmonary angioplasty (BPA) was scheduled, as recommended for inoperable or high-risk cases (Class I, Level B – ESC 2022). Optimized medical therapy included high-intensity statin therapy (LDL target <50 mg/dL), SGLT2 inhibitors, and transition to short-term triple antithrombotic therapy in the periprocedural period for one week, followed by dual therapy (oral anticoagulant plus clopidogrel) for 12 months. Conclusions: This case highlights the importance of percutaneous revascularization as hemodynamic support to enable subsequent pulmonary mechanical interventions in patients with extreme surgical risk, demonstrating the effectiveness of a personalized and multimodal approach in referral centers.

13596

PURULENT PERICARDITIS AFTER ACUTE MYOCARDIAL INFARCTION: A VARIANT OF DRESSLER?

ANA ELISA DA SILVA FERNANDES1; GABRIELA MEDEIROS JUNQUEIRA DE PÁDUA1; JÉSSICA CAMPIONI NASCIMENTO1; THAÍS FERNANDES DE ARAÚJO KUNH1; TALITA TIEMI HOSHINO BUENO1; CHARLENE TROIANI DO NASCIMENTO1;

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Introduction: Dressler syndrome(DS), also called post-myocardial infarction syndrome, is characterized as a form of secondary pericarditis that may present with or without pericardial effusion resulting from injury to the heart or pericardium. Case Description: A 50-year-old man was referred to the emergency department of a public hospital with back pain at rest radiating to the left hemithorax for three days, associated with a measured fever of 39°C and dyspnea requiring supplemental oxygen. He had been recently hospitalized at the same institution and discharged one week earlier due to an inferior ST-segment elevation acute myocardial infarction that occurred 25 days prior, for which delayed coronary angioplasty was performed on the second left marginal branch. Cardiac catheterization revealed multivessel coronary artery disease. The patient was an active smoker with a history of previous deep vein thrombosis, diabetes mellitus, and heart failure with reduced ejection fraction of 40%, associated with moderate mitral and tricuspid regurgitation, grade II diastolic dysfunction in addition to an intracavitary thrombus in the same chamber. Stent thrombosis was ruled out, with myocardial necrosis markers showing only a mild isolated elevation of troponin and electrocardiogram demonstrating diffuse ST-segment elevation. Hematology evaluation excluded hereditary thrombophilias. Blood cultures were positive for Staphylococcus aureus, leading to initiation of antibiotic therapy and transfer to the intensive care unit. The patient subsequently developed mixed shock (distributive and cardiogenic) requiring hemodialysis. Transthoracic echocardiography showed worsening of the ejection fraction to 28%, with an image suggestive of rupture of the LV lateral wall and significant pericardial effusion with systolic collapse of the right atrium (Figure 1). These findings were confirmed by transesophageal echocardiography, and the patient was referred for exploratory mediastinotomy. Purulent secretion was drained after pericardial resection with the presence of fibrin, without evidence of ventricular wall discontinuity, thus ruling out rupture (Figure 2). In the postoperative period, the patient evolved with refractory vasoplegic shock and, on the third day, presented cardiac arrest in pulseless electrical activity without return of spontaneous circulation, progressing to death. Conclusions: Dressler syndrome remains a clinical challenge due to its variable presentation and potential for severe outcomes.





21835

SPONTANEOUS CORONARY ARTERY DISSECTION CONCOMITANT WITH NEWLY DIAGNOSED SECONDARY HYPERTENSION AS THE FIRST MANIFESTATION OF ENDOGENOUS CUSHING SYNDROME: A CASE REPORT

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Introduction: Spontaneous coronary artery dissection is a cause of non-atherosclerotic and non-iatrogenic acute coronary syndrome and may present as myocardial infarction with non-obstructive coronary arteries. It is characterized by an intramural hematoma within the coronary artery wall, usually related to vasa vasorum disruption or underlying arterial wall abnormalities, leading to luminal compression, impaired coronary blood flow, and myocardial necrosis. Although considered an uncommon condition, it has been increasingly recognized, particularly among young women and pregnant or postpartum patients. Elevated cortisol levels may contribute to vascular fragility and arterial wall weakening, potentially predisposing to this condition. Case Description: A 40-year-old obese woman with recently diagnosed and poorly controlled hypertension presented to the emergency department complaining of severe chest pain lasting two hours, radiating to the left arm and jaw. Physical examination showed no relevant abnormalities. The electrocardiogram demonstrated anterior ST-segment elevation. Urgent coronary angiography was performed and revealed normal right coronary and circumflex arteries, while the left anterior descending coronary artery showed diffuse narrowing of the distal segment, suggestive of type 2b spontaneous coronary artery dissection (Image 1). Cardiac magnetic resonance imaging revealed subendocardial, non-transmural late gadolinium enhancement in the mid-anteroseptal and apical walls, consistent with myocardial infarction (image 1). After clinical stabilization, a comprehensive investigation was performed. Abdominal computed tomography (image 2) showed bilateral adrenal masses. The post-dexamethasone cortisol suppression test was compatible with endogenous hypercortisolism. The diagnosis of Cushing syndrome was established, and surgical resection was subsequently performed. Conclusions: Spontaneous coronary artery dissection is an important cause of MINOCA. This case suggests endogenous hypercortisolism as a potential contributor to vascular wall fragility, hypertension, and coronary vulnerability. In young patients with SCAD, especially when associated with newly diagnosed or poorly controlled hypertension, secondary causes should be investigated. Early recognition of Cushing syndrome may guide treatment, prevent recurrence, and improve prognosis.

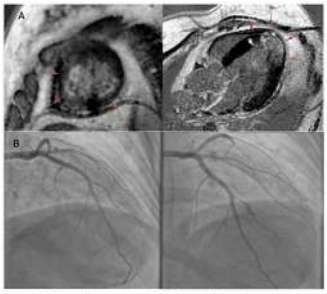


Figure 1. A. Cardiac magnetic resonance imaging showing late gadolinium enhancement consistent with acute myocardial infarction (red arrows). B. Coronary angiography of the left anterior descending artery showing diffuse narrowing of the distal segment, without other signs of coronary artery disease, consistent with type 2b spontaneous coronary artery dissection.

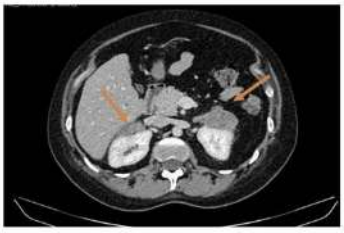


Figure 2. Computed tomography showing bilateral adrenal masses, consistent with adrenal lesions identified during the investigation of secondary hypertension and endogenous hypercortisolism.

Acute and Chronic Coronary Syndrome / Thrombolysis



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21552

AORTIC ARCH DISSECTION AND PSEUDOANEURYSM AFTER HIGH-IMPACT TRAUMA: MANAGEMENT CHALLENGES IN A POLYTRAUMA PATIENT

ANA LAURA SANTOS DE ALMEIDA1; FABIO MASTROCOLA1; MARIA GABRIELA MEDEIROS CUNHA DE ARAUJO1; INGRID NÓBREGA ARAÚJO QUEIROZ1; ROBERTO MORENO MENDONÇA1; LILIAN KAROLINE DE OLIVEIRA ROCHA1; LETICIA DE FREITAS BARRADAS SIEBRA1; DAVI NUNES SANTOS DE ALMEIDA2;

(1) UFRN - NATAL - RN - BRASIL; (2) UNIVERSIDADE POTIGUAR (UNP) - NATAL - RN - BRASIL;





Introduction: Traumatic aortic dissection results from high-impact deceleration forces and is the second most common cause of death in trauma patients. The aortic isthmus is the most frequent site, although the aortic arch can also be affected. Computed tomography angiography (CT angiography) is the diagnostic gold standard, with high sensitivity and specificity. Strict control of blood pressure and heart rate is essential to prevent rupture and extension of the lesion. Case Description: Male patient, 46 years old, truck driver, victim of a truck collision (motorcycle-truck). The patient initially presented with severe thoracoabdominal trauma, including aortic arch laceration, a 5.5 cm diameter pseudoaneurysm, traumatic diaphragmatic hernia on the left, bilateral hemothorax, and multiple rib fractures (3rd to 10th on the left). Initial management included laparotomy for reduction of herniated contents and herniorrhaphy, as well as bilateral thoracostomy. During stabilization, the patient developed limb pain and sweating, and a Stanford A-type aortic arch dissection was diagnosed via CT scan. The patient underwent complex surgical correction with interposition of a Dacron prosthesis between the brachiocephalic trunk and the left carotid artery (in a Y-shape), along with implantation of an endoprosthesis in the aortic arch and descending aorta. The cardiopulmonary bypass (CPB) time was 61 minutes. Postoperatively, the patient presented with post-pericardiotomy syndrome, treated with drainage of 400 mL of serosanguineous fluid and administration of colchicine. The patient was discharged from the hospital in good general condition, breathing normally and ambulating, maintaining outpatient follow-up with CT angiography, which demonstrated aortic prostheses without signs of leakage. Conclusions: The success in managing traumatic aortic dissection in polytrauma patients depends on early diagnosis and a precise surgical approach. The case highlights the complexity of hybrid treatment (open and endovascular surgery) and the need for vigilance for postoperative complications, such as post-pericardiotomy syndrome, ensuring long-term survival and stabilization.

17277

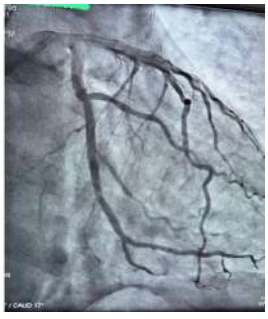
HIGH-VOLTAGE ELECTRICAL INJURY TRIGGERING ACUTE CORONARY STENT THROMBOSIS: A CASE REPORT

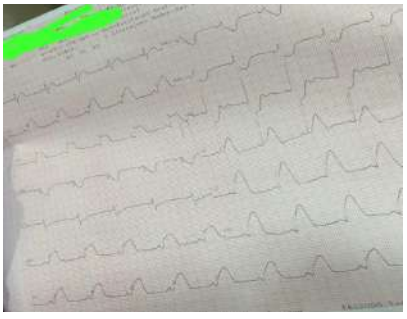
VINÍCIUS MENEZES ROZENWINKEL1; JULIA HELIOTERIO CAMPOS1; RUI NUNOMURA XAVIER1; MARIA ANTONIA FRIZZERA DE CARVALHO1; MURILLO JOSÉ DE ABREU ACERBI1; LEANDRO RUA RIBEIRO1;

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Introduction: Electrical injuries are associated with a wide spectrum of cardiac complications, including arrhythmias and myocardial damage. However, acute coronary stent thrombosis following high-voltage electrical shock is rarely described. We report a case of acute coronary stent occlusion immediately after electrical injury, highlighting a possible causal relationship. Case Description: A 64-year-old male electrician with a history of coronary artery disease treated with percutaneous coronary intervention and stent implantation in the circumflex artery eight years earlier presented with typical chest pain immediately after sustaining a high-voltage electrical injury (13,000 V) at work. The initial electrocardiogram showed ST-segment elevation in the inferior, anterior, and apical leads, with reciprocal ST-segment depression in the septal lead, consistent with acute inferoapical ST-segment elevation myocardial infarction. Emergency coronary angiography revealed acute thrombotic occlusion at the distal edge of the previously implanted circumflex stent, without significant obstructive lesions in the remaining coronary segments. During the procedure, the patient developed sustained ventricular tachycardia with hemodynamic instability, requiring immediate electrical cardioversion. Revascularization was successfully performed, restoring coronary flow and leading to clinical stabilization. The immediate onset of ischemic symptoms after the electrical accident, together with the angiographic findings and the absence of other evident triggers, supports a plausible association between the electrical injury and acute stent thrombosis. A potential mechanism may involve local electrical and thermal endothelial damage at the stent site, promoting thrombus formation and myocardial infarction. The marked temporal relationship between the accident and symptom onset, as well as the lack of significant obstructive disease elsewhere, reinforces the hypothesis that the electrical insult acted as the precipitating trigger of the coronary event. This case underscores the need for rapid recognition and immediate invasive management. Conclusions: High-voltage electrical injury may represent a rare trigger for acute coronary stent thrombosis in patients with previous coronary stenting. The marked temporal relationship, compatible electrocardiographic findings, and angiographic confirmation of stent-edge occlusion make this association clinically compelling and reinforce the importance of rapid recognition and reperfusion.







18763

LAVA-ECMO AS A RESCUE STRATEGY FOR REFRACTORY LEFT VENTRICULAR DISTENSION DURING VA-ECMO IN FULMINANT MYOPERICARDITIS: A CASE REPORT

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Introduction: Fulminant myopericarditis is a rare and potentially fatal condition, frequently associated with rapid hemodynamic deterioration and the need for advanced mechanical circulatory support. Among the complications of venoarterial extracorporeal membrane oxygenation (VA-ECMO), left ventricular distension represents a critical event that can compromise myocardial recovery. Case Description: A 29-year-old female patient, previously healthy, was admitted after experiencing flu-like symptoms and developed acute myopericarditis. The initial echocardiogram showed a left ventricular ejection fraction (LVEF) of 57% and moderate pericardial effusion with signs of increased intrapericardial pressures. She developed cardiac tamponade and underwent subxiphoid pericardial window surgery. In less than 24 hours, she experienced abrupt hemodynamic deterioration, with severe biventricular dysfunction (LVEF 15%). During pulmonary artery catheterization, the patient developed ventricular tachycardia followed by pulseless electrical activity, which resolved after advanced resuscitation maneuvers. The patient presented refractory cardiogenic shock, classified as SCAI E, and VA-ECMO was initiated. Despite the support, persistent left ventricular distension was observed, with acute dilation and impaired emptying on echocardiography. As an initial unloading strategy, an intra-aortic balloon pump was implanted, without clinical or echocardiographic improvement, with an LVEF of 9%. Given the refractory overload, left ventricular decompression was performed via LAVA-ECMO with percutaneous atrioseptostomy, allowing for a reduction in filling pressures and resolution of ventricular distension. After the intervention, there was hemodynamic stabilization, control of arrhythmias, and progressive recovery of ventricular function, with LVEF 42% during weaning and subsequent normalization of left ventricular function (LVEF 57%), allowing for decannulation. There were 19 days of hospitalization in intensive care. Conclusions: The use of LAVA-ECMO proved decisive for hemodynamic stabilization and myocardial recovery, highlighting its potential as a rescue strategy in fulminant myopericarditis. Early recognition of this complication and timely intervention were crucial for shock reversal and improved prognosis. The study was approved by the Institutional Research Ethics Committee (CAAE: 91641525.0.0000.5327)

Cardiac Arrhythmias / Electrophysiology / Electrocardiography / Cardiac Pacing



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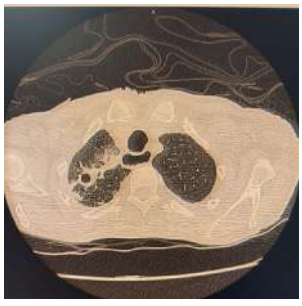
CARDIAC AMYLOIDOSIS DUE TO RARE ASP58ALA VARIANT WITH RECURRENT PERICARDIAL EFFUSION PROGRESSING TO CARDIAC TAMPONADE IN THE CONTEXT OF SUSPECTED PULMONARY TUBERCULOSIS

KELEN MARQUES DE SOUZA1; GUSTAVO GUARACY LOPES PEREZ2; ALINE BRASIL ARANHA3; NAYARA DO CARMO SANTOS LIMA3; MATHEUS MARTINS MONTEIRO3; MARCELA OLIVEIRA DE AZEVEDO3; DIEGO CORREA LAMBERTI3; MARINA DE CASTRO FERREIRA3; KATIA DO NASCIMENTO COUCEIRO2; ALVARO QUEIROZ MAGALHAES2; RENATA TEODORA JALES BARRETO1; JOAO MARCOS BEMFICA BARBOSA FERREIRA3;

(1) UNIVERSIDADE FEDERAL DO AMAZONAS - MANAUS - AM - BRASIL; (2) UEA - MANAUS - AM - BRASIL; (3) HOSPITAL DO CORACAO FRANCISCA MENDES - MANAUS - AM - BRASIL;

Introduction: Transthyretin cardiac amyloidosis is a progressive infiltrative disease. Pericardial effusion is common, although cardiac tamponade is a rare complication. The association with pulmonary tuberculosis may accelerate the progression of pericardial effusion and trigger hemodynamic instability. We report a case of rapid progression to cardiac tamponade in a patient with an aggressive genetic variant and suspected associated pulmonary tuberculosis. Case Description: A 66-year-old female patient with mixed transthyretin amyloidosis (neurological and cardiac involvement) carrying the rare Asp58Ala variant, on regular treatment with inotersen. In January 2026, she was hospitalized for investigation of massive hemoptysis. Chest computed tomography revealed a thick-walled cavitary lesion in the right upper lobe, suggestive of tuberculosis, and a 40-mm pericardial effusion, although without echocardiographic signs of diastolic restriction. The patient requested discharge against medical advice before completion of the investigation. In February 2026, she was readmitted with daily episodes of syncope on minimal exertion and hypotension. Echocardiography demonstrated progression of the pericardial effusion and the appearance of tamponade physiology, with respiratory variation of tricuspid inflow of 42% and mitral inflow of 22%. Emergency pericardiocentesis was performed, draining 550 mL of serosanguinous fluid with immediate clinical improvement. Acid-fast bacilli testing in the pericardial fluid was negative. Bronchoscopy with bronchoalveolar lavage was performed to investigate Mycobacterium tuberculosis. Conclusions: The Asp58Ala transthyretin amyloidosis variant may progress to cardiac tamponade, a rare complication, particularly in the presence of suspected pulmonary tuberculosis. Syncope in patients with amyloidosis requires immediate echocardiographic evaluation to rule out tamponade. This case highlights the importance of genetic characterization for prognostic definition and of comprehensive etiological investigation in patients with recurrent pericardial effusion.





16134

CARDIONEUROABLATION IN ELDERLY PATIENT - A CASE REPORT

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(1) INCOR - INSTITUTO DO CORACAO DA UNIVERSIDADE DE SAO PAULO - SAO PAULO - SP - BRASIL;

Introduction: Cardioneuroablation (CNA) has been presented as an alternative to pacemaker implantation for patients with refractory vasovagal syncope and demonstrated cardioinhibition. The ELEGANCE multicenter study has included elderly patients and expanded the age range for this procedure. This case reports one of the oldest patients submitted to catheter ablation of ganglionated plexi to highlight the possibility of this treatment at this age. Case Description: A 78-year-old man with a history of syncope after meal and documentation of pauses and advanced atrioventricular(AV) block came for evaluation for pacemaker implantation. He had been feeling dizzy after lunch for the past six months, but had never experienced syncope until then. He was otherwise healthy, with no other complaints and no significant medical history. Of note, he had practiced sports since childhood and played soccer as a professional for about 20years. After retirement, he kept practicing. He was used to taking large meals preceding the symptoms of dizziness. The 12-lead ECG showed sinus rhythm with first-degree AV block and narrow QRS. A 24-hour Holter monitor revealed 464 pauses greater than 2s (longest 4.3s) and episodes of advanced AV block during the night (including third-degree AV block). Atropine test resulted in an increasement in heart rate (57bpm to 78bpm) and a decrease in PR interval (280ms to 200ms). In the electrophysiology study, vagal stimulation elicited an AV block response of up to 6s. In the right atrium, a large area corresponding to the right inferior ganglionated plexus(RIGP) in the posterior aspect of the coronary sinus ostium also elicited prolonged AV block. RF ablation of this large area was performed using an irrigated ablation catheter guided by Surpoint. Following ablation, repeat high-frequency stimulation in the right internal jugular vein and at the RIGP was performed, and the AV nodal response was no longer reproduced. After the procedure, the patient had no further complaints of dizziness or syncope. An initial repeated Holter monitor revealed a PR interval < 200 ms, no further abnormal AV conduction, and no pauses. Conclusions: CNA was proposed in this case after the functional nature of AV block became unequivocal. Advanced age alone should not be an absolute exclusion criteria for CNA, provided the patient does not have specific contraindications. The main decision-making factors should rely on clinical characteristics and the assessment of frailty, rather than just chronological age.

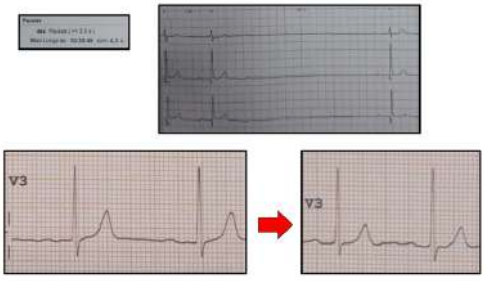


Figure 1: A -Holter monitor before Cardioneuroblation. B- Atropine test increased heart rate (57 bpm to 78 bpm) and a decreased in PR interval (280 ms to 200 ms)

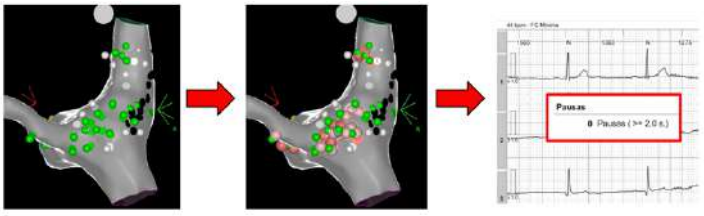


Figure 2: Electroanatomic mapping of posterior wall of RA using CARTO system. Fixed vagal stimulation parameters throughout the procedure were: pulse duration 5 seconds; frequency 30 Hz; pulse width 50 µs; amplitude 0.5–1 V/kg. A - Green points indicates the area where AV block could be elicited by vagal stimulation, while white points indicates it limits (no AV block elicited). Black dots indicates proximity to the phrenic nerve. Pink points indicates ablation lesions.

21379

CORONARY VASOSPASM AS A CAUSE OF SYNCOPE AND POLYMORPHIC NON-SUSTAINED VENTRICULAR TACHYCARDIA IN A YOUNG PATIENT WITHOUT STRUCTURAL HEART DISEASE

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(1) HOSPITAL ISRAELITA ALBERT EINSTEIN - SAO PAULO - SP - BRASIL;

Introduction: Syncope associated with chest pain and ventricular arrhythmias in young patients without apparent structural heart disease represents a diagnostic challenge and requires careful etiological investigation. Coronary vasospasm, although frequently underdiagnosed, may present with transient ischemia, ST-segment changes, and potentially life-threatening arrhythmias, even in the absence of obstructive coronary artery disease. Acetylcholine coronary reactivity testing is a key diagnostic tool for this condition. Case Description: A 40-year-old previously healthy male patient presented to the emergency department after an episode of syncope preceded by chest pain and palpitations. Echocardiography, coronary computed tomography angiography, and cardiac magnetic resonance imaging demonstrated preserved biventricular function and no evidence of structural heart disease. Tilt-table testing was positive for a vasodepressor response. Monitoring with an implantable loop recorder revealed frequent premature ventricular contractions, episodes of polymorphic non-sustained ventricular tachycardia (NSVT), and transient ST-segment elevation during symptoms. Coronary angiography demonstrated a myocardial bridge in the mid-segment of the left anterior descending artery, with significant systolic compression. Myocardial perfusion scintigraphy and exercise stress testing were negative for ischemia. Due to persistent symptoms and dynamic electrocardiographic changes, acetylcholine coronary reactivity testing was performed, demonstrating epicardial coronary spasm with significant luminal reduction of the left coronary artery, associated with ST-segment depression and T-wave inversion, which resolved after nitrate administration. Microvascular spasm was also observed, characterized by ST-segment depression in both right and left coronary territories without angiographic luminal reduction, in addition to transient atrioventricular block during infusion. Treatment with verapamil was initiated, resulting in complete symptom resolution and no recurrence of arrhythmias. Conclusions: Coronary vasospasm, involving both epicardial and microvascular dysfunction, should be considered in the differential diagnosis of syncope associated with ventricular arrhythmias and dynamic electrocardiographic changes in young patients with non-obstructive coronary arteries. Acetylcholine testing was decisive for establishing the diagnosis and guiding specific therapy, leading to a favorable clinical outcome.

18200

CORONARY-CAMERAL FISTULA AFTER LEFT BUNDLE BRANCH AREA PACING: A RARE CAUSE OF CHEST PAIN

FELIPE BARBOSA BOTELHO ROLIM1; VITOR DA SILVA DIAS1; BERNARDO NOYA ALVES DE ABREU1; FELIPE AUGUSTO ORTENCIO1; JUAN CARLOS ZERPA ACOSTA1; RAYZA KARLLA SALES ARAÚJO1; ELTON SIMIONATO SCURO1; MARIEL MARA PERON DE OLIVEIRA1; ANDRE KEVEN VIANA DA SILVA1; RAFAEL CRISTIANO BRANDL1; ANA CAROLINE PARAGUAY MARTINS2; BRUNA ORBITE GARCIA1;

(1) HOSPITAL DO CORACAO - HCOR - SAO PAULO - SP - BRASIL; (2) INSTITUTO DE MEDICINA INTEGRAL PROFESSOR FERNANDO FIGUEIRA - IMIP - RECIFE - PE - BRASIL;

Introduction: Conduction system pacing, specifically left bundle branch area pacing (LBBAP), is a physiological method to maintain ventricular synchrony. However, the deep septal lead penetration required poses risks of vascular trauma. Coronary-cameral fistula (CCF) is an exceptionally rare iatrogenic complication of this technique. As physiological pacing becomes more prevalent, identifying such adverse events is essential for postoperative management and patient safety. Case Description: A 58-year-old male with coronary artery disease (four previous infarctions and recent multivessel percutaneous intervention) and heart failure with reduced ejection fraction underwent a dual-chamber implantable cardioverter-defibrillator (ICD) placement with LBBAP. On the second postoperative (PO) day, an atrial lead displacement required repositioning. The following day, he developed severe retrosternal chest pain, refractory to intravenous nitroglycerin. Troponin levels rose significantly (peak 312 ng/L; reference 19.8 ng/L). Urgent angiography showed no new obstructive lesions but revealed a CCF exactly at the LBBAP lead fixation site. ICD interrogation showed optimal parameters. Due to hemodynamic stability, the patient was managed conservatively with high-dose opioids and intravenous nitroglycerin in the intensive care unit. Following gradual clinical improvement and analgesic titration, he was discharged on the 10th PO day. Conclusions: CCF can mimic acute coronary syndrome through refractory pain and troponin elevation, even with optimal pacing parameters. Multimodality imaging is crucial for diagnosis. In stable patients, a conservative approach focusing on symptom control may be a safe alternative to invasive interventions like embolization or lead extraction, avoiding the risks of removing a deep septal lead.



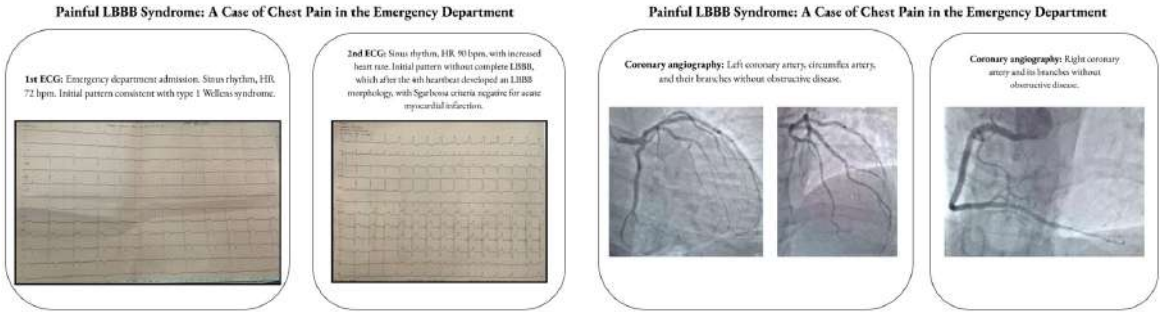
18742

PAINFUL LEFT BUNDLE BRANCH BLOCK (LBBB) SYNDROME: A CASE OF CHEST PAIN IN THE EMERGENCY DEPARTMENT

ANDRE ASSIS RODRIGUES1;

(1) UNIMED SERRANA - NOVA FRIBURGO - RJ - BRASIL;

Introduction: Painful LBBB syndrome is a rare condition characterized by the presence of intermittent LBBB during episodes of chest pain, without evidence of myocardial ischemia. Painful left bundle branch block syndrome was first described by William V. Vieweg et al. in 1976 in the article “Rate-dependent left bundle branch block...” published in Chest. The main differential diagnosis is acute coronary syndrome (ACS), particularly in the setting of dynamic electrocardiographic changes during chest pain. A systematic review identified only 50 published cases worldwide, highlighting the rarity of this condition. Case Description: We report the case of a 51-year-old woman with a history of obesity and systemic arterial hypertension. The patient had been evaluated at another hospital the day before admission due to exertional oppressive chest pain for three days, relieved by rest (typical angina). She was admitted following the chest pain protocol, and the admission ECG demonstrated sinus rhythm (72 bpm) with a pattern compatible with type 1 Wellens syndrome. On admission, vital signs and physical examination were normal, with a HEART score of 6. During episodes of chest pain, dynamic ECG changes occurred, with the appearance of new-onset LBBB, initially interpreted as high-risk ACS. The patient underwent urgent coronary angiography, which demonstrated no significant coronary artery obstruction. Laboratory tests, including high-sensitivity troponin, as well as chest radiography and echocardiography, were normal. After clinical assessment and review of complementary tests, the diagnosis of painful LBBB syndrome was established. Following 48 hours of monitoring, symptoms improved and the ECG normalized. The patient was discharged with treatment directed toward cardiovascular risk factors, including beta-blocker therapy, in addition to recommendations for supervised physical activity. She was referred for outpatient cardiology follow-up. Conclusions: This case highlights the importance of broadening the diagnostic approach in patients presenting to the emergency department with chest pain and dynamic ECG changes. Given the rarity of this clinical condition, it is essential that patients are informed about the diagnosis in order to avoid repeated invasive investigations during future episodes of chest pain. Furthermore, adherence to medical therapy and supervised exercise should be encouraged, with appropriate cardiology follow-up for symptom control and management of comorbidities.



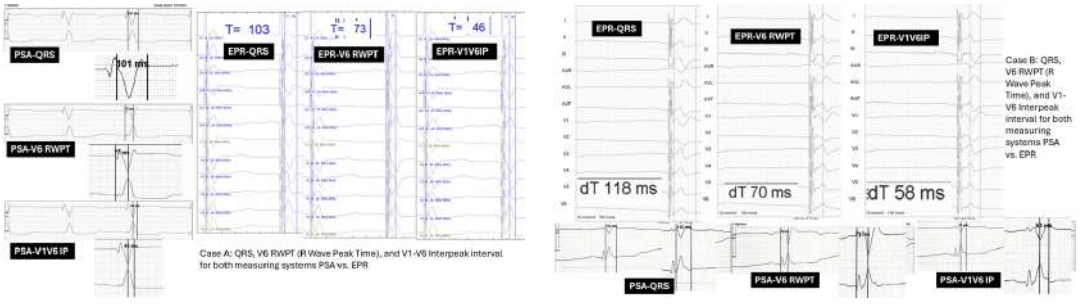
21568

SIMPLIFIED LEFT BUNDLE BRANCH AREA PACING GUIDANCE USING A MANUFACTURER PACING SYSTEM ANALYZER: COMPARISON WITH AN ELECTROPHYSIOLOGY RECORDING SYSTEM, A CASE SERIES

ANDRES DI LEONI FERRARI1; BERNARDO NEUHAUS LIGNATI1; GUSTAVO RAMIRES1; GUSTAVO CHIARI CABRAL2; JESSICA CAROLINE FELTRIN WILLES1; THIAGO CAMARGO MOREIRA1; LUISA RODRIGUES NUNES DE MARAES1; DANIEL NUNES DA ROSA1;

(1) PUCRS - PORTO ALEGRE - RS - BRASIL; (2) UNIVATES - UNIVERSIDADE DO VALE DO TAQUARI - LAJEADO - RS - BRASIL;

Introduction: Left bundle branch area pacing (LBBAP) requires confirmation of conduction system capture using intracardiac electrograms and ECG criteria. However, dependence on an electrophysiology recording system (EP-RS) may limit broader adoption. We evaluated whether a conventional manufacturer pacing system analyzer (PSA) could reliably reproduce EP-RS measurements during LBBAP implantation, aiming to simplify and expand access to conduction system pacing procedures. Case Description: We prospectively analyzed five consecutive patients undergoing LBBAP implantation at a tertiary university hospital in Porto Alegre, Brazil. We compared one brand PSA measurements against EP-RS from two different manufacturers. Surface lead positioning was modified to obtain PSA-derived V1 and V6 signals analogous to those displayed by the EP-RS, combined with intracardiac electrogram assessment. Measurements obtained from PSA and EP-RS during implantation were compared, including baseline QRS duration, paced QRS duration, V6 R-wave peak time (V6-RWPT), V6–V1 interpeak time (IPT), and morphology-based criteria for LBBAP, including the presence of r′/R′ in V1. PSA and EP-RS measurements were closely aligned.Initial W morphology in V1 was observed in both cases. Final paced QRS duration was 103.75 ± 13.38 ms with EP-RS versus 103.75 ± 13.38 ms with PSA. V6-RWPT 67.25 ± 5.62 ms versus 70.50 ± 3.32 ms, and V6–V1 IPT 47.50 ± 5.97 ms versus 44.50 ± 9.43 ms. According to current criteria, successful LBBAP was identified in all patients with EP-RS, and all these met criteria using PSA measurements. No PSA system in unipolar/bipolar configuration showed superiority over another. Conclusions: This is one of the first prospective demonstrations that a standard manufacturer PSA may reliably substitute for EP-RS guidance during LBBAP implantation. A simplified PSA-based approach centered on V1/V6 surface leads and intracardiac electrograms accurately reproduced key EP-RS implantation criteria for LBBAP. This strategy may facilitate conduction system pacing in centers without dedicated EP-RS infrastructure, including urgent pacemaker implantations, potentially broadening access to physiologic pacing techniques. Early experience also suggests a relatively short learning curve for reproducible measurements. Further studies comparing feasibility with all the PSAs in the market and different EP-RS systems are needed.

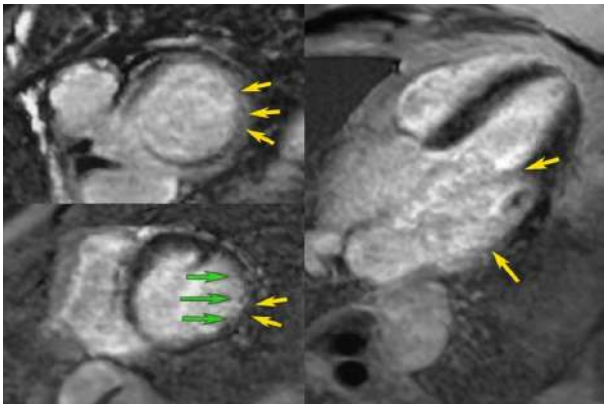


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SUSTAINED VENTRICULAR TACHYCARDIA IN ARRHYTHMOGENIC MITRAL VALVE PROLAPSE TWO YEARS AFTER MITRAL VALVE SURGERY

NÁGELA S V NUNES1; PAULA GONZALEZ1; ALFREDO S BOMFIM1;

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Introduction: Arrhythmogenic mitral valve prolapse (MVP) has been increasingly recognized as a substrate for malignant ventricular arrhythmias and sudden cardiac death. The persistence of arrhythmic events after surgical correction of mitral regurgitation highlights the role of the underlying myocardial substrate rather than the valvular abnormality alone. Case Description: A 74-year-old man with hypertension, diabetes mellitus, atrial fibrillation (previously ablated), and severe mitral regurgitation due to mitral valve prolapse underwent mitral valve replacement with a bioprosthesis and coronary artery bypass grafting (left internal mammary artery to left anterior descending artery). Two years after surgery, he was admitted with malaise and dizziness, progressing to syncope. On presentation, he was hemodynamically stable but had a regular wide-complex tachycardia (heart rate 171 bpm), which was terminated with intravenous amiodarone. Electrocardiographic analysis demonstrated sustained monomorphic ventricular tachycardia with morphology suggestive of an inferior left ventricular origin. Transthoracic echocardiography showed a normally functioning mitral bioprosthesis and no evidence of mitral annular disjunction. Cardiac magnetic resonance revealed mildly reduced left ventricular systolic function and non-ischemic late gadolinium enhancement in basal inferolateral segments, consistent with a typical arrhythmogenic substrate in MVP. Importantly, this fibrotic pattern did not correlate with the anatomical distribution of coronary artery disease. Ambulatory monitoring demonstrated a high burden of ventricular ectopy and episodes of nonsustained ventricular tachycardia. Given the documented sustained ventricular tachycardia, an implantable cardioverter-defibrillator was indicated and successfully implanted. The clinical presentation was interpreted as sustained ventricular tachycardia in the context of arrhythmogenic MVP, highlighting the persistence of arrhythmic risk despite prior surgical correction of mitral regurgitation. Conclusions: Arrhythmogenic MVP is a cause of malignant ventricular arrhythmias. Sustained ventricular tachycardia years after mitral valve surgery suggests that risk is driven by the underlying myocardial substrate rather than the valve lesion. Absence of mitral annular disjunction does not exclude fibrosis or arrhythmic risk, and when cardiac magnetic resonance identifies the inferolateral substrate, ICD implantation is warranted.

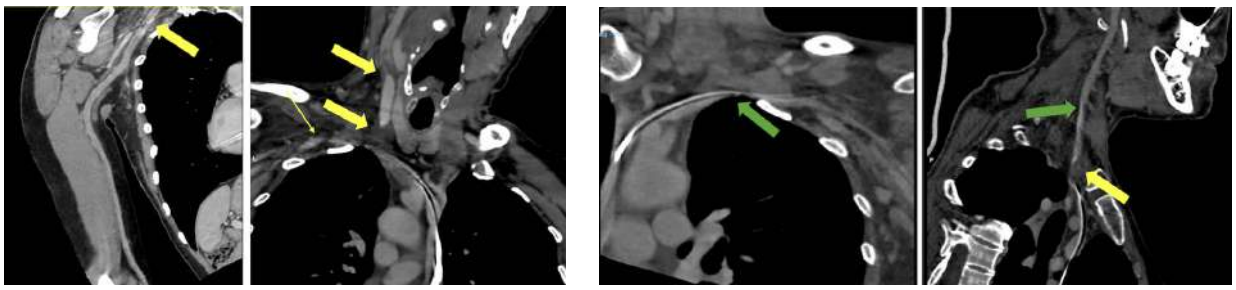
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WHEN THROMBOSIS MEETS DEVICE LEADS: NAVIGATING THROMBOLYSIS IN PAGET-SCHROETTER SYNDROME WITH A TRANSVENOUS ICD

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Introduction: Upper-extremity venous thrombosis is uncommon and should be suspected in patients presenting with acute arm swelling, particularly in the presence of transvenous cardiac device leads or thoracic outlet compression. Case Description: A 42-year-old woman presented with acute left upper limb swelling and erythema, after starting a new upper-body exercise program with repetitive overhead arm movements with forced abduction. She had a transvenous implantable cardioverter-defibrillator (ICD) implanted in primary prevention of sudden cardiac death for a spontaneous type I Brugada ECG pattern and a positive electrophysiological study, with a variant of uncertain significance in the SCN5A gene (p.Met881Ile). Lab tests showed elevated D-dimers, and transthoracic echocardiography was unremarkable. Since Doppler ultrasound was inconclusive due to device-related artifacts, contrast-enhanced CT was performed and showed extensive thrombosis of the left subclavian vein extending to the distal left internal jugular vein at the confluence with the brachiocephalic vein (Fig. 1). Despite therapeutic anticoagulation with UFH and the LMWH, no clinical improvement was observed. Given the extensive thrombosis, severe symptoms, young age, and the risk of post-thrombotic syndrome, early thrombus-removal strategy was considered. However, catheter-directed thrombolysis was considered high risk due to the presence of ICD lead within the thrombosed vein, with a risk of lead displacement or entanglement during endovascular manipulation. After Heart Team multidisciplinary discussion, systemic thrombolysis with alteplase was performed, followed by oral anticoagulation. This approach resulted in rapid clinical improvement of the upper limb. Follow-up imaging confirmed near-complete venous recanalization (Fig. 2). After thoroughly ruling out malignancy and thrombophilia as causes, we diagnosed the case as effort thrombosis consistent with Paget–Schroetter syndrome, linked to the dynamic compression of the subclavian vein at the thoracic outlet during the patient's recent physical activities. The transvenous ICD lead may have further contributed to local venous flow disturbance and promoted subsequent thrombosis. Conclusions: This case illustrates the complex interplay between effort thrombosis, namely Paget-Schroetter syndrome, and transvenous cardiac device lead, highlighting how device-related anatomical constraints may influence thrombolytic strategy in symptomatic upper-extremity deep vein thrombosis.



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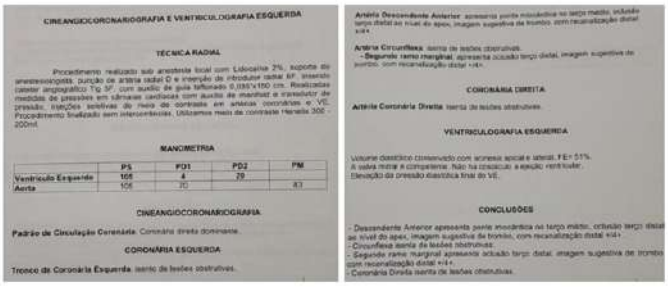
ACUTE MYOCARDIAL INFARCTION IN A YOUNG ADULT SECONDARY TO CARDIAC MYXOMA: CASE REPORT

LANA ALVES DE LIMA1; CAROLINE ALMEIDA PINTO2; LORENA BATISTA VALENCIANO1; NIVALDO CORTELA3; ANA BEATRIZ BOAMORTE CORTELA4; GIBRAN RODER FEGURI5;

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Introduction: Cardiac myxomas are the most frequent primary benign neoplasms of the heart, although their presentation as acute myocardial infarction is rare. Case Description: Male patient, 31 years old, previously healthy, admitted with sudden chest pain and electrocardiogram compatible with acute myocardial infarction with ST-segment elevation of the inferior wall. Due to the unavailability of primary angioplasty, thrombolysis was performed successfully. The etiological investigation evidenced, on transthoracic echocardiogram, an intracavitary mass in the left atrium compatible with myxoma. Coronary angiography demonstrated distal occlusions in multiple coronary territories, without significant atherosclerotic disease, suggesting tumor embolic phenomenon. The patient was submitted to complete surgical resection of the tumor, with favorable clinical evolution Conclusions: Atrial myxoma should be considered as a rare cause of myocardial infarction in young patients, especially in the context of non-obstructive coronaries, being fundamental the etiological investigation for adequate diagnosis and treatment.





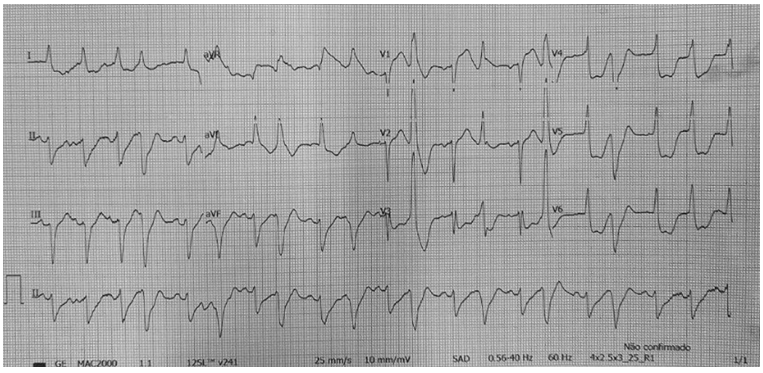
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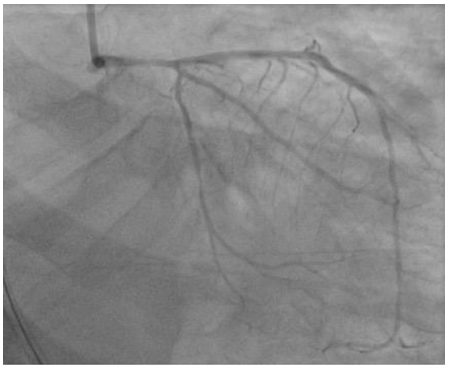
CARDIAC ARREST DUE TO CRITICAL LEFT CORONARY ARTERY VASOSPASM ASSOCIATED WITH CISPLATIN: A RARE AND POTENTIALLY FATAL CAUSE OF CARDIOTOXICITY

PEDRO RODRIGUES DE CARVALHO1; BEATRIZ LOPES FIGUEIREDO1; ANA CAROLINA LOAYZA BENCHIMOL BARBOSA1; JOÃO LUÍS GOMES DA SILVA1; ALICE FARIA SANTOS FERNANDES1; VICTOR ALMEIDA PONTES1; JULIA CALDAS BEDIN1; FELIPE GALLEGO LIMA1; ENZO MAY DE MIO1;

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Introduction: Coronary vasospasm is a recognized cause of acute coronary syndrome, often associated with vasoactive substances and fluoropyrimidines. Its occurrence with platinum-based agents, such as cisplatin, is less frequently described. We report a case of severe left coronary artery vasospasm associated with chemotherapy, progressing to cardiac arrest. Case Description: A 47-year-old man with lung cancer undergoing treatment with cisplatin and pemetrexed, with a history of HIV infection and extrapulmonary tuberculosis, was admitted after out-of-hospital cardiac arrest in a shockable rhythm (ventricular tachycardia), successfully reversed with defibrillation. On admission, he was intubated, hemodynamically stable, with a tendency toward hypertension. Electrocardiography showed ST-segment elevation in aVR and diffuse ST depression. There was a marked increase in troponin levels (peak >70,000; normal ≤14 ng/L), with no electrolyte disturbances or renal dysfunction. Coronary angiography revealed severe vasospasm of the left coronary artery, reversed with intracoronary nitroglycerin, without significant obstructive lesions. Echocardiography showed a left ventricular ejection fraction of 50% with anterior wall hypokinesia. A similar prior episode had occurred, presenting as angina (hospitalization at an external service less than one week earlier), with resolution after nitrate administration. After discontinuation of cisplatin, the patient had no recurrence and remained on diltiazem and nitrate therapy. Conclusions: Cisplatin-induced vasospasm, although rare, may present with severe events, including cardiac arrest. Early recognition and discontinuation of the offending agent are essential to prevent recurrence and reduce mortality.



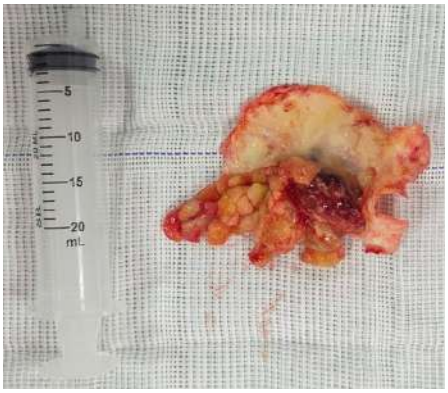


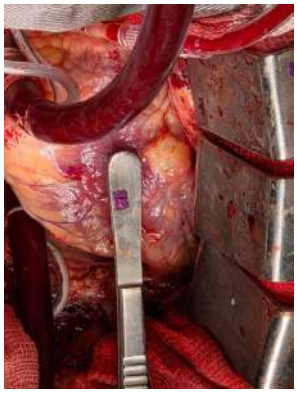
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DIAGNOSIS OF A POORLY DIFFERENTIATED CARDIAC SARCOMA IN A YOUNG PATIENT: A RARE CASE REPORT FROM A HOSPITAL IN NORTHWESTERN ESPÍRITO SANTO

JULIA TORRES MOULIN MARRÉ1; CAROLINA GUIDONE COUTINHO2; BÁRBARA TONINI RIBEIRO1; LARA ARAÚJO DIAS1; INGRID GILES RAMOS1; ALEXANDRA BONELLA CAPRIOLI1; MARIA EDUARDA SIQUEIRA1; ADRIENE DE FREITAS MORENO RODRIGUES1; LUCIANO ANTONIO RODRIGUES1; LORENZO CESANA VANZO3; SANDRO ADAUTO MARTINS4; LEONARDO CRISTIANO FRIGINI4;

(1) CENTRO UNIVERSITÁRIO DO ESPÍRITO SANTO (UNESC) - COLATINA - ES - BRASIL; (2) HOSPITAL UNIVERSITÁRIO CASSIANO ANTONIO MORAES - HUCAM - VITÓRIA - ES - BRASIL; (3) MULTIVIX - VITÓRIA - ES - BRASIL; (4) HOSPITAL SÃO JOSÉ - COLATINA - ES - BRASIL;





Introduction: Primary malignant cardiac neoplasms are extremely rare, with cardiac sarcomas accounting for most cases. Patients typically present with nonspecific symptoms, hindering early diagnosis. The condition carries a poor prognosis, and surgical resection remains the mainstay of treatment. Case Description: Patient, a 44-year-old female, presented with a syncopal episode 4 days prior following physical exertion. She also reported dyspnea on moderate and mild exertion, progressive lower limb edema for 1 month, pallor, and unmeasured febrile episodes. On physical examination: pale (+/4+), afebrile, normotensive, tachycardic, with irregular rhythm, no murmurs, and bilateral edema. Electrocardiography revealed sinus tachycardia, diffuse low voltage, and isolated ventricular extrasystoles. Transthoracic echocardiography demonstrated an ejection fraction of 56%, a thickened mitral valve, and a mass in the left atrium extending into the left ventricle (LV), causing mechanical obstruction (7 × 2 mm). Significant tricuspid regurgitation (PSAP of 81 mmHg), right ventricular (RV) dilation, and moderate pericardial effusion were observed. Anticoagulation, empirical antibiotic therapy, and transesophageal echocardiography were performed, revealing a mobile (7.2 × 2.5 cm), heterogeneous mass attached to the interatrial septum, prolapsing into the LV with significant obstruction. Extension into the right superior pulmonary vein reaching the mitral valve was noted. The patient was admitted to the ICU, and CT angiography demonstrated bilateral pulmonary thromboembolism. She developed worsening dyspnea, and milrinone was initiated. She progressed to acute respiratory failure, requiring orotracheal intubation, and developed cardiogenic shock. She underwent emergency cardiac surgery, which revealed infiltrative tumors in the myocardium and an extensive mass occupying the atrial cavity, protruding through the mitral valve, hardened with multiple nodules. Mitral valve replacement was performed; however, she developed severe RV dysfunction, refractory shock, and died intraoperatively. Histopathological analysis of intracardiac, myocardial, and epicardial lesions revealed a poorly differentiated malignant neoplasm with spindle epithelioid morphology, confirmed by immunohistochemistry as a high-grade poorly differentiated sarcoma. Conclusions: Cardiac sarcomas are rare and highly aggressive. Diagnosis relies on histopathology confirmation, and even with surgical intervention, prognosis is generally poor.

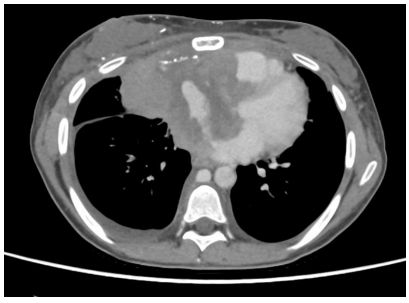
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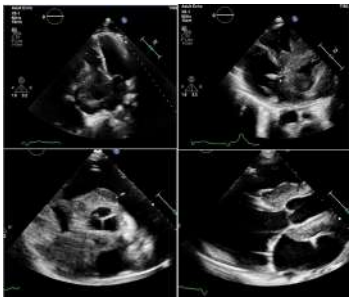
RARE CASE OF SEVERE CARDIAC INFILTRATION IN PRIMARY MEDIASTINAL B-CELL LYMPHOMA: MANAGEMENT AND THERAPEUTIC CHALLENGES

MARIA LUIZA ARANEGA DE ASSIS FIGUEIREDO1; HERBERT IAGO FEITOSA DA FONSECA1; TIAGO MANSUR KOBBAZ1; JESSICA LOUISE DE GODOI PIERINI1; IASMIN HASEGAWA1; DICKSON VENEGAS JUSTINIANO1; NATALIA SAVASTANO JORGE1; MARCELLA LUISA EIRAS AMARAL HOSSRI NOGUEIRA BRAGA1; DOUGLAS RIBEIRO TRISTAO DE OLIVEIRA1; JOÃO PAULO BRANDÃO DE MEDEIROS1; RAFISAH SEKEFF SIMÃO ALENCAR1;

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Introduction: Primary mediastinal B-cell lymphoma (PMBCL) is an uncommon aggressive subset of diffuse large B-cell lymphomas. It frequently spreads locally from the thymus into the pleura or pericardium. The myocardial infiltration in this type of tumor is rare, and it may occur due to direct invasion, hematogenous spread, transvenous invasion or lymphangitic spreading. The clinical presentation varies and may include conduction disturbances, Superior Vena Cava Syndrom, and symtoms of cardiac insuficiency. Case Description: The case reports a 22-year-old female patient with a history of diffuse large B-cell non-Hodgkin lymphoma, treated since 2022. In 2024, patient presented clinical symptoms and PET-CT scan revealed a hypermetabolic area suggesting relapse. She remained under outpatient follow-up but started with dyspnea, abdominal distension, anorexia, facial edema, in addition to daily fever and diarrhea which lead her to hospital in May 2025. A chest CT scan demonstrated a large, moderately hypervascular, expansile mass with a primitive/infiltrative appearance, centered in the anterior mediastinum, with myocardial invasion, involving the right heart chambers (RA/RV). There was also obliteration of the superior vena cava with no clear plane separating it from other mediastinal vessels, causing compressive effects on the inferior vena cava and the right pulmonary artery. Transthoracic echocardiography showed a LVEF: 51% and revealed an infiltrative mass with an interatrial communication - shunt from the RA to the RV resulting in hemodynamic repercussions; and left atrium, encasing the proximal aorta and pulmonary artery. The patient developed arrhythmias- junctional rhythm and complete atrioventricular block. An epicardial pacemaker was considered, as the presence of an intracavitary tumor mass precluded transvenous pacemaker implantation. Hematology team indicated chemotherapy. A cardiac MRI was performed for surgical planning, which determined that epicardial pacemaker implantation was not feasible due to tumor location in the anterior mediastinum. The patient's clinical condition deteriorated, progressing to respiratory failure requiring intubation. She died due to the severity of her condition. Conclusions: Although rare, this case is an example of the repercussions from the extensive mediastinal and cardiac involvement by a PMBCL, complicated by severe conduction disturbances and rapid clinical deterioration, illustrating the diagnostic and therapeutic challenges of this pathology.





18921

RECURRENT PERICARDIAL TAMPONADE AND MEDIASTINAL MASS IN A YOUNG ADULT: THE CHALLENGE OF DIFFERENTIAL DIAGNOSIS BETWEEN LYMPHOMA RELAPSE AND INFLAMMATORY PERICARDITIS

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(1) SANTA CASA DE MISERICORDIA DE BELO HORIZONTE - BELO HORIZONTE - MG - BRASIL;





Introduction: Lymphomas involving the mediastinum represent a significant proportion of mediastinal masses. Due to their anatomical proximity to cardiovascular structures, these neoplasms may be associated with cardiac complications, among which pericardial effusion stands out because of its potential severity. Pericardial effusion in patients with lymphoma may result from direct pericardial infiltration, lymphatic obstruction, or an inflammatory response associated with the disease. Although often asymptomatic, it may progress to cardiac tamponade, constituting a clinical emergency. Our objective is to report a case of recurrent pericardial effusion in a patient with a prior history of lymphoma. Case Description: A 27-year-old patient with a prior diagnosis of lymphoblastic lymphoma at age 17, previously treated and under outpatient follow-up. In May 2025, the patient presented with chest pain, and a large pericardial effusion was identified. Mediastinal and pericardial biopsies were performed, both showing no evidence of malignancy. Given the clinical severity, requiring intensive care and with a risk of death, empirical chemotherapy was initiated, considering the possibility of lymphoma relapse. In August 2025, a repeat biopsy of the mediastinal mass was performed, and histopathological analysis revealed lymphoid hyperplasia without evidence of neoplasia. In September 2025, the patient developed a new episode of chest pain associated with fever, again with a large pericardial effusion identified. Pericardial drainage with biopsy was performed. Immunophenotyping analysis of the pericardial fluid showed T lymphocytes without atypia, and the pericardial biopsy demonstrated mild lymphocytic infiltration, with no evidence of malignancy. Treatment for pericarditis was initiated with colchicine, nonsteroidal anti-inflammatory drugs, and corticosteroide. The patient showed an excellent response. During long-term follow-up, corticosteroids were tapered and subsequently discontinued; however, the patient developed recurrent chest pain secondary to a large pericardial effusion. Conclusions: Recurrent pericardial effusion in patients with a prior history of lymphoma represents a diagnostic challenge. The absence of malignancy in multiple biopsies and immunohistochemical analyses does not completely exclude relapse but reduces its likelihood. A favorable response to pericarditis treatment supports the hypothesis of an inflammatory mechanism, although it does not allow definitive exclusion of neoplastic disease.

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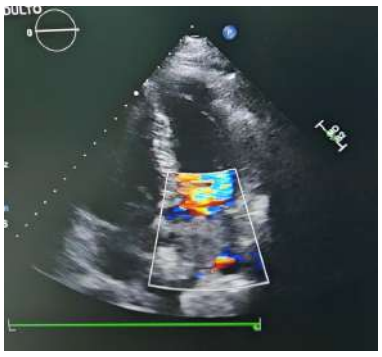
SURGICAL RESECTION OF A LEFT ATRIAL MASS WITH SEVERE MITRAL OBSTRUCTION: A MYXOMA-MIMICKING CASE

LEVI LOPES CAVALCANTE1; ELAINE CHAVES GADELHA1;

(1) HOSPITAL DE MESSEJANA - FORTALEZA - CE - BRASIL;

Introduction: Left atrial masses are classically attributed to myxoma, especially when attached to the interatrial septum and associated with mitral inflow obstruction. However, malignant cardiac tumours may present with overlapping imaging features, creating a critical diagnostic pitfall with major therapeutic and prognostic implications. Case Description: A 34-year-old male patient was admitted with progressive dyspnoea and dizziness. Initial evaluation raised suspicion of intracardiac pathology. Transthoracic echocardiography demonstrated preserved biventricular function and a large left atrial mass attached to the interatrial septum, occupying nearly the entire atrial cavity. The mass prolapsed through the mitral valve, causing severe functional obstruction, with a mean transmitral gradient of 10 mmHg and an estimated mitral valve area of 0.85 cm², mimicking severe mitral stenosis. Thoracic computed tomography revealed a hypodense expansile lesion with focal calcifications, reinforcing the initial suspicion of atrial myxoma. The patient underwent surgical resection. In the postoperative period, superior vena cava thrombosis was identified and anticoagulation was initiated. Episodes of atrial fibrillation and atrial flutter were documented. Histopathological analysis revealed a high-grade undifferentiated pleomorphic sarcoma, with a high proliferative index (Ki-67 approximately 70%) and immunohistochemical positivity for MDM2, p16, and CDK4. During follow-up, early intracardiac tumour recurrence was observed, accompanied by pulmonary hypertension, pleural effusion, and progressive respiratory deterioration. Conclusions: This case highlights a critical diagnostic pitfall: malignant cardiac tumours may closely mimic myxoma both anatomically and functionally, including classic features such as septal attachment and mitral obstruction. In this scenario, imaging alone was insufficient to differentiate benign from malignant disease. The aggressive postoperative course, with early recurrence and rapid clinical deterioration, contrasts with the expected benign evolution of myxoma and reinforces the importance of maintaining diagnostic suspicion. The presence of calcifications and large tumour burden did not allow reliable preoperative distinction. This case underscores the limitation of conventional imaging in characterizing atrial masses and the central role of histopathological diagnosis.





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21831

HEREDITARY PULMONARY ARTERIAL HYPERTENSION ASSOCIATED WITH SUDDEN DEATH: THE ROLE OF GENETIC INVESTIGATION IN A PEDIATRIC CASE REPORT

ARTHUR CHEDE CHAVES REIS1; LOURENÇO SALVADOR CÔRTES1; LUÍS FELIPE PARREIRA PELUSO1;

(1) UFJF - JUIZ DE FORA - MG - BRASIL;

Introduction: Pulmonary Arterial Hypertension (PAH) is a progressive and potentially fatal condition characterized by elevated pulmonary vascular resistance, leading to right ventricular dysfunction and heart failure. Heritable forms of PAH are strongly associated with pathogenic variants in the BMPR2 gene and are frequently linked to severe clinical presentation, early disease onset, and increased risk of sudden death. In this context, detailed family history and genetic investigation play a fundamental role in early diagnosis, therapeutic decision-making, and risk stratification of affected families. Case Description: A 3-year-old male patient presented with a significant family history suggestive of severe hereditary cardiovascular disease. His sister died suddenly at 2 years of age, while his maternal grandmother and maternal aunt died before the age of 30 due to acute respiratory failure and pulmonary embolism, respectively. In addition, his mother had been diagnosed with severe Pulmonary Arterial Hypertension four years earlier. At the initial evaluation, physical examination revealed a systolic murmur at the left sternal border. Echocardiography demonstrated findings compatible with primary PAH, including enlargement of the right heart chambers, right ventricular systolic dysfunction, moderate tricuspid regurgitation, and an estimated pulmonary artery systolic pressure (PASP) of 65 mmHg. During follow-up, the patient showed progressive worsening of right ventricular contractility, increased ventricular wall thickness, dilation of the pulmonary trunk, and elevation of PASP to 72 mmHg. Genetic testing identified a pathogenic variant in the BMPR2 gene, confirming the hereditary form of PAH. Treatment with Tadalafil and Bosentan was initiated, resulting in significant improvement in cardiac parameters during follow-up. Conclusions: Genetic screening in families with PAH and a history of sudden death is essential for early diagnosis, prompt therapeutic intervention, and improved prognosis. This case highlights the importance of combining family history assessment with molecular investigation to identify hereditary PAH and guide long-term surveillance strategies. However, clearer guidelines are still needed to better define indications and protocols for genetic testing among at-risk relatives.


CardioGen
CENTRO DE MEDICINA DE PRECISÃO EM CARDIOLOGIA

Variantes de nucleotídeo único / Inserções e deleções pequenas

Detalhes sobre a(s) variante(s) encontrada(s):

Gene	Sequência referência	Coordenada cromossômica (GRCh38)	Variante c.DNA	Variante Proteína	Classificação ACMG	Zigosidade
BMPR2	NM_001204.7	chr2-202467621	c.350G>A	p.Cys117Tyr	Patogênica	Heterozigose

16887

HYPERTROPHIC CARDIOMYOPATHY IN A PATIENT WITH RAF1, LINKED TO NOONAN SYNDROME, AND MYBPC3 MUTATIONS: A CASE REPORT

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Introduction: Noonan Syndrome is characterized by dysmorphic facial features, short stature and congenital heart defects. The most common cardiovascular defects found are pulmonary valve stenosis with dysplastic leaflets and hypertrophic obstructive cardiomyopathy with asymmetric septal hypertrophy. Hypertrophic cardiomyopathy in Noonan Syndrome is more frequently related to pathogenic variants in the genes MRAS and RAF1. In adults, establishing a clinical diagnosis can be very difficult, since their expression of facial dysmorphic features tends to be more subtle. Case Description: Male patient, 40 years old, born with congenital heart disease. On physical examination presents ocular hypertelorism, downward slanting palpebral fissures and short neck. In the family, his sister had a sudden death at age 12 and the mother has hypertrophic cardiomyopathy with a similar phenotype. Started outpatient follow-up in 2000 and had a diagnosis of hypertrophic cardiomyopathy, progressing with an ICD implanted in 2002. In his youth, he presented with persistent atrial fibrillation needing multiple ICD discharges. In 2019, at the age of 33, he received the diagnosis of Noonan Syndrome and genetics was consulted for evaluation and etiological investigation of hypertrophic cardiomyopathy with asymmetric septum and burnout phenotype – already with ventricular dilation and advanced heart failure with reduced ejection fraction. A genetic panel was performed, identifying pathogenic variants on RAF1 and on MYBPC3 c.1828G>A (p.Asp610Asn). Due to the progression of the disease, cardiac transplantation was performed in 2025. Conclusions: The case highlights a unique combination of Noonan syndrome in a patient with sarcomeric mutations leading to hypertrophic cardiomyopathy. The delayed diagnosis of both conditions may have an impact in clinical outcomes, evidencing the importance of early triage for Noonan Syndrome – especially since its more prominent features are present in children. This presentation, with dominance of asymmetrical septum hypertrophy, is more common in MYBPC3 mutations – although it can also be related to RAF1. Therefore, this case calls attention to the importance of expanded panels in detecting causes for ventricular hypertrophy that can coexist in a patient – valuing other variants of uncertain significance identified.

Cardiovascular Imaging – Echocardiography



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15867

VIRTUAL AND PHYSICAL THREE-DIMENSIONAL RECONSTRUCTION OF A FETAL HEART WITH A LEFT VENTRICULAR DIVERTICULUM

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Introduction: Congenital ventricular diverticulum is a rare cardiac malformation, accounting for 0.05% of congenital heart diseases, and is associated with other cardiac and extracardiac malformations, such as midline thoracoabdominal defects. A left ventricular (LV) diverticulum is defined as a pulsatile protrusion in the LV wall containing the endocardium, myocardium, and pericardium. It is generally benign but may be associated with complications such as embolism, arrhythmia, heart failure, and even ventricular rupture leading to the patient's death. Thus, the importance of early diagnosis via fetal echocardiography is emphasized in order to guide appropriate and timely treatment. 3D ultrasound with STIC software allows for the acquisition of these cardiac volumes, which can be reconstructed into virtual and physical three-dimensional models and used for anatomical understanding by the multidisciplinary team, in therapeutic planning, in medical education, and in parental counseling. Case Description: Cardiac volume measurements of the fetus with LV diverticulum were obtained via 3D ultrasound using STIC (Spatio-temporal image correlation) software on a Voluson E8 (GE Healthcare, Zipf, Austria) with a volumetric transducer (MB 4-8L) and sent to the post-processing stage, where virtual and physical 3D reconstruction was performed. 3D Slicer software (Bristol, UK) was used for segmentation, and a Stratasys 15 printer with Polyjet technology was used to print the 3D model in photosensitive resin. The print was life-size and allowed for clear visualization of the LV diverticulum with its posterior course until it adjoined the right ventricle. Conclusions: In conclusion, a 3D reconstruction of a fetal heart with a LV diverticulum was performed, resulting in both a virtual model and a printed model. 3D reconstruction proves to be a promising tool for the management of rare congenital heart diseases (illustrated by the LV diverticulum in this case). The printed model allows for anatomical detail that facilitates understanding of the heart disease in the neonatal period by both family members and cardiac surgeons and other professionals on the multidisciplinary team. The virtual model enables specialized teams worldwide to visualize the structures of the fetal heart realistically, including through 3D navigation, contributing to diagnostic accuracy in rare cases and therapeutic decision-making.





Cardiovascular Imaging – MRI and CT



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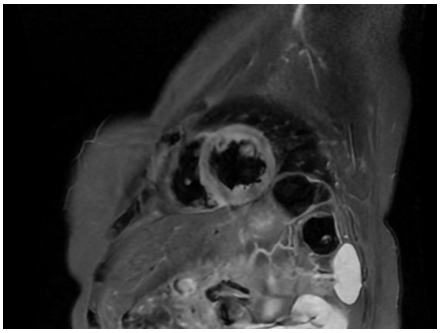
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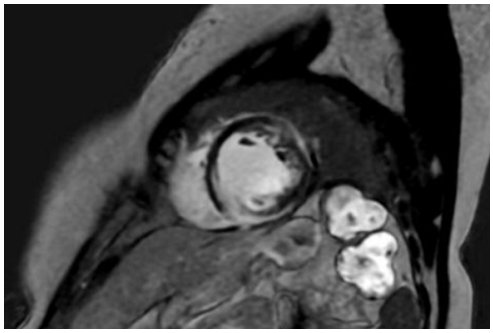
CARDIAC SARCOIDOSIS PRESENTING AS AN ACUTE ARTERIAL EMBOLIC EVENT: DIAGNOSIS GUIDED BY CARDIAC MAGNETIC RESONANCE IMAGING

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Introduction: Cardiac sarcoidosis is an inflammatory granulomatous disease with heterogeneous presentation and is frequently underdiagnosed, being associated with potentially severe outcomes such as heart failure, malignant arrhythmias, and sudden cardiac death. Case Description: We report the case of a previously healthy 51-year-old woman admitted with sudden pain and cyanosis of the left upper limb at rest. Electrocardiography showed no ischemic changes, and arterial Doppler ultrasonography demonstrated occlusion of the left subclavian artery, for which successful thromboembolectomy was performed. During etiological investigation, transthoracic echocardiography revealed left ventricular apical akinesia and apical septal hypokinesia associated with the presence of an apical thrombus and reduced ejection fraction (Left Ventricular Ejection Fraction: 42%). Based on these data, Coronary angiography was indicated, and demonstrates no obstructive coronary artery disease. Cardiac magnetic resonance was an option for complementary research, and revealed multiple foci of late gadolinium enhancement with a non-ischemic pattern, predominantly involving septal and apical segments, associated with myocardial thickening, characterizing infiltrative involvement suggestive of cardiac sarcoidosis. Chest computed tomography demonstrated multiple pulmonary nodules and mediastinal lymphadenopathy, and lung biopsy confirmed noncaseating granulomatous disease. After initiation of specific therapy, ventricular function recovered, and the patient remained in New York Heart Association functional class I during outpatient follow-up. This case illustrates a rare presentation of cardiac sarcoidosis as a peripheral arterial embolic event, emphasizing the importance of etiological investigation in patients with intracardiac thrombus and non-obstructive coronary arteries. Conclusions: The case highlights the decisive role of cardiac magnetic resonance imaging in the early detection of myocardial involvement, with direct impact on risk stratification, therapeutic decision-making, and prognostic modification. It represents an emblematic example of how multimodality imaging integration can be crucial in contemporary clinical practice.





21524

MULTIMODALITY IMAGING REVEALING BIVENTRICULAR ARRHYTHMOGENIC CARDIOMYOPATHY INITIALLY SUSPECTED AS PULMONARY HYPERTENSION

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Introduction: Arrhythmogenic cardiomyopathy (ACM) is a hereditary and progressive disease associated with an increased risk of sudden cardiac death. It is characterized by fibro-fatty replacement of the ventricular myocardium resulting from mutations in desmosomal proteins, leading to structural remodeling. Cardiac involvement may occur in isolation in the right ventricle (RV) or left ventricle (LV), although the classic phenotype predominantly affects the RV, with possible progression to biventricular disease. Clinical presentation ranges from asymptomatic individuals to malignant ventricular arrhythmias and heart failure. Transthoracic echocardiography (TTE) is the initial imaging modality and may demonstrate right chamber dilation, tricuspid regurgitation (TR), and estimated elevation of pulmonary artery systolic pressure (PASP). Cardiac magnetic resonance imaging (CMR) provides greater sensitivity for early detection of structural abnormalities and tissue characterization. Case Description: A 67-year-old female patient, former smoker, NYHA functional class I, with a history of arrhythmia and aborted sudden cardiac death during pregnancy in 2004. She remained asymptomatic thereafter, with no recurrence of arrhythmias. TTE demonstrated an estimated PASP of 50 mmHg, right chamber dilation, moderate TR, and grade I LV diastolic dysfunction, prompting investigation for possible pulmonary hypertension. Right heart catheterization revealed normal mean pulmonary artery pressure and pulmonary capillary wedge pressure; however, reduced cardiac output, elevated pulmonary vascular resistance, and hemodynamic signs of RV dysfunction were observed. CMR demonstrated marked right chamber dilation, severe RV systolic dysfunction (ejection fraction 14%), dyskinesia of the RV outflow tract, mid-apical akinesia, and non-ischemic mesocardial and epi-mesocardial late gadolinium enhancement, findings consistent with biventricular ACM. Conclusions: This case illustrates an atypical presentation of biventricular ACM and highlights the importance of multimodality imaging in diagnosis. TTE played a key role in the initial identification of structural and functional abnormalities, while CMR provided tissue characterization and precise definition of the disease phenotype. These imaging modalities therefore play complementary roles in the diagnosis and prognostic stratification of ACM.

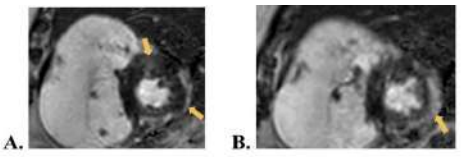


Imagem A: Sequência de realce tardio demonstrando fibrose mesocárdica na parede anterior e epi-mesocárdica na parede lateral
Imagem B: Sequência de realce tardio demonstrando fibrose epi-mesocárdica na parede lateral

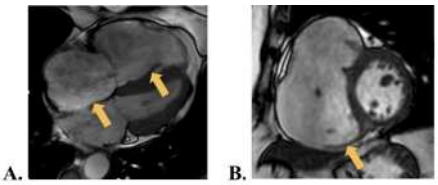


Imagem A: Sequência de cine SSFP corte 4 câmaras demonstrando dilatação das câmaras direitas
Imagem B: Sequência de cine SSFP eixo curto demonstrando dilatacão das câmaras direitas

Cardiovascular Prevention / Atherosclerosis / Dyslipidemia / Cardiovascular Risk Factors / Immunotherapy and Vaccines



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20455

INCLISIRAN AND LIPOPROTEIN(A) REDUCTION IN END-STAGE RENAL DISEASE: A CASE REPORT

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Introduction: Lipoprotein(a) [Lp(a)] is a particle primarily determined by genetics, with limited influence from lifestyle factors, playing a significant role in the development of atherosclerotic disease². Mendelian randomization studies and meta-analyses have linked elevated Lp(a) levels to an increased risk of coronary artery disease, suggesting a causal role in the progression of atherosclerosis. In patients with end-stage renal disease (ESRD), Lp(a) levels are elevated compared to those with preserved renal function, not due to increased production but rather a reduction in particle catabolism. Despite reductions in LDL cholesterol, studies evaluating statin therapy in ESRD patients have failed to demonstrate a significant reduction in cardiovascular events. It is well established that statins do not significantly lower Lp(a). Inclisiran, a small interfering RNA targeting PCSK9, has shown promise in reducing both LDL cholesterol and Lp(a) (by around 20%). Although the clinical benefit of lowering Lp(a) remains uncertain, this effect may have relevance in patients with ESRD. Case Description: A 48-year-old woman with dyslipidemia, anxiety disorder, and a history of total thyroidectomy at 16 years of age, with chronic kidney disease on dialysis since 2006 secondary to hypertension. She presented with an acute myocardial infarction in September 2025, undergoing percutaneous coronary intervention of the right coronary artery. The patient was started on diltiazem 120 mg twice daily, atorvastatin 40 mg, ezetimibe 10 mg, acetylsalicylic acid 100 mg, and prasugrel 10 mg. In addition, she was taking cinacalcet 60 mg/day, levothyroxine 150 mcg/day, erythropoietin 4000 IU twice weekly, and vortioxetine 10 mg/day. In 2025, Lpa(a) was measured for the first time and was found to be 419 nmol/L. Despite initial reductions in TC, LDL, and non-HDL-C, levels remained well above recommended targets. Inclisiran was initiated on December 12, 2025. After 5 months, a follow-up lipid profile demonstrated reductions in LDL cholesterol and non-HDL cholesterol, achieving targets for very high cardiovascular risk. Additionally, Lp(a) decreased to 195 nmol/L. Conclusions: In this patient, treatment with inclisiran led to a 51% reduction in LDL and a 53% reduction in Lp(a). Given the limited effect of statins on Lp(a) and their modest impact on cardiovascular outcomes in renal replacement therapy, Lp(a) reduction emerges as a potentially important therapeutic target; however, it may not translate into fewer CV events.

ANALYTES	07/04/2026	14/11/2025	07/10/2025	23/12/2021
LDL Cholesterol (mg/dL)	46	94	154	154
HDL Cholesterol (mg/dL)	58	62	58	82
Non-HDL Cholesterol (mg/dL)	68	128	186	181
VLDL Cholesterol (mg/dL)	22	34	32	27
Total Cholesterol (mg/dL)	126	190	244	263
Triglycerides (mg/dL)	137	257	185	143
Lipoprotein(a) (nmol/L)	195	—	419	—

17805

SITOSTEROLEMIA PRESENTING AS PREMATURE ATHEROSCLEROTIC CARDIOVASCULAR DISEASE IN ADULTHOOD: A CASE REPORT

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Introduction: Sitosterolemia is a rare autosomal recessive lipid disorder caused by pathogenic variants in the ABCG5 or ABCG8 genes, which encode sterol transporters responsible for limiting intestinal absorption and promoting biliary excretion of plant sterols. Defective function of these transporters leads to systemic accumulation of phytosterols, resulting in hypercholesterolemia. Due to phenotypic overlap with familial hypercholesterolemia, sitosterolemia is frequently underdiagnosed, particularly in adults presenting with premature coronary artery disease (CAD) and suboptimal response to statin therapy. We report a case of genetically confirmed sitosterolemia in an adult patient with premature coronary artery disease, highlighting the importance of etiological diagnosis and the favorable response to targeted therapy. Case Description: A 42-year-old man was referred due to persistently elevated low-density lipoprotein cholesterol (LDL-C), with a peak value of 199 mg/dL documented in 2021. His medical history was notable for elective coronary angioplasty at age 34 years old and a positive family history of premature CAD, with his father having died of an acute myocardial infarction at age 54 years old. Medications included atorvastatin 80 mg/day, atenolol 50 mg/day, enalapril 20 mg twice daily, and aspirin 100 mg/day. Laboratory tests showed total cholesterol 162 mg/dL, LDL-C 88 mg/dL on high-intensity statin therapy, HDL-C 36 mg/dL and triglycerides 188 mg/dL. Given the combination of premature coronary artery disease, family history and partial response to statins, genetic testing for monogenic dyslipidemias was performed, revealing a homozygous pathogenic variant in the ABCG8 gene, confirming sitosterolemia. Ezetimibe 10 mg/day was initiated along with dietary counseling. After continued adherence to combined therapy with atorvastatin and ezetimibe, repeat laboratory testing demonstrated a marked further reduction in LDL-C to 7 mg/dL. Conclusions: In conclusion, sitosterolemia, although rare, should be included in the differential diagnosis of premature coronary artery disease. Early recognition and targeted therapy with ezetimibe and dietary intervention can optimize lipid control and may improve cardiovascular outcomes. Failure to recognize this condition may delay appropriate treatment and contribute to disease progression.

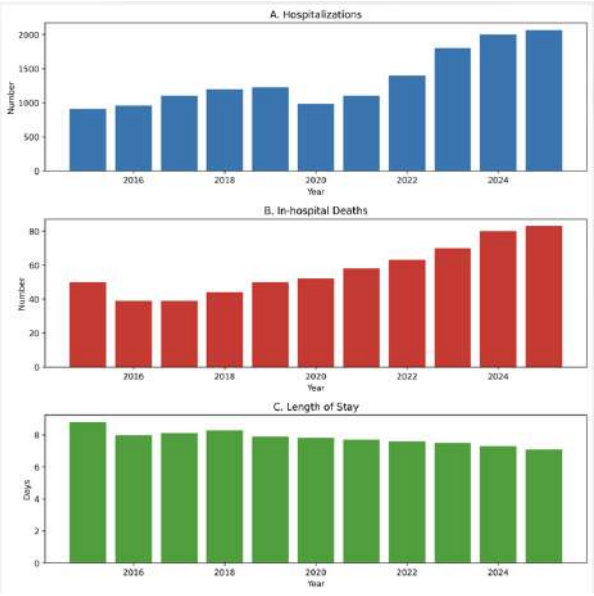
18457

TEMPORAL TRENDS AND HEALTHCARE BURDEN OF PERICARDITIS IN THE BRAZILIAN PUBLIC HEALTH SYSTEM (SUS): A NATIONWIDE ANALYSIS FROM 2015 TO 2025

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Introduction: Myopericardial inflammatory syndromes comprise a spectrum of diseases characterized by inflammation of the pericardium, with or without myocardial involvement. Pericarditis, the most common clinical presentation, is traditionally considered a benign condition with low mortality. In developed countries, viral etiologies predominate, whereas in low- and middle-income settings, infectious causes such as tuberculosis remain relevant. However, nationwide data on hospital burden and outcomes remain limited in Brazil. The objective of this study was to evaluate temporal trends and healthcare burden of pericarditis-related hospitalizations in the Brazilian Public Health System (SUS) over the past decade, including in-hospital mortality, length of stay, and associated costs. This retrospective observational study used publicly available data from the Brazilian Unified Health System database (DATASUS/TABNET). Hospitalizations for pericarditis from January 2015 to December 2025 were analyzed using the search term “treatment of pericarditis,” according to DATASUS procedural coding. Case Description: A total of 14,345 hospitalizations for pericarditis were recorded during the study period. The Southeast region accounted for approximately half of all cases (49.2%). A total of 628 in-hospital deaths were observed, corresponding to an overall in-hospital mortality rate of 4.38%. The Southeast region had the highest absolute number of deaths (245), followed by the Northeast (181). However, significant regional disparities were identified, with higher mortality rates in the North (7.26%), Northeast (5.82%), and Center-West (5.69%), compared to the Southeast (3.47%) and South (3.62%).A clear regional gradient was observed in length of hospital stay, with longer durations in the North (9.7 days) and Northeast (9.8 days), compared to shorter stays in the Southeast (7.4 days) and South (6.1 days).Over time, hospitalizations increased progressively, accompanied by a marked rise in healthcare costs. In contrast, the mean length of hospital stay decreased over the study period. Conclusions: In conclusion, pericarditis represents an increasing healthcare burden in the Brazilian public health system, with rising hospitalizations and costs despite shorter hospital stays. Regional disparities in mortality and length of stay reflect socioeconomic inequalities. Early diagnosis and optimized management are essential to improve outcomes and reduce disparities across regions.



21834

UNUSUALLY LARGE TENDON XANTHOMAS AS A PRESENTATION OF FAMILIAL HYPERCHOLESTEROLEMIA

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Introduction: Tendon xanthomas are nodular lesions resulting from the deposition of cholesterol and other lipids within tendinous tissue. They most commonly involve the Achilles tendon, although other tendons may also be affected. Tendon xanthomas are typically associated with familial hypercholesterolemia but may also occur in the context of other lipid metabolism disorders. The present case report describes a patient presenting with unusually large tendon xanthomas. Case Description: A 59-year-old woman sought medical attention for painless nodules affecting both ankles, which had shown progressive enlargement since the age of 16 years. During the preoperative evaluation for surgical excision of the lesions, severe dyslipidemia was identified, with an LDL-cholesterol level of 318 mg/dL, prompting referral for cardiologic assessment. At presentation, the patient reported episodes of mild chest tightness occurring at rest and unrelated to physical exertion. These symptoms led to coronary computed tomography angiography, which demonstrated a coronary artery calcium score of 753 and evidence of three-vessel coronary artery disease. Subsequent invasive coronary angiography revealed subtotal occlusive lesions in the right coronary artery and left anterior descending artery, as well as severe stenoses involving the first diagonal branch and the circumflex artery. The patient was therefore admitted for planned surgical myocardial revascularization. During hospitalization, family history assessment revealed two offspring with LDL-cholesterol levels ranging from 390 to 500 mg/dL. Physical examination demonstrated unusually large tendon xanthomas involving both Achilles tendons (Figures 1 and 2). Bilateral patellar tendon xanthomas were also observed. According to the Dutch Lipid Clinic Network criteria, the patient scored 15 points, consistent with a definitive diagnosis of familial hypercholesterolemia. Coronary artery bypass graft surgery was successfully performed, and the patient was discharged without postoperative complications. Conclusions: This case highlights the importance of physical examination and recognition of findings such as tendon xanthomas and corneal arcus in patients with dyslipidemia. Early recognition should prompt appropriate diagnostic evaluation, initiation of intensive lipid-lowering therapy, and cascade family screening, thereby reducing cardiovascular morbidity and mortality in affected patients and their relatives.

Cardiovascular Surgery



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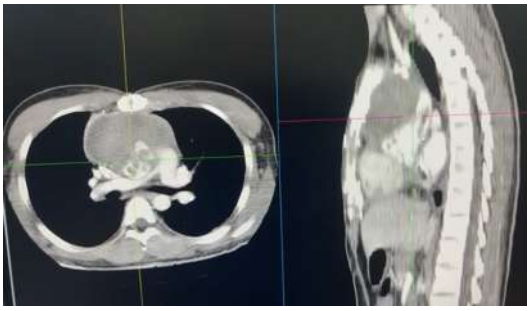
16374

CONTAINED RUPTURE OF A GIANT ASCENDING AORTIC PSEUDOANEURYSM PRESENTING AS ST-SEGMENT ELEVATION AFTER FAILED RIGHT CORONARY CATHETERIZATION: A CASE REPORT.

RICARDO CHMIELEWSKI DE CARVALHO1; ANDRE LUIZ XAVIER CANEVAROLI2; LUCAS HENRIQUE PRADO SOUSA2; RICARDO BARROS CORSO2; ABRAAO KESSLER SANTANA SILVA METELLO2;

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Introduction: Ascending aortic pseudoaneurysm is a rare but life-threatening complication following cardiac surgery, with reported high morbidity and mortality rates, particularly in cases of rupture or delayed diagnosis. It typically arises from suture lines or sites of previous aortic manipulation and is strongly associated with infection, reoperation, and prosthetic valve endocarditis. Its clinical presentation is highly variable and may mimic acute coronary syndromes, leading to diagnostic challenges and potential delays in management. In more severe cases, contained rupture may occur, resulting in compression of adjacent mediastinal structures, embolic phenomena, and hemodynamic instability. Case Description: A 26-year-old male with rheumatic heart disease underwent mitral/aortic repair (2017) and double bioprosthetic valve replacement (2025). He presented with acute chest pain, ST-segment elevation (inferior/lateral leads), and elevated troponin. Coronary angiography showed no left coronary lesions and difficulty catheterizing the right coronary artery, suggesting anatomical distortion. CT angiography revealed a giant ascending aortic pseudoaneurysm (7.0×8.9×7.7 cm) with contained rupture, mediastinal compression, and systemic embolization. Emergency surgery was performed using a transsternal bithoracotomy (clamshell incision) to minimize the risk of intraoperative rupture, combined with bicarotid cannulation to maintain adequate cerebral perfusion during surgical exposure and control of the ascending aortic rupture.. Conclusions: Reoperative aortic surgery in this context is highly complex and carries significant risk. Strategies such as peripheral cannulation, cerebral perfusion through carotid access, and hypothermic management are critical to minimize intraoperative complications,. CT angiography illustrates the extent of mediastinal involvement and justifies the need for a clamshell approach. The suspected association with prosthetic valve endocarditis further reinforces infection as an important etiological factor in pseudoaneurysm formation, particularly in patients undergoing multiple cardiac procedures Ascending aortic pseudoaneurysm with contained rupture may mimic STEMI, creating diagnostic challenges. Failure to catheterize the right coronary artery may indicate aortic pathology. Early CT diagnosis and surgical intervention are crucial for improved outcomes.





16889

LATE RECURRENCE OF CARDIAC FIBROMA AFTER RESECTION: A CASE REPORT

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Introduction: Primary cardiac tumors are rare, and cardiac fibroma is among the most clinically significant benign neoplasms due to its association with arrhythmias, intracardiac obstruction, and ventricular dysfunction. Surgical resection remains the treatment of choice in symptomatic patients or in those with significant anatomical and functional impairment. Recurrence after surgical treatment is uncommon, and reports of late reoperation remain scarce. Case Description: A 26-year-old woman with a history of cardiac fibroma resection at age 14 presented with tumor recurrence 12 years after the initial procedure, associated with exertional dyspnea. Preoperative cardiac magnetic resonance imaging revealed an oval lesion measuring 36 × 33 × 22 mm, located adjacent to the interventricular septum, with intense contrast enhancement. Because of the reoperation, cardiopulmonary bypass was established via femoral arterial and venous cannulation. The tumor was approached through a right ventriculotomy and identified in the upper portion of the interventricular septum. To enable resection, detachment of the septal papillary muscle of the tricuspid valve was required, followed by enucleation of the tumor, which had a firm consistency and was friable on manipulation. During reconstruction, a bovine pericardial patch was used to repair the septal area, followed by reimplantation of the papillary muscle and implantation of a Gore-Tex® artificial chord. Histopathological examination confirmed the diagnosis of cardiac fibroma. Postoperative transthoracic echocardiography showed normal ventricular function, moderate tricuspid regurgitation, and a pulmonary artery systolic pressure of 20 mmHg. Conclusions: Late recurrence of cardiac fibroma after surgical resection is rare. This case highlights the possibility of recurrence even after a long disease-free interval and emphasizes the importance of long-term follow-up and individualized surgical planning in reoperations for intracardiac tumors.

20490

RENAL ARTERY STENOSIS IN A SOLITARY KIDNEY IN POTTER SYNDROME: CARDIOVASCULAR IMPACT AND ENDOVASCULAR APPROACH

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Introduction: Potter syndrome is a malformative sequence arising from severe and persistent oligohydramnios, most commonly associated with bilateral renal agenesis or major fetal urinary tract anomalies. The reduction in amniotic fluid impairs fetal lung expansion and diminishes intrauterine mechanical protection, predisposing to pulmonary hypoplasia, characteristic facies, and limb deformities. Although the renal-pulmonary axis remains the defining hallmark of the syndrome, cardiovascular malformations may also integrate this developmental spectrum, underscoring its relevance in comprehensive perinatal assessment. We report a 55-year-old male with Potter syndrome and partial renal agenesis who developed renal artery stenosis of the remaining kidney, culminating in renovascular hypertension with significant cardiovascular structural impact. Case Description: A 55-year-old male with an established diagnosis of Potter syndrome, based on unilateral renal agenesis with a right kidney present but structurally defective at the superior pole, alongside characteristic syndromic facies including flattened nose, low-set protruding ears, receding chin, and epicanthal folds. He presented with refractory arterial hypertension, and investigation revealed significant stenosis of the right renal artery, corresponding to his sole functional kidney. He underwent percutaneous transluminal angioplasty with stent implantation, with successful restoration of renal perfusion. Transthoracic echocardiography demonstrated concentric left ventricular hypertrophy, with preserved ejection fraction and no evidence of systolic dysfunction or heart failure. Conclusions: This case illustrates the cardiovascular complexity that Potter syndrome may carry into adulthood, an aspect that remains underrecognized in the literature. The coexistence of a solitary functional kidney and hemodynamically significant renal artery stenosis resulted in structural cardiovascular remodeling, evidenced by concentric left ventricular hypertrophy. This presentation reinforces the importance of systematic screening for target-organ damage in patients with congenital renal anomalies. Early diagnosis, timely endovascular intervention, and multidisciplinary follow-up are paramount to mitigating cardiovascular morbidity and ensuring long-term renal functional preservation.

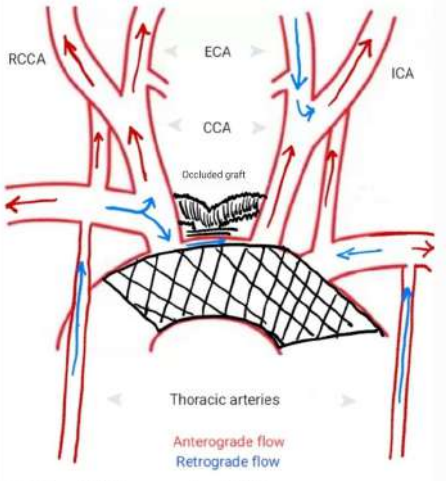
17463

RETROGRADE FLOW THROUGH THE INTERNAL THORACIC ARTERIES SUPPLYING SUPRA-AORTIC VESSELS AFTER DACRON GRAFT OCCLUSION: A CASE REPORT

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Introduction: Long-term patency remains a major challenge in the use of prosthetic vascular grafts due to complications such as thrombosis and intimal hyperplasia. Endothelial injury triggers thrombosis followed by smooth muscle cell proliferation, with intimal hyperplasia being the leading cause of late obstructive complications. We report the case of a patient with a thoracic aortic aneurysm secondary to Takayasu arteritis who developed occlusion of a Dacron graft to the supra-aortic vessels and a complex collateral circulation pattern. Case Description: A 34-year-old female with a diagnosis of Takayasu arteritis presented with aneurysms of the thoracic aorta and brachiocephalic trunk and underwent hybrid surgical treatment in 2014. The first stage consisted of revascularization of the supra-aortic vessels through interposition of a Y-shaped Dacron graft between the ascending aorta, the brachiocephalic trunk, and the left common carotid artery, along with proximal ligation of these vessels. The second stage involved implantation of an endograft extending from the proximal aortic arch to the distal descending thoracic aorta. The patient developed an ischemic stroke in 2025. Computed tomography angiography of the chest demonstrated occlusion of the prosthetic graft between the ascending aorta and the brachiocephalic trunk, as well as in the proximal segment of the left common carotid artery, with preserved patency of the thoracic endograft. Arterial Doppler ultrasound revealed bilateral flow reversal in the internal thoracic arteries, with retrograde supply originating from the superior epigastric arteries, resulting in reconstitution of the subclavian arteries. Additionally, reconstitution of the right common carotid artery from the right subclavian artery was observed, along with flow reversal in the left external carotid artery. The left common carotid artery demonstrated antegrade flow, likely maintained by collateral circulation. This hemodynamic pattern is consistent with complex collateral circulation characterized by retrograde filling of the supra-aortic vessels through the internal thoracic arteries. The patient is currently scheduled for corrective surgical reintervention. Conclusions: This case illustrates late failure of vascular reconstruction associated with the development of complex collateral circulation. The role of the internal thoracic arteries as an alternative pathway for cerebral perfusion is highlighted, demonstrating a rare and underreported hemodynamic adaptation.



RCCA – Right Common Carotid Artery
ECA – External Carotid Artery
CCA – Common Carotid Artery
ICA – Internal Carotid Artery

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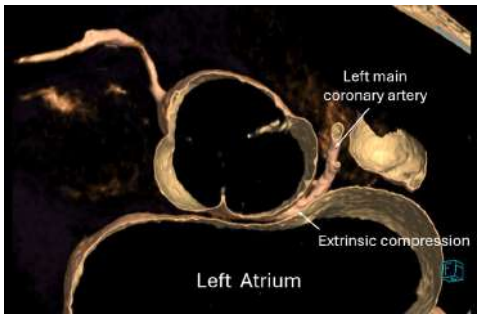
20596

CRITICAL LEFT MAIN CORONARY ARTERY COMPRESSION BY LEFT ATRIUM IN A PATIENT WITH MARFAN SYNDROME: DEFINING ROLE OF CARDIAC COMPUTED TOMOGRAPHY ANGIOGRAPHY (CTA)

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Introduction: Marfan Syndrome has major cardiovascular involvement, as evidenced by aortic root dilation and mitral valve disease. Less common complications, like extrinsic coronary compression from chamber enlargement, are rare but can be fatal. These abnormalities are detected through advanced imaging, particularly Cardiac CTA. Case Description: A 16-year-old male with Marfan syndrome and severe mitral regurgitation from mitral valve prolapse presented in our service with progressive chest pain. Imaging showed a large left spontaneous pneumothorax requiring drainage, as well as a persistent air leak suggestive of an air fistula. Holter monitoring revealed frequent supraventricular ectopy without malignant arrhythmias. Echocardiography revealed moderate left chamber dilatation, markedly enlarged left atrium (57,8 ml/m²), significant mitral regurgitation with myxomatous degeneration, and aortic root dilatation (Z score +3.0). Cardiac CTA was performed due to a discrepancy between clinical and echocardiographic findings, which identified marked left chamber enlargement (left atrium 136 ml/m²; left ventricle 167 ml/m²), mitral valve prolapse with flail P2 segment, and significant ostial narrowing (0,6 cm²) of the left main coronary artery due to extrinsic compression from the enlarged left atrium. This finding changed the management, which caused the planned thoracic surgery (air fistula closure) to be cancelled, and the patient was referred to cardiac intervention due to the high risk of myocardial ischemia and sudden death. The patient had mitral valve repair with Carpentier ring, left atrial plication, coronary exploration, pulmonary segmentectomy and pleurodesis with mild residual mitral regurgitation. Conclusions: In Marfan syndrome, severe mitral regurgitation leads to progressive left atrial enlargement, which can compress adjacent structures. It is a high-risk condition difficult to diagnose with echocardiography. In this instance, Cardiac CTA was required for correct anatomical assessment to the detection of coronary compression and redefinition of the surgical approach. Therefore, it is highly recommended in patients with severe heart disease in Marfan where the clinical and echocardiographic findings are not in accordance, affecting management and changing prognosis.





17130

EARLY NEONATAL DIAGNOSIS AND LONG-TERM SURVIVAL IN GENERALIZED ARTERIAL CALCIFICATION OF INFANCY

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Introduction: Generalized arterial calcification of infancy (GACI) is a rare, frequently underdiagnosed and often fatal disorder, commonly associated with hydrops fetalis and high neonatal mortality, with up to 85% of affected infants dying within the first six months of life. Due to its rapid and severe course, long-term survival is rarely reported, highlighting the importance of early diagnosis and intervention.. Case Description: We report an 11-year-old male who presented at birth with hydrops fetalis, severe cardiovascular compromise, and significant pericardial effusion requiring pericardiocentesis. Early echocardiography raised suspicion of GACI by demonstrating diffuse arterial hyperechogenicity involving the aorta, pulmonary arteries, coronary arteries, and great vessels. Computed tomography angiography confirmed extensive arterial calcification. Treatment with sodium pamidronate was initiated in the neonatal period and maintained in repeated cycles over long-term follow-up, along with optimized medical therapy for systemic hypertension and myocardial dysfunction. Serial imaging demonstrated marked regression of previously diffuse vascular calcifications, particularly in the pulmonary arteries and large vessels. Clinically, the patient evolved with progressive improvement, maintaining good functional status, appropriate growth and development, preserved renal function, stable metabolic profile, and controlled systemic hypertension. In the late phase, imaging revealed residual arteriopathy with segmental vascular narrowing and renovascular involvement, including right renal hypoplasia and compensatory left kidney hypertrophy. Cardiac function remained preserved, although mildly reduced global longitudinal strain suggested subclinical myocardial dysfunction. Conclusions: This case highlights the critical role of early diagnosis in GACI, a life-threatening condition with traditionally poor prognosis. Long-term follow-up demonstrates that continuous pamidronate therapy, combined with optimized clinical management, may be associated with prolonged survival and significant regression of vascular calcifications. The transition to residual arteriopathy reinforces the need for lifelong surveillance.



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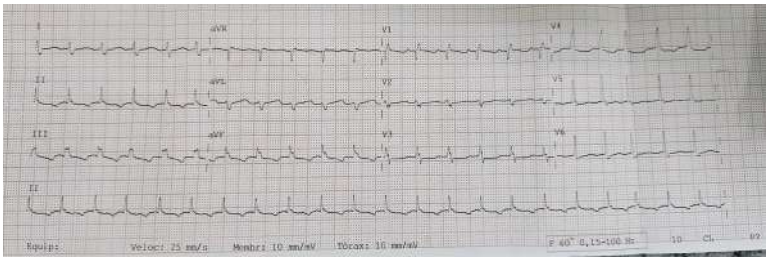
LATE DIAGNOSIS OF EBSTEIN ANOMALY PRESENTING AS UNSTABLE ATRIAL TACHYARRHYTHMIA: SURGICAL MANAGEMENT WITH CONE REPAIR IN AN ELDERLY PATIENT

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Introduction: Ebstein anomaly is a rare congenital heart disease that may remain undiagnosed until adulthood, especially in patients with less severe anatomical forms. Supraventricular arrhythmias are a common initial manifestation in adult patients and may lead to late diagnosis. Case Description: A 63-year-old female patient was admitted to the emergency department with supraventricular tachycardia (heart rate 150 bpm, narrow QRS), associated with chest discomfort. She had a prior history of presumed mitral valve disease and heart failure, with loss of outpatient follow-up. Initial management with adenosine showed no response but revealed atrial activity suggestive of atrial flutter. Amiodarone was initiated, resulting in adequate rhythm control. Transthoracic echocardiography demonstrated marked right atrial enlargement, mild right ventricular dilation, and severe tricuspid regurgitation, in addition to moderate left ventricular systolic dysfunction. Multimodality imaging confirmed the diagnosis of Ebstein anomaly. The patient underwent tricuspid valve repair using the cone technique, associated with right atrial reduction and reconstruction of the right ventricular outflow tract. In the early postoperative period, echocardiography showed reduction of tricuspid regurgitation to mild degree, recovery of left ventricular function, and persistence of right ventricular dysfunction. During follow-up, she developed recurrent atrial tachyarrhythmias, requiring antiarrhythmic therapy and electrical cardioversion. At late evaluation, persistent atrial tachyarrhythmia and ongoing right ventricular dysfunction were observed, without hemodynamic compromise. She was discharged on beta-blocker, digoxin, amiodarone, and oral anticoagulation, with planned outpatient follow-up and consideration of catheter ablation. Conclusions: Ebstein anomaly may present in adulthood, including in advanced age groups, with atrial arrhythmias as the initial manifestation. Surgical correction using the cone technique improves valvular function; however, residual right ventricular dysfunction and recurrence of arrhythmias are common, requiring long-term follow-up and individualized management.





21660

PATENT FORAMEN OVALE AS A CAUSE OF CHRONIC HYPOXEMIA: A CASE REPOR

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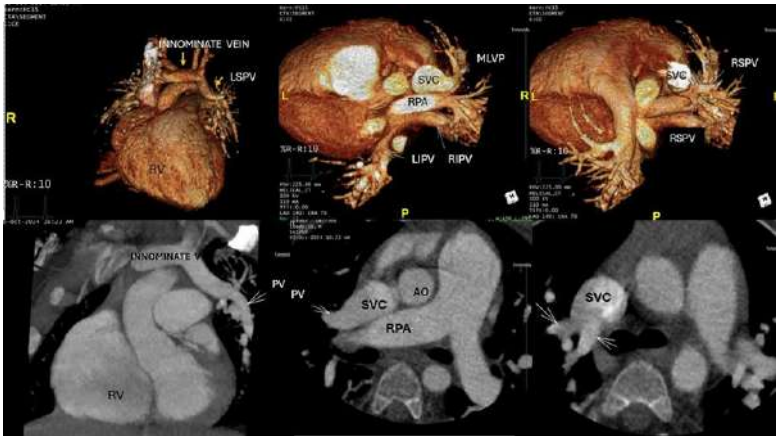
Introduction: Patent foramen ovale (PFO) is the most common congenital cardiac abnormality of fetal origin[1], which typically closes after birth but may persist in up to 25% of adults[2], remaining asymptomatic in most cases[3]. PFO is classically associated with cryptogenic stroke resulting from paradoxical embolism. However, in some patients, a right-to-left shunt with clinical repercussions may occur; resting hypoxia is a rare manifestation, generally related to the presence of predisposing variants such as atrial septal aneurysm[4]. Case Description: A 21-year-old female patient with a diagnosis of congenital total atrioventricular block, having used a pacemaker since the age of two, with no other known structural cardiac abnormalities. She presented with chronic hypoxemia (baseline oxygen saturation of 87% on room air), associated with peripheral cyanosis and digital clubbing, previously investigated for pulmonary etiologies without a definitive diagnosis. She progressed with worsening dyspnea, hypoxemia, and syncopal episodes, leading to hospital admission for further investigation. During the diagnostic workup, she underwent a transthoracic echocardiogram with microbubbles, which suggested a right-to-left shunt, later confirmed by transesophageal echocardiogram, revealing an atrial septal aneurysm with immediate passage of microbubbles from the right atrium to the left atrium. Right heart catheterization confirmed a patent foramen ovale with a significant right-to-left shunt (right atrial pressure: 8 mmHg; left atrial pressure: 6 mmHg; mean pulmonary artery pressure: 11 mmHg), without right ventricular dysfunction or tricuspid regurgitation. An occlusion test resulted in an immediate increase in arterial saturation (from 90% to 98%) without an increase in right atrial pressures, followed by a drop after balloon deflation, confirming the functional repercussion of the shunt. Percutaneous PFO closure was performed, resulting in improvement of hypoxemia and regression of peripheral cyanosis. Conclusions: Patent foramen ovale is a frequent condition and, in most cases, carries no clinical repercussion. However, it should be considered in the investigation of intracardiac shunts and may be the cause of unexplained chronic hypoxemia, as in the present case, with the possibility of resolution following appropriate treatment.

16242

RIGHT HEART DILATION IN A CASE OF DUCHENNE MUSCULAR DYSTROPHY: UNRAVELING A DIAGNOSTIC CHALLENGE THROUGH MULTIMODALITY IMAGING

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Introduction: Duchenne muscular dystrophy (DMD) is characterized by progressive cardiomyopathy, predominantly affecting the left ventricle. Although right ventricular involvement may occur, significant right heart dilation is uncommon in early stages and should prompt investigation for alternative etiologies. In this context, multimodality imaging plays a pivotal role in clarifying complex and potentially misleading clinical scenarios. Case Description: A 10-year-old male with genetically confirmed Duchene muscular dystrophy (deletion of exons 45–50), weighing 28 kg and measuring 124 cm in height, under long-term cardiologic follow-up, presented with borderline left ventricular ejection fraction and reduced global longitudinal strain, under optimized medical therapy. During follow-up, he developed marked right atrial and right ventricular dilation, disproportionate to the expected pattern of DMD. Transthoracic echocardiography was limited by suboptimal acoustic windows, related to the patient's body habitus in the context of DMD. Cardiac magnetic resonance revealed significant right heart enlargement with preserved right ventricular function and raised suspicion of partial anomalous pulmonary venous connection (PAPVC). Cardiac computed tomography confirmed a complex PAPVC, with three right pulmonary veins draining into the superior vena cava and the left upper pulmonary vein draining into the innominate vein, while inferior pulmonary veins drained normally into the left atrium, resulting in a significant left-to-right shunt. The patient underwent successful surgical correction, with favorable clinical outcome and evidence of reverse remodeling of the right-sided chambers on follow-up imaging. Conclusions: This case highlights that right heart dilation in DMD should not be solely attributed to myocardial involvement. Multimodality imaging was essential in unraveling a diagnostic challenge, allowing identification of a coexisting and surgically treatable congenital anomaly. An integrated imaging approach is crucial in complex patients, as it may significantly alter management and improve clinical outcomes.

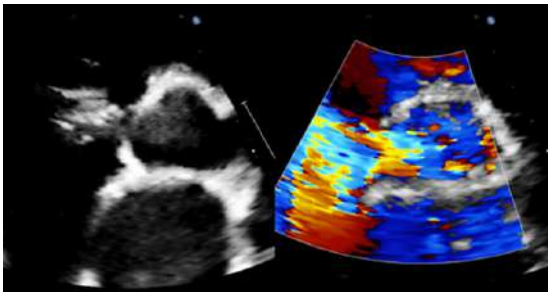
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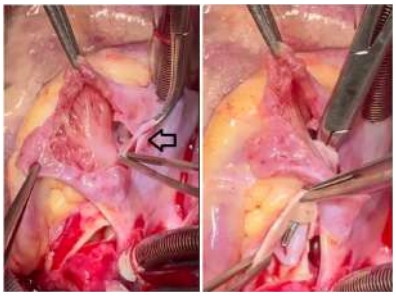
RUPTURED SINUS OF VALSALVA ANEURYSM INTO RIGHT ATRIUM IN A CHILD WITH BICUSPID AORTIC VALVE: TEN-YEAR EVOLUTION

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(1) AFYA FACULDADES DE CIENCIAS MEDICAS GUANAMBI - GUANAMBI - BA - BRASIL; (2) UNIVERSIDADE FEDERAL DA FRONTEIRA SUL - PASSO FUNDO - RS - BRASIL; (3) UNOESTE CAMPOS GUARUJÁ - GUARUJÁ - SP - BRASIL; (4) AFYA FACULDADE DE CIENCIAS MEDICAS GUANAMBI - GUANAMBI - BA - BRASIL;

Introduction: Sinus of Valsalva aneurysm is a rare cardiovascular condition, representing approximately 0.09% of congenital heart diseases. Rupture constitutes the main clinical severity determinant, potentially causing acute heart failure and hemodynamic instability. Echocardiography plays a central role in diagnosis and hemodynamic assessment. Most evidence derives from retrospective series and case reports, particularly in pediatric populations, making new case descriptions valuable for understanding natural history and management strategies. Case Description: A male patient was followed since six months of age for mild aortic stenosis secondary to bicuspid aortic valve, diagnosed due to characteristic murmur. Serial transthoracic echocardiograms demonstrated stable valve dysfunction. At age 10, echocardiography revealed aneurysmal dilation of the right sinus of Valsalva with increased mobility but no color Doppler flow, measuring over 50% of unaffected sinuses diameter. Elective surgical correction was indicated. Six months later, while awaiting referral appointment, he presented to emergency department with acute chest pain, dyspnea, and presyncope during physical exertion. Examination revealed blood pressure 90/50 mmHg, heart rate 110 bpm, and grade 6/6 continuous murmur with thrill at all auscultatory areas. Urgent echocardiography confirmed rupture into the right atrium with torrential left-to-right shunt and reversed diastolic flow in abdominal aorta. Emergency cardiac surgery confirmed fistulous communication between right sinus of Valsalva and right atrium. Surgical repair included aortic annular enlargement with synthetic patch, aortic valve repair, fistula closure, and patent foramen ovale closure. At two-year follow-up, patient remains asymptomatic with unrestricted physical activity and no residual shunt on control echocardiography. Conclusions: This case documents rare ten-year longitudinal follow-up from bicuspid aortic valve diagnosis to sinus of Valsalva aneurysm rupture, potentially representing the first such documented evolution in pediatric literature. It reinforces unpredictable natural history of unruptured aneurysms even in asymptomatic patients and supports early surgical intervention when size exceeds 50% of contralateral sinus, shows progressive growth, or presents increased mobility. Echocardiography proved essential throughout clinical course. Surgical repair demonstrated excellent medium-term outcomes with no residual shunt or valvular dysfunction.





18849

THROMBOSIS IN THE INTERATRIAL SEPTUM IN THE LATE POSTOPERATIVE PERIOD FOLLOWING REPAIR OF AN ATRIAL SEPTAL DEFECT WITH MULTIPLE SYSTEMIC EMBOLISMS.

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(1) HOSPITAL DO CORACAO FRANCISCA MENDES - MANAUS - AM - BRASIL;

Introduction: Atrial septal thrombosis can occur in cases of septal aneurysm or postoperative percutaneous Amplatzer prosthesis implantation, and is rare after surgery to correct an atrial septal defect (ASD). Case Description: A 41-year-old female patient from Manaus- AM, with systemic arterial hypertension and surgical correction of an ostium secundum ASD in July 2024. She has been using combined oral contraceptives for 22 years, in addition to angiotensin receptor blockers and calcium channel blockers. Ten months after the surgical correction of the ASD, she began experiencing claudication in her lower limbs and dyspnea on exertion. Physical examination showed no abnormalities. The resting electrocardiogram showed altered ventricular repolarization of the anteroseptal wall. Transthoracic echocardiography revealed a heterogeneous, pedunculated, and mobile mass adhered to the left atrial face of the interatrial septum, measuring 11 × 17 mm, suggesting a differential diagnosis between atrial myxoma and thrombus. In contrast, cardiac magnetic resonance imaging described the lesion as homogeneous, isointense on T1, without late enhancement, an appearance more compatible with thrombus. Transesophageal echocardiography confirmed a homogeneous echogenic mass covering the interatrial septum and projecting into the left atrium via a pedicle (approximately 1.1 × 0.9 cm), suggestive of thrombus. Doppler ultrasound revealed extensive arterial thrombosis in multiple segments of both lower limbs, with significant occlusions and stenoses, suggestive of multiple systemic embolization. Without deep vein thrombosis. Antiphospholipid antibody testing and screening for hereditary thrombophilias were negative. Fifteen months after the ASD repair, the patient underwent a new surgical intervention. During the intraoperative period, a closed atrial septal defect with a bovine pericardial patch was observed, presenting a pedunculated thrombus adhered to the left atrial surface. Excision of the patch with thrombectomy, plication of the left atrium, and atrial septoplasty with a new bovine pericardial patch were performed, with good postoperative evolution. Conclusions: This is a rare report of postoperative thrombosis following ASD repair with multiple peripheral embolisms, whose thrombophilia tests were normal. It is speculated that prolonged use of contraceptives may have been the cause of the event.

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21189

FROM INTRA-AORTIC BALLOON PUMP TO ECMO AS A BRIDGE TO HEART TRANSPLANTATION: NURSING CARE IN LATE CHEMOTHERAPY-INDUCED CARDIOTOXICITY

LETICIA RODRIGUES LEITE1; REBECA EVANGELISTA FOLHADELA1; VANESSA ROSSATO GOMES1;

(1) INCOR - INSTITUTO DO CORACAO DA UNIVERSIDADE DE SAO PAULO - SAO PAULO - SP - BRASIL;

Introduction: Nursing care for patients with heart failure secondary to late chemotherapy-induced cardiotoxicity requiring mechanical circulatory support includes hemodynamic monitoring, infection prevention, anticoagulation management and surveillance for device complications. Case Description: 51-year-old female with breast cancer cT4aN1M0 follow-up that received neoadjuvant chemotherapy and radiotherapy. In 2018, she underwent right mastectomy and axillary node dissection, followed by adjuvant hormone therapy with Tamoxifen. In 2025, was treated for pulmonary tuberculosis and bacterial spondylodiscitis plus palliative radiotherapy at T12-L1 for four months due to suspected bone tuberculosis. The patient had dilated cardiomyopathy secondary to late chemotherapy-induced cardiotoxicity, biventricular dysfunction and LVEF of 20%. She was admitted to the intensive care unit with cardiorenal syndrome and decompensated heart failure requiring optimization of inotropic support, mechanical circulatory support with an intra-aortic balloon pump and continuous renal replacement therapy for systemic congestion. Besides, vertebral biopsy demonstrated no evidence of neoplasia, inflammatory process, or granulomatous disease. Subsequently, developed signs of low cardiac output, leading to the indication for venoarterial extracorporeal membrane oxygenation (VA-ECMO) as a bridge to heart transplantation. As a result, highly specialized nursing care was required due to hemodynamic instability and the concomitant use of multiple advanced support devices, including intra-aortic balloon pump, continuous renal replacement therapy, and VA-ECMO. Nursing care included hemodynamic monitoring, vasoactive drug management, fluid balance control, peripheral perfusion assessment and early identification of complications associated with the devices. The nursing team also played a central role to ensure patient safety during intra-hospital transport and prone positioning for vertebral biopsy, considering the limitations imposed by the intra-aortic balloon pump and the high risk of clinical instability. Emotional support for the patient and family also was essential throughout the prolonged hospitalization and the anticipation of heart transplantation. Conclusions: Systematized and specialized nursing care was essential for maintaining advanced circulatory support, ensuring patient safety, and enabling heart transplantation in a highly complex clinical context.

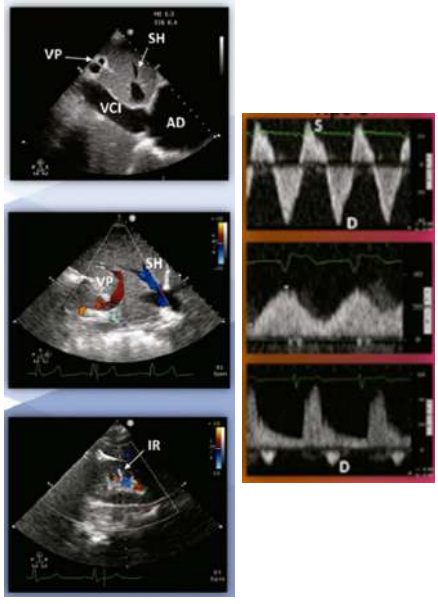
20361

VEXUS AS A DECISION-MAKING TOOL IN THE MANAGEMENT OF DIURETIC THERAPY IN PATIENTS POST-CARDIAC SURGERY: A CASE REPORT

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Introduction: Point-of-care ultrasound (POCUS) is a tool for assessing venous congestion, with the Venous Excess Ultrasound (VExUS) technique gaining prominence. VExUS facilitates noninvasive quantification of venous congestion based on measurements of inferior vena cava (IVC) size and Doppler assessments of the hepatic vein (HV), portal vein (PV), and intrarenal vein, providing real-time information on hemodynamic status and guiding therapeutic interventions. The VExUS classification system aids in stratifying the severity of congestion. Case Description: Patient J.G.M., male, born in Rio de Janeiro, 79 years old, widower, with hypertension, type 2 diabetes, dyslipidemia, and a history of smoking for 18 years. Admitted in the late postoperative period following coronary artery bypass grafting (CABG) with 3 bypasses, 48 hours prior, requiring ventilation via nasal cannula at 2 L/min, tachycardic, tachypneic, hyperthermic, with a urine output of 0.40 mL/kg/h over the past 6 hours. On physical examination, he presents with cold skin, capillary refill time >3s, clammy skin, and bilaterally edematous lower extremities. Laboratory results show Cr 2.1 mg/dL, lactate 3.2 mmol/L, elevated BNP, and Hb 9.8 g/dL. When performing a POCUS was performed, revealing diffuse hypokinesis in the cardiac window and an enlarged (2.5 cm) left ventricle with collapse. Bilateral B-lines were present, suggestive of pulmonary congestion. Low cardiac output and systemic congestion were noted, and VExUS the IVC was performed. It revealed slight collapse of the IVC, with reverse flow during systole, increased pulsatile right ventricle (>50%), and a discontinuous pattern in the renal vein, concluding a grade 3 classification of severe venous congestion. Based on the nursing diagnoses of decreased cardiac output, ineffective renal perfusion, impaired gas exchange, and fluid volume excess. The medical team was called, and diuretics and inotropes were initiated, in addition to maintaining strict fluid balance. Conclusions: VExUS has proven to be a decisive tool in guiding diuretic therapy and the initiation of inotropic therapy in the postoperative period following cardiac surgery, as it allows for an objective assessment of venous congestion and greater precision in volume management. The use of this technology strengthens the nurse's role in advanced hemodynamic assessment, expands professional autonomy, and contributes to safer, individualized care grounded in scientific evidence.



Epidemiology and Health Policy / Global Health



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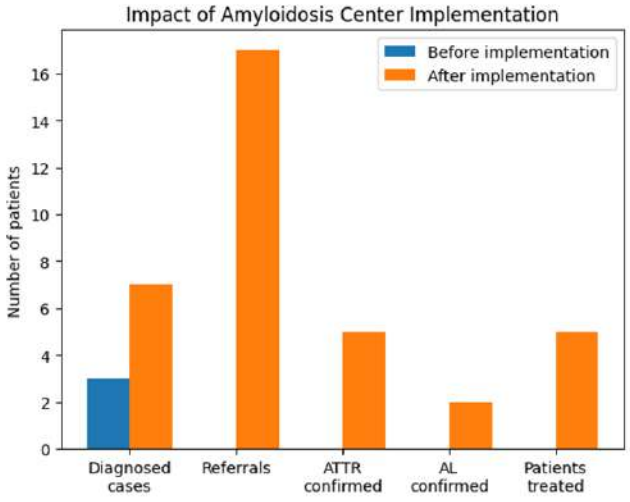
17799

IMPLEMENTATION OF A CARDIAC AMYLOIDOSIS CENTER OF EXCELLENCE IN A TERTIARY PRIVATE HOSPITAL: A CASE STUDY FROM BRAZIL

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Introduction: Background: Cardiac amyloidosis remains underdiagnosed due to low clinical suspicion and limited access to diagnostic tools. Centers of excellence may improve detection and management of rare diseases. Objectives: To describe the implementation of a cardiac amyloidosis center in a tertiary private hospital and evaluate its initial impact on diagnosis and treatment. Case Description: Methods: This is a case study conducted in a tertiary hospital in Rio de Janeiro, Brazil. Implementation strategies included multidisciplinary team formation, diagnostic workflow structuring, professional training, and partnerships to enable access to advanced diagnostic methods. Data were collected from institutional registries during the first year of operation. Results: Seventeen patients were referred in the first year. Five cases of transthyretin amyloidosis (ATTR) and two cases of light-chain amyloidosis (AL) were diagnosed. All patients underwent echocardiography, 82% underwent cardiac MRI, and 41% underwent scintigraphy. Targeted therapies, including Tafamidis for transthyretin amyloidosis and chemotherapy for the cases of light-chain amyloidosis, were initiated accordingly. Compared to previous institutional data, there was a significant increase in diagnostic rates. Conclusions: Conclusion: The implementation of a center of excellence significantly improved clinical suspicion, diagnostic capacity, and treatment initiation in cardiac amyloidosis. This model may be replicated for other rare cardiovascular diseases at the same institution and may be replicated for the same disease at others hospitals.



Heart Failure / Transplantation / Ventricular Assist Devices / Cardiomyopathies



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16648

ABORTED SUDDEN CARDIAC DEATH IN A YOUNG GENOTYPE-POSITIVE HYPERTROPHIC CARDIOMYOPATHY PATIENT WITH PHENOTYPE-NEGATIVE

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Introduction: Sudden cardiac death in young individuals, especially during physical activity, is a rare event but is often associated with genetic cardiomyopathies, such as hypertrophic cardiomyopathy. We report the case of a previously healthy male patient who presented with cardiac arrest during sports activity. Case Description: A 22-year-old previously healthy male from Tabatinga (AM), Brazil, experienced a sudden collapse during physical activity (soccer), progressing to witnessed cardiac arrest. Cardiopulmonary resuscitation was initiated on-site and maintained for approximately 40 minutes until return of spontaneous circulation. The patient developed initial respiratory and neurological complications, with progressive clinical recovery during intensive care unit hospitalization. Given the suspicion of arrhythmic etiology, an implantable cardioverter-defibrillator was indicated for secondary prevention of sudden cardiac death. Electrocardiogram showed right bundle branch conduction abnormality. Echocardiography and cardiac magnetic resonance imaging were within normal limits, with preserved cardiac dimensions and systolic function, and no evidence of structural abnormalities. Etiological investigation included genetic testing, which revealed a pathogenic variant in the MYBPC3 gene, consistent with genetically determined hypertrophic cardiomyopathy, despite the absence of overt structural changes. Conclusions: This case highlights the importance of genetic investigation in young patients with unexplained cardiac arrest, as well as the relevance of genotype–phenotype correlation in risk stratification and clinical management.

15915

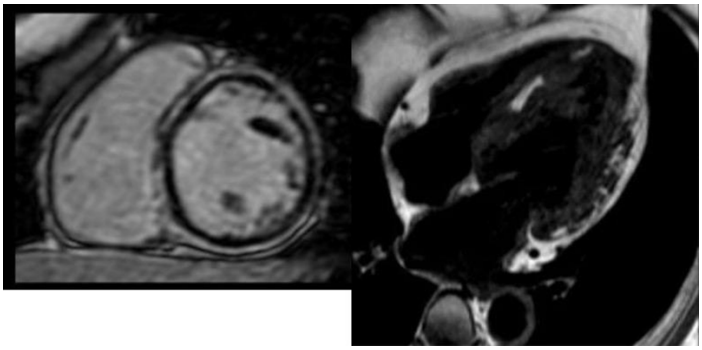
CURLY HAIR AND PALMOPLANTAR KERATODERMA AS DIAGNOSTIC CLUES TO LEFT-DOMINANT ARRHYTHMOGENIC CARDIOMYOPATHY: A RARE CASE OF CARVAJAL SYNDROME

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Introduction: Carvajal syndrome is a rare inherited cardiocutaneous disorder caused by bi-allelic pathogenic variants in desmoplakin (DSP), characterised by myocardial fibrofatty replacement, woolly hair, and palmoplantar keratoderma. Left-dominant arrhythmogenic cardiomyopathy (LDAC) represents a particularly rare and diagnostically challenging phenotype within this spectrum. Case Description: A 32-year-old male with no prior medical history presented with a two-month history of progressive dyspnoea, orthopnoea, paroxysmal nocturnal dyspnoea, and peripheral oedema. No family history of cardiomyopathy or sudden cardiac death was reported. Physical examination revealed NYHA class III heart failure, jugular venous distension, and positive hepatojugular reflux. Transthoracic echocardiography demonstrated severe left ventricular dilatation with markedly reduced ejection fraction. Cardiac magnetic resonance imaging revealed extensive circumferential subepicardial late gadolinium enhancement forming a ring-like pattern, highly suggestive of DSP-related cardiomyopathy. Dermatological assessment identified diffuse palmoplantar keratoderma and woolly hair. Genetic testing confirmed a pathogenic DSP variant. Guideline-directed medical therapy was optimised and an implantable cardioverter-defibrillator was implanted for primary prevention given the high arrhythmic risk associated with the DSP genotype. The patient remains clinically stable on outpatient follow-up. Conclusions: LDAC may manifest as new-onset heart failure in young adults without family history, underscoring the importance of systematic extracardiac examination. Woolly hair and palmoplantar keratoderma are pathognomonic clues that, when integrated with multimodality imaging and genotype-phenotype correlation, enable timely diagnosis and risk stratification in cardiocutaneous syndromes





16458

EARLY GRANULOMATOUS RECURRENCE OF CARDIAC SARCOIDOSIS IN THE ALLOGRAFT: DIAGNOSIS AND MANAGEMENT

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Introduction: Cardiac sarcoidosis is a rare and potentially fatal cause of dilated cardiomyopathy that may progress to refractory heart failure requiring heart transplantation. Recurrence of the disease in the allograft has been described in the literature; however, its incidence, timing, and optimal management remain poorly defined. Endomyocardial biopsy (EMB) plays a central role in surveillance and diagnosis in this setting. Case Description: A 38-year-old male, former athlete, diagnosed with dilated cardiomyopathy secondary to cardiac sarcoidosis (cardiac MRI with ring-like late gadolinium enhancement pattern; negative genetic panel for inherited cardiomyopathy). He underwent orthotopic bicaval heart transplantation due to advanced heart failure with cardiogenic shock. Native heart pathology confirmed sarcoidosis. First surveillance EMB (post-transplant week 7): ISHLT Grade 0R, no granulomas. Second EMB (post-transplant week 10): granulomatous myocarditis with lymphohistiocytic infiltrate and giant cells in 2 of 5 fragments, consistent with sarcoidosis recurrence in the allograft, associated with acute cellular rejection Grade 2R. Intravenous methylprednisolone pulse therapy was administered for 11 days, followed by transition to oral corticosteroids with a taper extended beyond the standard 6-month protocol, along with optimization of mycophenolate sodium. Third EMB (post-transplant week 12): ISHLT Grade 0R, no granulomas on serial histological sections. Conclusions: Cardiac sarcoidosis can recur in the allograft, manifesting even in early postoperative phases. Serial EMB surveillance is essential in transplant recipients with sarcoidosis as the underlying etiology. Extended corticosteroid maintenance beyond standard protocols may be warranted in this subgroup. This case highlights the importance of individualized immunosuppressive strategies in high-risk transplant populations.

16501

GLOBALLY RARE VARIANT, PREDOMINANT IN ASIA, CAUSING HEREDITARY TRANSTHYRETIN AMYLOIDOSIS IN THE BRAZILIAN AMAZON

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(1) BENEFICENCIA PORTUGUESA - SAO PAULO - AM - BRASIL; (2) UNIVERSIDADE DO ESTADO DO AMAZONAS - MANAUS - AM - BRASIL; (3) UNIVERSIDADE NILTON LINS - MANAUS - AM - BRASIL; (4) HOSPITAL DO CORACAO FRANCISCA MENDES - MANAUS - AM - BRASIL;

Introduction: Transthyretin amyloidosis may occur in either wild-type or hereditary forms. In Brazil, the most common variants are Val50Met and Val142Ile. The Asp58Ala variant is considered globally rare and has not been described in large epidemiological studies conducted in Brazil. In Asian populations, particularly in South Korea, it has been reported as the most frequent variant. This report describes the detection of this variant in the Brazilian Amazon. Case Description: This was a descriptive study conducted at a referral center in the Amazon region. Patients with hereditary transthyretin amyloidosis carrying the Asp58Ala genetic variant confirmed by genetic testing were included. Results: In recent years, ten cases of hereditary transthyretin amyloidosis associated with the Asp58Ala variant were diagnosed through genetic testing in a cardiology service in the Amazon. Among these patients, six were index cases and four were identified through family screening. In the state of Amazonas, this variant accounted for 27.3% of index cases, representing the most frequent mutation alongside Val50Met. The mean age at diagnosis was 59.7 years, with a predominance of female patients (77.8%). Most patients originated from the municipality of Maués (66.7%), followed by Manaus (22.2%) and Barcelos (11.1%), reinforcing the regional concentration of cases. Regarding clinical presentation, the mixed phenotype was the most prevalent (55.6%), followed by asymptomatic cases (22.2%), isolated cardiac involvement (11.1%), and familial amyloid polyneuropathy (11.1%), highlighting the phenotypic heterogeneity of the disease. Among index cases, the mean left ventricular ejection fraction was 53.8%, with a mean septal thickness of 16.2 mm and posterior wall thickness of 14.4 mm. During follow-up, three of the six index cases died, corresponding to 33.3% of the total sample. In addition to the index cases, four relatives carrying the same variant were identified through genetic screening and remain under specialized follow-up. Conclusions: The Asp58Ala mutation is rare and more frequently described in Asian populations. The identification of multiple cases in the Amazon highlights an unusual regional pattern with potential epidemiological relevance.

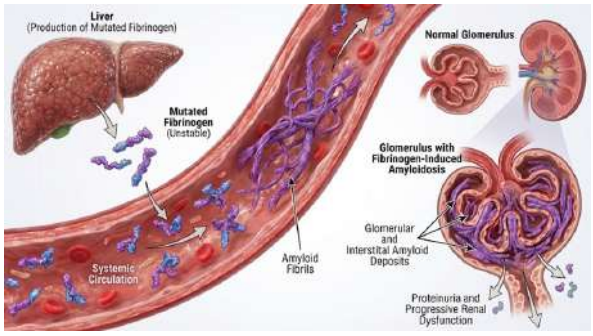
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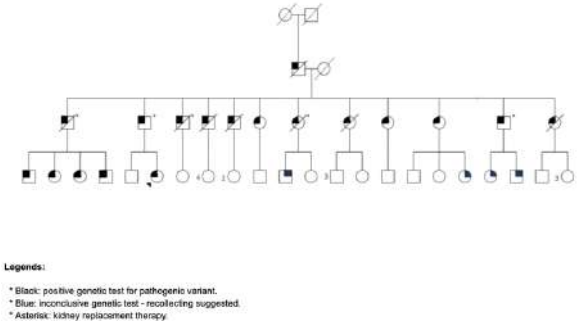
HEREDITARY FIBRINOGEN DEPOSITION AMYLOIDOSIS: RARE, BUT FUNDAMENTAL FOR DIFFERENTIAL DIAGNOSIS

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Introduction: Hereditary fibrinogen amyloidosis is a rare and frequently underdiagnosed condition. It is predominantly characterized by progressive renal involvement. The recognition of familial aggregation, associated with genetic confirmation, is fundamental for diagnosis, clinical management, and genetic counseling. Case Description: A 45-year-old white female patient, healthy, without cardiovascular manifestations at the time of evaluation, was referred due to a marked family history of chronic kidney disease and early deaths. Genetic investigation identified the pathogenic variant c.1634 A>T in the FGA gene, which is associated with hereditary fibrinogen deposition amyloidosis. In terms of family history, her paternal grandfather had advanced heart failure and her uncles and aunts (paternal side), 5 out of 12 had kidney disease requiring replacement therapy, 3 died, and another 4 died without a diagnosis of kidney disease. All of them underwent genetic testing which evidenced the presence of the same pathogenic variant. In addition to chronic kidney disease, frequently progressing to kidney replacement therapy, they also presented other heterogeneous systemic manifestations, such as amyotrophic lateral sclerosis, chronic obstructive pulmonary disease, multi-vessel coronary artery disease, and non-amyloidosis related neoplasms. In the next generation, which includes our patient, genetic screening revealed positive results in some of those investigated. The patient is asymptomatic from a cardiovascular standpoint, doesn't have structural cardiac or renal changes, and doesn't have proteinuria or renal dysfunction. Conclusions: We describe a large family with hereditary fibrinogen amyloidosis, with incomplete penetrance and variable phenotypic expressivity, predominantly featuring progressive renal involvement and high morbidity and mortality. We did not detect cardiac or renal involvement in the described patient, and the other family members were not investigated. The case reinforces the importance of clinical suspicion in the face of a suggestive family history of kidney disease, as well as genetic confirmation and cascade family screening for early diagnosis, genetic counseling, and target organ surveillance. Although this form of amyloidosis is not included among those that deposit in the heart, the presence of heart failure in the family may raise this possibility, which was not investigated.





20332

PRKAG2 CARDIOMYOPATHY AND PROGRESSION TO ADVANCED HEART FAILURE: DIAGNOSTIC AND THERAPEUTIC CHALLENGES

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(1) UNIVERSIDADE FEDERAL DA BAHIA - SALVADOR - BA - BRASIL;

Introduction: PRKAG2 cardiomyopathy is a rare autosomal dominant genetic disorder resulting from glycogen deposition, characterized by ventricular pre-excitation and myocardial hypertrophy. The phenotype mimics hypertrophic cardiomyopathy, frequently associated with arrhythmias, sudden death, and the need for cardiac device. We report a case of progression to advanced heart failure (HF), highlighting clinical and therapeutic aspects. Case Description: A 49-year-old woman with a family history of cardiomyopathy presented with electrocardiographic evidence of ventricular pre-excitation and marked concentric left ventricular hypertrophy (echocardiography: interventricular septum 22 mm; posterior wall 20 mm). Due to these findings and episodes of syncope, an implantable cardioverter-defibrillator was indicated. Family screening identified the Iç5 years with progressive HF (NYHA functional class IV). In 2022, the left ventricular ejection fraction (LVEF) on cardiac magnetic resonance imaging was 44%, in addition to ventricular dyssynchrony. Progressive deterioration of ventricular function was later documented on echocardiography, with LVEF declining to 27% in 2025. Due to the presence of ventricular dyssynchrony, advanced HF, and recurrent hospitalization for decompensation, cardiac resynchronization therapy was performed. Although symptomatic improvement was achieved, the patient remains under evaluation for heart transplantation. Conclusions: PRKAG2 cardiomyopathy is a genetic heart disease with a progressive clinical course. This case demonstrates the possibility of progression of this heart disease to advanced heart failure, reinforcing the importance of genetic investigation and family screening. Early diagnosis allows for appropriate monitoring and treatment, including the indication of implantable devices and heart transplantation, capable of reducing severe outcomes.

20067

THE HIDDEN THIRD ATRIUM? A CASE REPORT OF A LEFT ATRIAL APPENDAGE ANEURYSM

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Introduction: Introduction: Left atrial appendage aneurysm (LAAA) is an uncommon anomaly that may be congenital, usually related to dysplasia of the pectinate musculature or pericardial defects, or acquired, secondary to mitral valve disease or chronic atrial hypertension. It can lead to serious complications, including arrhythmias and thromboembolic events, with stroke reported in up to 12% of cases. Case Description: Case: A 49-year-old previously healthy woman presented with recurrent ischemic stroke despite oral anticoagulation. On initial evaluation, atrial fibrillation was documented, and computed tomography angiography revealed an enlarged left atrial appendage measuring 7.6 × 4.7 cm. Decision making: Given the history of embolic events and persistent atrial fibrillation, the dilated appendage was considered the most likely substrate for thrombus formation and arrhythmogenesis. Medical management with anticoagulation was deemed insufficient to adequately reduce the high risk of recurrent thromboembolic events. The case was reviewed by a multidisciplinary team (cardiology, cardiac surgery, and radiology), and surgical resection of the aneurysmal appendage was recommended as definitive treatment. The patient underwent successful excision of the aneurysm, with intraoperative findings confirming a large, thin-walled saccular dilation. Postoperative recovery was uneventful, and the patient was discharged in good condition under rhythm control and anticoagulation therapy. Conclusions: Conclusion: LAAA is an exceptionally rare diagnosis. Early recognition through multimodality imaging is essential, particularly in patients with unexplained left atrial enlargement, arrhythmias, or embolic events. Timely surgical intervention may transform prognosis and prevent devastating and irreversible complications.

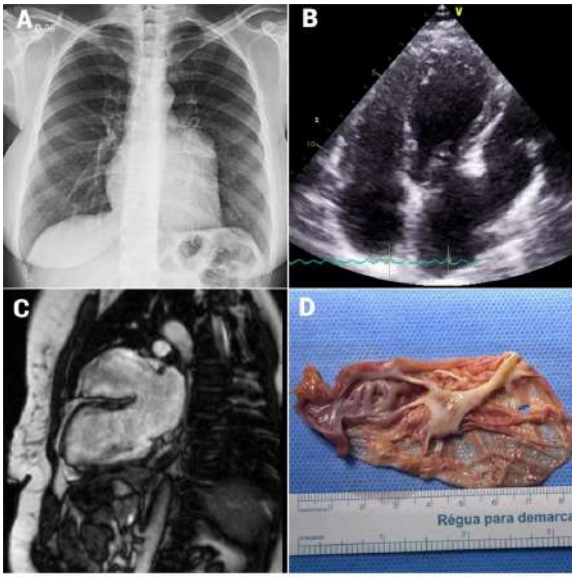


FIGURE 1: Imaging findings of a left atrial appendage aneurysm. (A) Chest X-ray showing prominence of the left atrium. (B) Transthoracic echocardiogram in a four-chamber view demonstrating the left atrial appendage aneurysm. (C) Cardiac magnetic resonance imaging showing left atrial enlargement. (D) Macroscopic view of the surgical specimen, with the left atrial appendage aneurysm measuring approximately 8 cm in diameter.

Hypertension / Renal Denervation



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14532

BLOOD PRESSURE INSTABILITY ASSOCIATED WITH CHRONIC CANNABIS USE IN A HYPERTENSIVE PATIENT WITH MODERATE AORTIC REGURGITATION: A 24-HOUR AMBULATORY BLOOD PRESSURE MONITORING (ABPM) CASE REPORT

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Introduction: Cannabis may produce complex cardiovascular effects, including transient blood pressure elevation and clinically significant hypotension after use. These effects may be especially relevant in patients with structural heart disease. This study aimed to analyze the impact of chronic cannabis use on blood pressure control in a hypertensive patient with moderate aortic regurgitation. Case Description: A 61-year-old physically active man with hypertension and moderate aortic regurgitation, followed as an outpatient for 3 years, presented with marked blood pressure oscillation, dizziness, and anxiety. He had smoked cannabis for 20 years. Past history included diverticulitis with vesicocolic fistula and two abdominal surgeries. Medications included olmesartan 20 mg, hydrochlorothiazide 25 mg, and bupropion 300 mg. Office blood pressure was 150/70 mmHg. He had recently reduced cannabis use, although he continued nightly smoking before sleep. The most relevant pattern occurred after cannabis use, when he developed symptomatic hypotension with dizziness, weakness, and persistence of low blood pressure during sleep. Twenty-four-hour ambulatory blood pressure monitoring (ABPM) showed normal mean blood pressure (125/61 mmHg), yet documented post-cannabis hypotension, followed by awakening at around 3:00 a.m. with agitation. Management included psychological and psychiatric support, olmesartan reduction to 10 mg, and counseling for cannabis cessation. At 30-day follow-up, symptoms improved and blood pressure normalized to 120/60 mmHg. Conclusions: This case shows that normal average values on ambulatory blood pressure monitoring may conceal clinically relevant symptomatic hypotension related to cannabis use. In moderate aortic regurgitation, post-cannabis blood pressure decline may have greater impact because of the underlying valvular physiology and wide pulse pressure. Recognition of this pattern may support careful antihypertensive adjustment, gradual cannabis cessation, mental health support, and close hemodynamic follow-up.

18966

HYPERTENSIVE EMERGENCY AS THE INITIAL MANIFESTATION OF POLYCYTHEMIA VERA IN A YOUNG PATIENT: A CASE REPORT

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Introduction: Hypertensive emergency (HE) is associated with thrombotic microangiopathy (TMA), a condition with diverse etiologies. Polycythemia vera (PV) typically affects older individuals and is commonly associated with thrombotic events; however, its presentation as renal TMA in young patients is rare. This report describes a case of PV presenting as HE with renal involvement in a young patient. Case Description: A 23-year-old male was admitted with altered mental status, headache, nausea, and vomiting. Blood pressure was 212/144 mmHg. Physical examination was unremarkable. Intravenous sodium nitroprusside was initiated. Fundoscopy and brain CT were normal. Laboratory tests revealed polycythemia (hemoglobin 18.5g/dL; hematocrit 56.4%), thrombocytosis (1,200,000/mm³), and renal dysfunction (creatinine 3.54mg/dL; urea 56mg/dL), along with hyperkalemia (5.7mEq/L) and significant proteinuria (protein-to-creatinine ratio 2.2g/g). Urinalysis showed leukocyturia without hematuria. Renal ultrasound revealed normal kidney size, increased echogenicity, and patent renal arteries. The etiological investigation excluded autoimmune, infectious, and endocrine causes of secondary hypertension. Evaluation of polycythemia revealed a JAK2 V617F mutation, confirming the diagnosis of PV as the underlying etiology, associated with acquired von Willebrand disease. Initial assessment showed reduced von Willebrand factor (vWF) activity, which improved after hematologic stabilization under cytoreductive therapy. Given the reduced bleeding risk, a kidney biopsy was performed 15 days after admission due to persistent renal dysfunction and proteinuria. It revealed diffuse mesangiolysis, interstitial fibrosis with lymphomononuclear infiltrate, focal hyalinosis, and onion-skin arteriolar myointimal proliferation. Immunofluorescence showed IgM and C3 mesangial deposits, consistent with thrombotic microangiopathy (TMA) After 25 days, the patient was discharged on losartan 100mg per day. Six months follow-up has shown improvement in creatinine level (2.4mg/dL), hemoglobin 16.5g/L but no thrombotic event. Conclusions: This case illustrates an atypical age presentation of PV, resulted in chronic kidney disease due to the rapid progression of TMA without systemic manifestations. Although uncommon, PV may present with small-vessel TMA leading to kidney disease in young patients. This case highlights the importance of a thorough investigation of hypertension in young individuals, considering diverse etiologies to ensure optimal care.

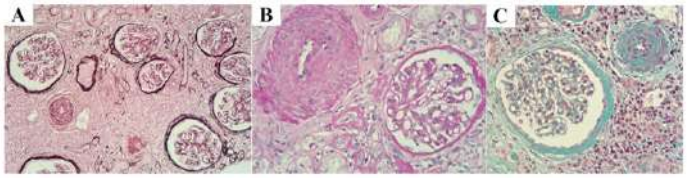


Figure 1. Histopathological findings in the patient's renal biopsy. Microscopic analysis of the kidney biopsy with hematoxylin and eosin staining revealed (**A**, 40×; **B**, 100×) diffuse mesangiolysis, focal segmental mesangial expansion, and concentric interstitial fibrosis accompanied by lymphomononuclear inflammatory infiltrate. Additionally, there was focal hyalinosis and arteriolar myointimal proliferation with an onion-skin pattern. Immunohistochemical examination targeting immunoglobulin M demonstrated (**C**, 100×) finely granular deposits in the mesangium, confirming the diagnosis of thrombotic microangiopathy in a reparative phase.

20206

REFRACTORY HYPERTENSION RESPONSIVE TO AMILORIDE: A CASE OF LIDDLE SYNDROME

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Introduction: Liddle Syndrome is a disorder characterized by increased function of the epithelial sodium channel of the distal nephron, leading to excessive sodium retention and potassium excretion, metabolic alkalosis and early-onset hypertension. These features often mimic primary hyperaldosteronism, but the renin and aldosterone dosages are normal or low. It can also cause sudden death due to arrhythmias caused by hypokalemia and ventricular hypertrophy. Case Description: A 58-year old female patient was admitted to investigate secondary causes and optimize treatment of refractory hypertension. At the moment of admission, the patient was receiving olmesartan, amlodipine, hydrochlorothiazide, spironolactone, carvedilol, methyldopa, hydralazine and clonidine. Medical history includes diagnosis of hypertension at 12 years old and familiar history of two siblings with unexplained sudden death at 7 and 21 years of age. During the hospitalization, the patient maintained systolic pressure between 190 and 220mmHg at all times. The inpatient screening of secondary causes of hypertension was negative for aortic coarctation, renal artery stenosis and other renal or adrenal causes, and hypercortisolism; electrolytes were within the normal range. The serum bicarbonate was 26,5mmol/L (normal range 22-26), renin 4,3µUI/mL (normal range 2,8-39) and aldosterone 5,2ng/dL (normal range 1,76-23,3). Previous dosage of plasmatic renin activity was below the normal range. Considering hypertension diagnosed at a young age associated with metabolic alkalosis, renin and aldosterone near the lower limit of normal and unexplained sudden death in the family, the hypothesis of Liddle Syndrome was considered and amiloride and chlorthalidone were initiated in association due to the disponible formulations. In the first day of amiloride administration, the systolic pressure decreased to values between 140 and 170mmHg and in the following days it decreased to values between 100 and 130mmHg with the need to lower the dosage of other hypertension medications due to hypotension. The bicarbonate dosage was normalized and the patient was discharged after 5 days. Genetic testing has not been done yet. Conclusions: Liddle Syndrome is a rare cause of hypertension not responsive to spironolactone and needs to be considered in patients with early-onset hypertension with no apparent cause. If genetic testing is not readily available, therapeutic testing with amiloride may be considered.

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17754

GHOST THROMBUS ON LEFT ATRIAL APPENDAGE. STOP OR GO AHEAD ON CLOSURE IT?

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Introduction: The left atrial appendage (LAA) is a small ear-shaped structure that is attached to the left atrium of the heart. This small structure may present low to moderate blood flow, which is an important component of Virchow's triad for thrombus formation. In this context, several studies have evaluated its closure to prevent thromboembolic consequences, with varying results. This report describes a patient previously on anticoagulation, with no thrombus detected in the echocardiogram, who subsequently developed a sudden stroke and was later found to have a thrombus in the LAA during angiography closing procedure. Case Description: An 86-year-old female with a history of hypertension, dyslipidemia, diabetes, and permanent atrial fibrillation on DOACs was initially admitted with decompensated heart failure. During hospitalization, she developed melena with significant bleeding, requiring blood transfusion. Upper endoscopy and colonoscopy were performed but did not identify active bleeding. Capsule endoscopy was then performed, revealing intestinal ulcers, which were treated with argon plasma coagulation. Given the need for anticoagulation and the high bleeding risk, left atrial appendage occlusion (LAAO) was proposed. Transthoracic echocardiography showed no thrombus and preserved emptying velocity. A decision was made not to perform CT imaging due to impaired renal function. Four days after transesophageal echocardiography, the patient developed sudden left hemiplegia, and stroke was confirmed by MRI. After heart team discussion, the decision was made not to reintroduce DOACs and to maintain aspirin 100 mg daily. LAAO was performed three days after the stroke. Intra-procedural transesophageal echo showed no thrombus in the LAA. Cerebral protection was not available (healthcare insurance denied). Angiographic images during the procedure demonstrated a thrombus in the distal segment of the appendage. A "no-touch" technique was considered feasible and was performed despite the associated risks. Due to the high bleeding risk, the patient was maintained on aspirin alone after the procedure, and showed a good functional recovery. Conclusions: Thrombi can form quickly in the LAA, even with a few days without use of anticoagulants. The size, location and mobility ot the thrombi should be evaluated to help in the decision of the progression ou postergation of the procedure. Cerebral Protection should be considered in cases like this.





17268

HETEROTOPIC CAVAL VALVE IMPLANTATION WITH TRICVALVE FOR TORRENTIAL TRICUSPID REGURGITATION IN EBSTEIN'S ANOMALY

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Introduction: Ebstein's anomaly is a rare congenital heart disease frequently associated with severe tricuspid regurgitation and progressive right heart failure. Management becomes particularly challenging in patients with prior surgical repair and high risk for reintervention. In this context, transcatheter therapies have emerged as a promising alternative. Heterotopic caval valve implantation using the TricValve system represents an innovative approach aimed at reducing systemic venous congestion by preventing backflow into the venae cavae, thereby improving symptoms and functional status in selected patients. Case Description: A 55-year-old woman with a history of Ebstein's anomaly underwent surgical tricuspid valve repair 40 years earlier. She subsequently developed Wolff–Parkinson–White syndrome, which was treated with catheter ablation, followed by permanent pacemaker implantation. Over the past few years, she experienced progressive right heart failure with severe systemic venous congestion, classified as New York Heart Association (NYHA) class IV, despite optimal medical therapy, including high-dose diuretics (furosemide 200 mg/day). Transesophageal echocardiography revealed torrential tricuspid regurgitation with preserved right and left ventricular systolic function. Additional assessment included evaluation of inferior and superior vena cava dimensions, right atrial volume, fractional area change (FAC), tricuspid annular plane systolic excursion (TAPSE), suprahepatic vein Doppler flow, and exclusion of patent foramen ovale. Pre-procedural planning with cardiac computed tomography angiography was performed, including detailed assessment of caval anatomy, landing zones, and spatial relationship with hepatic veins and azygos vein. A three-dimensional (3D) anatomical model was also used to simulate the procedure and optimize prosthesis sizing and positioning. Given the prohibitive surgical risk and persistent symptoms, a Heart Team decision was made to proceed with heterotopic caval valve implantation using the TricValve system. Conclusions: Heterotopic caval valve implantation using the TricValve system is a feasible and effective option for patients with Ebstein's anomaly and torrential tricuspid regurgitation at prohibitive surgical risk. Multimodality imaging is essential for accurate planning and device positioning. This approach can significantly reduce systemic venous congestion and improve functional status in carefully selected patients.

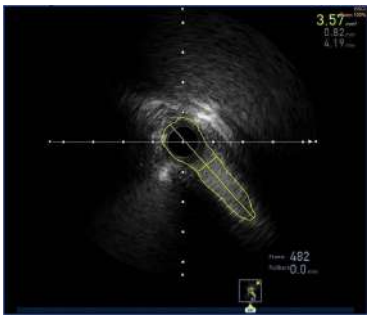
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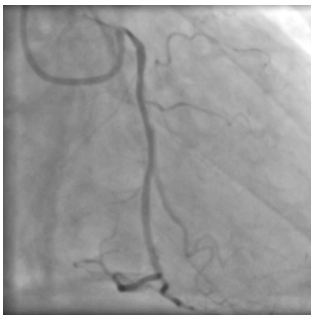
INTEGRATED ANATOMICAL AND FUNCTIONAL ASSESSMENT FOR SURGICAL INDICATION IN ANOMALOUS RIGHT CORONARY ARTERY: THE ROLE OF STRESS-FFR AND IVUS

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Introduction: The anomalous origin of the right coronary artery (RCA) from the left coronary sinus with an intramural course is a high-risk condition associated with sudden cardiac death. In middle-aged patients, surgical indication is often challenging and requires more than just anatomical identification. A multimodality approach, combining high-risk anatomical features with physiological evidence of ischemia, is essential to guide clinical decision-making. Case Description: A 59-year-old male with dyslipidemia and a significant family history of premature sudden death presented with complaints of chest discomfort and palpitations. Coronary computed tomography angiography (CCTA) was performed, identifying an anomalous origin of the RCA in the left coronary sinus with an interarterial course and suspected intramural course. For diagnostic completion, invasive coronary angiography associated with intravascular ultrasound (IVUS) was performed, confirming a high-risk intramural course in the ostial region with a change in vessel morphology from cylindrical to elliptical (slit-like ostium). Dynamic compression was observed, resulting in a significant cross-sectional area reduction, with a minimal luminal area (MLA) of 3.57 mm². Functional assessment was conducted using the Resting Full-Cycle Ratio (RFR) and Fractional Flow Reserve (FFR). While the RFR was negative at rest (0.93), pharmacological stress with dobutamine (30 mcg/kg/min) and atropine (0,5mg) reached a maximum heart rate (HR) of 162 bpm (100% of the predicted maximum HR), resulting in a positive FFR of 0.80. Based on symptoms, high-risk anatomical features on IVUS, and physiological evidence of stress-induced ischemia, surgical correction was indicated. The patient underwent surgical repair with RCA reimplantation in the left coronary sinus, presenting a good clinical evolution. Conclusions: This case illustrates that the surgical indication for anomalous RCA should be based on the integration of clinical, anatomical, and functional data. IVUS provides critical details about ostial morphology and dynamic compression, while stress-FFR is important to document ischemia when resting indices are negative. This multimodality framework ensures that surgical intervention is targeted precisely at patients with proven physiological compromise.





19429

PACLITAXEL-COATED BALLOON ANGIOPLASTY IN AN EXTREMELY PRETERM INFANT WITH MULTIFACTORIAL PULMONARY HYPERTENSION AND SEVERE RIGHT INFERIOR PULMONARY VEIN STENOSIS

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Introduction: Pulmonary hypertension (PH) in extremely preterm infants with bronchopulmonary dysplasia (BPD) is frequently multifactorial and associated with high morbidity and mortality. Structural abnormalities such as pulmonary vein stenosis and intracardiac shunts may further increase pulmonary vascular burden and hinder clinical stabilization. Early recognition of these contributors is essential for individualized management. Case Description: A 6-month-old female infant (corrected age 2 months), born at 25+3 weeks of gestation with a birth weight of 834 g, remained hospitalized since birth because of complications related to extreme prematurity. She required early surfactant therapy, prolonged mechanical ventilation, and subsequently developed severe BPD, chronic ventilator dependence, and tracheostomy. Persistent PH progressed despite combination therapy with sildenafil, bosentan, iloprost, inhaled nitric oxide, diuretics, and vasoactive support. Serial echocardiograms demonstrated a large secundum atrial septal defect, right heart dilation, and suspected abnormal pulmonary venous return. Owing to refractory disease, she underwent cardiac catheterization and pulmonary angiography, which revealed mean pulmonary artery pressure of 31 mmHg, significant pulmonary overcirculation (Qp/Qs 2.3:1), and severe stenosis of the right inferior pulmonary vein associated with hypoperfusion of the right middle and lower lobes. Percutaneous intervention was therefore performed with angioplasty of the right inferior pulmonary vein using conventional balloons followed by a paclitaxel-coated balloon. The procedure achieved an immediate favorable angiographic result, reduction in pulmonary pressures, and no periprocedural complications. In the subsequent clinical course, the patient showed recovery of pulmonary function with improved respiratory status and was able to tolerate progressive reduction of ventilatory parameters. Conclusions: This case highlights the complexity of PH in former preterm infants with severe BPD and supports invasive evaluation when clinical deterioration appears disproportionate or refractory to standard therapy. Identification of pulmonary vein stenosis significantly changed therapeutic strategy. Percutaneous angioplasty with a paclitaxel-coated balloon was feasible and may represent a valuable adjunctive option in selected high-risk infants, with favorable hemodynamic and respiratory recovery.

22113

SUCCESSFUL MANAGEMENT OF IATROGENIC LEFT MAIN CORONARY PERFORATION USING SIMULTANEOUS KISSING COVERED STENTS: A CASE REPORT.

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Introduction: Coronary perforation is a rare but life-threatening complication of percutaneous coronary intervention, frequently encountered in complex interventions particularly in elderly patients. Rapid recognition and management are essential to prevent catastrophic outcomes such as cardiac tamponade, haemodynamic collapse and death. Case Description: A woman in her late 80s was admitted with NSTEMI following a 6-month history of exertional chest pain. Her medical history included giant cell arteritis and polymyalgia rheumatic. ECG demonstrated widespread ST-segment depression. Troponin T was elevated (92 ng/L), and echocardiography showed moderately impaired left ventricular systolic function (EF 45%) with anterolateral hypokinesia. Coronary angiography via right radial access revealed moderate LMS disease and severe disease to LAD and dominant circumflex artery . The right coronary artery was small non-dominant and unobstructed. The patient underwent IVUS-guided PCI to the LMS bifurcation. An upfront two-stent crush technique was planned with initial stenting of the circumflex and crushing the side-branch stent. After re-wiring of the Cx, and final optimisation including POT, an Ellis type III coronary perforation occurred at the LAD–circumflex bifurcation as shown in Figure 1. This resulted in haemodynamic collapse with hypotension and bradycardia, and echocardiographic evidence of cardiac tamponade. Emergency pericardiocentesis was performed with drainage of approximately 750 mL of blood, supported by autotransfusion, vasopressors, and blood transfusion. Initial balloon tamponade to the Cx failed to control the perforation. A ping-pong guiding catheter technique was employed via femoral route to facilitate the delivery of two covered stents (Papyrus), 7F guiding catheter via the right femoral artery, allowing for simultaneous kissing covered stents (SKS), with successful sealing of the perforation. The patient stabilised and was discharged home and at 24-month follow-up, the patient remained clinically well, with no reported recurrent ischaemic symptoms or adverse cardiovascular events. Conclusions: This case demonstrates successful management of catastrophic coronary perforation during complex LMS bifurcation PCI using simultaneous kissing covered stents. Early recognition and advanced interventional techniques are critical to achieving favourable outcomes in such high-risk unexpected cases.



Figure 1a: LMS coronary perforation –PA caudal



Figure 1b: LMS coronary perforation – LAO projection



Figure 2: Cross-sectional IVUS image demonstrating dual covered stents. The IVUS catheter is positioned within the LAD stent, while the LCx stent is visible with an associated wire artefact

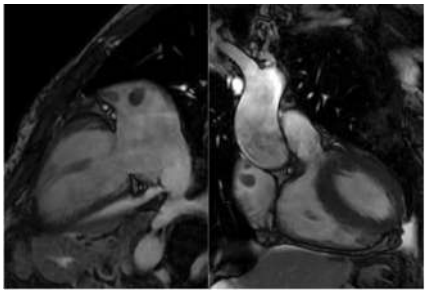
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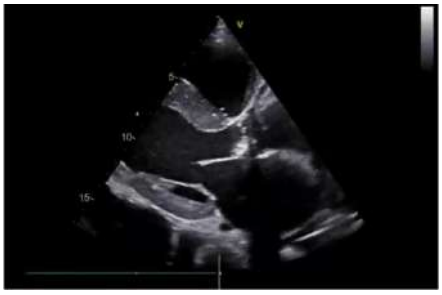
TRANSCATHETER AORTIC VALVE IMPLANTATION (TAVI) IN CARDIOGENIC SHOCK IN A TRANSGENDER PATIENT WITH MULTIPLE INTRACARDIAC THROMBI ON HORMONE THERAPY

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Introduction: Bicuspid aortic valve (BAV) is the most common congenital heart disease, affecting 0.5% to 2% of the population, with a 3:1 male predominance. Frequently associated with early-onset aortic stenosis (AS) in young adulthood, BAV leads to the classic symptoms of angina, syncope, and dyspnea. Since there are no effective pharmacological therapies for severe AS, valve replacement remains the definitive treatment, with BAV accounting for half of the surgeries in patients under 70 years of age. Transcatheter Aortic Valve Implantation (TAVI) has established itself as a minimally invasive technique for high-risk patients, although BAV anatomy — characterized by asymmetric calcification and a non-circular annulus — makes the procedure challenging. Furthermore, thromboembolic complications in advanced stages of AS are significant concerns, particularly in transgender women on estrogen hormone therapy, a factor associated with hypercoagulability. Case Description: A 57-year-old transgender woman with hypertension sought medical attention in February 2025 presenting with NYHA class III dyspnea and edema. She reported continuous use of hormone therapy for 30 years. The echocardiogram revealed critical aortic stenosis (AS) in a bicuspid aortic valve (BAV) (valve area 0.5 cm, mean gradient 49 mmHg), severe pulmonary hypertension, and an ejection fraction of 20%. Cardiac magnetic resonance imaging identified intracavitary thrombi in the left atrium and both ventricles, while CT scans showed pulmonary infarctions. Considered high-risk (Euroscore II 4.85%), the patient progressed to cardiogenic shock, and emergency aortic valvuloplasty was performed as a bridge therapy, despite a cardiac arrest that was reversed in April 2025. After stabilization, TAVI (Myval® 26mm) was performed on April 29. The postoperative period included the need for a permanent pacemaker and treatment for pulmonary sepsis. A follow-up echocardiogram in August 2025 showed LVEF recovery to 58% and a mean gradient of 8 mmHg, with the patient being discharged in September 2025. Conclusions: The case highlights the complexity of TAVI in emergency scenarios and challenging anatomy. Although the presence of intracavitary thrombi is a relative contraindication, the Heart Team opted for the intervention due to the severity of the cardiogenic shock, using balloon valvuloplasty as a successful bridge therapy. It is concluded that emergency TAVI is a viable and effective rescue strategy for critically ill patients.





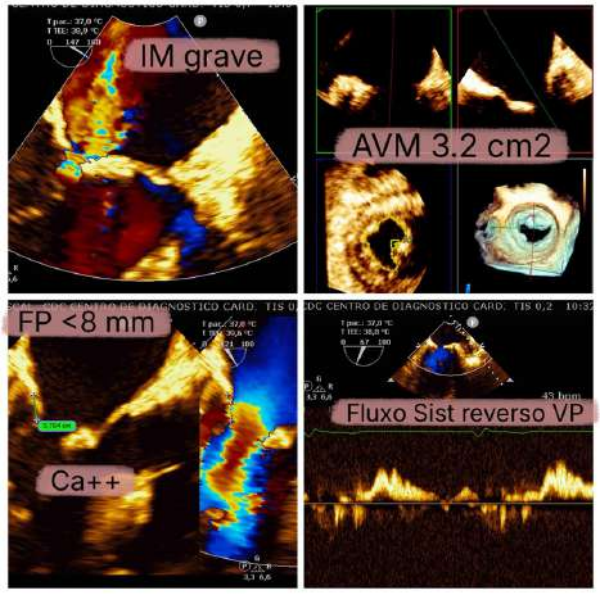
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TRANSCATHETER EDGE-TO-EDGE MITRAL REPAIR (M-TEER) WITH THE PASCAL P10 SYSTEM IN COMPLEX MITRAL ANATOMY: LEAFLET CALCIFICATION AND REDUCED MITRAL VALVE AREA.

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Introduction: M-TEER has become an established alternative for patients with significant mitral regurgitation (MR) and high surgical risk. However, complex anatomies — such as anterior leaflet calcification, short posterior leaflet, and reduced mitral valve area (MVA) (< 4 cm²) — represent technical challenges that require expertise. The PASCAL Precision system, featuring spacer-based orifice filling technology and independent leaflet capture, may expand feasibility and safety in these borderline scenarios. Case Description: A 79-year-old male patient with multiple comorbidities (advanced multivessel disease, prior cardiac surgery, chronic kidney disease, diabetes mellitus, and peripheral arterial disease) presented with heart failure (profile B) due to significant functional MR and pulmonary hypertension, with prohibitive surgical risk (high STS score). Three-dimensional transesophageal echocardiography (3D TEE) revealed highly challenging anatomy: MVA of 3.1 cm², short posterior leaflet (7 mm), and calcification in the distal portion of the anterior leaflet. The procedure was performed under general anesthesia and guided by 3D TEE. A PASCAL P10 device was implanted at the A2-P2 scallop transition. The system's independent leaflet capture capability was essential to overcome both the calcification and the limited posterior leaflet length. Technical success was achieved, with reduction of MR from severe to mild and a residual mean left atrial–left ventricular gradient of only 3.54 mmHg, without evidence of iatrogenic mitral stenosis. The patient remained hemodynamically stable immediately after the procedure. Conclusions: This case demonstrates that the PASCAL P10 system is effective and safe even in mitral anatomies considered "outside" the classical guideline-based screening criteria. The independent leaflet capture technology and the P10 device profile enabled an excellent hemodynamic result in a patient with reduced MVA and valvular calcification, reinforcing the expansion of percutaneous intervention to scenarios of high anatomical complexity in reference centers.



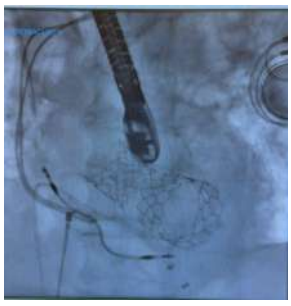
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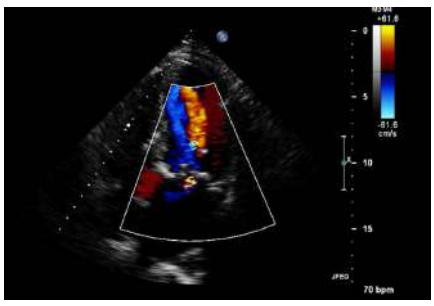
TREATMENT OF MITRAL STENOSIS IN A ELDERLY WOMAN WITH HIGH SURGICAL RISK: ''VALVE-IN-MAC'' TECHNIQUE COMBINED FOR OPTIMIZED RESULTS

GABRIEL NOVAES DOS SANTOS1; JULIA LASSERRE MOREIRA1; RAFAELA DA SILVA FERREIRA1; HUGO VINICIUS NEVES MORAIS1; LEONARDO GARCIA GÓES1; MARIANA CARVALHO VEIGA1; FELIPE AMBRÓSIO FONTES1; ROBERTO KALIL FILHO1; VICTORIA CERCHIARI AFONSO1;

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Introduction: Several conditions can cause mitral stenosis (MS), both in younger patients through inflammatory conditions such as rheumatic fever, rheumatoid arthritis, or Marfan syndrome, and in elderly patients through calcification and valvular tissue degeneration. Despite this, surgical valve replacement or repair are the first-line therapies. However, a large proportion of patients present with high morbidity, which can increase the in-hospital mortality rate by approximately 8 to 12%. Case Description: We describe a case of a multi-comorbid patient with significant, symptomatic MS, refractory to drug therapies, and with surgical contraindications. The patient, a female, 83 years old, diabetic, with non-dialysis chronic kidney disease, suffering from sleep apnea-hypopnea syndrome (OSAHS), coronary artery disease, with subsequent angioplasty in 2025, pacemaker implantation in the same year, transcatheter aortic valve implantation due to significant valvular insufficiency, subsequently evolving into significant mitral stenosis. During this hospitalization, the patient presented with hypoxemia and dyspnea on minimal exertion. Upon admission, a transthoracic echocardiogram (TTE) revealed a thickened mitral valve and significant calcification of the mitral valve annulus (MAC), significant stenosis, peak diastolic velocity of 2.4 m/s, maximum gradient of 27 mmHg and mean gradient of 10 mmHg, and an area of 1.2 cm² according to the continuity equation. Therefore, the need arose for intervention or replacement of this valve. Transcatheter mitral valve implantation in calcified annulus (Valve-in-MAC) has become a good therapeutic alternative, especially when there is a contraindication or high surgical risk. Conclusions: Therefore, the anterior mitral valve leaflet laceration technique to prevent outflow obstruction (LAMPOON) was used, combined with three-dimensional visualization software. These methods have proven to minimize the main anatomical challenge of the procedure, which is left ventricular outflow tract obstruction. After clinical stabilization, the patient underwent Valve-in-MAC, associated with LAMPOON and alcohol septal ablation (ASA). The procedure was uneventful, despite the use of vasoactive drugs and an intra-aortic balloon pump (IABP) during the intraoperative period. After the procedure, the patient showed improvement. Doppler ultrasound of the mitral valve prosthesis detected a peak diastolic velocity of 1.2 m/s, a maximum LA/LV gradient of 5.8 mmHg, and a mean gradient of 2.8 mmHg.





21215

WHEN A ROUTINE PROCEDURE LEADS TO SEVERE DISEASE: PULMONARY VEIN STENOSIS AFTER ATRIAL FIBRILLATION ABLATION

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Introduction: Pulmonary vein stenosis is an underdiagnosed and potentially devastating complication of atrial fibrillation ablation, typically resulting from injury at the pulmonary vein ostia and potentially progressing to severe pulmonary hypertension with significant hemodynamic consequences. Case Description: A 42-year-old woman with a history of prior electrophysiological study and atrial fibrillation ablation developed severe pulmonary hypertension secondary to pulmonary vein stenosis, presenting with dyspnea (NYHA class IV). Right heart catheterization (April 7) demonstrated a mean pulmonary artery pressure of 60 mmHg and a systolic pressure of 100 mmHg. She underwent percutaneous intervention via a transseptal approach. Angioplasty was attempted in three affected pulmonary veins, but only one vessel was successfully treated. A 10 × 19 mm Palmaz Genesis stent was implanted in the left pulmonary vein. The pre-procedural pressure gradient between the pulmonary vein and the left atrium was 22 mmHg, with complete resolution following the intervention. Intraoperative echocardiography demonstrated a well-positioned stent in the left common pulmonary vein, with adequate expansion and laminar flow. The right ventricle showed preserved systolic function, and left-sided chambers were normal. Mild tricuspid regurgitation and a small residual atrial septal defect were observed. During follow-up, the patient was referred to cardiovascular rehabilitation, initially presenting significant functional limitation (≈60% of predicted for lower limbs and 76% on cardiopulmonary testing). She subsequently demonstrated progressive clinical improvement and is currently in NYHA class II. This case highlights a severe complication of a commonly performed procedure that is often overlooked during long-term follow-up. It underscores the hemodynamic impact of pulmonary vein stenosis and the role of percutaneous intervention in reversing pressure overload and improving clinical status. Conclusions: Pulmonary vein stenosis after atrial fibrillation ablation should be considered in patients presenting with dyspnea and pulmonary hypertension. Early recognition and targeted intervention may significantly modify the clinical course.

Neglected Cardiovascular Diseases



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21760

MINOCA IN A PATIENT WITH HEREDITARY THROMBOPHILIA: THE ROLE OF OCT IN THE ETIOLOGICAL REDEFINITION OF MYOCARDIAL INFARCTION – A CASE REPORT

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Introduction: Myocardial infarction with non-obstructive coronary arteries (MINOCA) represents a heterogeneous clinical entity with difficult etiological definition. In patients with prothrombotic states, such as hereditary thrombophilias related to factor V Leiden and prothrombin gene mutation, angiographic findings suggestive of intracoronary thrombus may lead to misleading diagnostic interpretations. In this context, optical coherence tomography (OCT) plays a relevant role in identifying atherosclerotic plaque, endothelial erosion, and other substrates associated with MINOCA. Case Description: Patient P.F., 34 years old, transgender woman, smoker, with hereditary thrombophilia (G20210A mutation and factor V Leiden) and a history of pulmonary thromboembolism in 2016, was admitted with typical chest pain for 2 hours. She had previously been using Rivaroxaban 20 mg/day, which had been discontinued on her own 6 months earlier. Electrocardiogram showed ST-segment elevation in the inferior wall. She received ASA 200 mg and Ticagrelor 180 mg and was immediately referred to the catheterization laboratory. Coronary angiography demonstrated an image suggestive of thrombus in the distal third of the right coronary artery, without flow restriction, associated with proximal occlusion of the posterior descending artery, without significant coronary atheromatosis. Balloon angioplasty of the posterior descending artery was performed, with arterial recanalization, in addition to Tirofiban infusion due to the large thrombotic burden. The patient remained stable, without recurrence of chest pain. Based on the initial hypothesis of isolated coronary thrombosis, full anticoagulation was maintained without antiplatelet therapy. After four days, a new catheterization with OCT was performed, revealing thrombus associated with a dissection flap and a fibrotic/lipid-rich atherosclerotic plaque in the right coronary artery, with a minimal luminal area >6.8 mm². The patient was discharged on ASA 100 mg/day for 30 days, Clopidogrel 75 mg/day, and Rivaroxaban 20 mg/day. At outpatient follow-up after 1 month, she was asymptomatic and adherent to treatment. Conclusions: This case highlights the importance of OCT in the diagnostic elucidation of MINOCA, especially in the presence of inconclusive angiographic findings. The examination allowed identification of an atherosclerotic plaque associated with intracoronary thrombus, redefining the etiology of the ischemic event and appropriately guiding therapy.

Pericardium / Endocardium / Valvular Heart Disease / Aortic Diseases



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20775

CARCINOID HEART DISEASE REVEALING A METASTATIC SMALL-BOWEL NEUROENDOCRINE TUMOR

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Introduction: Carcinoid syndrome (CS) is a paraneoplastic manifestation frequently observed in patients with neuroendocrine tumors that secrete bioactive amines and peptides. CS typically develops in the presence of hepatic metastatic disease or extra-portal tumors, leading to the secretion of serotonin into the post-portal venous territory. CS classic manifestations include flushing, diarrhea, bronchospasm, carcinoid heart disease, and hemodynamic instability. Cardiac involvement in CS is characterized by the deposition of fibrous plaques on the endocardial surfaces, predominantly affecting the right-sided heart chambers and valves, most commonly leading to tricuspid and pulmonary valve dysfunction. Case Description: A 57-year-old female patient was referred to a cardiologist in 2018 following the identification of a cardiac murmur. Concurrent cross-sectional imaging identified a primary small bowel mass with synchronous hepatic metastases. Histopathological analysis of intestinal and hepatic biopsy specimens confirmed a well-differentiated neuroendocrine tumor of carcinoid morphology. She was subsequently referred to a valvular heart disease team for assessment of surgical feasibility. At presentation, the patient was in New York Heart Association (NYHA) functional class III. Transthoracic echocardiography demonstrated a left ventricular ejection fraction (LVEF) of 69%; both tricuspid and pulmonary valves with thickening and fixed leaflets, causing severe tricuspid and pulmonary regurgitation. Surgical replacement of both the tricuspid and pulmonary valves was performed using bioprosthetic valves. The patient was discharged 20 days after surgery with no complications. During follow-up, she demonstrated progressive clinical improvement, achieving NYHA functional class I at five months postoperatively. Conclusions: Carcinoid heart disease represents a serious and frequently underdiagnosed complication of functioning neuroendocrine tumors. This case highlights the importance of considering neuroendocrine tumors in patients presenting with marked thickening and isolated involvement of the tricuspid and pulmonary valves. Management should be multidisciplinary, integrating oncology, cardiology, and cardiovascular surgery, with the goals of controlling tumor activity, reducing exposure to vasoactive substances, and determining the optimal timing of valvular intervention in symptomatic patients or those with significant hemodynamic compromise.



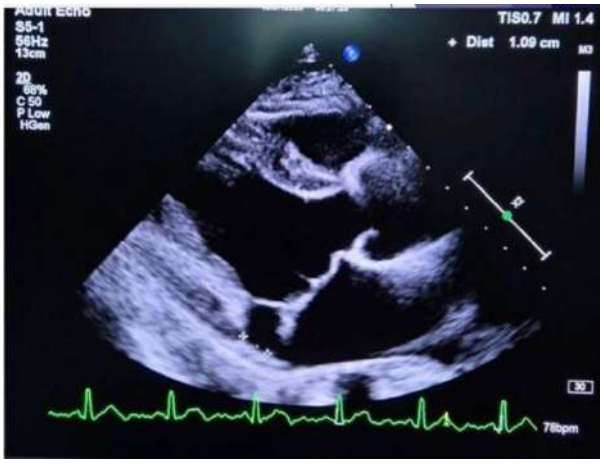
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DEGENERATIVE MITRAL REGURGITATION DUE TO BARLOW'S DISEASE ASSOCIATED WITH MITRAL ANNULAR DISJUNCTION AND VENTRICULAR ARRHYTHMIAS IN A YOUNG PATIENT: A CASE REPORT

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Introduction: Degenerative mitral regurgitation (MR) is one of the main primary valvular heart diseases in adults. Barlow's disease represents a complex phenotype of mitral valve prolapse, associated not only with progressive mitral regurgitation but also with ventricular arrhythmias and sudden cardiac death, with an estimated annual risk ranging from 0.2% to 1.9%. Mitral annular disjunction (MAD), present in a significant proportion of patients, is associated with a higher arrhythmic risk. Although the disease typically presents between the fifth and sixth decades of life, early-onset cases may occur. Case Description: A previously healthy 30-year-old man presented with a 6-year history of palpitations characterized by sudden onset, short duration, and no relation to exertion, associated with dizziness and no history of syncope. In recent months, he developed increased symptom frequency and dyspnea on moderate exertion. Physical examination revealed a grade 3/6 holosystolic murmur at the mitral area radiating to the axilla, associated with a third heart sound. Transthoracic echocardiography demonstrated preserved systolic function, mild enlargement of the left-sided chambers, and severe MR due to myxomatous degeneration consistent with Barlow's disease, associated with findings suggestive of MAD. Cardiac magnetic resonance imaging confirmed severe MR, bileaflet prolapse, and MAD measuring 8.9 mm, without late gadolinium enhancement or myocardial fibrosis. Twenty-four-hour Holter monitoring revealed 816 ventricular premature beats (<1%), predominantly isolated, in addition to two episodes of non-sustained ventricular tachycardia. The patient underwent mitral valve repair in January 2026, with favorable postoperative evolution. He was discharged on beta-blocker therapy and remains under outpatient follow-up. Conclusions: The association between Barlow's disease, MAD, and ventricular arrhythmias represents a complex phenotype within arrhythmic mitral valve syndrome. This case is notable for its early presentation, non-sustained ventricular tachycardia, and absence of myocardial fibrosis on cardiac magnetic resonance imaging, supporting the role of mechanical factors such as myocardial traction and curling in arrhythmogenesis, even without late gadolinium enhancement. Although mitral valve repair is the treatment of choice for degenerative mitral regurgitation, its effect on arrhythmic risk remains uncertain, emphasizing the need for multimodality assessment and long-term follow-up.



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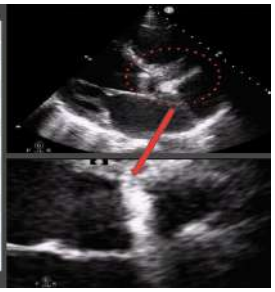
LIFE-SAVING FIBRINOLYSIS IN OBSTRUCTIVE AORTIC VALVE THROMBOSIS: THE ROLE OF MULTIMODAL IMAGING AND A MULTIDISCIPLINARY APPROACH

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Introduction: Prosthetic valve thrombosis (PVT) is a severe and potentially fatal complication, with an annual incidence ranging from 0.1% to 5.7% in mechanical valves. The main risk factors include subtherapeutic anticoagulation and valve positioning in the mitral or right-sided chambers. Valvular dysfunction manifests through leaflet thickening and restricted mobility, resulting in elevated transvalvular gradients and, in the most critical presentations, obstructive shock. Case Description: A 36-year-old male with a history of a Bentall-de Bono procedure and prior cardioembolic MI due to warfarin non-compliance presented with a 4-day history of progressive dyspnea. Admission labs revealed INR (1.2) and BNP (2,555 pg/mL). Initial imaging suggested acute aortic syndrome, delaying definitive diagnosis. The patient's clinical status rapidly deteriorated into obstructive shock followed by cardiac arrest; return of spontaneous circulation was achieved after three CPR cycles. A multidisciplinary review, multimodal imaging including transesophageal echocardiogram (TEE) subsequently confirmed mechanical valve thrombosis, showing restricted leaflet mobility, a 35 mmHg peak gradient, and an 8x5 mm thrombus. Given the extreme instability and high surgical risk, systemic thrombolysis with alteplase was performed. The patient showed significant improvement, weaning of vasopressors and extubation within 48 hours. A follow-up TEE at 10 days confirmed normal leaflet mobility, no residual thrombus, and a mean transvalvular gradient at 4 mmHg. Conclusions: PVT presents a broad clinical spectrum, from subclinical dysfunction to life-threatening obstructive shock. While guidelines favor surgery for stable obstructive PVT, systemic fibrinolysis proved to be a life-saving alternative in the context of profound hemodynamic collapse and cardiac arrest. Rapid clinical suspicion and a multidisciplinary approach are essential to ensure early diagnosis, reduce mortality, and avoid high-risk emergency reinterventions.

Parâmetro	Resultado
Hemoglobina (Hb)	14,3 g/dL
Hematócrito (Ht)	41%
Leucócitos	9.790 /mm³
Plaquetas	197.000 /mm³
Troponina	60 ng/L
BNP	2555 pg/mL
Creatinina	1,17 mg/dL
Ureia	71 mg/dL
INR	1,2
PCR	48 mg/L
Lactato	24 mg/dL





21816

SEQUENTIAL MITRAL AND TRICUSPID TRANSCATHETER EDGE-TO-EDGE REPAIR IN A HIGH-RISK PATIENT: A CASE REPORT

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Introduction: Valvular heart diseases, traditionally managed with surgery, have increasingly incorporated minimally invasive percutaneous approaches in recent decades. Transcatheter edge-to-edge repair (TEER) was initially established for the treatment of mitral regurgitation and, with technological advances and growing clinical experience, has expanded to tricuspid regurgitation. This strategy is now included in guidelines for carefully selected patients. Although combined mitral and tricuspid TEER has been described, it remains limited to a few reports, and further data on its safety and efficacy are needed. Case Description: An 81-year-old male with hypertension and dyslipidemia, diagnosed with mitral and tricuspid valve prolapse, presented with dyspnea. Transthoracic echocardiogram revealed posterior mitral leaflet prolapse with chordal rupture, flail, and severe mitral regurgitation. Due to significant and symptomatic mitral regurgitation, despite optimized medical therapy, interventional treatment was indicated. Considering the patient's age and high surgical risk, after a decision by the heat team, mitral TEER was indicated. The procedure was performed with implantation of three devices, resulting in mild residual regurgitation. Despite technical success, the patient remained symptomatic, with elevated biomarkers and progression of tricuspid regurgitation to torrential severity. Procedure-related complications, including mitral stenosis, were excluded by transthoracic echocardiogram, echocardiogram with cycleergometer and invasive hemodynamic assessment, which demonstrated an adequate valve area (2.4 cm²), stable gradients, normal pulmonary pressures, but low cardiac output. Given persistent symptoms, tricuspid TEER was performed with implantation of three devices, achieving reduction to moderate regurgitation and significant clinical improvement due to improved stroke volume. The results was sustained at one-month follow-up. Conclusions: This case highlights the feasibility and potential clinical benefit of TEER as a therapeutic strategy in selected patients with significant mitral and tricuspid regurgitation. A combined and sequential approach proved effective in reducing regurgitation severity, improving symptoms, and avoiding major complications. These findings support TEER as a safe and promising alternative, although further studies are required to better define indications and long-term outcomes.

19898

SEVERE AORTIC VALVE INFECTIOUS ENDOCARDITIS AND MECHANICAL VALVE REPLACEMENT IN A PATIENT WITH PRIMARY ANTIPHOSPHOLIPID SYNDROME AND RECURRENT THROMBOTIC EVENTS

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Introduction: Antiphospholipid Syndrome (APS) is a systemic autoimmune disorder characterized by arterial or venous thrombosis and pregnancy morbidity, associated with the persistence of antiphospholipid antibodies. Cardiac involvement is frequent, often manifesting as valvular thickening or sterile vegetations (Libman-Sacks endocarditis). The exacerbated prothrombotic state of APS complicates anticoagulation management, especially in scenarios of mechanical valve replacement, where therapeutic failure with direct oral anticoagulants (DOACs) can be fatal. This report describes a challenging case of destructive aortic endocarditis in a patient with primary APS and triple antibody positivity. Case Description: A 22-year-old male patient with a history of illicit substance use (cannabis and cocaine) and recurrent deep vein thrombosis (DVT) since 2021 was evaluated. Despite continuous therapy with rivaroxaban, he presented multiple thrombotic recurrences, including pulmonary embolism and chronic DVT in the lower limbs. Over a 4-year period, he developed severe infectious endocarditis of the aortic valve, requiring urgent surgical intervention, and underwent aortic valve replacement with a mechanical prosthesis. He was treated with meropenem and daptomycin. Blood cultures were negative.During hospitalization, the patient developed acute kidney injury requiring hemodialysis and hemolytic anemia.

Table 1: Summary of Echocardiographic Data

Category	Parameter	Result	Observation
Dimensions	LV Diastolic Diameter	68 mm	Increased
	LV Systolic Diameter	51 mm	Increased
	Left Atrium (LA)	52 mm	Severe enlargement (71 ml/m²)
	Right Atrium (RA)	-	Severe enlargement (49 ml/m²)
	Aorta	39 mm	-
Systolic Function	Ejection Fraction (Simpson)	40 %	Reduced (Mild/Moderate)
	LV Contractility	Diffuse hypokinesia	Global impairment
Aortic Valve	Mass/Vegetation	8 mm	Affects all three leaflets
	Aortic Regurgitation	Severe	Turbulent diastolic flow
	Aortic Stenosis	Moderate	Mean Gradient: 29 mmHg (corrected)
Other Valves	Mitral Regurgitation	Mild	-
	Tricuspid Regurgitation	Moderate	Estimated PASP: 63 mmHg
Hemodynamics	Pericardial Effusion	Mild	10 mm (posterior) / 7 mm (RA)
	Heart Rate	135 bpm	Tachycardic and tachypneic patient



Figura 1: Figure 1: Echographic image of the aortic valve with significant insufficiency and thickening due to a slightly mobile mass, which apparently "covers" the three valve leaflets, having more prominent areas, particularly in the left coronary leaflet (measuring 8 mm in "height") and non-coronary leaflet (measuring 8 mm in "height").

Immunological screening confirmed Primary APS, revealing triple positivity with high titers: Anti-cardiolipin IgG >250 U/mL, Anti-beta 2 glycoprotein 1 IgG 85 U/mL, and reduced C3/C4 levels. ANA was 1/80 (nuclear fine speckled). Systemic symptoms included chronic polyarthralgia in small and large joints and photosensitivity. After surgery, therapy was transitioned to warfarin, with rigorous PT/INR monitoring. A follow-up echocardiogram showed a normally functioning mechanical prosthesis (mean gradient of 12 mmHg) and minimal residual central leaks. Clinical evolution showed improvement in edema and stabilization of renal function (Creatinine 1.72 mg/dL). Conclusions: This case highlights the importance of investigating primary thrombophilias in patients with thrombosis refractory to DOACs. The association between APS and infectious endocarditis increases embolic risk and valvular dysfunction. A mechanical prosthesis requires lifelong warfarin therapy, as DOACs are contraindicated in high-risk APS and mechanical valves. A multidisciplinary approach is vital to manage both infection and autoimmunity.

19888

SPONTANEOUS HEMOPERICARDIUM LEADING TO CARDIAC TAMPONADE: A CASE REPORT OF DIAGNOSTIC COMPLEXITY AND EMERGENCY MANAGEMENT

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Introduction: Hemopericardium is defined as the accumulation of blood within the pericardial sac. While often associated with trauma or iatrogenic procedures, spontaneous cases are rare and constitute a life-threatening emergency due to the risk of cardiac tamponade. Rapid accumulation of fluid compromises cardiac filling, leading to obstructive shock. This report describes a case of massive spontaneous hemopericardium, highlighting the challenges in identifying underlying etiologies in a non-traumatic context. Case Description: A female patient with a history of hypertension presented with a 5-day history of right hypochondrium pain, burning chest pain, vomiting, and dyspnea on mild exertion. Initial physical examination showed her to be afebrile and hemodynamically stable. However, computed tomography and echocardiography revealed a voluminous pericardial effusion with signs of cardiac tamponade (diastolic collapse of right chambers). Emergency pericardiocentesis was performed, draining 860 mL of hematic fluid. Analysis of the pericardial fluid characterized it as an exudative effusion with lymphomononuclear predominance; cultures, bacterioscopy, and GeneXpert were negative. Further investigation showed elevated LDH (832 U/L) and CA-125 (114 U/L), with normal CEA and CA 19.9 levels. Ancillary imaging identified a TI-RADS 5 thyroid nodule, suggesting the need for fine-needle aspiration. The clinical course was complicated by nosocomial pneumonia, which was successfully treated with antibiotics. Following drainage and stabilization, the patient reported significant symptomatic relief and remained hemodynamically stable during follow-up. Conclusions: Spontaneous hemopericardium is a critical clinical entity that requires immediate pericardiocentesis to prevent cardiovascular collapse. In the absence of trauma, the presence of hematic fluid necessitates a rigorous diagnostic workup to exclude occult malignancy or systemic inflammatory diseases, as suggested by the incidental thyroid findings and elevated tumor markers in this case. Multimodal imaging and fluid analysis are essential for both emergency management and long-term diagnostic orientation.

Table 1: Findings from imaging exams.

Exam	Key Findings	Classification/Relevance
Chest CT	Right-sided pleural effusion and ipsilateral basal infiltrate.	Acute Finding
Abdominal CT	Voluminous pericardial effusion.	Clinical Emergency
Thyroid Ultrasound	Nodule N3; Probable colloid cysts.	TI-RADS: 5
Breast Ultrasound	Probably benign findings.	BI-RADS: 3
Echocardiogram	LVEF 64%; Mild diastolic and valvular dysfunction; Mild effusion.	Post-Drainage
Abdominal Ultrasound	Mild hepatic steatosis (Grade I); Simple hepatic cysts.	Incidental Finding
Transvaginal Ultrasound	No detectable abnormalities.	Normal

Table 2: Laboratorial exams.

Category / Test	Result	Unit
Erythrocytes (RBC)	4.48	million/mm³
Hemoglobin	12.7	g/dL
Hematocrit	38.4	%
Mean Corpuscular Volume	85.7	fL
Mean Corpuscular Hemoglobin	28.3	pg
Red Cell Distribution Width	12.4	%
Total Leukocytes	7,200	/mm³
Total Neutrophils	5,112 (71%)	/mm³
Lymphocytes	1,440 (20%)	/mm³
Monocytes	504 (7%)	/mm³
Eosinophils	144 (2%)	/mm³
Platelet Count	245,000	/mm³
Creatinine	0,6	mg/dl
Urea	23	mg/dl
TSH	4,24	mIU/L
Free T4	1,52	Ng/dl

20655

TAKOTSUBO SYNDROME FOLLOWING TRANSCATHETER EDGE-TO-EDGE MITRAL VALVE REPAIR

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Introduction: Transcatheter edge-to-edge mitral valve repair (M-TEER) is an established therapy for severe mitral regurgitation (MR) in patients at high surgical risk. Despite its favourable safety profile, acute left ventricular systolic dysfunction may occur following the procedure in up to 20% of cases and has important prognostic implications. Takotsubo syndrome represents a rare differential diagnosis in this setting, having been described only in sporadic case reports, with a causal relationship that remains uncertain and potential recovery of ventricular function within the first month. Case Description: A frail 73-year-old hypertensive, former smoker with stable coronary artery disease and chronic pulmonary embolism was admitted with decompensated heart failure, New York Heart Association class III symptoms and orthopnoea. Transthoracic echocardiography showed left ventricular ejection fraction (LVEF) of 60%, severe primary mitral regurgitation due to posterior leaflet prolapse with P2 flail, severe pulmonary hypertension and right ventricular dysfunction. Coronary angiography showed no obstructive coronary disease. Following Heart Team discussion, transcatheter edge-to-edge mitral valve repair (M-TEER) was performed because of prohibitive surgical risk. The procedure included implantation of three transcatheter mitral valve repair devices, reducing mitral regurgitation to mild severity with preserved LVEF. Shortly after the procedure, the patient developed nausea, epigastric discomfort, electrocardiographic repolarisation abnormalities and troponin elevation (peak 190 ng/L). Echocardiography demonstrated mid-apical akinesia with basal hypercontractility and LVEF reduction to 26%, consistent with Takotsubo syndrome. The patient remained haemodynamically stable with progressive clinical improvement and was discharged in functional class I. One month later, LVEF had recovered to 54%, with mild residual mitral regurgitation. Cardiac magnetic resonance demonstrated mid-apical myocardial oedema and non-ischaemic late gadolinium enhancement, compatible with Takotsubo syndrome Conclusions: This case illustrates a rare and clinically relevant occurrence of Takotsubo syndrome following M-TEER. Although the pathophysiological mechanisms and causal relationship remain incompletely established, early recognition is essential because it directly influences management and prognosis. Further studies are required to improve understanding of this association.

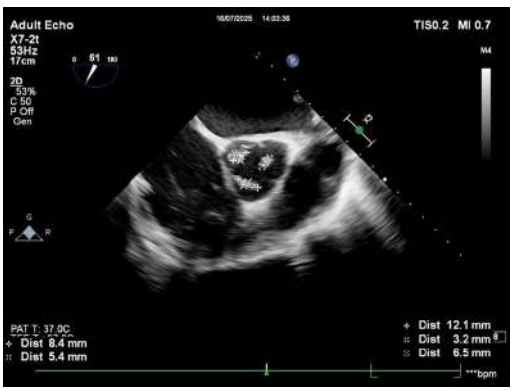
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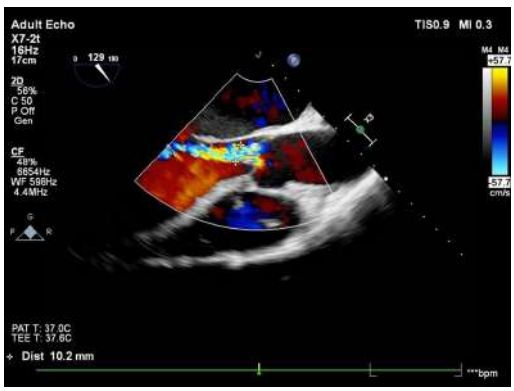
TRIVALVULAR ENDOCARDITIS – A RARE CONDITION WITH HIGH MORBIDITY AND MORTALITY

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Introduction: Infective endocarditis (IE) is a severe disease characterized by infection of the endocardium, usually associated with turbulent blood flow due to valvular disease or congenital abnormalities. Multivalvular involvement is uncommon and is associated with higher morbidity and mortality. Case Description: A 59-year-old male patient with hypertension, on dialysis for 2 years due to hypertensive nephropathy, presented with asthenia, hyporexia, weight loss of 13 kg over 2 weeks, fever and chills for 2 months, and dyspnea on minimal exertion. On physical examination, he was pale, with +1 lower pitting edema, a diastolic murmur at the aortic area radiating to the apex area, and a systolic murmur at the tricuspid area. Laboratory tests showed elevated C-reactive protein (88.9 mg/dL) and a normal white blood cell (WBC) count. Serial blood cultures were negative. Transesophageal echocardiography revealed preserved contractility and multiple vegetations: on the aortic valve (up to 8.4 mm) with significant regurgitation (EROA 0.32 cm²); on the mitral valve (4.9 mm), associated with perforation; and on the tricuspid valve (up to 29.4 mm). The patient underwent triple valve replacement (mitral, aortic, and tricuspid) with bioprostheses. Conclusions: In this case, the patient died within the first 24 hours after triple valve replacement surgery, highlighting the high severity of the condition and the need for early diagnosis and timely surgical management, despite its rarity.





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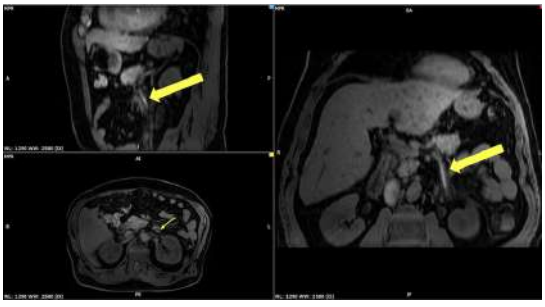
UNMASKING Q FEVER: A TALE OF ENDOCARDITIS AND UNEXPECTED THROMBOSES

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Introduction: Blood culture-negative infective endocarditis (IE) represents a diagnostic challenge, particularly in the context of concomitant atypical systemic manifestations. Case Description: A 56-year-old sailor, with no prior cardiovascular history, presented with persistent fever following treated interstitial pneumonia. On admission, he was subfebrile (37.8°C), hemodynamically stable, with elevated inflammatory markers, mild hepatic cytolysis and cholestatic pattern. Transthoracic echocardiography was unremarkable. Transesophageal echocardiography (TEE) showed 8 mm mitral vegetations with mild mitral regurgitation (Fig. 1). Empirical antibiotherapy was initiated for possible IE. Four sets of aerobic and anaerobic blood cultures were collected. In the context of abdominal pain developed during hospitalization, CT and MRI showed inferior mesenteric and splenic vein thrombosis, with no embolic complications (Fig. 2). The association of high suspicion of culture-negative IE and atypical venous thromboses raised concern of atypical pathogens involvement. Serological testing was positive for Coxiella burnetii, with positive IgM and high IgG titers, confirming definite acute C. burnettii IE. Targeted therapy with doxycycline and hydroxychloroquine was initiated, alongside rivaroxaban for atypical thromboses. The clinical course was favorable, with fever resolution, normalization of inflammatory syndrome and regression of mitral valve vegetations on follow-up TEE. Serological C. burnetii monitoring allowed for discontinuation of antibiotics after 18 months. Venous recanalization was documented on repeated MRI and anticoagulation was stopped after 6 months. Conclusions: This case highlights the importance of considering C. burnetii in patients with blood culture-negative IE, particularly those with prolonged fever and extracardiac atypical manifestations. Furthermore, it underscores the role of early serological testing and that of TEE in providing timely diagnoses, and suggests that uncommon venous thromboses may serve as an important clue to Q fever. The reassuring outcome of this case emphasizes that, despite its reputation as a chronic and difficult-to-treat condition, C. burnetii IE can be effectively cured when diagnosed early and managed as per current guidelines.





Physiotherapy / Physical Therapy

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20641

CARDIAC REHABILITATION AS A BRIDGE THERAPY TO HEARTMATE 3 IMPLANTATION IN AN ADVANCED HEART FAILURE INPATIENT: A CASE REPORT

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Introduction: Advanced heart failure (HF) patients often present frailty, exercise intolerance and functional decline, limiting eligibility for advanced therapies. Cardiac rehabilitation (CR) can contribute as a strategy for clinical and functional improvement in this high-risk population. We report the case of an advanced HF patient who underwent inpatient CR during a prolonged hospitalization as a bridge therapy to a left ventricular assist device (HeartMate 3) implantation. Case Description: This study received ethical approval and is registered under CAAE number 12683519.9.0000.5327. A 69-year-old male patient admitted for advanced HF (LVEF 22%), dependence on continuous intravenous milrinone, classified as NYHA IV and INTERMACS 3. At initial assessment he presented clinical frailty, reduced peripheral muscle strength (Handgrip Strength [HGS]: 29 kgf, 79.8% of predicted / 5 Times Sit-to-Stand Test [STS]: 12.26 seconds), reduced respiratory strength (Maximal Inspiratory Pressure [MIP]: 40 cmH2O, Maximal Expiratory Pressure [MEP]: 95 cmH2O; 39.96% and 86.8% of predicted, respectively), Self-Selected Gait Speed [GS]: 0.36 m/s, SPPB Score: 8 points, unable to perform the Six-Minute Walk Test (6MWT). The patient underwent inpatient CR (low-intensity aerobic training, progressive muscle strengthening and inspiratory muscle training under continuous clinical monitoring). Four months later, on reassessment: improved muscle strength (HGS: 33 kgf, 83.5% of predicted / STS: 8.16s), improved physical performance (SPPB: 12 points, GT: 0.7 m/s), increase in MIP (55 cmH2O), and reduced submaximal cardiorespiratory capacity (6MWT: 330 meters / 56.3% of predicted). No clinical adverse events occurred during CR or assessments. The indication for HeartMate 3 implantation was made through multidisciplinary discussion and considered clinical stability, functional recovery and potential benefit. On early post-implantation reassessment, muscle strength kept stable (HGS: 31 kgf, 78.1% of predicted / STS: 10.54s), as physical performance (SPPB: 10 points, GT: 0.62 m/s), although decline of submaximal cardiorespiratory capacity (6MWT: 302 meters / 51.9% of predicted). Conclusions: Inpatient CR proved to be safe and was associated with significant functional recovery in an inotrope-dependent patient with advanced HF. This case increases CR potential as a strategy for mechanical circulatory support and access to advanced therapies for clinically frail patients.

19144

INSPIRATORY MUSCLE TRAINING IN HEART FAILURE WITH PRESERVED EJECTION FRACTION WITH REGISTRATION AND MONITORING VIA MOBILE APPLICATION – A CASE REPORT

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Introduction: In recent decades, the evolution in the care of patients with heart failure (HF) has significantly reduced morbidity and mortality. However, new challenges have emerged, focused on understanding the mechanisms of functional capacity and the search for a better quality of life. Although Inspiratory Muscle Training (IMT) is an effective resource for improving respiratory strength and functional capacity, physical therapists must consider strategies to improve adherence when prescribing rehabilitation exercises for HF patients. This work presents a case report focused on the use of a technological tool to optimize adherence to IMT. Case Description: A 69-year-old white female patient with Heart Failure with Preserved Ejection Fraction (HFpEF) of hypertensive etiology, LVEF: 58%, and NYHA functional class II. The study was approved by the Research Ethics Committee. The patient underwent 8 weeks of home-based IMT using a linear load resistor for 20 minutes, 5 times a week, at a 60% load. To enable and monitor the intervention, a mobile application with a web interface was used, specifically developed for this purpose in partnership with Computer Science specialists. The software allowed for exercise scheduling, sent reminders for execution at prescribed times, and collected data on the completion or non-completion of sessions. Conclusions: After the 8-week protocol monitored via the application, the patient showed significant improvement in clinical indicators, exceeding predicted values: Respiratory Muscle Strength: MIP evolved from -50 cm/H2O to -80 cm/H2O (predicted: -77 cm/H2O) and MEP from 60 cm/H2O to 90 cm/H2O (predicted: 73 cm/H2O). In the 6MWT, the distance covered had a slight increase from 483 meters to 492 meters (predicted: 447 m). Handgrip strength evolved from 22 to 28 kg/f in the right upper limb (predicted: 26 kg/f) and from 20 to 24 kg/f in the left (predicted: 24 kg/f). Bendopnea remained negative at the initial and final evaluations. In this case report, IMT combined with mobile app monitoring proved to be an effective strategy for improving respiratory and peripheral muscle strength in HFpEF, with the potential to facilitate home management and treatment adherence. This report is part of an expanding line of research, and data collection will continue through a prospective, randomized, and controlled protocol.

21144

PRE-EXISTING SARCOPENIA AND MUSCLE WEAKNESS AFTER HEART TRANSPLANTATION: A CASE REPORT

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(1) ICFUC - PORTO ALEGRE - RS - BRASIL;

Introduction: Heart transplant recipients are at high risk for ICU-acquired weakness and diaphragmatic dysfunction, potentially affecting clinical outcomes. Early postoperative functional assessment is crucial to guide multidisciplinary management Case Description: A 52-year-old male with prior acute myocardial infarction and cardiac arrest, status post angioplasty, with chronic kidney disease, hypertension, liver cirrhosis, and pre-existing sarcopenia, underwent heart transplantation for end-stage heart failure (ejection fraction: 26%). Cardiopulmonary bypass time was 140 minutes. The patient required mechanical ventilation for 24 hours and chest drains for four days. At 48 hours post-extubation: Glasgow Coma Scale 15, heart rate 100 bpm, respiratory rate 25 breaths/min, and SpO□ 90% on room air. Diaphragmatic excursion was 3.08 cm with a thickening fraction of 50%. Quadriceps thickness was 19.48 mm (right) and 19.70 mm (left), and rectus femoris cross-sectional area was 1.80 cm² (right) and 1.11 cm² (left). MRC score was 36 and Perme score 16. Nutritional screening indicated moderate risk. Conclusions: : Early postoperative findings revealed significant peripheral muscle impairment despite preserved diaphragmatic function. This dissociation suggests a predominant systemic effect driven by baseline sarcopenia, surgical inflammatory response, and hypercatabolism, even without prolonged mechanical ventilation. Ultrasound findings were consistent with functional decline, reinforcing its role as a sensitive bedside tool. Pre-existing sarcopenia may amplify early functional impairment after heart transplantation, regardless of ventilation duration. Integrated assessment combining ultrasound and functional scales enables early risk stratification and supports targeted interventions, with potential to improve recovery and clinical outcomes.





Sports Cardiology, Exercise, Ergometry and Cardiovascular Rehabilitation



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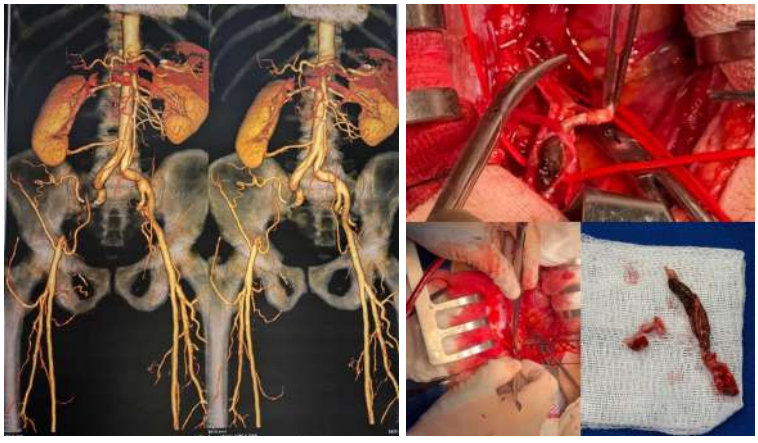


20926

ILIAC ARTERY ENDOFIBROSIS IN AN AMATEUR CYCLIST: FROM DIAGNOSTIC CHALLENGE TO DEFINITIVE TREATMENT

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(1) INSTITUTO NACIONAL DE CARDIOLOGIA - RIO DE JANEIRO - RJ - BRASIL; (2) UNIVERSIDADE FEDERAL DE MINAS GERAIS - BELO HORIZONTE - MG - BRASIL;



Introduction: Iliac artery endofibrosis is a non-atherosclerotic arteriopathy causing exercise-induced claudication in high-performance cyclists, with prevalence up to 20%. Pathophysiology involves intimal fibrous thickening due to repetitive hip hyperflexion, psoas hypertrophy, and high blood flow, leading to microtrauma and stenosis. The external iliac artery is most affected, usually unilaterally. Symptoms include cramping, pain, and fatigue during intense effort. Diagnosis is often delayed by low clinical suspicion, making treatment challenging in athletes with high functional demands. Case Description: A 41-year-old male amateur cyclist, with several years of regular training, presented throughout 2024 with progressive cramping, pain, and weakness in the right lower limb during intense efforts, leading to reduced athletic performance. Initially, the condition was misinterpreted as a sports-related musculoskeletal injury. Conservative measures—including physical therapy, biomechanical adjustments to cycling posture, and training modifications—provided only partial relief. Persistent symptoms during high-intensity activity raised the clinical suspicion of arterial endofibrosis. Vascular Doppler ultrasound and CT angiography confirmed occlusion of the right external iliac artery. Conservative management and restriction from competition were initially recommended. However, due to ongoing symptoms and functional impairment, the patient sought specialized evaluation and elected surgical treatment via endarterectomy. The procedure was performed in November 2025 without perioperative complications. The patient demonstrated significant clinical improvement upon resuming activities, with follow-up imaging confirming restoration of arterial flow. He has progressed through a gradual training program and remains under clinical monitoring, with expectations of returning to competitive cycling. Conclusions: Iliac artery endofibrosis should be considered in the differential diagnosis of exercise-induced claudication in athletes, particularly cyclists, even in the absence of atherosclerotic risk factors. Diagnosis relies on clinical suspicion supported by imaging modalities such as vascular Doppler ultrasound and CT angiography. While conservative measures may be attempted initially, their efficacy is limited in symptomatic athletes. In such cases, endarterectomy offers an effective therapeutic option to restore arterial flow and enable functional return to sport.

Women's Cardiology



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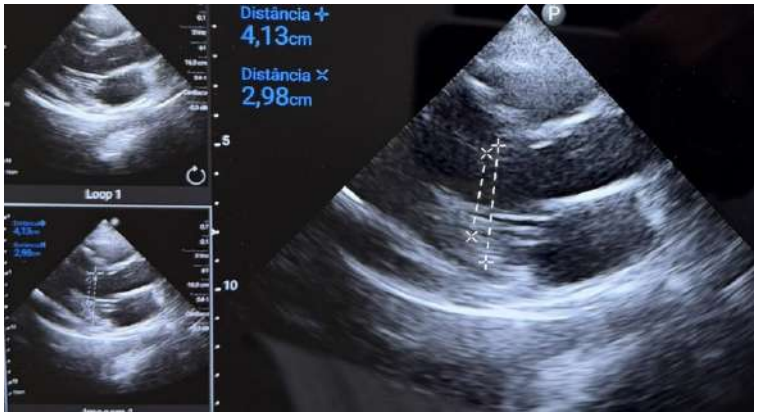


17866

CDI-RELATED INFECTIVE ENDOCARDITIS IN RECOVERED PERIPARTUM CARDIOMYOPATHY DURING SUBSEQUENT PREGNANCY: AN UNUSUAL PRESENTATION

JULIANA CRISTINA DUARTE BRAGA1; FERNANDA ROQUETTE DE ARAUJO2; GUSTAVO TOBIAS PIMENTA2; GUILHERME SOUZA LAMOUNIER2; ANNA LUISA RAMOS SILVA2; FILIPE ALBERTO MOREIRA LIESNER2; ESTEVAO LANNA FIGUEIREDO2; CLAUDIA MARIA VILAS FREIRE1;

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Introduction: Peripartum cardiomyopathy (PPCM) is a rare condition characterized by left ventricular dysfunction occurring during late pregnancy or the postpartum period. Recurrence and the presence of intracardiac devices, such as implantable cardioverter-defibrillators (ICDs), may increase the risk of severe complications, including device-related infections. Case Description: A 27-year-old woman with previous PPCM diagnosed in 2017 underwent ICD implantation for primary prevention due to severe left ventricular dysfunction (LVEF 19%). In 2019, she received eight appropriate ICD shocks. Four years after the index pregnancy, complete recovery of ventricular function was documented (LVEF 61%). During a subsequent pregnancy, she remained under specialized follow-up, presenting preserved ventricular function and good functional status. Pregnancy evolved uneventfully until cesarean delivery at 38 weeks. One week postpartum, she developed acute uterine rupture with hemorrhagic shock, followed by endometritis and severe acute kidney injury requiring hemodialysis. Subsequently, she presented fever and systemic signs of infection. Blood cultures were positive for Staphylococcus aureus, and transesophageal echocardiography demonstrated vegetation attached to the ICD lead, confirming device-related infective endocarditis. The patient progressed with severe sepsis, requiring intensive care admission, ventilatory support, and prolonged intravenous antibiotic therapy. Complete ICD system removal was performed. Additional obstetric complications during hospitalization required multidisciplinary management. Conclusions: This case highlights the complexity of ICD management in patients with recovered PPCM, particularly regarding late ventricular recovery and subsequent pregnancies. Although bacteremia related to delivery is uncommon, obstetric complications may increase infectious risk. Early recognition and multidisciplinary management are essential to improve maternal outcomes in this rare and challenging scenario.

19396

SECONDARY HYPERTENSION DUE TO PRIMARY ALDOSTERONISM IN PREGNANCY PRESENTING AS FLACCID QUADRIPARESIS: A CASE REPORT

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Introduction: Primary Aldosteronism (PA) is the most common cause of secondary systemic arterial hypertension (SAH), yet it remains a frequently underdiagnosed etiology. In the context of pregnant patients, the diagnosis is even more challenging due to the physiological changes of pregnancy in the human body, which can mask mineralocorticoid hyperactivation. We present a clinical case of a patient with a history of hypertensive disease in a second pregnancy, controlled with losartan, who developed severe hypokalemia and transient tetraparesis, highlighting the importance of screening for this frequently overlooked condition. Case Description: A 36-year-old female patient with a history of hypertension initiated during her third pregnancy, previously controlled with Losartan 100 mg/day, with no history of hypertensive disease in previous pregnancies and no criteria for preeclampsia. Ten months after delivery, she was admitted to a tertiary hospital presenting with two episodes of transient flaccid tetraparesis and intense myalgia within a 48-hour interval, both episodes preceded by gastroenteritis. On admission, her blood pressure was 140/90 mmHg, and laboratory tests revealed mild anemia (hemoglobin 11.8 g/dL), severe hypokalemia (K□ 1.82 mEq/L), metabolic alkalosis (pH 7.54, HCO□ 36.6 mmol/L, pCO□ 43.6 mmHg), and rhabdomyolysis (CPK 1,488 U/L). Investigation for secondary hypertension, triggered by a hypertensive peak of 170/100 mmHg and refractory hypokalemia, showed an aldosterone level of 32.5 ng/dL and plasma renin activity of 0.33 ng/mL/h, with an aldosterone-to-renin ratio (ARR) of 98.4, confirming mineralocorticoid autonomy. Abdominal computed tomography *CT)identified a 1.6 × 1.1 cm nodule in the left adrenal gland. The patient was prepared with spironolactone and potassium replacement and underwent videolaparoscopic adrenalectomy. At outpatient follow-up, she showed improvement in hypertension and definitive normalization of serum potassium without the need for medications. Conclusions: This case demonstrates a challenging diagnosis of PA in pregnancy in a patient without resistant hypertension, presenting with neurological motor symptoms due to hypokalemia. Although poorly described, it highlights the importance of investigating secondary hypertension and the need for universal diagnostic criteria, as hormonal imbalance, especially the vasodilatory effects of progesterone and increased aldosterone and renin, that may mask the condition.

YOUNG RESEARCHER POSTER – ORIGINAL RESEARCH



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Acute and Chronic Coronary Syndrome / Thrombolysis



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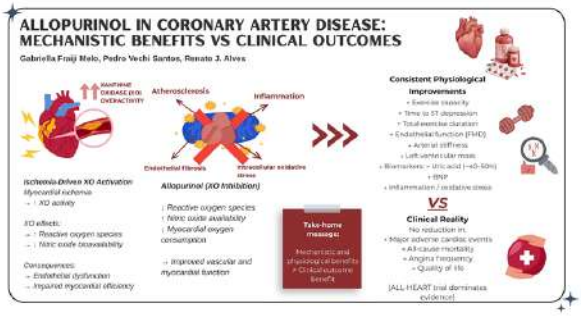
15009

ALLOPURINOL IN CORONARY ARTERY DISEASE: FROM PROMISING MECHANISMS TO UNCERTAIN CLINICAL BENEFIT

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Background/Introduction: Coronary artery disease (CAD) is the leading global cause of death, affecting 197 million people and causing over 9.1 million deaths annually. Angina, a common manifestation, significantly impairs quality of life despite advances in therapy. Xanthine oxidase (XO) activity increases during ischemia, generating reactive oxygen species and reducing nitric oxide bioavailability. Allopurinol, an XO inhibitor, may improve ischemia by reducing oxidative stress and myocardial oxygen consumption. This systematic review evaluates its clinical role. Objectives: To evaluate the efficacy and safety of allopurinol in patients with angina or ischemic heart disease, focusing on its impact on clinical outcomes, symptom burden, and cardiovascular biomarkers. Methods: A systematic search of PubMed, Cochrane, and EMBASE was conducted to identify studies comparing allopurinol with placebo or usual care in patients with angina or ischemic heart disease. The review was prospectively registered in PROSPERO (CRD420250572006) and conducted in accordance with PRISMA guidelines. Primary outcomes included cardiac adverse events and all-cause mortality. Secondary outcomes included angina symptoms, serum uric acid, B-type natriuretic peptide (BNP), vascular function, and safety. Results and Conclusions: Six randomized controlled trials (n=6,267) were included, ranging from mechanistic studies to a large multicenter trial. Allopurinol consistently improved surrogate outcomes, including exercise capacity, with prolongation of time to ST-segment depression and total exercise duration (Noman et al, 2010), as well as improvements in endothelial function, arterial stiffness, and left ventricular structure (Rajendra et al, 2011; Rekhraj et al, 2013). Significant reductions in serum uric acid (~40–50%), BNP, oxidative stress, and inflammatory markers were also observed. One smaller study (Huang et al, 2017) demonstrated a reduction in cardiovascular events, whereas the largest trial (ALL-HEART, 2022) found no significant differences in major adverse cardiovascular events, all-cause mortality, angina frequency, or quality of life. These findings indicate that, although allopurinol improves physiological and mechanistic markers of ischemia, these benefits do not translate into improved hard clinical outcomes in unselected populations. Further large-scale studies targeting high-risk subgroups are warranted.



Allopurinol in Coronary Artery Disease: From Promising Mechanisms to Uncertain Clinical Benefit

Gabriella Fraiji Melo, Pedro Vechi, Renato J. Alves

Table 1. Effects on Angina, Vascular Function, and Biomarkers

Study	Angina Symptoms and Exercise Capacity	Vascular Function and Cardiac Structure	Biomarkers and Physiological Markers
ALL-HEART (2022)	No significant difference in angina frequency or physical limitation (SAQ).	Not assessed as a primary outcome.	Uric acid: ~50% reduction (0.34 to 0.18 mmol/L).
Noman et al. (2010)	↑ Time to ST depression: +43 s (p=0.0002); ↑ total exercise time: +58 s.	Suggestive reduction in afterload (ventricular resistance).	BNP reduced from 84.3 to 55.6 pg/mL (p=0.045); significant uric acid reduction.
Huang et al. (2017)	Angina efficacy: 93.2% vs 76% (p<0.05); ECG improvement: 96% vs 82%.	Increased nitric oxide (NO), indicating improved endothelial function.	Reductions in BNP, MDA, Ox-LDL, hs-CRP, and TNF-α (p<0.05).
Rajendra et al. (2011)	Not directly assessed.	↑ FMD (5.4% vs 4.1%); ↓ AIx (24.7% vs 27.6%) (p<0.001).	Vascular oxidative stress markedly reduced; ↓ Ox-LDL.
Rekhraj et al. (2013)	Not directly assessed.	↓ LV mass (−5.2 g vs −1.3 g); ↓ end-systolic volume; ↑ FMD and ↓ AIx.	Uric acid reduced by 46%; BNP trend toward reduction (p=0.08).

Table 2. Clinical Outcomes, Quality of Life, and Safety

Study	Clinical Outcomes and Mortality	Quality of Life (QoL) and Safety
ALL-HEART (2022)	No difference in composite outcome (11.0% vs 11.3%) or all-cause mortality.	QoL: No difference (EQ-5D/SAQ); Safety: 57.4% discontinuation, increased skin rash.
Noman et al. (2010)	Not assessed for long-term clinical outcomes.	Safety: Well tolerated; no adverse events reported.
Huang et al. (2017)	Lower CV events in allopurinol group (10% vs 30%) at 2 years.	QoL not formally assessed.
Rajendra et al. (2011)	Suggests potential mortality benefit based on endothelial improvement.	Safety: Well tolerated; no rash or renal impairment.
Rekhraj et al. (2013)	LV hypertrophy regression discussed as prognostically beneficial.	Safety: Generally well tolerated; one case of rash.

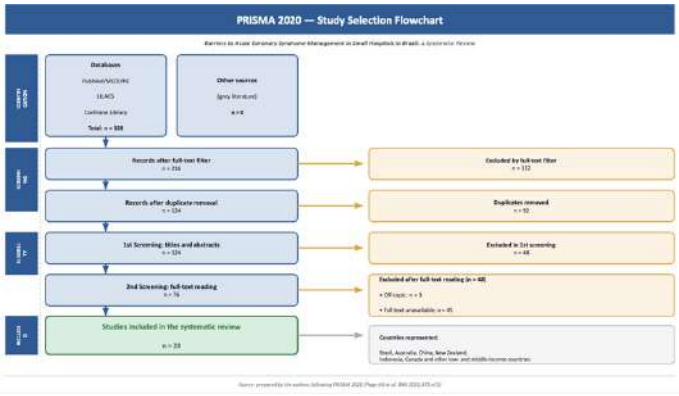
16424

BARRIERS TO ACUTE CORONARY SYNDROME MANAGEMENT IN SMALL HOSPITALS IN BRAZIL: A SYSTEMATIC REVIEW

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(1) AFYA - FACULDADE DE CIENCIAS MEDICAS DA PARAIBA - CABEDELO - PB - BRASIL;

Background/Introduction: Introduction: ACS is one of the leading causes of cardiovascular mortality in Brazil. SIH-SUS data (2015–2026) reveal in-hospital mortality of 5.57% (men) and 7.05% (women) in the Northeast, above national averages, suggesting critical barriers to access to percutaneous coronary intervention (PCI)-capable services Objectives: Objective: To systematically review barriers to ACS management in non-PCI-capable hospitals, focusing on resource availability and clinical outcomes. Methods: Methods: Systematic review following PRISMA 2020, registered in PROSPERO (CRD420261350747). PubMed/MEDLINE, LILACS, and Cochrane Library were searched, yielding 328 records. After full-text filter (n=216), duplicate removal, and two-stage screening, titles/abstracts (n=124) and full-text peer-reviewed reading, 28 studies were included. Risk of bias was assessed using the Newcastle-Ottawa Scale. Results and Conclusions: Results: Twenty-eight studies were included (Brazil, Australia, China, New Zealand, Indonesia, Canada, and other low- and middle-income countries). Main barriers identified: only 41% of patients received ECG within ≤10 minutes of arrival; door-to-balloon times with medians of 114–189 minutes for transfers, with only 12–24% achieving ≤90 minutes; in-hospital mortality reaching 21.5% in public hospitals in low-income settings. Women experienced longer ECG delays (53 vs. 34 min; p=0.001) and higher mortality (23.6% vs. 13.9%). Telecardiology was associated with a 17% reduction in mortality (RR: 0.83; 95% CI: 0.73–0.95). Regional protocols and continuing education demonstrated potential to optimize time to reperfusion.Conclusion: ACS management in small hospitals is marked by ECG delays, prolonged transfers, and high in-hospital mortality — particularly in women. Telecardiology and regional protocols show potential to reduce these barriers, reinforcing the need for equity in care and infrastructure investment in underserved regions.



15621

BASELINE RENAL DYSFUNCTION AND IN-HOSPITAL MORTALITY IN ACUTE MYOCARDIAL INFARCTION TREATED WITH A PHARMACOINVASIVE STRATEGY

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Background/Introduction: Ischemic heart disease remains the leading cause of mortality worldwide. Chronic kidney disease frequently coexists with acute myocardial infarction (AMI) and is associated with adverse outcomes. However, the prognostic impact of renal dysfunction in patients undergoing a pharmacoinvasive strategy remains incompletely defined. Objectives: To evaluate the association between baseline renal dysfunction and in-hospital mortality in patients with AMI treated with a pharmacoinvasive strategy. Methods: This cohort included 2,710 consecutive patients with AMI managed within a pharmacoinvasive network. All patients received fibrinolysis followed by early coronary angiography (2–24 hours) or rescue percutaneous coronary intervention when indicated. Multivariable logistic regression was performed to identify independent predictors of in-hospital mortality. Odds ratios (OR) with 95% confidence intervals (CI) were reported. Results and Conclusions: In-hospital mortality occurred in 162 patients (6%). Creatinine clearance estimated by the CKD-EPI equation showed good discrimination for in-hospital mortality (AUC 0.76; 95% CI 0.71–0.80; p<0.001). Reduced creatinine clearance was independently associated with mortality after adjustment for age (OR 1.07; 95% CI 1.05–1.08). Advanced Killip class (III–IV) was also independently associated with increased in-hospital mortality.Baseline renal dysfunction was independently associated with in-hospital mortality in patients undergoing a pharmacoinvasive strategy, supporting its role as an early and readily available marker for risk stratification in AMI.

Figure 1 ROC curve: creatinine clearance x mortality

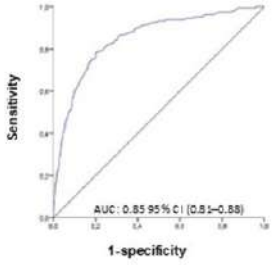
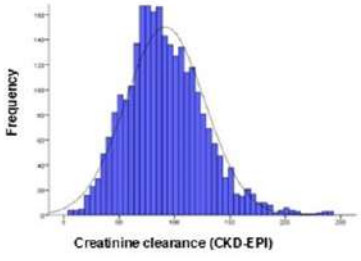


Figure 2 Histogram



Tab. 1

Epidemiological characteristics	Variable metrics
Smoking, n (%)	1721 (63,5)
Alcoholism, n (%)	334 (12,3)
Hypertension, n (%)	1633 (60,2)
Diabetes, n (%)	837 (30,9)
Dyslipidemia, n (%)	1335 (49,2)
DAOP, n (%)	117 (4,3)
Obesity, n (%)	526 (19,4)
Rescue angiography, n (%)	856 (31,6)
BMI (mean, SD)	26,92 ± 4,54
Creatinine clearance (CKD-EPI) (mean, SD)	91,48 ± 35,64
KILLIP (I-IV),(%)	I: 65 II: 19,6 III: 2,0 IV: 13,5

Leg. Data are presented as n (%) or mean ± SD. PAD: peripheral arterial disease BMI: body mass index, CKD-EPI: Chronic kidney disease-epidemiology.

Tab. 2

Complications in the catheterization laboratory	Metrics of variables
Coronary dissection, n (%)	70 (2,6)
Coronary rupture, n (%)	1 (<1)
Tamponade, n (%)	2 (<1)
No-reflow n (%)	106 (3,9)

Leg. Data are presented as n (%).

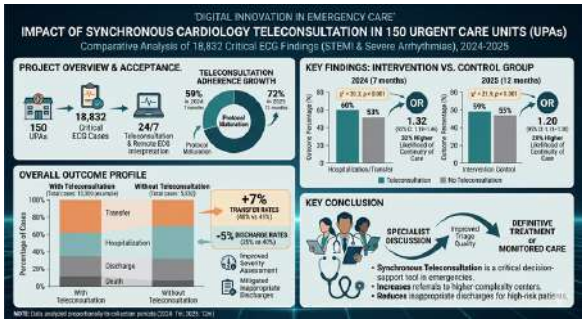
15800

DIGITAL INNOVATION IN EMERGENCY CARE: IMPACT OF CARDIOLOGY TELECONSULTATION ON MEDICAL DECISION-MAKING IN 150 URGENT CARE UNITS

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Background/Introduction: ST-segment elevation myocardial infarction (STEMI) and severe arrhythmias are time-sensitive conditions requiring early diagnosis and immediate intervention. In resource-constrained urgent care settings, limited access to specialist input may delay appropriate management. A large-scale initiative implemented 24-hour teleconsultation with remote electrocardiogram (ECG) interpretation to provide real-time specialist support, aiming to improve clinical decision-making and optimize healthcare resource utilization. Objectives: To evaluate the impact of synchronous cardiology teleconsultation on clinical decision-making and outcomes in patients with critical ECG findings (STEMI and severe arrhythmias), comparing cases managed with and without specialist consultation. Methods: This multicenter retrospective observational study was conducted from June 2024 to December 2025. Cases with teleconsultation were compared with those managed without specialist consultation in routine clinical practice. The analysis was restricted to ECG reports classified as critical. Clinical outcomes (discharge, death, hospitalization, and transfer) were assessed within 48 hours of the index ECG. Data were analyzed according to study periods (2024: 7 months; 2025: 12 months). Pearson's chi-square test (χ^2) and odds ratios (OR) with 95% confidence intervals (95% CI) were applied, with statistical significance set at $p < 0.05$. Results and Conclusions: A total of 18,832 critical cases were analyzed. Teleconsultation adherence increased from 59% in 2024 to 72% in 2025, reflecting progressive protocol uptake. In 2024, the teleconsultation group showed higher rates of hospitalization or transfer compared with controls (60% vs. 53%; $\chi^2 = 30.3$; $p < 0.001$), corresponding to a 32% higher likelihood of escalation of care (OR 1.32; 95% CI: 1.19–1.46). In 2025, this pattern persisted (59% vs. 55%; $\chi^2 = 21.9$; $p < 0.001$), with a 20% higher likelihood of these outcomes (OR 1.20; 95% CI: 1.11–1.30). Teleconsultation was also associated with higher transfer rates (48% vs. 41%) and lower discharge rates (35% vs. 40%). These findings provide real-world, system-level data indicating that teleconsultation-supported care is associated with more risk-adjusted clinical decision-making, favoring appropriate referral to higher-complexity care and reducing the likelihood of premature discharge. As a scalable system-level intervention, teleconsultation may enhance triage quality and patient safety in emergency cardiovascular care.



19433

DURATION OF DUAL ANTIPLATELET THERAPY AFTER ACUTE CORONARY SYNDROME: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background/Introduction: Dual antiplatelet therapy (DAPT), consisting of aspirin and a P2Y12 receptor inhibitor, is a cornerstone in the treatment of acute coronary syndrome (ACS). However, the optimal duration of therapy remains controversial, particularly in balancing the reduction of ischemic events and the risk of bleeding. Objectives: To compare the efficacy and safety of different durations of DAPT in patients after acute coronary syndrome. Methods: A systematic review conducted according to PRISMA guidelines, with searches in PubMed, Embase, and Cochrane Library databases up to January 2026. Randomized clinical trials comparing short-duration DAPT (≤6 months) versus standard (12 months) or prolonged (>12 months) therapy were included. The outcomes analyzed were major cardiovascular events (MACE) and major bleeding. The meta-analysis was performed using a random-effects model, with calculation of relative risk (RR) and 95% confidence intervals (95% CI). Heterogeneity was assessed using the I^2 index. Results and Conclusions: Eleven studies were included, totaling 32,684 patients. Prolonged DAPT was associated with a reduction in major cardiovascular events (RR=0.86; 95% CI: 0.78–0.95; p=0.003), but with a significant increase in major bleeding (RR=1.42; 95% CI: 1.25–1.61; p<0.001). Short-duration DAPT showed a lower risk of bleeding (RR=0.74; 95% CI: 0.65–0.84; p<0.001), without a significant increase in ischemic events. The duration of dual antiplatelet therapy should be individualized, considering both ischemic and bleeding risk profiles. Short-duration strategies may be safe in selected patients, while prolonged therapy should be reserved for those at high ischemic risk.

19048

EFFICACY AND SAFETY OF VERY EARLY P2Y12 INHIBITOR MONOTHERAPY AFTER PCI IN ACUTE CORONARY SYNDROMES: SYSTEMATIC REVIEW AND RANDOM-EFFECTS META-ANALYSIS OF RANDOMIZED TRIALS

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Background/Introduction: Very early withdrawal of aspirin (<1 month of DAPT) after PCI in ACS, with continuation of a potent P2Y12 inhibitor as monotherapy, has been proposed to reduce bleeding. Although strategies with abbreviated DAPT of 1–3 months (TWILIGHT, NEJM 2019; TICO, JAMA 2020; ULTIMATE-DAPT, Lancet 2024) support hemorrhagic benefit, the <1-month window remains controversial: T-PASS (Hong, Circulation 2024) demonstrated superiority in net clinical benefit, whereas NEO-MINDSET (Guimarães, NEJM 2025) failed to demonstrate ischemic non-inferiority. The 2025 ACC/AHA/SCAI guideline endorses ticagrelor monotherapy after ≥1 month of DAPT (Class I/A); the <1-month interval remains an open question. Objectives: The aim of this review and meta-analysis was to focus on early aspirin discontinuation by integrating time-to-event estimates from randomized trials to quantify hemorrhagic, ischemic, and clinical effects during this very early de-escalation period. Methods: Systematic review and meta-analysis (PRISMA), DerSimonian–Laird random-effects model, comparing P2Y12 monotherapy initiated at <1 month of DAPT versus standard 12-month DAPT after PCI in ACS. From the initial search (156 records), 2 RCTs were eligible after exclusion of 4 due to inadequate comparator: T-PASS (n=2,850) and NEO-MINDSET (n=3,410); total 6,260 patients. Outcomes: ischemic composite/MACE, major or clinically relevant bleeding (BARC 2–5 or 2/3/5), and net adverse clinical events (NACE). Heterogeneity assessed by I^2. Results and Conclusions: Very early monotherapy robustly reduced major/clinically relevant bleeding (HR 0.38; 95% CI 0.27–0.53; I^2=0%; relative reduction ≈60%). For MACE, the effect was neutral (HR 0.98; 95% CI 0.53–1.81), with substantial heterogeneity (I^2≈75%), consistent with differences in the timing of aspirin discontinuation and outcome definitions. For NACE, there was a trend favoring monotherapy (HR 0.70; 95% CI 0.45–1.10; I^2≈76%). In ACS patients undergoing PCI, aspirin withdrawal at <1 month with potent P2Y12 monotherapy consistently reduces bleeding, with no uniform signal of increased ischemic risk. The low number of studies, substantial heterogeneity, and the pre-specified analysis of NEO-MINDSET (Tavares, JACC 2026) — suggesting harm in STEMI and safety in NSTEMI or Unstable Angina — indicate that thrombotic safety depends on the timing of discontinuation and individual ischemic profile. The findings support an individualized approach, prioritizing bleeding reduction, with caution in high thrombotic risk, particularly NSTEMI.

16681

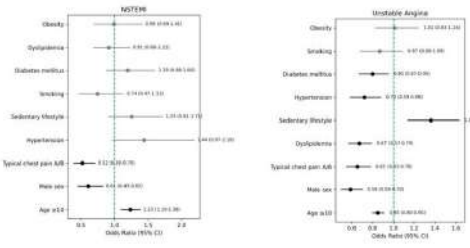
FACTORS ASSOCIATED WITH A CONSERVATIVE STRATEGY IN THE MANAGEMENT OF NSTEMI OR UNSTABLE ANGINA: A NATIONWIDE MULTICENTER REGISTRY ANALYSIS

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Background/Introduction: The definition of an invasive strategy in NSTEMI or unstable angina is based on risk stratification; however, determinants of this decision in real-world practice remain incompletely understood. Objectives: To identify factors associated with a conservative strategy in the management of NSTEMI or unstable angina. Methods: Multicenter retrospective study based on a nationwide registry from 14 Brazilian states (January 2020–June 2024). Patients were classified as NSTEMI, or unstable angina. Multivariable logistic regression was used to identify factors independently associated with conservative management. Analyses were performed using RStudio. Results and Conclusions: Invasive management decisions were largely driven by the acuity and clarity of clinical presentation, but also reflected important demographic and behavioral disparities. Male sex was consistently associated with lower odds of conservative management across NSTEMI and unstable angina, indicating a higher threshold for invasive referral in women regardless of disease severity. Lifestyle and risk profile also played a relevant role. A sedentary lifestyle independently predicted conservative management, possibly reflecting clinician perception of limited functional benefit. In contrast, traditional atherosclerotic risk factors such as dyslipidemia and smoking were inversely associated with conservative management, likely increasing physician confidence in obstructive coronary disease and favoring invasive investigation. Age demonstrated a bidirectional effect: it increased conservative management in NSTEMI, suggesting procedural risk aversion in older patients, but decreased it in unstable angina, consistent with a more proactive diagnostic approach. Chronic comorbidities showed limited independent influence. Conclusions: In both NSTEMI and unstable angina, invasive management was influenced by factors beyond clinical presentation, with male sex and traditional atherosclerotic risk factors consistently favoring invasive strategies, while a sedentary lifestyle was associated with conservative management. However, age showed a divergent pattern: it increased the likelihood of conservative management in NSTEMI, suggesting greater procedural risk aversion, but decreased it in unstable angina, reflecting a more proactive diagnostic approach. Overall, these findings highlight both shared and condition-specific drivers of decision-making, suggesting that non-clinical characteristics may contribute to variability and potential disparities in care.

Variable	Beta	OR (95% CI)	p-value	Events (n)
STEMI diagnosis	-1.245	0.29 (0.24–0.34)	<0.001	1213
NSTEMI diagnosis	-2.058	0.13 (0.06–0.17)	<0.001	1213
Age (per 10-year increase)	-0.052	0.95 (0.90–1.00)	0.065	1212
Male sex	-0.539	0.58 (0.51–0.67)	<0.001	1213
Typical chest pain (Type A/B)	-0.497	0.61 (0.53–0.70)	<0.001	1213
Diabetes mellitus	-0.121	0.89 (0.77–1.02)	0.102	1097
Hypertension	-0.115	0.89 (0.75–1.06)	0.187	1069
Dyslipidemia	-0.313	0.73 (0.63–0.84)	<0.001	1097
Smoking	-0.221	0.80 (0.66–0.97)	0.026	1097
Obesity	0.0531	1.05 (0.89–1.25)	0.535	1066
Sedentary lifestyle	0.2933	1.34 (1.15–1.56)	<0.001	1097



17659

IMPACT OF DOOR-TO-ECG DELAY ON CLINICAL OUTCOMES IN STEMI: INSIGHTS FROM A LARGE BRAZILIAN MULTICENTER REGISTRY

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Background/Introduction: Timely electrocardiogram is a cornerstone of STEMI management and a key quality-of-care metric. However, the impact of door-to-ECG (DTE) delays on patient outcomes remains uncertain, particularly in large real-world populations. Objectives: To evaluate the association between DTE time and in-hospital clinical outcomes in STEMI patients from a Brazilian cohort. Methods: A multicenter study was conducted using data from a large retrospective registry with data from 14 Brazilian states between January 2020 and June 2024 from the largest private hospital network in Brazil (n=7,171). The DTE time of patients with acute coronary syndrome (ACS) was analyzed in categories (<10min, 10–29min and ≥30min) and as a continuous variable every 10 minutes. Multivariable regression models were used to evaluate the effect of the variables on clinical outcomes. Logistic regression was used for binary outcomes and linear regression for continuous outcomes, with adjustment for age and sex. Results and Conclusions: A total of 1,345 patients with STEMI were included (75.6% male, mean age 61.3±13.6 years). Patients with DTE ≥30min had significantly higher in-hospital mortality (OR 3.10; 95%CI 1.27–7.55; p=0.013) and overall complication rates (OR 3.49; 95%CI 1.71–7.14; p<0.001). Delayed diagnosis was associated with increased length of stay (>10 days) (OR 2.57; 95%CI 1.23–5.39; p=0.012). Prolonged ICU stay (>5 days) was also higher in the >30min group (OR 3.00; 95%CI 1.26–7.16; p=0.013). Conversely, DTE <10min was associated with reduced mortality (OR 0.57; 95%CI 0.34–0.97; p=0.039) and fewer overall complications (OR 0.49; 95%CI 0.34–0.71; p<0.001). Each 10 minutes increment in DTE time was associated with higher mortality (OR 1.12; 95%CI 1.03–1.22; p=0.012), more complications (OR 1.10; 95%CI 1.02–1.20; p=0.020), higher acute respiratory failure rates (OR 1.18; 95%CI 1.02–1.37; p=0.030) and longer hospital stay (β 0.27; 95%CI 0.02–0.53; p=0.038). In summary, delays in DTE time were independently associated with higher mortality, more complications, and longer hospitalization in STEMI patients, highlighting the importance of early ECG in ACS management.

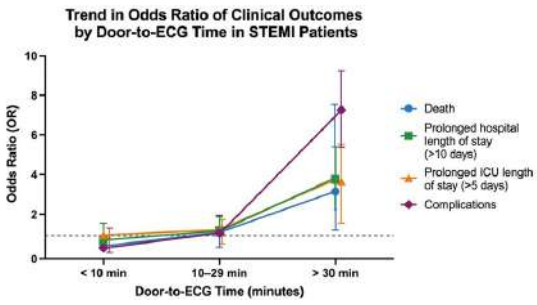


Table 1. Population characteristics.

Variable	DTE <10min (n=1,142)	DTE 10-29min (n=148)	DTE ≥30min (n=35)	p-value
Male sex, n(%)	873 (76.4)	105 (70.9)	25 (71.4)	0.285*
Age (years), M±SD	61.4 ± 13.5	63.9 ± 13.8	64.7 ± 16.3	0.053‡
Obesity, n(%)	224 (22.6)	27 (20.6)	9 (28.1)	0.653*
Hypertension, n(%)	686 (69.2)	100 (76.3)	20 (62.5)	0.160*
Diabetes, n(%)	313 (31.6)	54 (41.9)	15 (46.9)	**0.016***
Dyslipidemia, n(%)	391 (39.4)	59 (45.0)	6 (18.8)	**0.024***
Smoking hist., n(%)	237 (24.0)	26 (20.0)	12 (37.5)	0.114*
CVD family hist., n(%)	171 (17.5)	22 (16.9)	4 (12.9)	0.798*
CKD, n(%)	21 (8.3)	6 (16.2)	3 (23.1)	0.088*
Previous IM, n(%)	106 (42.1)	14 (37.8)	3 (23.1)	0.369*
In-hospital mortality	72 (6.3)	14 (9.5)	7 (20.0)	**0.004***
Complications	181 (16.6)	38 (26.8)	15 (44.1)	**<0.001***
Hosp. ≥10d, n(%)	177 (15.5)	26 (17.6)	12 (34.3)	**0.011***
ICU ≥5d, n(%)	489 (48.8)	59 (46.1)	20 (74.1)	**0.027***

*Yates's continuity-corrected Pearson's chi-squared test. ‡One-way ANOVA. CVD: cardiovascular disease. CKD: chronic kidney disease. ICU: intensive care unit.

15676

IMPACT OF THE COVID-19 PANDEMIC ON ACUTE MYOCARDIAL INFARCTION HOSPITALIZATIONS IN MARANHÃO: AN ECOLOGICAL TIME-SERIES STUDY (2018–2024)

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(1) UFMA - CAMPUS SAO LUIS - SÃO LUÍS - MA - BRASIL;

Background/Introduction: Acute myocardial infarction (AMI) remains a leading cause of cardiovascular mortality in Brazil. During the COVID-19 pandemic, emergency avoidance and system overload may have delayed AMI care, with consequences on hospitalization patterns and outcomes. Evidence on this impact in the Brazilian Northeast, a region with disparities in cardiovascular care access, is limited. Objectives: To compare AMI hospitalizations, in-hospital mortality, and length of stay across pre-pandemic, pandemic, and post-pandemic periods in Maranhão. Methods: Ecological time-series study using data from SIH/SUS (ICD-10 I21–I22) via DATASUS. Monthly records were divided into pre-pandemic (Jan/2018–Dec/2019), pandemic (Jan/2020–Dec/2021), and post-pandemic (Jan/2022–Sep/2024). Variables: monthly hospitalizations, mortality rate (%), and mean length of stay (days). Given the non-normal distribution of monthly data, Kruskal-Wallis was used as the primary test with DSCF pairwise comparisons; one-way ANOVA with Games-Howell post-hoc served as confirmatory analysis. The post-pandemic period (33 vs. 24 months) and DATASUS reporting cutoff at September 2024 are acknowledged limitations; monthly means were used to mitigate temporal asymmetry. Results and Conclusions: Mean monthly hospitalizations: 128.8 ± 20.2 (pre), 118.8 ± 23.2 (pandemic), 163.0 ± 17.5 (post). Pre vs. pandemic difference was not statistically significant (ANOVA p = 0.260; Kruskal-Wallis p = 0.345); post-pandemic was significantly higher than both periods (p < 0.001). In-hospital mortality rose from 12.5% (pre) to 15.0% (pandemic), then fell to 11.5% (post); pandemic was higher than both pre (p = 0.030) and post (p < 0.001), with no significant pre-post difference (p = 0.350). Length of stay: 8.1, 7.8, and 8.7 days (overall p = 0.006); pandemic vs. post differed significantly (p = 0.005), while pre did not differ from either period. AMI hospitalizations did not decline significantly during the pandemic, possibly reflecting the obligatory nature of AMI presentations, unlike chronic HF where decompensation may be initially managed at home. Elevated pandemic mortality suggests reduced access to timely AMI care during that period. The post-pandemic rebound in hospitalizations with normalized mortality supports recovery of care pathways with persisting increased demand.

		F	gl1	gl2	p
Internacoes	**Welch**	39.81	2	46.6	<.001
	Fisher	38.55	2	78	<.001
Mortalidade	**Welch**	7.68	2	47.0	0.001
	Fisher	9.50	2	78	<.001
Permanencia	**Welch**	5.61	2	47.6	0.006
	Fisher	5.82	2	78	0.004

Comparações múltiplas - Internacoes

		W	p
Pandemia	**Pos**	7.85	<.001
Pandemia	**Pre**	1.97	0.345
Pos	**Pre**	-7.30	<.001

Comparações múltiplas - Mortalidade

		W	p
Pandemia	**Pos**	-5.45	<.001
Pandemia	**Pre**	-4.08	0.011
Pos	**Pre**	1.98	0.342

Comparações múltiplas - Permanencia

		W	p
Pandemia	**Pos**	4.45	0.005
Pandemia	**Pre**	2.09	0.303
Pos	**Pre**	-2.33	0.225

18664

LEFT VENTRICULAR DYSFUNCTION AS A PREDICTOR OF MACE IN MYOCARDIAL INFARCTION WITH NON-OBSTRUCTIVE CORONARY ARTERIES (MINOCA): EVIDENCE FROM A BRAZILIAN TERTIARY REGISTRY

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Background/Introduction: Myocardial Infarction with Non-Obstructive Coronary Arteries (MINOCA) represents a heterogeneous entity with diverse pathophysiology. Although most patients present with preserved ventricular function, a subgroup develops systolic dysfunction (LVEF ≤40%), whose clinical and prognostic characterization remains incomplete. Objectives: To describe the clinical characteristics, etiologies, and outcomes in patients with MINOCA and left ventricular dysfunction (LVEF ≤40%), comparing them to those with preserved ventricular function (LVEF >40%). Methods: A retrospective cohort of 197 patients diagnosed with MINOCA and followed at a tertiary cardiology center between 2018 and 2023 in Brazil was analyzed. A total of 162 patients with documented LVEF were included and divided into two groups: LVEF ≤40% (n=46) and LVEF >40% (n=116). The primary outcome was MACE (death, recurrent myocardial infarction, stroke, or cardiovascular hospitalization). Secondary outcomes included individual components and functional symptoms. Categorical variables were compared using the chi-square or Fisher's exact test; continuous variables were analyzed using the t-test or Mann–Whitney test. Multivariate logistic regression was used to identify independent predictors of MACE. Results and Conclusions: Patients with LVEF ≤40% were significantly younger (46.2±11.8 vs 52.3±11.7 years; p=0.004), with a lower proportion of females (45.7% vs 57.8%; p=0.18). MACE occurred in 43.5% of the dysfunction group versus 16.4% in the preserved function group (p<0.001; OR=3.93; 95% CI 1.83–8.42). Mortality was higher in the dysfunction group (8.7% vs 0.9%; p=0.023). Recurrent cardiovascular hospitalization was the main differentiating component (47.8% vs 9.6%; p<0.001; OR=5.60). Dyspnea was more prevalent in patients with LVEF ≤40% (65.2% vs 28.4%; p<0.001). In multivariate analysis, LVEF as a continuous variable was an independent predictor of MACE (OR=0.926 per 1% increase; 95% CI 0.895–0.958; p<0.001), as was hypertension (OR=6.17; p=0.003). Left ventricular dysfunction in patients with MINOCA identifies a high-risk subgroup with significant cardiovascular morbidity and mortality, greater symptom burden, and frequent hospitalizations. LVEF as a continuous variable is an independent predictor of MACE, reinforcing the need for systematic ventricular function stratification in this population.

Tabela 1. Características demográficas e comorbidades por grupo de FEVE.

Variável	FEVE ≤40% (n=46)	FEVE >40% (n=116)	Valor p
Idade, anos (média±DP)	46,2±11,8	52,3±11,7	0,004*
Sexo feminino, n (%)	21 (45,7%)	67 (57,8%)	0,17
Hipertensão arterial sistêmica	24 (52,2%)	75 (64,7%)	0,14
Dislipidemia	22 (47,8%)	59 (50,9%)	0,73
Diabetes mellitus	9 (19,6%)	27 (23,3%)	0,61
Tabagismo	33 (71,7%)	66 (56,9%)	0,08
Obesidade	9 (19,6%)	21 (18,1%)	0,83
Fibrilação/flutter atrial	5 (10,9%)	6 (5,2%)	0,19
DRC (TFG <60 ml/min)	4 (8,7%)	3 (2,6%)	0,10
DPOC	2 (4,3%)	1 (0,9%)	0,19
Miocardiopatia prévia	4 (8,7%)	4 (3,4%)	0,22

Tabela 2. Desfechos clínicos e funcionais por grupo de FEVE.

Desfecho	FEVE ≤40% (n=46)	FEVE >40% (n=116)	Valor p	OR (IC 95%)
MACE (desfecho primário)	20 (43,5%)	19 (16,4%)	<0,001	3,93 (1,83–8,42)
Óbito por qualquer causa	4 (8,7%)	1 (0,9%)	0,023	10,5 (1,1–98,0)
Morte cardiovascular	4/4 (100%)	2/2 (100%)	–	–
Novo IAM	3 (6,5%)	7 (6,0%)	1,00	1,08 (0,27–4,37)
AVC	5 (10,9%)	4 (3,4%)	0,12	3,44 (0,87–13,6)
Nova hospitalização CV	22 (47,8%)	11 (9,6%)	<0,001	5,60 (2,36–13,3)
Revascularização	0 (0%)	1 (0,9%)	1,00	–
Dispneia (qualquer grau)	30 (65,2%)	33 (28,4%)	<0,001	5,03 (2,40–10,5)
Angina (qualquer grau)	4 (8,7%)	21 (18,1%)	0,16	0,43 (0,14–1,35)

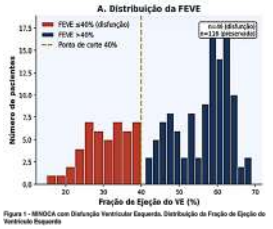


Figura 1 - MINOCA com Disfunção Ventricular Esquerda. Distribuição da Fração de Ejeção do Ventrículo Esquerdo

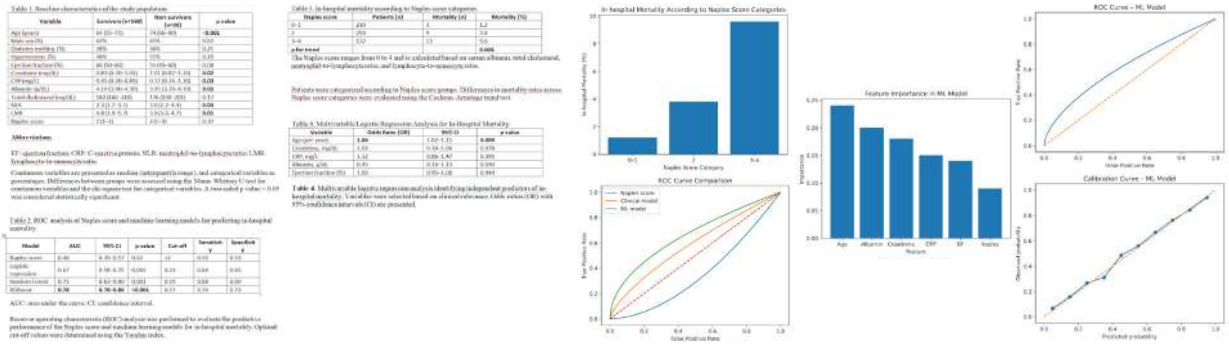
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MACHINE LEARNING OUTPERFORMS THE NAPLES SCORE FOR PREDICTING IN-HOSPITAL MORTALITY IN PATIENTS UNDERGOING CORONARY ANGIOGRAPHY

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Background/Introduction: The Naples prognostic score integrates inflammatory and nutritional parameters; however, its discriminative ability in heterogeneous cardiovascular populations remains uncertain. Accurate risk stratification in patients undergoing coronary angiography is essential, particularly for predicting in-hospital mortality. Machine learning (ML) approaches may offer improved predictive performance by capturing complex nonlinear relationships between clinical variables. Objectives: To evaluate the predictive performance of the Naples score and to compare it with machine learning models for predicting in-hospital mortality in patients undergoing coronary angiography. Methods: This retrospective study included 462 patients undergoing coronary angiography. The Naples score was calculated using admission laboratory parameters, and patients were categorized into three groups (0–1, 2, and 3–4). Predictive performance was assessed using receiver operating characteristic (ROC) analysis. Multivariable logistic regression and machine learning models, including random forest and gradient boosting, were developed. Model performance was evaluated using area under the curve (AUC) analysis. Results and Conclusions: Although in-hospital mortality increased across Naples score categories (p for trend = 0.004), the score demonstrated poor discriminative ability (AUC 0.48). Logistic regression showed modest performance (AUC 0.67), while machine learning models provided improved discrimination, with the best-performing model achieving an AUC of 0.78. Age was the only independent predictor in multivariable analysis (OR 1.06, p = 0.009). These findings suggest that machine learning approaches outperform traditional composite scores and may better capture complex risk patterns in patients undergoing coronary angiography.



17284

MINOCA IN YOUNG PATIENTS: PATHOPHYSIOLOGICAL MECHANISMS AND RISK FACTORS — A RETROSPECTIVE COHORT STUDY

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Background/Introduction: Myocardial infarction with non-obstructive coronary arteries (MINOCA) accounts for 5–15% of acute myocardial infarctions and represents a heterogeneous group of ischemic conditions without flow-limiting stenosis. It frequently affects younger adults and involves diverse mechanisms, including spontaneous coronary artery dissection (SCAD), vasospasm, and microvascular dysfunction. Accurate diagnosis requires exclusion of non-ischemic causes and often relies on advanced imaging. Objectives: To compare clinical characteristics and likely etiologic mechanisms of MINOCA in adults younger than 50 years versus those aged 50 years or older. Methods: We retrospectively analyzed 198 consecutive patients diagnosed with MINOCA between 2018 and 2023 at a tertiary cardiology center. Diagnosis followed the Fourth Universal Definition of Myocardial Infarction and required biochemical evidence of myocardial infarction, less than 50% stenosis in all major epicardial coronary arteries, and exclusion of alternative non-ischemic causes through clinical evaluation and imaging. Clinical and demographic characteristics, cardiovascular risk factors, and underlying mechanisms were compared according to age group. Continuous variables were analyzed using Student's t-test, and categorical variables using chi-square or Fisher's exact test. Logistic regression was performed to estimate the odds ratio (OR) for non-atherosclerotic mechanisms in younger versus older patients, with adjustment for clinically relevant confounders. Results and Conclusions: Among 198 patients, 90 (45.5%) were younger than 50 years. Younger individuals had lower prevalence of hypertension and higher rates of obesity and stimulant or illicit drug use. An underlying etiologic mechanism was identified in 47.7% of cases. Non-atherosclerotic mechanisms predominated in younger patients, particularly SCAD and vasospasm, whereas atherosclerotic causes were more frequent in older individuals. Younger age was independently associated with lower odds of atherosclerotic etiology (OR 0.36; 95% CI 0.15–0.88). MINOCA in young adults is characterized by a distinct clinical profile with fewer traditional risk factors and predominance of non-atherosclerotic mechanisms. These findings reinforce the importance of systematic etiologic investigation, including advanced cardiac imaging, and support age-tailored diagnostic and therapeutic strategies.

Mechanism	< 50 y (n = 90)	≥ 50 y (n = 108)	Test Statistic	p value
Atherosclerotic plaque injury	12 (23.1%)	19 (45.2%)	χ^2 = 4.81	0.029
SCAD	15 (28.8%)	5 (10.6%)	χ^2 = 7.02	0.008
Vasospasm / vasomotor disorder	14 (26.9%)	9 (19.1%)	χ^2 = 1.20	0.27
Thromboembolic / embolic	7 (13.5%)	3 (6.4%)	χ^2 = 1.81	0.18
Other (bridge / aneurysm)	4 (7.7%)	2 (4.3%)	χ^2 = 0.54	0.46

TABLE 2: Etiologic mechanisms of MINOCA by age group (N = 198)

Values are n (%). χ^2 = Pearson chi-square; p < 0.05 significant.

Cause Group	<50 years (n = 52)	≥50 years (n = 42)	Total (n = 94)	Test / regression	p
Atherosclerotic (CAD <50%)	12 (23.1%)	19 (45.2%)	31 (33%)	χ^2 = 4.81	0.0285
No atherosclerotic	40 (76.9%)	23 (54.8%)	63 (67%)	—	
Total	**52 (100%)**	**42 (100%)**	**94 (100%)**	—	
OR (95% CI)	0.36 (0.15–0.88)				p = 0.0251

TABLE 3: Distribution of patients with MINOCA by age group and etiologic category (atherosclerotic vs non-atherosclerotic)

Values = n (%). Pearson χ^2 for categorical comparison; logistic regression used to estimate odds ratio (OR) and 95% confidence interval.

18320

MYOCARDIAL VIABILITY ASSESSED BY LATE GADOLINIUM ENHANCEMENT ON CARDIAC MAGNETIC RESONANCE DOES NOT PREDICT LV FUNCTIONAL RECOVERY NOR CLINICAL OUTCOMES AFTER CABG IN ISCHEMIC CARDIOMYOPATHY: SINGLE-CENTER COHORT (2022–2025)

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Background/Introduction: In patients with ischemic cardiomyopathy and severe LV dysfunction, viability testing has been losing its decision-making weight. The STICH substudy (Bonow, NEJM 2011; Panza, NEJM 2019) — based on SPECT/echo — did not demonstrate a significant interaction between viability and CABG benefit, and REVIVED-BCIS2 (Perera, NEJM 2022) reinforced this limitation in the percutaneous context. The 2024 ESC guideline on chronic coronary syndromes leaves its isolated decision-making role open. The incremental value of late gadolinium enhancement (LGE) on cardiac magnetic resonance imaging (CMRI) for predicting functional recovery and outcomes after CABG remains uncertain. Objectives: The aim of the study was to evaluate the prognostic value of late gadolinium enhancement on cardiac magnetic resonance imaging for left ventricular functional recovery and the occurrence of clinical outcomes after coronary artery bypass grafting. Methods: Single-center observational cohort of patients with CAD and LVEF <40% who underwent preoperative CMRI before CABG (2022–2025). Viability was pre-defined in the revascularized territories, based on the AHA 17-segment model: absent — transmural LGE >50% in ≥4 segments; present — LGE <50% in ≥4 segments. Outcomes: functional remodeling (ΔLVEF and ΔLVESD pre- vs. postoperative) and extended MACE at follow-up. Analysis: paired non-parametric tests, ANCOVA adjusted for baseline LVEF, and Kaplan–Meier with log-rank. Results and Conclusions: Fifty-seven patients were included; 8 extended MACE occurred over a median follow-up of 3 years. In the overall cohort, significant reverse remodeling was observed: ΔLVEF +4.1% (p<0.001) and ΔLVESD −9.3 mm (p<0.001). LGE-based viability did not discriminate functional recovery, even after adjustment for baseline LVEF (ANCOVA p=0.786). Extended MACE-free survival was similar between groups (log-rank p>0.05). In patients with ischemic cardiomyopathy and LVEF <40% undergoing CABG, significant LV functional improvement and reverse remodeling occurred regardless of LGE viability status, which also failed to discriminate clinical outcomes. Limitations include the single-center observational design and modest sample size. These real-world data reinforce — in alignment with STICH, REVIVED-BCIS2, and the 2024 ESC guideline — that CMRI-based viability should not be an isolated criterion for surgical indication, but rather integrated into multidisciplinary assessment (coronary anatomy, symptoms, comorbidities, and surgical risk).

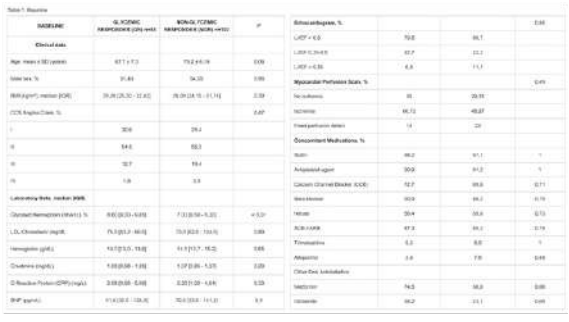
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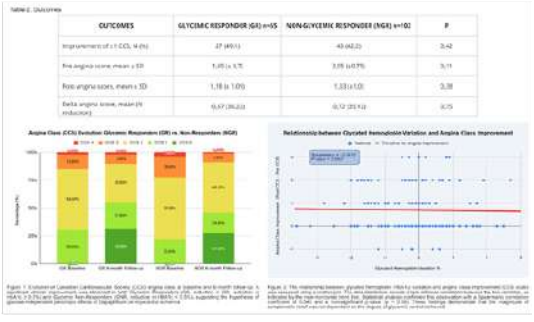
PLEIOTROPIC EFFECTS OF DAPAGLIFLOZIN ON ANGINA PECTORIS: A RETROSPECTIVE ANALYSIS

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Background/Introduction: Sodium-glucose cotransporter-2 inhibitors (SGLT2i) provide cardiovascular benefits beyond glycemic regulation, potentially through improved myocardial bioenergetics and reduced oxidative stress. While SGLT2i may enhance coronary flow reserve, clinical evidence regarding sustained angina reduction remains limited. Objectives: To evaluate the impact of dapagliflozin on Canadian Cardiovascular Society (CCS) angina class improvement and to determine its correlation with HbA1c reduction. Methods: This single-center retrospective study (2022–2025) enrolled diabetic patients (HbA1c ≥ 6.5%) with stable angina (> 6 months) at first prescription of dapagliflozin 10mg/day. Patients with concurrent antianginal titration or revascularization were excluded. The primary endpoint was a ≥ 1 CCS class improvement over 3 to 12 months. To isolate pleiotropic effects, patients were stratified into Glycemic Responders (GR; ΔHbA1c ≥ 0.5%) and Non-Glycemic Responders (NGR; ΔHbA1c < 0.5%). Results and Conclusions: Results: The study analyzed 157 patients (53,1% male; mean age 69.3 ± 6.7 years), characterized by a high prevalence of obstructive coronary artery disease (94.7%). At baseline, the NGR group had higher HbA1c (8.6% IQR [8,00 - 9,85] vs. 7.0% IQR [6,50 - 8,20]; p < 0.001), but lower multi-vessel disease prevalence (16.7% vs 45%; p = 0.018) compared to GR. Initial CCS distribution was balanced between groups (p = 0.47). At a median 6-month follow-up, significant CCS reduction occurred in both cohorts: 49.1% in the GR group (mean CCS 1.85 ± 0,7 to 1.18 ± 1,09; p < 0.001) and 42.2% in the NGR group (mean CCS 2.05 ± 0,75 to 1.33 ± 1,0; p < 0.001). Complete symptom resolution (CCS 0) was achieved in 38% of GR and 28% of NGR (p = 0.42). The use of standard antianginal and cardioprotective medications was high and balanced across both groups, ensuring comparable background therapy. Clinical response was independent of baseline ventricular function, though the LVEF < 35% subgroup analysis was limited by sample size. Notably, scatter plot analysis revealed a complete lack of linear correlation between the magnitude of HbA1c reduction and CCS improvement (Spearman's ρ = - 0.043; p = 0.59). Conclusion: Dapagliflozin was associated with significant improvement in angina pectoris regardless of glycemic response or ventricular function. These findings support the hypothesis of direct cardioprotective mechanisms on microcirculation and myocardial efficiency.





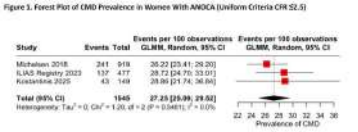
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PREVALENCE OF CORONARY MICROVASCULAR DYSFUNCTION IN WOMEN WITH ANGINA AND NON-OBSTRUCTIVE CORONARY ARTERIES: A META-ANALYSIS WITH UNIFORM DIAGNOSTIC CRITERIA

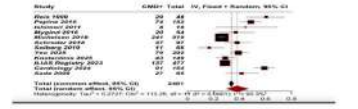
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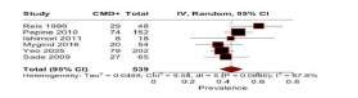
Background/Introduction: Angina with non-obstructive coronary arteries (ANOCA) disproportionately affects women, and coronary microvascular dysfunction (CMD) is recognized as a central pathophysiological mechanism. However, accurate estimates of its prevalence are limited by methodological heterogeneity among studies. Objectives: To estimate the prevalence of CMD in women with ANOCA using a uniform diagnostic criterion (coronary flow reserve – CFR ≤ 2.5) assessed by invasive thermodilution. Methods: Systematic review of the PubMed, Embase, and Scopus databases (2000–2026). Three observational studies were included that evaluated women with confirmed ANOCA by coronary angiography, who underwent invasive microvascular function testing, with CMD defined as CFR ≤ 2.5. Data extraction was performed independently, and methodological quality was assessed using the Newcastle-Ottawa Scale. A fixed-effects model was used for meta-analysis (PROSPERO protocol CRD420261320465). Results and Conclusions: Three studies were included (Michelsen 2018, n=919; ILIAS Registry 2023, n=477; Kostantinis 2025, n=149), totaling 1,545 women (mean age: 57–64 years). Individual CMD prevalence ranged from 26.2% to 28.9%. The pooled prevalence was 27.2% (95% CI: 24.8%–29.7%), with no heterogeneity (I^2 = 0%; p = 0.42). Sensitivity analyses confirmed the robustness of the findings. All studies had good methodological quality (Newcastle-Ottawa ≥ 8).



eFigure 2. Pooled Prevalence of Coronary Microvascular Dysfunction in Women With ANOCA – Meta-Analysis of 12 Studies Including All Diagnostic Criteria



eFigure 3. Pooled Prevalence of Coronary Microvascular Dysfunction in Women With ANOCA Assessed by Other Diagnostic Methods (Doppler, PET, etc.) – Random-Effects Meta-Analysis of 6 Studies



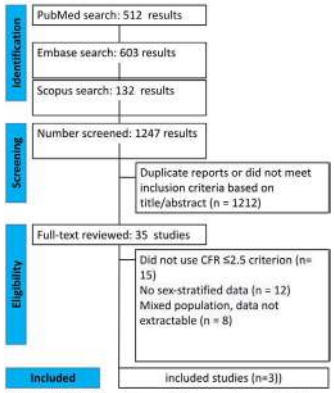


Figure 1. PRISMA flow diagram of study screening and selection

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RECLASSIFICATION OF SCAI SHOCK STAGING AND MORTALITY RISK IN ST-SEGMENT ELEVATION MYOCARDIAL INFARCTION PATIENTS USING LVOT-VTI AND POINT-OF-CARE LUNG ULTRASOUND

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Background/Introduction: The Society for Cardiovascular Angiography and Interventions (SCAI) shock classification categorizes patients with cardiogenic shock (CS) to standardize severity and guide management. The LUV classification combines lung ultrasound (LUS) and the left ventricular outflow tract velocity-time integral (LVOT-VTI), enhancing prognostic capability in patients with ST-segment elevation myocardial infarction (STEMI) compared to clinical assessment alone. Objectives: We aimed to evaluate whether LUV can improve the early classification of SCAI stages to guide CS management. Methods: A cohort of STEMI patients treated with primary percutaneous coronary intervention (pPCI) at a single-center general hospital was evaluated. LUS, LVOT-VTI, and SCAI stages were obtained upon hospital admission. The primary endpoint was in-hospital mortality. Results and Conclusions: A total of 549 patients were included, with a mean age of 61.9 years, and 64.1% were male. In-hospital mortality was observed in 57 (10.4%) patients and increased with worsening SCAI stage (A: 2.7%; B: 10.7%; C: 37.8%; D: 66.7%; E: 80%) and SCAI-LUV stage (A: 1.0%; B: 3.6%; C: 37.8%; D: 66.7%; E: 80%). A total of 100 patients (18.2%) were reclassified into different risk categories with the addition of LUV to SCAI. Considering only the 452 patients in SCAI stages A and B, the areas under the ROC curve for SCAI staging and SCAI-LUV were 0.645 and 0.828, respectively, with a net reclassification index (NRI) of 0.122. In patients with STEMI, pulmonary congestion identified by LUS and indirect cardiac output estimation by LVOT-VTI are associated with in-hospital mortality and correlate with the severity and progression of the SCAI shock stage. Furthermore, the LUV classification presented an NRI of 0.122 in patients in SCAI stages A and B. Therefore, integrating non-invasive point-of-care ultrasound into the initial assessment of cardiogenic shock may facilitate the early identification of high-risk patients and allow for more individualized initial therapeutic strategies.

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ST-SEGMENT ELEVATION MYOCARDIAL INFARCTION WITH NON-OBSTRUCTIVE CORONARY ARTERIES AFTER EARLY ANGIOGRAPHY: CHARACTERIZATION OF A MINOCA PHENOTYPE WITHIN A PHARMACOINVASIVE STRATEGY

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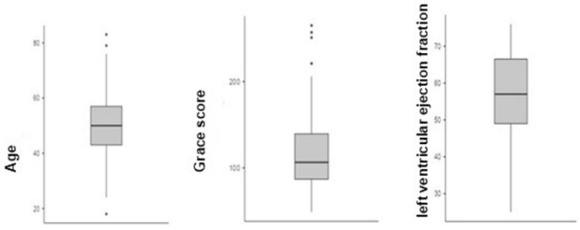
Background/Introduction: ST-segment elevation myocardial infarction (STEMI) treated with a pharmacoinvasive strategy combines immediate fibrinolysis followed by early coronary angiography. A relevant proportion of patients undergoing this approach present without significant obstructive coronary artery disease, representing myocardial infarction with non-obstructive coronary arteries (MINOCA), a heterogeneous condition associated with diagnostic uncertainty and therapeutic challenges. Objectives: To characterize the clinical, epidemiological, laboratory, and angiographic profile of patients with STEMI undergoing a pharmacoinvasive strategy who presented without obstructive coronary lesions, exploring phenotypes compatible with MINOCA and potential diagnostic mimickers. Methods: This single-center descriptive study included consecutive patients with STEMI treated with a pharmacoinvasive strategy. Demographic, clinical, laboratory, and angiographic variables were collected, including ischemic presentation, functional class, risk scores, renal function, and markers of myocardial injury. Continuous variables were expressed as mean±SD or median [IQR], and categorical variables as frequencies (%). Results and Conclusions: Among 2,418 patients undergoing a pharmacoinvasive strategy, 67 (3%) presented without obstructive coronary lesions (≥50%) at angiography. Patients were predominantly male (80%), with hypertension in 60%, diabetes in 9%, and active smoking in 55%. Clinical presentation was mainly typical chest pain and was comparable to patients with obstructive coronary artery disease. In-hospital mortality occurred in one patient (1.5%) in the non-obstructive group compared with 161 patients (7%) among patients with obstructive disease. Patients with a MINOCA phenotype demonstrated marked clinical and laboratory heterogeneity. Conclusion: A clinically relevant proportion of patients undergoing a pharmacoinvasive strategy for STEMI presented with non-obstructive coronary arteries, consistent with a MINOCA phenotype. Despite similar clinical presentation, these patients showed lower in-hospital mortality compared with obstructive STEMI. Recognition of this phenotype highlights the need for systematic etiological investigation to differentiate ischemic mechanisms from mimickers and to guide tailored therapeutic management.

Table. Clinical, functional, and biomarker characteristics of the "MINOCA" group

Age (m ± sd)	51,27 ± 13,22
BMI (m ± sd)	26,18 ± 4,55
MDRD (m ± sd)	91,96 ± 34,54
Killip-Kimball I-IV (%)	85; 7,5; 1,5;6
GRACE (m ± sd)	119± 48,46
LVEF (m ± sd)	55,66 ± 13,01
Tropo adm md (IIQ)	265 (15,9-2219)

Legend: BMI: body mass index; MDRD (Modification of Diet in Renal Disease): creatinine clearance; Killip-Kimball classification on admission; GRACE (Global Registry of Acute Coronary Events): mortality score on admission; LVEF: left ventricular ejection fraction; Tropo adm: troponin on admission. Data are expressed as mean ± SD; median and interquartile range.

Figure: Box plots of age, GRACE score, and left ventricular ejection fraction variables



16628

TELECARDIOLOGY AND MORTALITY IN CRITICAL CARDIOVASCULAR PATIENTS IN URGENT CARE UNITS

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Background/Introduction: Cardiovascular diseases are the leading cause of death worldwide. ST-segment elevation myocardial infarction (STEMI) and severe arrhythmias are acute conditions in which early diagnosis and immediate treatment are essential for favorable clinical outcomes. A project aimed at optimizing the quality of emergency care implemented 24-hour teleconsultation with remote electrocardiogram (ECG) interpretation, providing real-time specialist support for urgent care units. Objectives: To evaluate the association between specialist teleconsultation and mortality among critical patients with STEMI and severe arrhythmias during the implementation of a cardiovascular care protocol. Methods: Longitudinal observational study with a comparative time-period design conducted in 24 urgent care units during the second implementation cycle of the care protocol. Two consecutive four-month periods were analyzed (June–September 2025 and October 2025–January 2026). Critical cases were defined according to operational criteria, with outcomes including discharge, hospitalization, transfer, or death. Follow-up was performed through contact with the units 48 hours after ECG acquisition. The indicators evaluated were mortality rate and teleconsultation rate. Exploratory analysis included calculation of odds ratio (OR) for mortality associated with teleconsultation. Results and Conclusions: A total of 1,406 critical cases were recorded. Overall mortality decreased from 5.06% in the first period to 4.42% in the second, representing a relative reduction of 12.6%, without statistical significance (p = 0.58). Teleconsultation rates increased from 77.9% to 79.0%. Exploratory analysis demonstrated an OR for mortality of 0.55 (95% CI: 0.22–1.38) among patients discussed with a specialist, suggesting a lower likelihood of death, although without statistical significance. The proportion of teleconsulted cases among patients who died decreased from 97% to 86% between periods. Implementation of a telecardiology-supported care protocol was associated with an observed trend toward reduced mortality and sustained high teleconsultation adherence. Although statistical significance was not achieved, findings suggest potential clinical benefit of synchronous specialist support in critical cardiovascular scenarios. Continued follow-up and expanded sample size may allow more robust evaluation of the impact on mortality.

20633

TEMPORAL TRENDS AND REGIONAL DISPARITIES IN CORONARY ANGIOPLASTY PROCEDURES PERFORMED IN THE BRAZILIAN PUBLIC HEALTH SYSTEM BETWEEN 2020 AND 2025: A NATIONWIDE SIH/SUS ANALYSIS

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Background/Introduction: Percutaneous coronary intervention (PCI) remains a cornerstone therapy for acute coronary syndromes and selected patients with chronic coronary artery disease, improving symptoms and clinical outcomes. Contemporary guidelines emphasize timely access to revascularization, particularly for ST-elevation myocardial infarction and high-risk ischemic presentations. However, in middle-income countries, unequal distribution of specialized cardiovascular services may limit access to PCI. In Brazil, updated nationwide analyses evaluating post-pandemic procedural trends within the Unified Health System (SUS) are scarce. Recent evidence also highlights persistent global disparities in cardiovascular care delivery. Objectives: To evaluate temporal trends and regional distribution of coronary angioplasty procedures performed in the Brazilian Public Health System from 2020 to 2025. Methods: Ecological retrospective study using publicly available data from the Brazilian Hospital Information System (SIH/SUS), accessed through DATASUS. Approved hospital admissions (AIH) related to the following procedures were included: coronary angioplasty, angioplasty with one stent, two stents, primary angioplasty, and angioplasty in coronary grafts. The study period comprised January 2020 to December 2025. Annual procedural volume and regional distribution were analyzed descriptively. Results and Conclusions: A total of 645,888 PCI-related hospital authorizations were identified during the study period. Annual volume increased progressively from 89,099 procedures in 2020 to 133,935 in 2025, representing a 50.3%. Marked regional concentration was identified: Southeast (46.8%), South (27.1%), Northeast (15.3%), Midwest (7.8%), and North (3.0%). Between 2020 and 2025, coronary angioplasty volume in the Brazilian public health system increased substantially, suggesting recovery after the COVID-19 disruption and expansion of interventional cardiology capacity. Nevertheless, pronounced regional disparities persisted, with nearly three-quarters of procedures concentrated in the Southeast and South regions. These findings support the need for public policies aimed at decentralizing high-complexity cardiovascular care, improving referral networks, and expanding equitable access to PCI across Brazil.

Table 1. Annual Coronary Angioplasty Volume in Brazil (SUS), 2020–2025

Year	Number of Procedures	Annual Change
2020	89,099	—
2021	92,197	+3.5%
2022	100,126	+8.6%
2023	107,211	+7.1%
2024	123,320	+15.0%
2025	133,935	+8.6%
Total	**645,888**	—

Table 2. Regional Distribution of Coronary Angioplasty Procedures

Region	Procedures	Share of Total
Southeast	302,093	46.8%
South	174,968	27.1%
Northeast	99,037	15.3%
Midwest	50,348	7.8%
North	19,442	3.0%

17499

UNMASKING SPONTANEOUS CORONARY ARTERY DISSECTION: INSIGHTS FROM A PROSPECTIVE COHORT CHALLENGING CONVENTIONAL RISK PARADIGMS

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Background/Introduction: Spontaneous coronary artery dissection (SCAD) is an underrecognized, non-atherosclerotic cause of acute myocardial infarction, predominantly affecting women and often occurring in the absence of traditional cardiovascular risk factors. Its heterogeneous presentation and uncertain triggers pose diagnostic and therapeutic challenges, highlighting the need for real-world data. Objectives: Prospective cohort study including consecutive patients diagnosed with SCAD between 2018 and 2026 in a university hospital. Clinical, angiographic, and therapeutic characteristics, as well as in-hospital and long-term outcomes, were analyzed. Methods: A total of 47 patients were included, with a marked female predominance (93.9%) and mean age of 47.5 ± 11.5 years. Most patients had few or no traditional cardiovascular risk factors.Triggers were absent in 81% of cases, with emotional stress identified in 12.1% and no cases related to physical stress. Type 2 SCAD was the most frequent angiographic pattern.Notably, 45.4% of patients received thrombolysis prior to diagnosis. During hospitalization, 27.3% required intensive care, with cardiogenic shock in one case and one in-hospital cardiovascular death.At follow-up, recurrence was low (3 cases), and no patients required revascularization or developed heart failure. Results and Conclusions: SCAD predominantly affected women without typical risk factors and was frequently not associated with identifiable triggers. Outcomes were favorable with a conservative approach. These findings support increased clinical awareness, avoidance of unnecessary interventions, and individualized management. Importantly, these findings call for a paradigm shift in the evaluation of myocardial infarction in women.

Table. Baseline characteristics, clinical presentation and management (n = 47)

Female sex, n (%)	44 (93.6)
Age, years, mean ± SD	47.5 ± 11.5
Hypertension, n (%)	25 (53.2)
Diabetes mellitus, n (%)	5 (10.6)
Dyslipidemia, n (%)	14 (29.8)
Smoking, n (%)	9 (19.1)
Anxiety/depression, n (%)	4 (8.5)
Alcohol use, n (%)	4 (8.5)
Illicit drug use, n (%)	2 (4.3)
Puerperium, n (%)	6 (12.8)
Chest pain, n (%)	32 (68.1)
STEMI, n (%)	27 (57.4)
NSTEMI, n (%)	16 (34.0)
Unstable angina, n (%)	2 (4.3)
Stable angina, n (%)	2 (4.3)
Left anterior descending artery, n (%)	17 (36.2)
Diagonal branch, n (%)	9 (19.1)
Marginal branch, n (%)	7 (14.9)
Circumflex artery, n (%)	3 (6.4)
Left main coronary artery, n (%)	3 (6.4)
Right coronary artery, n (%)	2 (4.3)
Percutaneous coronary intervention, n (%)	14 (29.8)
Medical therapy, n (%)	33 (70.2)

Acute Cardiovascular Care / Cardiovascular Emergencies



81º CONGRESSO BRASILEIRO DE CARDIOLOGIA together with WORLD CONGRESS OF CARDIOLOGY





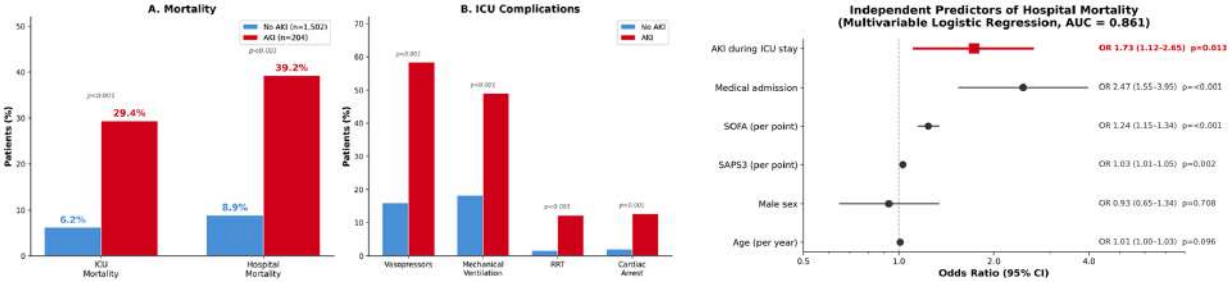
15958

ACUTE KIDNEY INJURY AS AN INDEPENDENT PREDICTOR OF HOSPITAL MORTALITY IN A CARDIAC INTENSIVE CARE UNIT

RENATO DE FARIAS VIGOLO1; RAPHAEL FERNANDES CARDOSO VIANNA ALVES1; CINTIA PERINETTI ALVES MARTINS1; PAULO GONÇALVES MARTIN1; VITOR AZEM ARANTES CALIL1; EDUARDO ESTEVES BRAMBATTI1; CAROLINA BERTINI BONINI1; ADIEL CARVALHO JUNIOR1; LIVIA MARIANA LIMA GAVA1; MAURICIO DE NASSAU MACHADO1;

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Background/Introduction: Acute kidney injury (AKI) is a frequent complication in critically ill cardiac patients, associated with increased morbidity and mortality. However, its independent impact on mortality in cardiac intensive care units (CICU) in Brazil remains poorly characterized, particularly after adjustment for severity scores such as SAPS3 and SOFA. Objectives: To evaluate the incidence of AKI and its independent impact on hospital mortality in patients admitted to a public tertiary hospital CICU. Methods: Retrospective cohort including consecutive admissions to a 23-bed CICU between October 2024 and April 2026. AKI was defined according to KDIGO criteria during ICU stay. The primary outcome was hospital mortality. Secondary outcomes included ICU mortality, need for advanced organ support, and length of stay. Multivariable logistic regression was adjusted for age, sex, SAPS3, SOFA, and admission type. Data from the Epimed Monitor system. Results and Conclusions: A total of 1,706 patients were included (median age 65 years, 62.1% male). AKI incidence was 12.0% (n=204). Patients with AKI were older (median 68 vs 65 years; p=0.002), with higher SOFA (6 vs 1; p<0.001) and SAPS3 scores (63 vs 41; p<0.001). Hospital mortality was 39.2% in AKI patients vs 8.9% without AKI (p<0.001). ICU mortality followed a similar pattern (29.4% vs 6.2%; p<0.001). AKI patients required more vasopressors (58.3% vs 16.0%), mechanical ventilation (49.0% vs 18.2%), and renal replacement therapy (12.3% vs 1.7%), all p<0.001. On logistic regression, AKI was an independent predictor of hospital mortality (OR 1.73; 95%CI 1.12–2.65; p=0.013), along with SOFA (OR 1.24; p<0.001), SAPS3 (OR 1.03; p=0.002), and medical admission (OR 2.47; p<0.001). The model achieved an AUC of 0.861. AKI during CICU stay is an independent predictor of hospital mortality, even after adjustment for severity scores. Its high incidence and association with advanced organ support requirements underscore the importance of early renal monitoring and nephroprotective strategies in this population.



21879

ANATOMICAL DISTRIBUTION AND OUTCOMES IN ACUTE PULMONARY EMBOLISM: DOES LOCATION REALLY MATTER?

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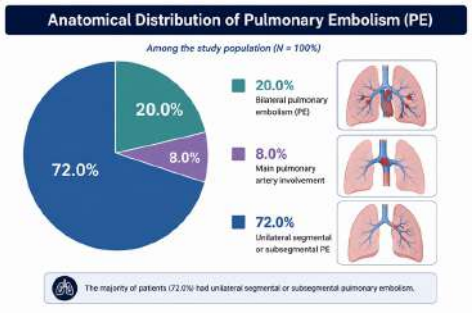
(1) SANATORIO DELTA, ROSARIO - ARGENTINA;

Background/Introduction: Acute pulmonary embolism (PE) is the third leading cause of cardiovascular mortality. Its prognosis ranges from mild cases to cardiogenic shock with high mortality. Early risk stratification is based on clinical evaluation, hemodynamic status, biomarkers, and right ventricular (RV) dysfunction. However, the anatomical extent of PE may influence RV overload and outcomes, particularly in elderly patients. Objectives: To evaluate the association between the anatomical extent of acute pulmonary embolism and mortality in elderly patients. Methods: A retrospective, single-center registry was conducted between May 2024 and February 2026, including patients hospitalized with a diagnosis of PE in a high-complexity private institution. Variables included age, sex, risk factors, clinical presentation, anatomical extent, complications, treatment, and mortality. Results and Conclusions: A total of 105 patients were included, with a median age of 72 years (IQR 66–77); 61.0% were female. Baseline characteristics of the study participants are summarized in Table 1. At admission, 79.8% presented dyspnea, 21.2% chest pain, 16.3% palpitations, 2.3% hemoptysis, and 2.9% syncope. Lower limb pain was reported in 35.2%, and altered mental status in 7.7%. Deep vein thrombosis was diagnosed in 41.8%. According to the PESI score, 8.7% were class I, 16.3% class II, 28.3% class III, 15.2% class IV, and 31.5% class V. On echocardiography, 6.0% had isolated right atrial dilation, 12.1% right ventricular dilation, and 14.5% both; mild RV dysfunction was observed in 10.5% and severe in 4.5%. Regarding anatomical distribution, 20.0% had bilateral PE, 8.0% main pulmonary artery involvement, and 72.0% unilateral segmental or subsegmental PE (Figure 1). During hospitalization, 6.7% developed hemodynamic instability, 5.0% required inotropes, and 4.9% mechanical ventilation. Overall mortality was 9.2%, with no significant differences between bilateral and unilateral PE (4.4% vs 11.3%; p=0.445) or in hemodynamic instability (7.1% vs 5.6%; p=0.540). Patients with bilateral localization showed a trend toward higher right ventricular dysfunction (23.1% vs 13.5%; p=0.317). Mortality was higher in patients >70 years (11.9% vs 5.1%; p=0.224). Patients with hemodynamic instability had higher mortality (50.0% vs 6.5%; p=0.010). These findings suggest that bilateral anatomical involvement is not associated with worse prognosis or increased hemodynamic instability compared with unilateral PE in elderly patients.

Table 1. Baseline Characteristics of the Registry Participants

Characteristics	Total (n=105)
Female sex	61.0%
Male sex	39.0%
Median age	72 (66–77)
Temporary immobilization	38.5%
Major trauma	12.0%
Recent surgery	26.0%
Autoimmune disease	2.0%
Active malignancy	29.0%
Malignancy in remission	3.0%
Previous PE	8.7%
Previous DVT	16.5%
Previous DVT and PE	3.9%

PE = pulmonary embolism; DVT = deep vein thrombosis.



21491

DIAGNOSTIC ACCURACY OF POINT-OF-CARE ULTRASOUND IN IDENTIFYING ABDOMINAL AORTIC ANEURYSM IN EMERGENCY SETTINGS: A SYSTEMATIC REVIEW

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Background/Introduction: Abdominal aortic aneurysm (AAA), defined as a dilation ≥ 3 cm, presents a mortality rate of up to 90% following rupture. In the emergency department, diagnosis is challenging, as approximately 50% of patients do not manifest the classic triad (hypotension, back pain, and pulsatile mass), leading to misdiagnoses such as renal colic or diverticulitis. Point-of-care ultrasound (POCUS) has established itself as an essential bedside tool due to its rapid and non-invasive nature. Studies indicate that, when performed by emergency physicians, the technique has a sensitivity of 99% and a specificity of 98%, streamlining surgical consultation and definitive management, especially in unstable patients. Objectives: To evaluate the diagnostic accuracy of POCUS in identifying AAA in emergencies, analyzing sensitivity, specificity, predictive values, and clinical applicability. Methods: A systematic review conducted according to the PRISMA protocol. The search was performed across PubMed, EMBASE, and Cochrane Library databases, using descriptors such as “point-of-care ultrasound”, “POCUS”, “abdominal aortic aneurysm”, “emergency ultrasound”, and “diagnostic accuracy”. Out of 1,787 initial studies, 9 articles (observational studies, prospective studies, and meta-analyses) were selected for the final review after applying eligibility criteria. The primary outcome was the diagnostic accuracy of the method. Results and Conclusions: Among the 9 studies included, POCUS demonstrated high diagnostic accuracy for AAA identification in emergency settings. In the studies by Rubano et al., sensitivity ranged from 97.5% to 100% and specificity from 94.1% to 100%. Rowland et al. and Costantino et al. reported 100% sensitivity and specificity, while Jones et al. demonstrated 97.5% sensitivity and 100% specificity. A near-zero negative likelihood ratio reinforced the method’s ability to exclude AAA in symptomatic patients. The studies also demonstrated reduced diagnostic time and faster clinical decision-making in unstable patients. Despite limitations related to operator dependence and technical difficulties, POCUS demonstrated high applicability as a rapid, non-invasive diagnostic tool in emergency settings.

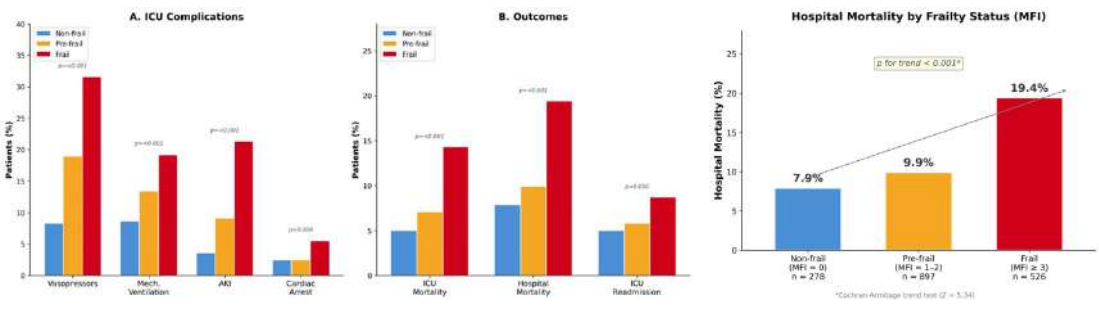
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IMPACT OF FRAILTY ON IN-HOSPITAL MORTALITY IN A CARDIAC INTENSIVE CARE UNIT: A RETROSPECTIVE COHORT

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Background/Introduction: Frailty is a multidimensional syndrome associated with adverse outcomes in critically ill patients. Even though it is widely studied in geriatric and surgical scenarios, its impact on the cardiac intensive care unit (CICU) remains poorly studied in Brazil. The “Modified Frailty Index” (MFI) is a validated and easy-to-use tool for the point-of-care assessment of frailty. Objectives: To analyze the association between frailty measured by MFI and hospital mortality in patients admitted to the CICU of a public tertiary hospital. Methods: A retrospective cohort study was conducted, including all consecutive admissions to a 23-bed CICU of a tertiary hospital from October 2024 to April 2026. Patients were classified by the MFI tool as “non-frail” (MFI=0), “pre-frail” (MFI=1-2) and “frail” (MFI ≥ 3). Primary outcome was defined as hospital mortality. Secondary outcomes included mortality in the intensive care unit, need for organ support and length of stay. Data was prospectively collected from the “Epimed Monitor” system. Results and Conclusions: A total of 1,706 patients were included (median age of 65 years, 62.1% men, 62.5% clinical admissions). Patients were distributed as follows: 278 (16.3%) non-frail, 897 (52.6%) pre-frail and 526 (30.8%) frail. Frail patients were older (median 68 vs 60 years; p<0.001) and had higher SOFA (median 2 vs 0; p<0.001) and SAPS 3 (48 vs 36; p<0.001) scores. Hospital mortality increased progressively across frailty groups: 7.9%, 9.9%, and 19.4% (p<0.001, test for trend). Mortality in the intensive care unit followed a similar pattern: 5.0%, 7.1% and 14.3% (p<0.001). Frail patients needed more vasopressors (31.6% vs 8.3%; p<0.001), mechanical ventilation (19.2% vs 8.6%; p<0.001) and developed more acute kidney injury (21.3% vs 3.6%; p<0.001). Length of stay was longer in frail patients (median 12 vs 7 days; p<0.001). In clinical patients, mortality reached 24.3% vs 8.4% in non-frail (p<0.001). Frailty measured by MFI was associated, in a progressive and significant manner, with hospital mortality, as well as mortality in the intensive care unit and with the need for advanced organ support in the CICU. The systematic incorporation of MFI in the admission assessment may be useful in risk stratification and clinical decision-making in this population.



19801

LATE PALLIATIVE CARE INTEGRATION AND INTENSIVE CARE UTILIZATION IN ADVANCED CARDIOVASCULAR DISEASE

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Background/Introduction: Patients with advanced cardiovascular disease are frequently exposed to low-value interventions at the end of life, often associated with late integration of palliative care. Delayed identification of palliative care eligibility may limit the clinical impact of this approach on critical care resource use, particularly intensive care units. Objectives: To evaluate the association between implementation of a Palliative Care Committee, recognition of palliative care eligibility, time to referral, and intensive care unit (ICU) utilization in patients with advanced cardiovascular disease. Methods: Retrospective observational study conducted in a public emergency hospital in Rio de Janeiro state, Brazil. Patients aged ≥18 years, with in-hospital death and hospital stay >24 hours, eligible for palliative care according to Murtagh criteria and age-adjusted Charlson Comorbidity Index ≥3 were included. The period from November 2022 to October 2024 was divided into pre-implementation (n=210) and post-implementation (n=264) phases of the Palliative Care Committee. Analyses of time to referral and ICU utilization were restricted to the post-implementation period to reduce selection bias. Pearson's chi-square or Fisher's exact test were used for categorical variables, and multivariable logistic regression was adjusted for age, sex, and comorbidities. Results and Conclusions: After implementation, there was a significant increase in recognition of cardiovascular patients eligible for palliative care (≈18% to 55%; p<0.001), corresponding to an absolute increase of 37 percentage points. Despite this, time to referral remained longer compared with non-cardiovascular patients (up to 2.4-fold longer; p<0.001), suggesting later recognition in the cardiovascular population. Among cardiovascular patients, palliative care referral was not associated with reduced ICU utilization after multivariable adjustment (aOR=0.81; 95%CI 0.40–1.63; p=0.564). In contrast, among non-cardiovascular patients, palliative care referral was associated with reduced ICU utilization (aOR=0.36; 95%CI 0.18–0.68; p=0.002), corresponding to an approximately 64% reduction in intensive care use. These findings suggest that, despite improved recognition of cardiovascular patients eligible for palliative care, late integration may limit its influence on ICU utilization. The results reinforce the need for early identification strategies to reduce low-value interventions at the end of life

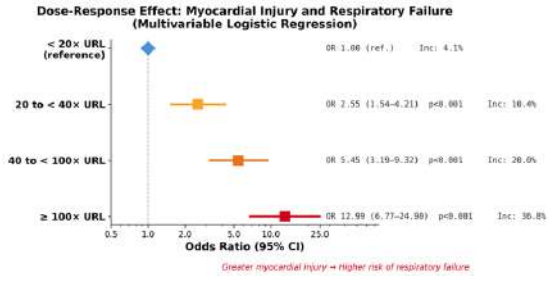
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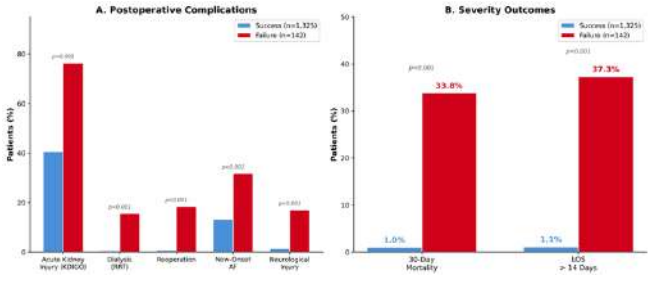
POST-CPB MYOCARDIAL INJURY AS A DETERMINANT OF RESPIRATORY FAILURE AFTER CORONARY ARTERY BYPASS GRAFTING: AN ANALYSIS OF 1,467 PATIENTS

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Background/Introduction: Postoperative respiratory failure in cardiac surgery is multifactorial, frequently attributed to pre-existing pulmonary conditions or cardiopulmonary bypass (CPB) duration. However, cardiopulmonary interaction suggests that myocardial injury, detected by high-sensitivity cardiac troponin T (hs-cTnT), plays a central role in pulmonary congestion and weaning failure. Objectives: To analyze the impact of post-CPB myocardial injury magnitude on a composite respiratory outcome (prolonged mechanical ventilation > 24 hours or reintubation within 7 postoperative days) in patients undergoing coronary artery bypass grafting (CABG). Methods: Retrospective cohort (n = 1,467). The composite outcome "Respiratory Failure" was defined as tracheal reintubation within 7 postoperative days or mechanical ventilation > 24 hours. Patients were compared regarding demographic, laboratory, and surgical profiles. Multivariable logistic regression was adjusted for age, COPD, ejection fraction, CPB time, and surgical priority, using the < 20× URL group as reference. Results and Conclusions: The incidence of respiratory failure was 9.7% (n = 142). Patients with failure were older (67 vs. 62 years; P < 0.001) and had higher COPD prevalence (8.5% vs. 2.9%; P < 0.001). Peak hs-cTnT was significantly higher in the failure group (537 vs. 259 ng/L; P < 0.001). Notably, 19.7% of patients with respiratory failure reached extreme injury (≥ 100× URL), compared to 3.6% in the success group. There was a strong association with multiorgan failure: 76.3% developed acute kidney injury and 15.5% required dialysis (P < 0.001). 30-day mortality was 33.8% vs. 1.0% (P < 0.001). Multivariable analysis revealed a dose-response effect: 20 to < 40× URL (OR 2.55; 95% CI 1.54–4.21); 40 to < 100× URL (OR 5.45; 95% CI 3.19–9.32); and ≥ 100× URL (OR 12.99; 95% CI 6.77–24.90), all P < 0.001. Respiratory failure after CABG with CPB directly correlates with the magnitude of myocardial injury. Risk triples above 20× URL and becomes critical above 100× URL, surpassing the clinical impact of COPD. The high associated lethality reinforces that respiratory insufficiency frequently represents an underlying cardiovascular failure.





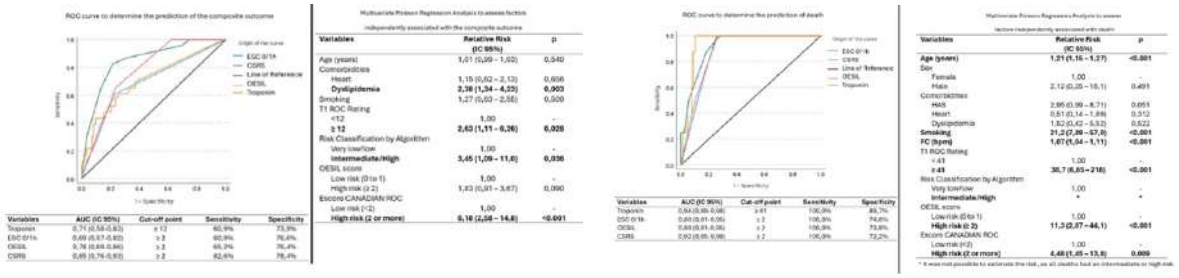
16530

SINGLE-DOSE HIGH-SENSITIVITY CARDIAC TROPONIN FOR PROGNOSTIC EVALUATION IN SYNCOPE

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Background/Introduction: Measurement of cardiac troponin (Tn) has been used in patients presenting to the emergency department (ED) with syncope. However, the specific interpretation of results and the necessity for serial Tn measurements in this context have not yet been established. Objectives: Evaluate the prognostic value of a single high-sensitivity Tn measurement in patients presenting to the ED with syncope, and to determine whether additional measurements improve prognostic accuracy Methods: A historical cohort study was conducted using medical records from 220 patients aged 18 years or older who presented to an ED with syncope between 2021 and 2023. Four strategies were assessed and compared for their prognostic value: (1) a single Tn measurement, (2) the ESC 0/1-Hour Algorithm (as applied in chest pain assessment), (3) a 'classical' syncope risk score (Osservatorio Epidemiologico della Sincope nel Lazio – OESIL), and (4) a 'modern' risk score (Canadian Syncope Risk Score – CSRS). Telephone contact was made to obtain consent for medical record review and to evaluate out-of-hospital outcomes. The primary outcome was a composite event of all-cause mortality and/or major cardiovascular events (stroke, life-threatening arrhythmia, pacemaker or cardioverter-defibrillator implantation, acute myocardial infarction, pulmonary embolism, intracranial haemorrhage, or percutaneous/surgical valve intervention) within 30 days. The secondary outcome was all-cause mortality within 30 days. Results and Conclusions: Optimal Tn cut-off points determined by ROC curve analysis for the composite outcome and 30-day mortality were 12 ng/L and 41 ng/L, respectively. The numerically highest AUC for the composite endpoint was observed for CSRS (0.85), and for mortality, for troponin (0.94). Multivariate analysis showed that high-sensitivity Tn levels above 12 ng/L were independently associated with the composite outcome (relative risk [RR] 2.63; 95% CI: 1.11–6.26). The ESC 0/1-Hour Algorithm was associated with an RR of 3.45 (95% CI: 1.09–11.0), and CSRS with an RR of 6.18 (95% CI: 2.58–14.8), whereas OESIL was not an independent predictor. Tn levels above 41 ng/L were independently associated with death (RR 38.7; 95% CI: 6.85–218), CSRS with RR 4.48 (95% CI: 1.45–13.8), and OESIL with RR 11.3 (95% CI: 2.87–44.1). The ESC 0/1-Hour Algorithm classified as very low or low demonstrated a negative predictive value of 100%. A single high-sensitivity Tn measurement demonstrated satisfactory accuracy as a prognostic tool for evaluating syncope in the ED



17353

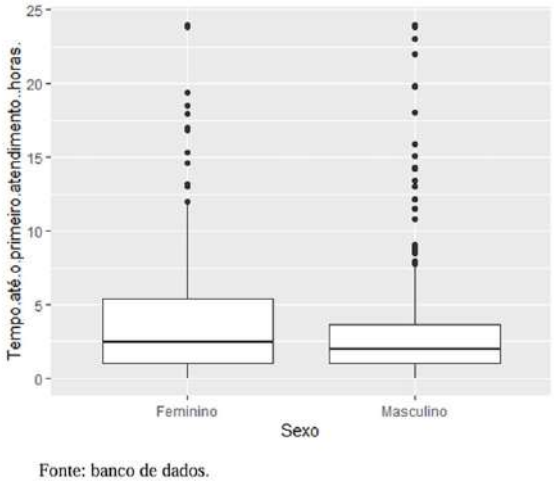
TEMPORAL DISPARITIES IN FIRST MEDICAL CONTACT BETWEEN MEN AND WOMEN WITH ACUTE MYOCARDIAL INFARCTION

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Background/Introduction: Cardiovascular diseases are the leading cause of death worldwide, with acute myocardial infarction (AMI) as a major contributor. Early recognition and timely treatment are critical, as outcomes are strongly time-dependent. Women more frequently present atypical symptoms, which may delay symptom recognition and access to care. These differences contribute to disparities in diagnosis and management of AMI. Despite advances in care systems, most evidence regarding sex-related delays is derived from North American and European populations, with limited data from Brazil. Objectives: To evaluate sex-related differences in the time from symptom onset to first medical contact in patients with AMI, as well as clinical presentation and mortality. Methods: Retrospective observational study including 539 patients admitted through the Salvador AMI Protocol (2021–2023). Demographic, clinical, and time-to-care variables were analyzed. Statistical tests included Student's t-test, Mann–Whitney, and chi-square, with significance set at $p < 0.05$. Results and Conclusions: Among 539 patients, 62.5% were male and 37.3% female, with most individuals aged between 40 and 80 years. Hypertension and diabetes mellitus were the most prevalent comorbidities. Women presented a significantly longer time from symptom onset to first medical contact compared to men (5.1 vs. 3.4 hours; $p < 0.05$). Only 21.7% of patients sought care within the first hour, with a higher proportion of men in this group. Analysis of time distribution showed that 75% of men sought medical care within approximately 3 hours, whereas 75% of women required more than 5 hours, indicating greater variability and delay among female patients. Chest pain was the most frequent symptom in both sexes (>94%); however, women more commonly presented atypical symptoms, including nausea/vomiting (31.1%), dyspnea (12.6%), syncope (3.7%), and epigastric pain (3.9%). Overall in-hospital mortality was 8.7%, with no significant difference between sexes. However, diabetic patients showed significantly higher mortality compared to non-diabetic patients (13.9% vs. 7.0%; $p = 0.0126$). These findings highlight a consistent pattern of delayed access to care among women, associated with differences in clinical presentation.

Gráfico 2 - Tempo médio até o primeiro atendimento



Fonte: banco de dados.

Cardiac Arrhythmias / Electrophysiology / Electrocardiography / Cardiac Pacing



81º CONGRESSO BRASILEIRO DE CARDIOLOGIA together with WORLD CONGRESS OF CARDIOLOGY





18975

ARTIFICIAL INTELLIGENCE IN ECG INTERPRETATION OF ARRHYTHMIAS: CONCORDANCE WITH ELECTROPHYSIOLOGICAL STUDY AND LIMITATIONS IN MECHANISM DEFINITION

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(1) HOSPITAL PRO CARDIACO - RIO DE JANEIRO - RJ - BRASIL;

Background/Introduction: The use of artificial intelligence (AI) in electrocardiogram (ECG) analysis has expanded rapidly, with algorithms capable of recognizing complex patterns associated with different arrhythmias. However, its clinical applicability still requires validation against the diagnostic gold standard, the electrophysiological study (EPS). Objectives: To compare the diagnostic accuracy of an AI algorithm in ECG interpretation against the definitive diagnosis obtained by EPS. Methods: This is a retrospective, observational, single-center study including 24 consecutive patients who underwent electrophysiological study (EPS) in 2025. The study population comprised patients with paroxysmal supraventricular tachycardia (PSVT), premature ventricular complexes (PVC), and ventricular tachycardia (VT). Patients with atrial fibrillation were excluded. Pre-procedural ECGs were analyzed using an artificial intelligence algorithm through up to three sequential interactions (prompts): Prompt 1 (standard text), Prompt 2 (oriented toward generic diagnosis — GDO) and Prompt 3 (oriented toward specific diagnosis — SDO). Results were compared against the definitive electrophysiological diagnosis. The analysis considered: (1) accuracy for generic diagnosis (PSVT, PVC, or VT), and (2) concordance with the specific arrhythmic mechanism identified at EPS. Results and Conclusions: Of the 24 cases, 66.7% were PSVT, 25% PVC, and 8.3% VT. Accuracy for generic diagnosis was 58% with Prompt 1, 75% with Prompt 2, and 100% with Prompt 3. For specific diagnosis, concordance rates were 58%, 75%, and 75%, respectively, with no statistically significant difference among interactions (p = 0.351). The main errors occurred in the differentiation of supraventricular mechanisms and in the precise localization of ventricular foci. AI demonstrated progressive improvement in the generic classification of arrhythmias with successive interactions, achieving high accuracy. However, precision in identifying the specific arrhythmic mechanism was lower, highlighting current limitations in the differentiation of complex substrates. AI shows potential as an auxiliary tool, but does not replace EPS in defining the arrhythmic mechanism.

Arritmia	n (%)	Diagnostico Genérico e Específico [Diagnóstico sugerido pela IA - quando Errado]			P-valor
		Prompt 1	Prompt 2	Prompt 3	
TPSV	16 (66,7%)	10 (62,5%)	14 (87,5%)	16 (100%)	
FLA típico	04 (25,0%)	04 (100%)	Ok	Ok	
TRN	08 (50,0%)	06 (75%) [sinus]	08 (100%)	08 (100%)	
TRAV	02 (12,5%)	Errou [sinus]	Errou [sinus e TRN]	Errou [TRN e TA]	
TA	02 (12,5%)	Errou [BRE]	Errou [sinus]	Errou [TRN]	
Extrassístole Ventricular	06 (25,0%)	02 (33%)	02 (33%)	06 (100%)	
VD					
TSVD	02 (33,3%)	02 (100%)	Ok	Ok	
VE	04 (66,6%)	Errou (0%)	Errou (0%)	04 (100%)	
Musc. Papilar Ant.	02 (33,3%)	Errou [sinus]	Errou [TSVD]	Errou [TSVE]	
Cúspide Coronáriana	02 (33, 3%)	Errou [sinus]	Errou [TSVD]	02 (100%)	
TV	2 (8,3%)	02 (100%)	02 (100%)	02 (100%)	
Isquêmica – Post/Lat.	2 (100%)	02 (100%)	Ok	Ok	
Total (% geral / % específico)	24 (100%)	14 (58% / 58%)	18 (75% / 75%)	24 (100% / 75%)	p=0,351)

16142

ASSESSMENT OF THE INCIDENCE OF MAJOR ELECTROCARDIOGRAPHIC ABNORMALITIES IN PATIENTS WITH CHAGAS DISEASE, SAMI TROP COHORT

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(1) UNIVERSIDADE ESTADUAL DE MONTES CLAROS - MONTES CLAROS - MG - BRASIL; (2) UNIVERSIDADE DE SAO PAULO - SÃO PAULO - SP - BRASIL; (3) UNIVERSIDADE FEDERAL DE MINAS GERAIS - BELO HORIZONTE - MG - BRASIL;

Background/Introduction: Chagas disease (CD) remains one of the main neglected tropical diseases in Latin America, with a high cardiovascular impact and a predominance among socially vulnerable populations. Individuals with CD have twice the likelihood of developing electrocardiographic abnormalities, classified as minor and major. Major electrocardiographic abnormalities (MEA) represent early manifestations of chagasic cardiac involvement and are associated with worse clinical outcomes. Objectives: To investigate the incidence of MEA in individuals with CD participating in a cohort with nine years of follow up in endemic regions of northern Minas Gerais and the Jequitinhonha Valley. Methods: This is a longitudinal study using data from the SaMi-Trop cohort (Center for Research on Biomarkers in Neglected Tropical Diseases of São Paulo/Minas Gerais) which included individuals aged over 18 years with CD and followed them through two follow up assessments between 2013 and 2021. During the cohort, interviews and electrocardiograms (ECG) were performed. The dependent variable of this study was defined based on ECG results, and electrocardiographic abnormalities were classified according to the Minnesota Code. Incidence was estimated among selected participants who did not present MEA at baseline and was subsequently stratified by sex. Incidence was analyzed using Poisson regression. Results and Conclusions: A total of 2.159 individuals participated at the cohort baseline, of whom 1.709 took part in the first follow up and 1.115 in the second follow up. A total of 158 individuals were excluded for not having reactive serology for CD, and 12 due to the absence of this information. For this study, 706 individuals who did not present MEA at baseline were considered. The presence of MEA showed an incidence of 66 new cases among men, corresponding to 60.38 (95% CI: 46.70; 76.82) events/1.000 person-years, and 169 new cases among women, corresponding to 58.93 (95% CI: 50.38; 68.52) events/1.000 person-years. In the stratified analysis, regardless of sex, the presence of MEA showed an incidence of 59.33 events/1.000 person-years (95% CI: 51.99; 67.42). The findings indicate a significant incidence of MEA in this population, reinforcing MEA as a marker of progression of cardiac involvement in CD and the role of the ECG as a fundamental tool for surveillance and clinical management in endemic areas.

Incidence of major electrocardiographic abnormalities on ECG by sex during follow up in the group without major electrocardiographic abnormalities at baseline, Minas Gerais (n= 706), Brazil, 2013-2021.

Abnormality	Number at risk	Follow up time (person- years)	Number of events	Incidence of eventos/ 1000 person-years (95% CI)	Incidence rate difference (95% CI)
Presence of major electrocardiographic abnormality					
Male	200	1093.07	66	60.38 (46.70 ; 76.82)	1.45 (-15.61 ; 18.51)
Female	506	2867.74	169	58.93 (50.38 ; 68.52)	

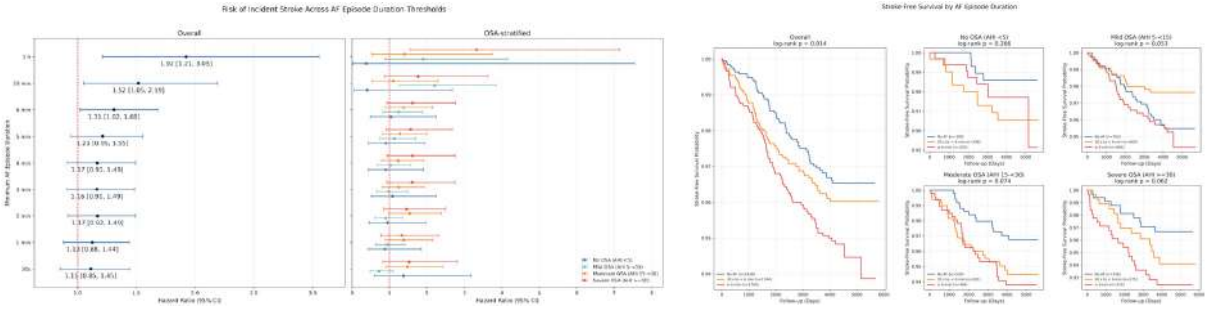
18234

ATRIAL FIBRILLATION EPISODE DURATION AND STROKE RISK: BEYOND THE 30-SECOND STANDARD THRESHOLD

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(1) INCOR - INSTITUTO DO CORACAO DA UNIVERSIDADE DE SAO PAULO - SAO PAULO - SP - BRASIL;

Background/Introduction: Atrial fibrillation (AF) is a major risk factor for stroke and is highly prevalent among patients with obstructive sleep apnea (OSA). While electrocardiography (ECG) remains the gold standard for AF diagnosis, current clinical guidelines require a minimum of 30 seconds of irregular RR intervals (RRI) and absent P waves to confirm it. However, the thromboembolic risk associated with short AF episodes just above this threshold remains unclear. Objectives: To evaluate different AF episode duration thresholds for AF diagnosis, assess their association with incident stroke, and determine whether this risk varies according to OSA severity. Methods: This observational cohort analysis used data from the Sleep Heart Health Study (SHHS), excluding participants with prior stroke or missing valid ECG recordings. A validated, proprietary deep neural network was used to detect AF from ECG-derived RRI. Cox proportional hazards models determined the association between incident stroke and AF episode duration thresholds (30s, 1min, 2min, 3min, 4min, 5min, 6min, 30min, and 1h), adjusting for age, sex, race, body mass index, smoking status, diabetes, hypertension, prevalent cardiovascular heart disease/myocardial infarction, apnea-hypopnea index (AHI), and ECG duration. Stroke-free survival was estimated using Kaplan-Meier curves and compared with log-rank tests. Participants were further stratified by OSA severity using standard AHI categories (0-5, 5-15, 15-30, and ≥30 events/h). Results and Conclusions: The cohort included 5,451 patients with 212 incident strokes over a mean follow-up of 10.95 years. Adjusted models revealed that neither the standard 30s threshold (HR 1.11 [0.85-1.45], p=0.437) nor any other threshold below six minutes was significantly associated with stroke. In contrast, longer AF episodes were significant predictors: ≥6min (HR 1.31 [1.02-1.68], p=0.035), ≥30min (HR 1.52 [1.05-2.19], p=0.025), and ≥1h (HR 1.92 [1.21-3.05], p=0.006), with the strongest association observed in severe OSA for episodes ≥1h (HR 3.32 [1.54-7.14], p=0.002). Stroke-free survival differed significantly across AF exposure groups (no AF, 30s to <6min, and ≥6min; log-rank p=0.014), driven by reduced survival for episodes ≥6min in moderate (p=0.028 vs no AF) and severe (p=0.018 vs no AF) OSA. These findings suggest that the traditional 30-second threshold may not adequately capture thromboembolic risk, whereas AF episodes longer than six minutes are stronger predictors of incident stroke, particularly among severe OSA patients.



16566

ATRIAL FIBRILLATION, SOCIOECONOMIC VULNERABILITY, AND MORTALITY IN DECOMPENSATED HEART FAILURE: AN INTERSECTIONAL ANALYSIS

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(1) BARRA D`OR - RIO DE JANEIRO - RJ - BRASIL; (2) UNIVERSIDADE FEDERAL DO RIO DE JANEIRO - RIO DE JANEIRO - RJ - BRASIL; (3) UNIVERSIDADE ESTADUAL DO RIO DE JANEIRO - RIO DE JANEIRO - RJ - BRASIL;

Background/Introduction: Atrial fibrillation (AF) affects 25–50% of patients with decompensated heart failure (DHF) and independently worsens outcomes. However, its prognostic impact may vary by mortality timing and intersect with social determinants of health (SDH) such as hospital-level socioeconomic deprivation and ethnicity. Whether arrhythmia type and socioeconomic vulnerability jointly shape competing mortality outcomes in DHF remains underexplored. Objectives: To characterize the differential prognostic impact of AF and non-AF arrhythmias on competing mortality outcomes and examine how SDH modulate arrhythmia-related risk across two tertiary centers in contrasting socioeconomic zones. Methods: From 1,023 consecutive DHF patients at two centers (West Zone HDI 0.959 vs. North Zone HDI 0.814; median follow-up 6.9 years, IQR 4.4–9.9), arrhythmias were classified as: no arrhythmia (n=618; 60.4%), chronic AF (n=222; 21.7%), acute AF (n=59; 5.8%), and non-AF cardiac arrhythmia (n=124; 12.1%). Fine–Gray competing risk models and Elastic Net Cox regression assessed independent prognostic contributions. Subgroup analyses by hospital zone (SDH proxy) and ethnicity evaluated SDH–arrhythmia interactions. Results and Conclusions: Compared with no-arrhythmia patients (total mortality 443/618; 71.7%; in-hospital 53/618; 8.6%), chronic AF independently predicted higher total mortality (179/222; 80.6%; P=0.010) and in-hospital death (36/222; 16.2%; P=0.002), with Fine–Gray SHR 1.85 (95%CI 1.24–2.75; P=0.003). Non-AF arrhythmia showed paradoxically lower post-discharge mortality in adjusted models (SHR 0.74; P=0.0003) yet elevated in-hospital risk (SHR 1.75; P=0.008). SDH substantially modified arrhythmia risk: in-hospital mortality for chronic AF was 26.4% at the higher-HDI West Zone vs. 9.2% at the North Zone (P<0.001), reflecting differential acute management capacity across socioeconomic contexts. Brown/Black patients with chronic AF had higher overall mortality than White counterparts (84.6% vs. 79.0%). Arrhythmia type and socioeconomic context jointly determine mortality trajectories in DHF, arguing for integrated management strategies that account for both electrical substrate and social vulnerability.

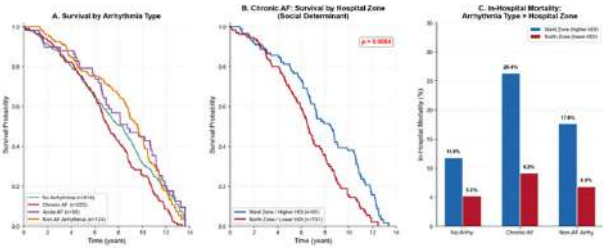


Table. Clinical Profile and Mortality by Arrhythmia Type and Hospital Zone (n=1,023)

Characteristic	No Arrhythmia (n=618)	Chronic AF (n=222)	Non-AF Arrhy. (n=124)	P*
Age, median (IQR), years	76.5 (66.0–84.8)	81.0 (74.0–86.0)	79.0 (71.0–86.0)	<0.001
LVEF, median (IQR), %	45 (34–57)	49 (37–60)	40 (31–51)	<0.001
BNP, median (IQR), pg/mL	2,460 (1,032–7,652)	2,278 (938–7,498)	3,610 (1,160–9,338)	NS
North Zone hospital, n (%)	304 (49.2%)	131 (59.0%)	73 (58.9%)	0.009
Brown/Black ethnicity, n (%)	58 (9.4%)	16 (7.2%)	5 (4.0%)	NS
Total mortality, n (%)	443 (71.7%)	179 (80.6%)	99 (79.8%)	0.010†
In-hospital mortality, n (%)	53 (8.6%)	36 (16.2%)	14 (11.3%)	0.002†
In-hosp. mort. @ West Zone	53/314 (11.8%)‡	24/91 (26.4%)‡	9/51 (17.6%)‡	—
In-hosp. mort. @ North Zone	16/304 (5.3%)‡	12/131 (9.2%)‡	5/73 (6.8%)‡	—

18492

CLINICAL ASSESSMENT OF THE ROLE OF CARINA ABLATION AFTER FIRST-PASS PULMONARY VEIN ISOLATION: FIRST RESULTS OF THE CARINA STUDY

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Background/Introduction: Background: Several predictors of recurrence after atrial fibrillation (AF) ablation have been described. Clinical and technical factors influence outcomes regardless of energy source or technique. Cryoablation and pulsed-field ablation show better long-term results, possibly due to closer contact with the carina region. Objectives: Objective: To evaluate whether, in patients achieving first-pass pulmonary vein isolation (FPI), additional carina ablation reduces recurrence. Methods: Methods: Prospective, randomized study from December 2023 to May 2025 with 63 patients undergoing first-time AF ablation in whom FPI was achieved. All patients perform antral pulmonary vein isolation and in patients randomized to carina ablation this approach was performed. Follow-up was for 10 ± 4.8 months. High-power short-duration protocol was performed using 50 W (TactiCath catheter) /6–12 s (30 ml/min flow) in 34 patients and 60W (Tactiflex catheter) for 6/9 s (20 ml/min flow) in 29 patients. Contact force was 10–20 g on the anterior wall and 5–10 g on the posterior wall of the left atrium. Intracardiac echocardiogram was used ant the descrition of the operator. Results and Conclusions: Results: Male were 49 (77,8%) with baseline characteristics similar between success and recurrence groups except for a higher CHA2DS2VA score (3.1 ± 1.6 vs 1.9 ± 1.7, p=0.008) in the carina group. The total recurrence rate was 31,7% (20 of 63). Recurrence occurred in 5/31 (16.1%) patients with carina ablation versus 15/32 (46.9%) without (p=0.014; OR 0.22, 95% CI 0.07–0.71). After multivariable adjustment for persistent AF, sex, BMI, CHA2DS2VA, left atrial diameter, and LVEF, carina ablation remained strongly protective (adjusted OR 0.07, 95% CI 0.01–0.41; p=0.003) with a NNT of 3.2. Follow-up period was 11.6±4.8 months. One pericardial effusion occurred 20 days post-ablation in the success group (with 60W). One patient died 13 months after ablation in complication of a stroke (recurrence group). Conclusion: In patients with FPI, additional carina ablation is associated with an 81% relative reduction in atrial tachyarrhythmia recurrence, supporting its use as a simple and effective adjunctive strategy during AF ablation.

Graphical abstract

AF type and Carina ablation outcomes

	Yes			No		
Paroxysmal (n=38)	18	2	11.1%	20	6	30%
	Yes		No		No	
Persistent (n=25)	14	3	21.4%	11	9	81.8%

Hazard Ratio	#p		Inajusnt Ratio	
Unadjusted HR:	0.28	95% CI	0.10 – 0.78	p=0.015
Adjusted for Persistent AF:	0.26	95% CI	0.09 – 0.73	p=0.011
Fully adjusted:	0.19	95% CI	0.06 – 0.63	p=0.006

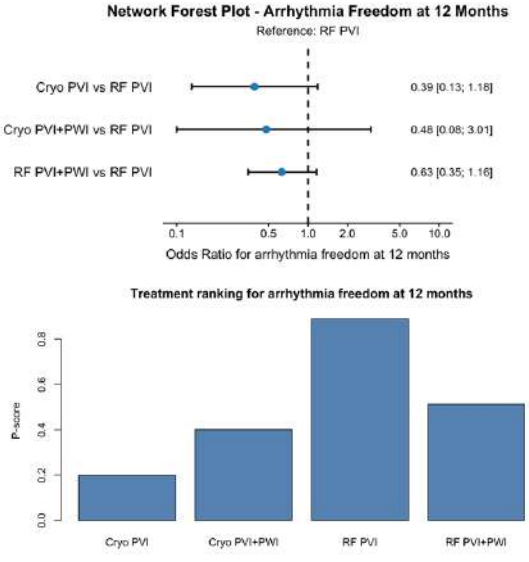
15691

COMPARATIVE EFFICACY OF PULMONARY VEIN ISOLATION WITH OR WITHOUT POSTERIOR WALL ISOLATION IN PAROXYSMAL ATRIAL FIBRILLATION ACROSS DIFFERENT ENERGY SOURCES: A SYSTEMATIC REVIEW AND NETWORK META-ANALYSIS

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Background/Introduction: Catheter ablation is a cornerstone therapy for atrial fibrillation (AF), with pulmonary vein isolation (PVI) as the standard approach. However, recurrence rates remain significant, prompting the evaluation of adjunctive strategies such as posterior wall isolation (PWI). The incremental benefit of adding PWI to PVI, particularly across different energy sources, remains uncertain in patients with paroxysmal AF. Objectives: To compare the efficacy and safety of PVI alone versus PVI combined with PWI across different energy sources in patients with paroxysmal AF using a network meta-analysis. Methods: PubMed, Embase, and the Cochrane Library were systematically searched. Randomized and observational studies comparing PVI versus PVI+PWI were included. A frequentist network meta-analysis was performed using R. The primary outcome was arrhythmia freedom at 12 months. Secondary outcomes included arrhythmia freedom at 6 months, total procedural time, and major procedural complications. Results and Conclusions: Five studies (n=1,052) were included. Using radiofrequency (RF) PVI as the reference, no strategy showed a statistically significant benefit in arrhythmia freedom at 12 months: cryoballoon (Cryo) PVI (OR 0.39, 95% CI 0.13–1.18), Cryo PVI+PWI (OR 0.48, 95% CI 0.08–3.01), and RF PVI+PWI (OR 0.63, 95% CI 0.35–1.16). Results at 6 months were similarly non-significant. Procedural time was consistently longer in strategies incorporating posterior wall isolation (PWI), without a clear increase in major complications. Catheter ablation is an established rhythm control strategy for atrial fibrillation (AF), with pulmonary vein isolation (PVI) as its cornerstone. However, recurrence after PVI alone remains substantial, prompting investigation of adjunctive approaches such as PWI. The posterior left atrial wall shares embryological and electrophysiological features with pulmonary veins, suggesting a role in AF maintenance. Despite this rationale, clinical evidence supporting PWI remains inconsistent, particularly in paroxysmal AF, where arrhythmogenesis is more trigger-dependent. Moreover, differences in energy sources (radiofrequency vs cryoballoon) may influence lesion durability and outcomes. In patients with paroxysmal AF, adding PWI to PVI did not significantly improve arrhythmia freedom. Although PWI strategies increased procedural time, safety outcomes were comparable. These findings support PVI alone as an effective first-line ablation strategy.



21844

CONGENITAL ATRIOVENTRICULAR BLOCK: IMPORTANCE OF EARLY PACEMAKER IMPLANTATION IN A PEDIATRIC COHORT

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Background/Introduction: Congenital atrioventricular block (CAVB) is a rare cause of severe bradycardia in neonates and children. ESC/ACC guidelines recommend pacemaker implantation in the presence of symptoms, ventricular dysfunction, or very low ventricular rates. However, the optimal timing for implantation in infants remains controversial due to anatomical limitations and a lack of longitudinal data. Objectives: To evaluate clinical outcomes in children with CAVB, compare heart failure-free survival between those undergoing early pacemaker implantation and those managed clinically, and identify factors associated with the need for implantation. Methods: Retrospective cohort study of 25 children diagnosed with CAVB and followed between 2012 and 2024. Fifteen children received a pacemaker (PM group) and ten remained under clinical follow-up (non-PM group). Variables analyzed included age at diagnosis, baseline heart rate, symptoms (syncope, heart failure), left ventricular ejection fraction (LVEF), maternal autoimmune etiology, and follow-up duration. Kaplan-Meier curves estimated heart failure-free survival, and Cox regression adjusted for age and LVEF evaluated risk factors. Results and Conclusions: The mean age at diagnosis was 3.5 ± 2.1 months, and 60% had an autoimmune etiology. Pacemaker indications included LVEF <45% or symptomatic bradycardia (<55 bpm). After a median follow-up of 8 years, heart failure-free survival was 93% in the PM group (95% CI 79–100%) versus 60% in the non-PM group (95% CI 31–89%), corresponding to an adjusted hazard ratio of 0.25 (95% CI 0.07–0.89; p=0.03). Two children in the non-PM group required late implantation due to syncope, and one developed significant ventricular dilation. There were two deaths from heart failure in the non-PM group and none in the PM group. Device-related complications included two lead dislodgements corrected by surgical revision, and one generator infection treated without removal. Maternal autoimmune etiology was associated with an earlier need for implantation (p=0.02). Early pacemaker implantation in children with CAVB is associated with higher heart failure-free survival and lower mortality, with a low incidence of complications. These findings support guideline recommendations for implantation in symptomatic patients or those with ventricular dysfunction and highlight the importance of continuous electrocardiographic follow-up in infants with CAVB.

21214

DIAGNOSTIC PERFORMANCE OF ELECTROCARDIOGRAPHIC CRITERIA FOR LEFT VENTRICULAR HYPERTROPHY: A META-ANALYSIS AND BAYESIAN LATENT CLASS MODEL APPROACH

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Background/Introduction: The low sensitivity of electrocardiographic (ECG) criteria for left ventricular hypertrophy (LVH) is traditionally attributed to the intrinsic limitations of the ECG. However, echocardiography (ECHO), frequently used as the reference standard, also has diagnostic imperfections that may distort ECG performance estimates. Objectives: To evaluate the diagnostic performance of the main ECG criteria for LVH using both frequentist and Bayesian latent class model (BLCM) approaches. Methods: Retrospective study of 142 adults randomly selected from the ECHO database of a Brazilian tertiary center. Medical records were reviewed to identify ECGs performed within ±3 months of ECHO. Sokolow-Lyon, Cornell, Romhilt-Estes, and Peguero-Lo Presti criteria were evaluated. Frequentist analysis used ECHO as reference; BLCM was applied accounting for the inaccuracy of ECHO. Priors were derived from a systematic review and diagnostic accuracy meta-analysis conducted by the authors for this study, including more than 100,000 individuals (Table 1). Results and Conclusions: Of 142 included patients, 100 (70.4%) had LVH on ECHO. Mean age was 66.4±11 years (LVH group) and 60.0±14.4 years (controls), with similar sex distribution between groups.
In the frequentist analysis, all criteria showed low sensitivity, particularly Sokolow-Lyon (6.4%). Peguero-Lo Presti showed the highest sensitivity, whereas Cornell presented the highest positive likelihood ratio (LR+). In the Bayesian analysis, sensitivity remained globally low. Higher specificity and LR+ were observed for Cornell (96.8% and 7.44) and Romhilt-Estes than in frequentist results, suggesting their greater confirmatory value after accounting for ECHO imperfection. Peguero-Lo Presti maintained the best balance between sensitivity and negative likelihood ratio (LR−) (41.0% and 0.67). Complete results are presented in Table 2. Even after Bayesian modeling, ECG criteria maintained low sensitivity and limited utility for LVH screening. However, the Bayesian approach suggested partial underestimation of the confirmatory value of some criteria by frequentist analysis, particularly Cornell and Romhilt-Estes. These findings suggest that the ECG should not be interpreted as a direct anatomical marker of ventricular mass, but rather as an expression of left ventricular electrical remodeling, more related to cardiovascular risk and prognosis than to the isolated estimation of anatomical hypertrophy.

Criteria	Number of Studies	Number of patients	Sensitivity		I^2 (%)	Specificity		I^2 (%)
			Overall (%)	95% CI		Overall (%)	95% CI	
Sokolow-Lyon	35	107,446	11	[0.07; 0.16]	99.6	95	[0.93; 0.97]	99.2
Cornell	34	107,120	21	[0.17; 0.27]	99.5	95	[0.93; 0.97]	99.6
Romhilt-Estes	8	5,135	21	[0.12; 0.36]	98	93	[0.85; 0.97]	97.2
Peguero-Lo Presti	16	89,484	42	[0.35; 0.49]	99.3	84	[0.78; 0.88]	98.8

Table 01. Systematic review and meta-analysis of diagnostic accuracy evaluating the electrocardiographic criteria for left ventricular hypertrophy (LVH) detection. Only studies using standard ECG cutoffs and echocardiography as the reference test were included. LVH was defined by left ventricular mass indexed to body surface area using established sex-specific thresholds (>115 g/m² for men and >95 g/m² for women). Pooled sensitivity and specificity were estimated separately using random-effects proportional meta-analysis with logit transformation (PLOGIT). Between-study heterogeneity was assessed using I^2 and τ^2 estimated by maximum likelihood.

Criteria	Sensitivity %		Specificity %		LR+		LR−	
	Frequentist (95%CI)	Bayesian (97.5%CrI)	Frequentist (95%CI)	Bayesian (97.5%CrI)	Frequentist (95%CI)	Bayesian (97.5%CrI)	Frequentist (95%CI)	Bayesian (97.5%CrI)
Sokolow-Lyon	**6.4** (2.4–13.4)	**7.2** (3.8–12.2)	**100.0** (92.6–100.0)	**97.4** (92.6–99.5)	NA	**2.82** (0.81–16.58)	**0.94** (0.05–17.12)	**0.95** (0.90–1.01)
Cornell	**26.6** (18.0–36.7)	**24.0** (17.6–31.4)	**95.8** (85.7–99.5)	**96.3** (91.4–99.3)	**6.38** (1.44–28.26)	**7.44** (2.58–36.06)	**0.77** (0.17–3.39)	**0.79** (0.71–0.87)
Romhilt-Estes	**27.7** (18.9–37.8)	**26.7** (19.9–34.1)	**77.1** (62.7–88.0)	**90.5** (80.9–97.0)	**1.21** (0.54–2.72)	**2.83** (1.25–9.33)	**0.94** (0.42–2.11)	**0.81** (0.71–0.95)
Peguero-Lo Presti	**41.5** (31.4–52.1)	**41.0** (33.2–49.3)	**89.6** (77.3–96.5)	**88.4** (80.0–94.4)	**3.98** (1.45–10.97)	**3.55** (1.95–7.53)	**0.65** (0.24–1.80)	**0.67** (0.56–0.79)

Table 2. Diagnostic performance of electrocardiographic criteria for left ventricular hypertrophy by frequentist and Bayesian latent class approaches. The Bayesian model assumed conditional independence between tests ($\rho=0$) and incorporated beta priors for ECG sensitivity and specificity derived from a systematic review and meta-analysis using the same conventional ECG cutoffs and echocardiographic reference standard. Priors for echocardiographic performance were defined from established literature assuming high, but imperfect, diagnostic accuracy (mean sensitivity 85% and specificity 95%). The prior prevalence of LVH was centered on the observed prevalence and clinical profile of the study population. Moderately informative priors (effective sample size ≈50 for test performance and ≈30 for prevalence) were adopted due to substantial between-study heterogeneity in the meta-analysis (I^2 >97%).

18615

DOES THE TIME FROM FIRST ATRIAL FIBRILLATION DIAGNOSIS TO CATHETER ABLATION INFLUENCE IN LONG-TERM OUTCOMES?

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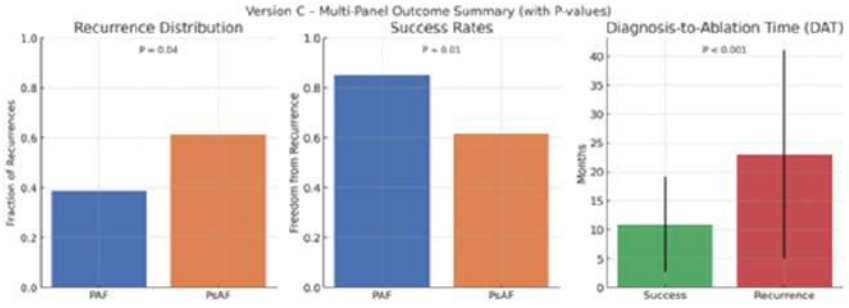
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Background/Introduction: Background A substantial proportion of patients with atrial fibrillation (AF) experience arrhythmia progression over time. The optimal timing of catheter ablation in the natural history of AF remains debated. Recent data suggest that delays in rhythm-control interventions may negatively impact outcomes. Objectives: Objective To evaluate the impact of the interval between the first documented AF episode and catheter ablation, defined as diagnosis-to-ablation time (DAT), on long-term arrhythmia recurrence. Methods: Methods We prospectively evaluated consecutive patients who underwent first-time AF ablation with pulmonary veins isolation between December 2018 and December 2023 that started the procedure in sinus rhythm. Ablation was performed using 50 W radiofrequency power, target contact force 10–20g (anterior wall) and 5–10g (posterior wall). Results and Conclusions: Results A total of 282 patients were included (mean age 64.9±11.8 years; 61.3% male). Paroxysmal AF (PAF) in 175 (62.1%) and mean CHA_2DS_2VA of 2.8±1.9. Mean follow-up was 36.1±14.2 months. Late AF recurrence (>90 days) occurred in 67 patients (23.8%), including 26 (38.8%) with PAF and 41 (61.2%) with PsAF (p = 0.04). In PAF we observed 85.1% and in PsAF 61.7% of freedom from recurrence (p=0.01), respectively. Patients free from recurrence had a significantly shorter DAT (10.9±8.2 months) compared with those with recurrence (23.0±18.1 months, p< 0.001). Conclusion A delay between first AF diagnosis to catheter ablation is a strong predictor of long-term recurrence. Patients with persistent AF exhibited substantially higher recurrence rates, suggesting that delayed referral for catheter ablation may contribute to progression from paroxysmal to persistent AF, subsequently reducing procedural success.

Table 1

Variable	Value
N	282
Age (years)	64.9 ± 11.8
Male sex	173 (61.3%)
Paroxysmal AF	175 (62.1%)
Persistent AF	107 (37.9%)
Weight (kg)	78.2 ± 15.1
Height (m)	1.73 ± 1.39
Hypertension	188 (66.7%)
Sleep apnea	155 (55.1%)
Coronary artery disease	102 (36.2%)
Diabetes mellitus	63 (22.4%)
Heart failure	43 (15.2%)
Ischemic stroke	23 (8.15%)
CHA_2DS_2VA score	2.8 ± 1.9
Follow-up (months)	36.1 ± 14.2

Figure 1: Diagnosis to ablation (DAT) in success and recurrence patients.



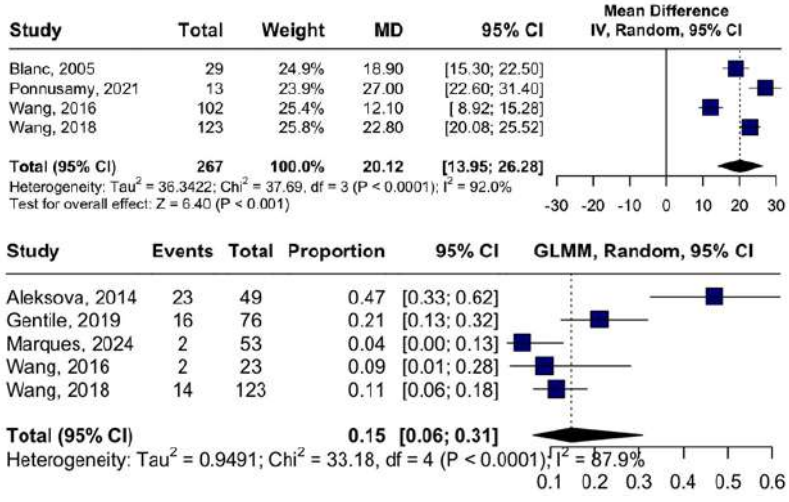
19242

EFFECTIVENESS OF CARDIAC RESYNCHRONIZATION THERAPY IN LEFT BUNDLE BRANCH BLOCK-INDUCED CARDIOMYOPATHY: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background/Introduction: Introduction: LBBB-induced cardiomyopathy (LBBB-CM) is a recognized non-ischemic cardiomyopathy subtype with mechanical dyssynchrony and progressive left ventricular dysfunction from long-standing LBBB. Cardiac resynchronization therapy (CRT) is a targeted therapy, but its precise clinical impact in this scenario remains incompletely defined. Objectives: To systematically evaluate CRT efficacy in adult LBBB-CM patients via single-arm meta-analysis of observational evidence, focusing on LVEF changes and all-cause mortality. Methods: A systematic search was performed in PubMed, Scopus, Embase, and Web of Science from inception to May 2025. The review followed PRISMA guidelines and was prospectively registered in PROSPERO. We included observational studies reporting outcomes of CRT in adult patients with LBBB-induced cardiomyopathy, defined by the presence of LBBB, left ventricular systolic dysfunction, and exclusion of alternative cardiomyopathy etiologies. Studies without relevant clinical outcomes were excluded. The primary outcome was change in left ventricular ejection fraction (LVEF). Secondary outcome was all-cause mortality. Meta-analysis was performed using a random-effects model in R (version 4.2.3). Risk of bias was assessed using ROBINS-I. Follow-up duration varied across included studies. Results and Conclusions: Results: Eight studies (628 patients) met criteria. CRT significantly improved LVEF (pooled mean increase 20.12 percentage points; MD 20.12; 95% CI 13.95–26.28; p < 0.001). Pooled all-cause mortality was 15% (0.15; 95% CI 0.06–0.31; p < 0.001) across studies with heterogeneous follow-up. Heterogeneity was moderate to high for primary (I^2 = 75%) and secondary (I^2 = 82%) outcomes. Conclusion: CRT in LBBB-CM is associated with substantial LVEF improvement. Despite functional recovery, observed mortality remains clinically relevant. Findings emphasize early LBBB-CM recognition and further research on prognostic determinants, patient selection, and optimal CRT timing for long-term benefits.



18297

EFFICACY AND SAFETY OF ANTICOAGULATION VERSUS DUAL ANTIPLATELET THERAPY FOLLOWING LEFT ATRIAL APPENDAGE OCCLUSION: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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Background/Introduction: Left atrial appendage occlusion (LAAO) is an established strategy for stroke prevention in patients with atrial fibrillation (AF), particularly in those with contraindications to long-term oral anticoagulation. However, the optimal antithrombotic regimen following LAAO remains uncertain. While dual antiplatelet therapy (DAPT) has traditionally been used in patients at high bleeding risk, emerging evidence suggests that direct oral anticoagulants (DOACs) may offer improved protection against device-related thrombosis with a potentially favorable safety profile. Although previous meta-analyses have explored this topic, most included observational studies and heterogeneous populations, and none have exclusively evaluated randomized controlled trials (RCTs). Therefore, robust high-level evidence directly comparing these strategies remains limited. Objectives: This study aimed to systematically compare the efficacy and safety of DOAC-based anticoagulation versus DAPT after LAAO, including only evidence from RCTs. Methods: PubMed, Embase and Cochrane databases were systematically searched for RCTs comparing DOAC-based anticoagulation versus DAPT in patients with AF following LAAO. Outcomes of interest included: (1) major bleeding; (2) all-cause mortality; and (3) stroke. Results and Conclusions: Three RCTs (ANDES, ADRIFT, and ADALA) including 704 patients undergoing left atrial appendage occlusion were analyzed, with 368 patients assigned to DOAC-based anticoagulation and 336 to DAPT. The mean follow-up duration was 3 months. DOAC-based anticoagulation was associated with a significantly lower risk of major bleeding compared with dual antiplatelet therapy (OR 0.61; 95% CI 0.38–0.96; p = 0.03 - Figure 1A), with no significant differences in all-cause mortality (OR 0.60; 95% CI 0.24–1.53; p = 0.29 - Figure 1B) or stroke (OR 0.46; 95% CI 0.06–3.33; p = 0.45 - Figure 1C) at short-term follow-up. These findings suggest that anticoagulation may represent a safer and effective alternative to DAPT in the early post-procedural period following LAAO. A limitation of this analysis is the heterogeneity in the definition of major bleeding across the included trials. Given the limited number of RCTs and short follow-up duration, further large-scale randomized trials are warranted to confirm these findings and to define the optimal long-term antithrombotic strategy.

Figure 1 A – Major bleeding

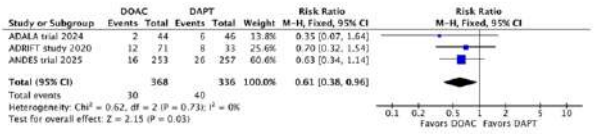


Figure 1 B – All-cause mortality

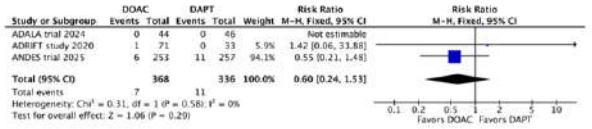
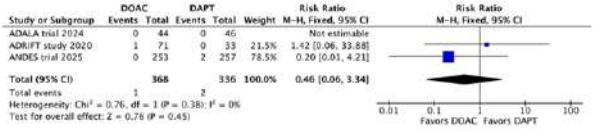


Figure 1 C – Stroke



21578

ELECTRICAL STORM IN CHAGAS CARDIOMYOPATHY: IN-HOSPITAL OUTCOMES FROM A CONTEMPORARY BRAZILIAN TERTIARY-CARE COHORT

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Background/Introduction: Electrical storm (ES) is a life-threatening arrhythmic emergency associated with high in-hospital morbidity and mortality. Data from Chagas cardiomyopathy, a major cause of advanced heart disease in Latin America, remain scarce. Objectives: To describe the clinical profile, management strategies and in-hospital outcomes of patients admitted with ES, comparing Chagas and non-Chagas etiologies. Methods: We performed a retrospective cross-sectional analysis of consecutive patients admitted to a tertiary university hospital in 2024-2025 with ES. Baseline characteristics, triggers, therapies and outcomes were compared according to Chagas etiology. Categorical variables were compared using chi-square tests and continuous variables using Mann-Whitney tests. Results and Conclusions: Thirty-six patients were included; median age was 66.5 years (IQR 58-72), 72.2% were male and 94.4% had an implantable cardioverter-defibrillator. Chagas cardiomyopathy was the leading etiology (55.6%), followed by ischemic heart disease (13.9%). Median left ventricular ejection fraction was 34.7% (IQR 25.5-40.0), and right ventricular dysfunction was present in 33.3%. No trigger was identified in 72.2% of cases. During admission, catheter ablation was performed in 61.1%, amiodarone was used in 58.3%, non-selective beta-blockers in 52.8%, stellate ganglion block in 22.8% and lidocaine in 22.8%. Compared with non-Chagas patients, those with Chagas cardiomyopathy more frequently required stellate ganglion block and lidocaine (both 35.0% vs 6.2%; p=0.039). The combined in-hospital endpoint of death, heart transplantation or transition to palliative care occurred in 7 patients (19.4%). Although not statistically significant, this endpoint was numerically higher in Chagas versus non-Chagas patients (30.0% vs 6.2%; p=0.074). Individual outcomes did not differ significantly between groups. In this contemporary tertiary-care cohort, ES was predominantly associated with Chagas cardiomyopathy and carried a substantial in-hospital burden, with nearly one in five patients experiencing death, transplantation or palliative-care transition. The higher use of advanced antiarrhythmic rescue strategies and the numerical excess of adverse outcomes in Chagas cardiomyopathy highlight the need for dedicated research in this neglected high-risk population.

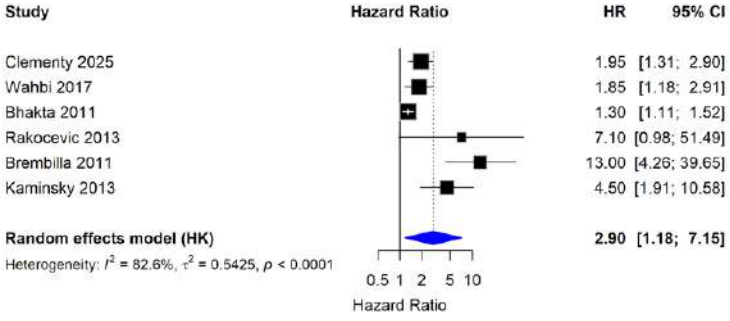
20208

ELECTROCARDIOGRAPHIC PREDICTORS OF ADVERSE CARDIAC OUTCOMES IN MYOTONIC DYSTROPHY TYPE 1: AN EXPLORATORY META-ANALYSIS

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Background/Introduction: Myotonic dystrophy type 1 (DM1) is a multisystemic genetic disorder with frequent cardiac involvement, marked as one of the leading causes of death in affected adults. Electrocardiographic (ECG) findings can be useful in predicting the progression of conduction disease and clinically significant outcomes, but a formal quantitative synthesis of their prognostic value is lacking. Objectives: To assess the prognostic value of ECG parameters for predicting conduction system disease and clinically relevant outcomes in adults with DM1. Methods: Eight databases were systematically searched from inception to December 30, 2025. Eligible studies included patients >15 years with genetically confirmed DM1 and reported ECG predictors to clinically relevant conduction outcomes, such as advanced atrioventricular block, pacemaker or ICD implantation, and sudden cardiac death. Two reviewers independently screened articles and extracted data. When different ECG predictors were reported, the measure most comparable across studies and most representative of conduction disease was selected. Continuous measures were included when categorical thresholds were not consistently available across studies. Hazard ratios, risk ratios, and odds ratios were pooled as measures of relative risk, assuming equivalence for rare events. Studies reported different clinically related outcomes and heterogeneous ECG features, so these endpoints were analyzed together in an exploratory random-effects meta-analysis. The protocol was registered in PROSPERO. Results and Conclusions: Fifteen studies, including 3,699 patients with DM1, met the inclusion criteria, and 6 were included in the meta-analysis (n=2,907). ECG predictors evaluated included rhythm abnormalities, PR ≥240 ms and/or QRS ≥120 ms, QRS duration increase (per 10ms), and bundle branch block. Outcomes included major conduction defects, major bradyarrhythmic events, or sudden death. ECG abnormalities were associated with an increased risk of adverse cardiac outcomes, with a pooled hazard ratio of 2.90 (95%CI 1.18–7.15). Heterogeneity was high (I^2=82.6%), likely due to differences in ECG predictors and outcome definitions across studies, as well as the inclusion of different but clinically related endpoints. The results should be interpreted as exploratory, given the clinical heterogeneity of outcomes. ECG findings are significant predictors of clinically important conduction system disease and adverse cardiac outcomes in adults with DM1, supporting their role in risk stratification.



17201

EXTREME ELECTROCARDIOGRAPHIC VOLTAGES AS A PROGNOSTIC TOOL: INSIGHTS FROM THE JACKSON HEART STUDY

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Background/Introduction: Traditional electrocardiographic (ECG) criteria for left ventricular hypertrophy (LVH) are poor surrogates for increased left ventricular mass. However, recent studies have highlighted the prognostic significance of exaggerated voltages. The Multi-Ethnic Study of Atherosclerosis LVH criterion (MESA-LVH), defined as SV1 + SV2 + RV5, has been investigated as a spectrum-based diagnostic and prognostic marker, identifying patients with extreme voltages who, despite lacking true hypertrophy, carry risks comparable to those with confirmed LVH — a finding that warrants validation in diverse populations. Objectives: To assess whether the MESA-LVH criterion can predict a higher incidence of adverse outcomes independently of LVH. Methods: We retrospectively analyzed data from the Jackson Heart Study, a prospective cohort of self-identified African American (aged 21–94 years). LVH was defined using Echocardiogram (ECO) by LV mass indexed to height$^{2.7}$, with cutoffs of ≥49 g/m$^{2.7}$ for men and ≥45 g/m$^{2.7}$ for women. Participants' 12-lead ECGs were assessed for the presence of MESA-LVH. Extreme-Voltage Electrical Remodeling (EVER) was defined as participants with high electrocardiographic voltage meeting the MESA threshold (≥60 mm) without structural LVH by imaging. Cox proportional hazards models were used to evaluate associations between EVER and heart failure, mortality, coronary heart disease and stroke with adjustments for age, sex, body mass index, and systolic blood pressure. An LVH-adjusted model simultaneously included MESA-LVH and conventional echocardiographic LVH to assess each criterion's independent prognostic contribution. Hazard ratios (HR) and 95% confidence intervals (CI) were reported. Results and Conclusions: Table 1 presents baseline characteristics of the study population. Among 2,348 participants, echocardiographic LVH prevalence was approximately 13%, and 155 participants met the EVER phenotype. In fully adjusted analyses, EVER did not significantly predict any outcome. In the LVH-adjusted model, MESA-LVH showed borderline associations with all-cause mortality and heart failure, though these remained statistically insignificant. All data are summarized in Table 2. Conventional echocardiographic LVH, in contrast, independently predicted all outcomes analyzed. In this African American cohort, the EVER phenotype lost independent prognostic significance after adjustment, whereas LVH in ECO predicted all adverse outcomes analyzed, reinforcing the prognostic superiority of imaging-based LVH detection.

Table 1. Characteristics of EVER vs echo-LVH-positive participants among high-voltage individuals

Comparison within MESA ≥50 mm and MESA ≥60 mm subgroups. Values are mean ± SD or n (%). Bold p-values indicate p < 0.05.

Variable	MESA ≥50 mm			MESA ≥60 mm		
	EVER(n = 155)	Echo-LVH(n = 44)	p	EVER(n = 51)	Echo-LVH(n = 10)	
Demographics						
Age (years)	52.0 ± 13.3	60.0 ± 11.8	**<0.001**	54.3 ± 15.3	61.8 ± 15.1	0.108
Male sex	96 (64.0%)	16 (36.4%)	**0.002**	39 (74.5%)	6 (60.0%)	0.444
BMI (kg/m²)	27.9 ± 4.9	33.3 ± 8.0	**<0.001**	26.5 ± 4.8	31.8 ± 6.4	**0.013**
Height (cm)	173.3 ± 8.4	165.6 ± 8.8	**<0.001**	173.6 ± 8.2	165.2 ± 10.3	**0.029**
Systolic BP (mmHg)	132.7 ± 18.8	145.4 ± 22.2	**<0.001**	138.5 ± 20.9	145.8 ± 19.4	0.271
Diastolic BP (mmHg)	78.9 ± 9.4	79.0 ± 11.6	0.948	81.0 ± 10.3	78.9 ± 14.9	0.471
ECG voltages						
MESA voltage (mm)	58.9 ± 8.8	58.7 ± 11.9	0.241	68.6 ± 8.4	75.8 ± 15.2	0.121
Sokolow–Lyon (mm)	38.5 ± 6.6	40.0 ± 9.7	0.723	43.7 ± 6.7	51.5 ± 12.6	**0.028**
Cornell (mm)	19.8 ± 7.1	23.2 ± 8.2	**0.006**	21.4 ± 9.2	30.8 ± 9.3	**0.005**
Peguero–Lo Presti (mm)	29.0 ± 7.9	30.7 ± 11.2	0.727	32.7 ± 8.6	39.0 ± 13.8	0.189
RaVL (mm)	6.9 ± 4.1	9.5 ± 4.8	**0.001**	7.0 ± 4.7	11.6 ± 6.2	**0.021**
Echocardiographic parameters						
LV mass, echo (g)	153.2 ± 33.3	220.2 ± 40.9	**<0.001**	162.0 ± 35.9	237.3 ± 50.0	**<0.001**
LVMI/ht$^{2.7}$ (g/m$^{2.7}$)	34.7 ± 6.7	56.1 ± 7.3	**<0.001**	36.4 ± 6.9	60.7 ± 7.4	**<0.001**
LVEF (%)	61.2 ± 7.5	61.7 ± 9.9	0.342	62.0 ± 8.7	59.5 ± 14.8	0.358
Outcomes						
Death	15 (10.0%)	8 (18.2%)	0.182	10 (19.6%)	1 (10.0%)	0.673
MACE	19 (12.7%)	18 (40.9%)	**<0.001**	9 (17.6%)	5 (50.0%)	**0.041**
Death or MACE	30 (20.0%)	22 (50.0%)	**<0.001**	15 (29.4%)	6 (60.0%)	0.079

BMI = body mass index; BP = blood pressure; Echo-LVH = echocardiographic LVH confirmed; EVER = electrocardiographic voltage elevation without LVH (false positive); LV = left ventricular; LVEF = LV ejection fraction; LVMI = LV mass index; MACE = major adverse cardiovascular events; MESA = Multi-Ethnic Study of Atherosclerosis.

Table 2. Cardiovascular Risk Associated with Ever-LVH — Echocardiography (MESA criterion positive without conventional LVH)

	Ever-LVH · MESA criterion positive WITHOUT conventional LVH						Independent Effects — LVH-Adjusted Model			
	Unadjusted		Age + Sex Adjusted		Fully Adjusted		MESA-LVH criterion		Conventional LVH	
Endpoint	HR (95% CI)	p	HR (95% CI)	p	HR (95% CI)	p	HR (95% CI)	p	HR (95% CI)	p
All-Cause Mortality	1.85 (1.14-3.02)	0.01	1.44 (0.87-2.36)	0.15	1.15 (0.68-1.95)	0.60	1.44 (0.97-2.14)	0.074	1.56 (1.06-2.29)	0.025
	2.72 (1.42-5.19)	0.00	1.63 (0.84-3.15)	0.15	1.17 (0.58-2.33)	0.66	1.19 (0.68-2.07)	0.538	1.65 (1.13-2.41)	0.010
Heart Failure	2.00 (1.08-3.71)	0.02	1.72 (0.92-3.23)	0.09	1.41 (0.72-2.75)	0.32	1.64 (0.97-2.78)	0.064	1.65 (1.02-2.66)	0.040
	3.49 (1.60-7.60)	0.002	2.38 (1.07-5.30)	0.03	1.64 (0.71-3.79)	0.25	1.73 (0.88-3.43)	0.113	1.74 (1.08-2.78)	0.022
Coronary Heart Disease	1.44 (0.65-3.18)	0.37	1.21 (0.54-2.70)	0.64	1.18 (0.51-2.75)	0.69	1.11 (0.60-2.05)	0.729	2.13 (1.24-3.66)	0.006
	1.14 (0.28-4.66)	0.85	0.76 (0.18-3.19)	0.71	0.67 (0.15-2.89)	0.59	0.74 (0.29-1.94)	0.544	2.22 (1.30-3.78)	0.003
Stroke	2.21 (1.11-4.38)	0.02	1.65 (0.82-3.30)	0.16	1.04 (0.49-2.22)	0.91	1.16 (0.63-2.15)	0.625	1.74 (0.98-3.09)	0.059
	3.78 (1.62-8.81)	0.002	2.29 (0.96-5.46)	0.06	1.27 (0.51-3.18)	0.61	0.83 (0.34-2.03)	0.689	1.81 (1.03-3.20)	0.041

EVER-LVH: defined as meeting the MESA-LVH criterion in the absence of conventional LVH (echocardiographic standard). This group represents cases detected exclusively by the MESA criterion that would be missed by conventional screening.

LVH-Adjusted model includes MESA-LVH and Conventional LVH simultaneously, estimating the independent contribution of each.

HR = Hazard Ratio; CI = 95% Confidence Interval; HF = Heart Failure; CHD = Coronary Heart Disease. Bold yellow cells = p < 0.05.

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FAST ANATOMICAL MAPPING (FAM) INTEGRATED WITH CARTOSOUND®: OPTIMIZATION OF ANATOMICAL RECONSTRUCTION IN ZERO-FLUOROSCOPY ABLATION.

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Background/Introduction: Arrhythmia ablation using a zero-fluoroscopy strategy has been established as a safe and effective approach, particularly with the integration of intracardiac echocardiography (ICE) into electroanatomical mapping systems. The Fast Anatomical Mapping (FAM) algorithm, incorporated into the CartoSound system, uses artificial intelligence to accelerate and automate three-dimensional anatomical reconstruction. However, its application in fully fluoroscopy-free procedures remains poorly described. Objectives: To evaluate the initial experience with FAM in zero-fluoroscopy atrial fibrillation (AF) ablation procedures, analyzing anatomical accuracy, mapping time, and potential interferences in reconstruction. Methods: A prospective study including 20 patients undergoing AF ablation without fluoroscopy. Reconstructions obtained by FAM were compared to those performed with a conventional multipolar catheter. Mapping time, volumetric differences, need for manual corrections, and interferences in automatic reconstruction were assessed. Results and Conclusions: Mean age was 68 years (range 44–78), mean ejection fraction was 68%, and mean left atrial diameter was 44 mm (range 35–55). FAM produced more accurate reconstructions, particularly of the posterior wall and roof of the left atrium, reducing the need for manual corrections. Mean mapping time was significantly shorter with FAM (333 s vs. 712 s). Eight patients had intracavitary devices during reconstruction (6 catheters and 2 pacemakers). No relevant interference was observed, except in one pacemaker patient, in which electrode imaging distorted the left atrial anatomy, requiring multipolar complementation. Three patients (15%) required remapping. FAM demonstrated better volumetric correlation and greater detail of critical structures such as the mitral ridge and left atrial appendage, although apparent shortening of the pulmonary veins was noted in some cases. No complications occurred. The FAM algorithm proved to be a promising tool in zero-fluoroscopy AF ablation, providing more faithful anatomical reconstructions, significant reduction in mapping time, and better definition of critical structures compared to conventional multipolar mapping. Specific cases may require manual complementation, and full efficacy depends on the operator's experience with ICE and image integration.

Variáveis	Valores
Total de pacientes	20
Idade média (anos)	68 (44–78)
Volume do átrio esquerdo (mm)	44 (35–55)
Fração de ejeção do VE (%)	68
Tempo de mapeamento (segundos)	FAM: 333 s Multipolar: 712 s
Fidelidade anatômica	Maior com FAM, especialmente PP, teto do AE, Ridge e AAE
Necessidade de correção manual FAM Cateter multipolar	 6 casos (dificuldade de visualizar auriculeta) 20 casos
Necessidade de remapeamento FAM Cateter multipolar	 3 casos (15%) - Presença de dispositivo intracavitário 0 casos
Presença de dispositivos intracavitários Cateter Navi no SC Marcapasso	 6 casos 2 casos
Interferência dos dispositivos	Sem interferência na maioria; 1 caso de distorção com eletrodo do MP
Estruturas melhor delimitadas	Carina, ridge, teto e PP
Observação adicional	Veias pulmonares por vezes de pequena extensão
Complicações	Nenhuma registrada

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FEMORAL ACCESS-GUIDED IMPLANTABLE CARDIOVERTER-DEFIBRILLATOR AND CARDIAC RESYNCHRONIZATION THERAPY (CRT-D) IMPLANTATION: A SINGLE-CENTER EXPERIENCE IN 903 CASES FROM NORTHEAST BRAZIL

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Background/Introduction: Introduction: Cardiac resynchronization therapy with defibrillator (CRT-D) is the established treatment for patients with dilated cardiomyopathy, left bundle branch block (LBBB), and ventricular tachycardia (VT). However, procedure time can be prolonged due to difficulties in navigating to the coronary sinus (CS). Objectives: Objective: To present our extensive experience with a novel femoral vein puncture technique guiding subclavian sheath insertion, optimizing CS lead placement and reducing procedural complexity in 903 ICD-CRT implantations. Methods: Material and Methods: From March 2010 to August 2025, 903 ICD-CRT implantations were performed. The cohort (65% male) presented with refractory heart failure, LVEF ≤ 35%, LBBB, and VT. CS access was systematically facilitated by a femoral approach: initial femoral vein puncture and introduction of a steerable quadripolar catheter into the CS. This catheter guided a second quadripolar catheter coaxially within the subclavian sheath directly into the CS, enabling detailed venography and optimal LV electrode branch selection. Immediate success was defined by significant QRS narrowing. Results and Conclusions: Results: CS access was 99.8% successful, without major complications (perforation, rupture, tamponade). Clinically, 74% achieved significant QRS narrowing (mean post-implantation 110 ms vs. pre-implantation 165 ± 15 ms, p<0.001). Late LV lead dislodgement was 0.44% (n=4). Right subclavian implantation was needed in 0.88% (n=8); PLSVC in 0.44% (n=4). Immediate phrenic nerve stimulation (3.32%, n=30) was managed by reprogramming. Average procedure time was 1h 30min (range 1h 20min to 2h 30min), demonstrating significant efficiency gains. Conclusion: Systematic femoral access guiding subclavian sheath introduction effectively reduced procedure time to 1h 30min, significantly lowering ionizing radiation exposure. This robust single-center experience (903 cases) demonstrates a safe, efficient, and reproducible strategy for complex ICD-CRT implantations, particularly relevant in regions like Northeast Brazil.

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IMPACT OF CORONARY ARTERY DISTRIBUTION ON PULSED FIELD ABLATION IN REFRACTORY PERSISTENT ARRHYTHMIAS

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Background/Introduction: Patients with persistent arrhythmias have a greater substrate related to arrhythmogenesis, frequently requiring more extensive ablations. These may occasionally involve areas adjacent to the coronary vessels, with the potential occurrence of ischemic events during pulsed field ablation (PFA) applications. Strategies for defining coronary anatomy have not been sufficiently studied and may contribute to the efficacy and safety of the procedure." Objectives: Study the impact of the relationship between coronary artery proximity to regions undergoing electroporation and the occurrence of local effects on coronary and systemic vasomotility in patients with atrial fibrillation (AF), typical and atypical flutter (AFL), and refractory ventricular ectopy. Methods: A total of 20 patients submitted PFA using the FARAWAVE catheter (Boston Scientific) from April 2025 to April 2026: 18 with persistent and refractory AF/AFL, undergoing pulmonary vein antral ablation with extension to the mitral, pulmonary, and cavotricuspid isthmuses, as well as other atrial areas; and 2 patients with right ventricular outflow ectopy. Angiographies were performed in right and left anterior oblique (RAO/LAO) views and analyzed using the Vue Motion Picture Archiving and Communication System software, version 12 (Philips), measuring the distances between the coronary arteries and the electroporation areas. Projections showing the shortest distance between the ablation catheter and the evaluated coronary artery were considered, with distances of less than 5 mm defined as critical. Results and Conclusions: Mean arrhythmia duration was 5.7 years (0.1–20.5); 50% were male and 55% had undergone previous ablation. In areas related to the coronary course, RAO and LAO luminographies were performed, followed by 200 µg of intracoronary nitroglycerin (NTG) immediately before electroporation. Concomitant cavotricuspid isthmus ablation was performed in 60% of patients. Acute success was achieved in all cases. The right coronary artery (RCA) most frequently met the critical proximity criteria (p= 0.042), occurring in 50% of cases (95% CI: 29.9–70.1). There were 4 episodes of transient vasospasm, which correlated with critical proximity to the RCA (p= 0.043). No complications or arterial hypotension occurred. Conclusions: In the studied sample, the ablation strategy with coronary anatomy definition was safe and effective. Intracoronary NTG did not cause systemic hemodynamic changes. The RCA presented vasospasm in 33% of cases.

Coronary Artery	Distance > 5 mm	Distance < 5 mm	Vasospasm	Arterial Hypotension
RCA	10	10	4	0
LAD	20	0	0	0
LCX	17	3	0	0

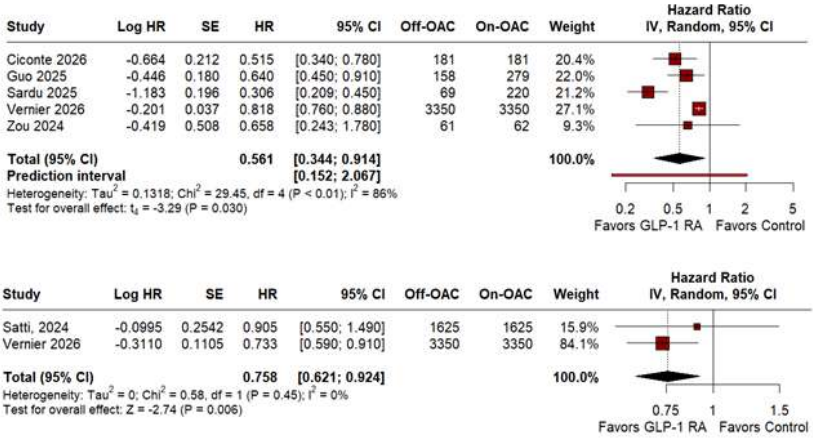
21181

IMPACT OF GLP-1 RECEPTOR AGONISTS ON ATRIAL FIBRILLATION RECURRENCE AFTER CATHETER ABLATION: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background/Introduction: Atrial fibrillation (AF) recurrence after catheter ablation remains frequent, particularly among patients with obesity and metabolic dysfunction — conditions that drive structural and electrical atrial remodeling. GLP-1 receptor agonists (GLP-1RAs), through their anti-inflammatory, antifibrotic, and cardiometabolic effects, may target key mechanisms underlying post-ablation recurrence. Objectives: To evaluate whether GLP-1RA use is associated with reduced atrial arrhythmia recurrence and all-cause mortality in patients submitted to catheter ablation for AF. Methods: This systematic review and meta-analysis was conducted following PRISMA guidelines. A systematic search of PubMed, Embase, and Web of Science identified randomized controlled trials and cohort studies comparing GLP-1RA use versus control in patients who underwent AF ablation. Pooled estimates were calculated using a random-effects model. Heterogeneity was assessed with the I-squared statistic. Effects were reported as hazard ratios (HR) with 95% confidence intervals (CI). Results and Conclusions: Five cohort studies were included, comprising 10,799 patients, of whom 5,263 (48.7%) received GLP-1RAs. For AF recurrence (four studies; n = 7,489), GLP-1RA use was associated with a 43% risk reduction (HR 0.57; 95% CI 0.35–0.91; I-squared = 88%; p = 0.020). The substantial heterogeneity observed may reflect differences in AF phenotype, concomitant pharmacotherapy, and ablation techniques across centers. For all-cause mortality (two studies; n = 9,950), a 24% risk reduction was observed (HR 0.76; 95% CI 0.62–0.92; I-squared = 0%; p = 0.006), without significant heterogeneity. GLP-1RA use was associated with lower AF recurrence and reduced all-cause mortality after catheter ablation. The observational design of the included studies limits causal inference; however, these findings support GLP-1RAs as a potential adjunctive strategy in post-ablation AF management and warrant confirmation through randomized trials.



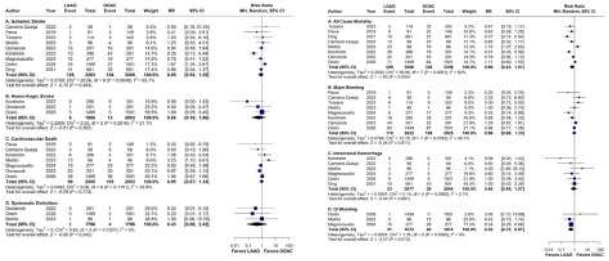
20750

LEFT ATRIAL APPENDAGE OCCLUSION VERSUS DIRECT ORAL ANTICOAGULANTS IN NON-VALVULAR ATRIAL FIBRILLATION: META-ANALYSIS OF CONTEMPORARY EVIDENCE

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Background/Introduction: Atrial fibrillation (AF) is the most common sustained cardiac arrhythmia and is associated with an increased risk of thromboembolic events and mortality. Left atrial appendage occlusion (LAAO) has emerged as an alternative strategy to direct oral anticoagulants (DOACs) for stroke prevention in patients with AF. However, comparative evidence regarding ischemic and bleeding outcomes remains limited and heterogeneous. Objectives: To compare the efficacy and safety of LAAO versus DOAC therapy exclusively in NVAF, excluding warfarin comparisons through a systematic review and meta-analysis of RCTs and propensity-matched studies. Methods: A systematic review and meta-analysis were conducted following PRISMA recommendations. Studies comparing LAAO and DOAC therapy in patients with atrial fibrillation were included. Risk ratios (RRs) with 95% confidence intervals (CIs) were pooled using a random-effects model. Heterogeneity was assessed using the I² statistic. Outcomes included all-cause mortality, ischemic stroke, hemorrhagic stroke, cardiovascular death, systemic embolism, major bleeding, intracranial hemorrhage, and gastrointestinal bleeding. Results and Conclusions: Nine studies comprising 6,869 patients were included. Compared with DOAC therapy, LAAO was associated with a lower risk of gastrointestinal bleeding (RR: 0.52; 95% CI: 0.31–0.87; p = 0.013; I² = 0%). No significant differences were found between groups for all-cause mortality (RR: 0.66; 95% CI: 0.43–1.01; p = 0.054; I² = 82%) major bleeding (RR: 0.96; 95% CI: 0.69–1.33; p = 0.811; I² = 45.1%), intracranial hemorrhage (RR: 0.88; 95% CI: 0.49–1.57; p = 0.661; I² = 2.7%), ischemic stroke (RR: 0.85; 95% CI: 0.53–1.35; p = 0.484; I² = 63.7%), hemorrhagic stroke (RR: 0.56; 95% CI: 0.16–1.96; p = 0.362; I² = 21.1%), cardiovascular death (RR: 0.95; 95% CI: 0.67–1.34; p = 0.774; I² = 33.8%), or systemic embolism (RR: 0.43; 95% CI: 0.08–2.42; p = 0.342; I² = 0%). In patients with atrial fibrillation, LAAO was associated with a lower risk of gastrointestinal bleeding compared with DOAC therapy, while showing comparable rates of ischemic and major adverse cardiovascular outcomes. Further randomized studies are warranted to better define the long-term comparative effectiveness of these strategies



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ORAL ANTICOAGULATION WITH OR WITHOUT SINGLE ANTI-PLATELET THERAPY AFTER ISCHEMIC STROKE IN ATRIAL FIBRILLATION: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background/Introduction: The addition of single antiplatelet therapy (SAPT) to oral anticoagulation (OAC) in patients with atrial fibrillation (AF) following ischemic stroke is common in clinical practice, particularly among patients with concomitant atherosclerotic disease. However, the net clinical benefit of this strategy remains uncertain. Objectives: To evaluate the safety and efficacy of OAC plus SAPT compared with OAC alone in patients with Atrial fibrillation following ischemic stroke or transient ischemic attack (TIA). Methods: We performed a systematic review and meta-analysis of observational cohort studies comparing OAC plus SAPT versus OAC alone in adults with AF and recent ischemic stroke or TIA. Adjusted hazard ratios (HRs) were pooled using random-effects models. The primary outcome was major bleeding. Secondary outcomes included recurrent ischemic stroke and all-cause mortality. Sensitivity analyses excluding vitamin K antagonist (VKA) based comparisons were performed. Results and Conclusions: Six observational cohort studies comprising 14,393 patients were included. Five studies contributed adjusted estimates for quantitative synthesis. Combination therapy was associated with a numerically increased though not statistically significant risk of major bleeding (HR 1.26, 95% CI 0.98–1.61; p=0.068), which became significant in DOAC-only analyses (HR 1.35, 95% CI 1.13–1.61; p=0.0008). There was no reduction in recurrent ischemic stroke (HR 1.32, 95% CI 0.94–1.85; p=0.111). Combination therapy was associated with higher all-cause mortality (HR 1.13, 95% CI 1.04–1.23; p=0.0049), although this finding should be interpreted cautiously given the likelihood of residual confounding by indication. Conclusions: In patients with AF following ischemic stroke or TIA, the addition of SAPT to OAC was not associated with reduced recurrent ischemic stroke and was associated with increased bleeding risk in DOAC-based analyses. These findings support a conservative approach to combination antithrombotic therapy outside established indications.

Study Selection

A total of 4677 records were identified through database searching. After removal of duplicates and screening, six studies met inclusion criteria. Study selection is summarized in Figure 1 (PRISMA flow diagram). Tsai et al. was included in the qualitative synthesis but excluded from quantitative synthesis due to non-comparable exposure definitions.

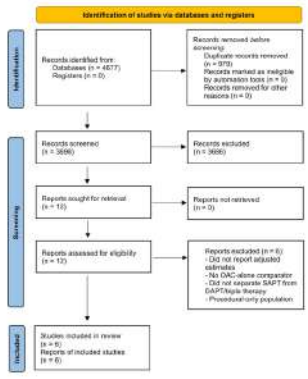


Figure 1. PRISMA 2020

Major Bleeding

Four comparisons were included in the primary analysis. Combination therapy was associated with a numerically increased though not statistically significant risk in major bleeding (HR 1.26, 95% CI 0.98–1.61; p = 0.068) (Figure 2).

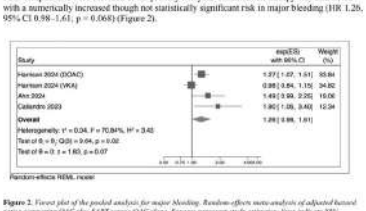


Figure 2. *Forest plot of the pooled analysis for major bleeding. Random-effects meta-analysis of adjusted hazard ratios comparing OAC plus SAPT versus OAC alone. Squares represent study estimates; lines indicate 95% confidence intervals; diamond represents the pooled effect. HR, hazard ratio; CI, confidence interval; OAC, oral anticoagulation; SAPT, single antiplatelet therapy.*

In sensitivity analysis excluding the VKA subgroup, combination therapy was associated with **significantly increased major bleeding** (HR 1.35, 95% CI 1.13–1.61; p = 0.0008) (Figure 3).

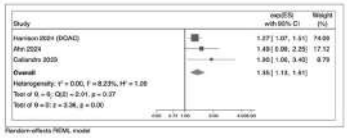


Figure 3. *Sensitivity analysis for major bleeding restricted to DOAC-based comparisons (excluding VKA subgroup). Combination therapy was associated with significantly increased major bleeding (HR 1.35, 95% CI 1.13–1.61; p = 0.0008). HR, hazard ratio; CI, confidence interval; DOAC, direct oral anticoagulant; VKA, vitamin K antagonist.*

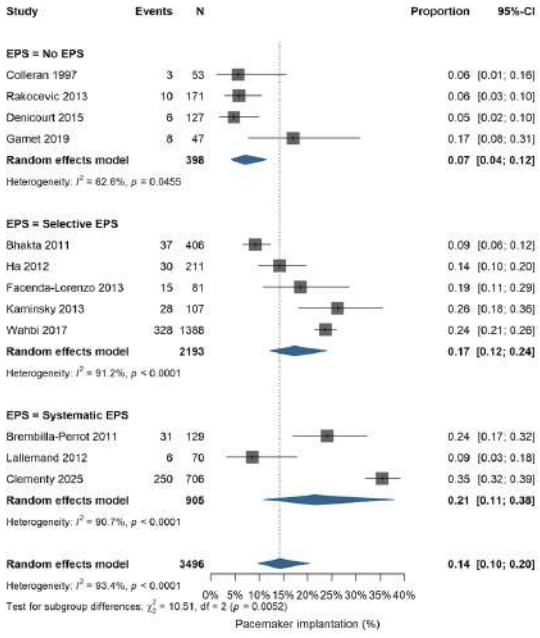
13651

PACEMAKER IMPLANTATION IN MYOTONIC DYSTROPHY TYPE 1: INCIDENCE ACROSS CLINICAL COHORTS

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Background/Introduction: Cardiac conduction disease is a frequent manifestation of myotonic dystrophy type 1 (DM1), and is one of the leading causes of death in affected adults. Pacemaker (PM) implantation is commonly required during follow-up, but reported rates vary across studies and clinical strategies. Objectives: To estimate the incidence of pacemaker implantation in patients with DM1 and explore factors associated with variability across studies. Methods: A systematic search of eight databases (LILACS, SciELO, PubMed/MEDLINE, ScienceDirect, EMBASE, CENTRAL, Web of Science, and Scopus) was conducted from inception to December 30, 2025, to identify studies evaluating cardiac conduction disease and related outcomes in patients ≥16 years with genetically confirmed DM1. Studies that reported pacemaker implantation during follow-up were eligible for this analysis. A random-effects meta-analysis of proportions was performed to estimate the pooled incidence of PM implantation. Subgroup analyses were conducted according to the electrophysiological study (EPS) strategy (no EPS, selective EPS, or systematic EPS). Results and Conclusions: Twelve studies (n = 3,496) reported pacemaker implantation during follow-up and were included in the quantitative analysis. A total of 752 pacemaker implantations occurred during follow-up. The pooled incidence of PM implantation was 14% (95% CI 10–20%), with high heterogeneity across studies (I^2 = 93.4%). When stratified by EPS strategy, studies without EPS reported a pooled PM implantation rate of 7% (95% CI 4–12%), whereas studies using selective EPS reported a rate of 17% (95% CI 12–24%). In studies employing systematic EPS strategies, the pooled rate increased to 21% (95% CI 11–38%). Meta-regression showed that the EPS strategy was significantly associated with PM implantation rates, whereas follow-up duration was not. Figure 1 summarizes these findings. In summary, higher PM implantation rates in studies adopting systematic electrophysiological evaluation suggest that the screening strategy may substantially influence device indication and clinical management in DM1 patients.



18429

PREDICTORS OF SUCCESS USING AUTOMARK ANALYSIS AND A CONTACT FORCE FLEXIBLE-TIP CATHETER IN ATRIAL FIBRILLATION ABLATION

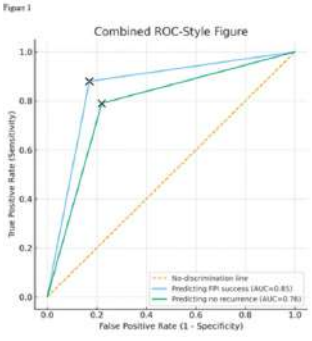
GUILHERME MOREIRA PIZETTA1; HENRIQUE TEIXEIRA GIESTAS SERPA1; THAIS COUTINHO NICOLA1; EDUARDO SERPA1; LUISA CARVALHO BENEDITO1; CHRISTIANO LEMOS DA CUNHA1; CARLOS ALEXANDRE VOLPONI LOVATTO1; ALOYR SIMOES JR.1; FABRICIO SARMENTO VASSALLO1; LUIZ FERNANDO MACHADO BARBOSA1;

(1) HOSPITAL SANTA CASA DE MISERICORDIA DE VITORIA - VITÓRIA - ES - BRASIL;

Background/Introduction: Background: Ultra-HPSD (90 W/4 s) ablation is effective and safe but requires dedicated RF generators. Contact-force flexible-tip catheters (FTC) allow higher power with conventional generators. Automark Analysis ApplicationTM (AAA) enables post-procedure lesion analysis to optimize quality. Objectives: Objective: To assess AAA in identifying variables associated with first-pass isolation (FPI) and arrhythmia recurrence using FTC with high-power short-duration (HPSD) and Very-HPSD strategies. Methods: Methods: First-time AF ablation was performed in 38 consecutive patients, mean follow-up 11.9±6.3 months. Power 60–70W, contact force 10–20 g anterior and 5–10 g posterior wall, irrigation 20 ml/min. If current >850 mA, power reduced to 55–50W. Results and Conclusions: Results: 29 male, 63.5±13.5 years, BMI 28.6±4.2, 22 (57.9%) paroxysmaL, CHA2DS2-VA 2.6±1.6, LA volume index 42.±14.5mm, ejection fraction 62±8.4%. Mean LA dwell time and procedure time 55±10.3 and 72.5±11.5min, respectively. Total RF delivery time 983.2±218.8 and first-pass isolation (FPI) in 29 (76.3%) patients. Esophageal temperature rise >1°C in 14 patients [(36.8%) mean increase of 1.3±0.5°C]. According to AAATM, predictors of success were: FPI, average Automark IndexTM (AI), average contact force, average tip stability and lateral force (Table 1). Average AI of ≥38 was the strongest independent predictor of first-pass isolation (adjusted OR 18.4, 95% CI 3.1–109; p=0.003) with 96% success rate versus 67% below this threshold (figure 1). FPI was the strongest predictor of arrhythmia-free survival (adjusted OR 0.05, 95% CI 0.006–0.42, p=0.006). Predictors of achievement of FPI: higher average contact force (9.9vs7.2g, p=0.048) and better catheter tip stability (1.0vs1.6mm, p=0.032). Independently of FPI, each 10-unit increase in AI was associated with a 56% reduction in recurrence risk (adjusted OR 0.44, 95% CI 0.20–0.97, p=0.043). One pericardial effusion occurred 20 days post-procedure in a patient treated with 60W. Conclusion: In HPSD and Very-HPSD AF ablation, AI independently predicts procedural success and long-term arrhythmia-free survival. Targeting AI ≥38 with optimal catheter stability should be adopted to improve outcomes.

Table 1: predictors of success (no recurrence) and First-Pass Isolation (FPI)

Variable	No recurrence (n=29)	Recurrence (n=9)	p-value	FPI achieved (n=32)	FPI not achieved (n=6)	p-value
First-Pass Bilateral Isolation	97%	56%	0.004	—	—	—
Recurrence rate with FPI	—	—	—	6%	50%	0.004
Average Automark Index	46.0 ± 16.4	34.2 ± 18.1	0.047	47.1 ± 16.1	29.3 ± 15.5	0.009
Average contact force (g)	10.1 ± 4.4	8.0 ± 3.3	0.08	10.2 ± 4.3	7.1 ± 2.9	0.035
Average tip stability (mm)	1.1 ± 0.6	1.4 ± 0.8	0.19	1.0 ± 0.5	1.8 ± 0.9	0.012
Lateral force (%)	81.5 ± 5.5	78.9 ± 6.2	0.21	81.8 ± 5.3	77.2 ± 6.8	0.06



21767

PURELY ANGIOGRAPHIC GUIDANCE FOR TRANSSEPTAL PUNCTURE IN ATRIAL FIBRILLATION ABLATION: A SINGLE-CENTER EXPERIENCE IN 476 CASES FROM BRAZIL

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Background/Introduction: Introduction: Pulmonary Vein Isolation (PVI) is the gold standard for rhythm control in atrial fibrillation (AF). Access to the pulmonary veins is universally achieved via transseptal puncture, traditionally guided by transesophageal echocardiography (TEE) or, as in this study, by angiography alone. Optimizing the safety and efficacy of transseptal puncture is crucial. Objectives: Objective: To present our center's experience with purely angiographic transseptal puncture guidance, evaluating its safety, efficacy, and impact on procedure time in 476 patients undergoing AF ablation. Methods: Material and Methods: Between March 2006 and September 2025, 476 patients underwent PVI. In 100% of cases, transseptal puncture was guided exclusively by angiography. Patients were sedated. Catheters were positioned in the coronary sinus (CS) and a "pigtail" catheter in the aortic valve plane. Fluoroscopy was set to 45° Left Anterior Oblique (LAO) projection. The puncture needle was advanced to the fossa ovalis, and the interatrial septum marked by contrast injection. After puncture, the sheath was advanced. Two transseptal punctures were typical for conventional or EnSite mapping. 5,000 IU of Heparin administered post-puncture. Catheters removed after isolation confirmation, followed by local compressive dressing. Results and Conclusions: Results: The cohort (23-83 years, 72.9% male) presented with Paroxysmal AF (67%), Persistent (16.37%), and Permanent (16.63%). Ablation methods: conventional PVI (3.7%), EnSite mapping (46.8%), PVAC (10.8%), and Cryoablation (38.7%). Complications were minimal: one cardiac tamponade (0.21%), managed by pericardiocentesis without sequelae; two cases (0.42%) of impossible puncture due to post-cardiac surgery anatomy. Crucially, zero esophageal injuries. Two transient phrenic nerve palsies (0.42%) occurred with Cryoablation. Average procedure time was 90 ± 15 minutes, demonstrating efficiency. Conclusion: Despite technological advancements in guidance, this large, experienced cohort demonstrates that the purely angiographic method for transseptal puncture remains a safe and effective strategy. Its continued use in experienced centers offers low complication rates, reduced cost, optimized operating room time, and lower ionizing radiation exposure.

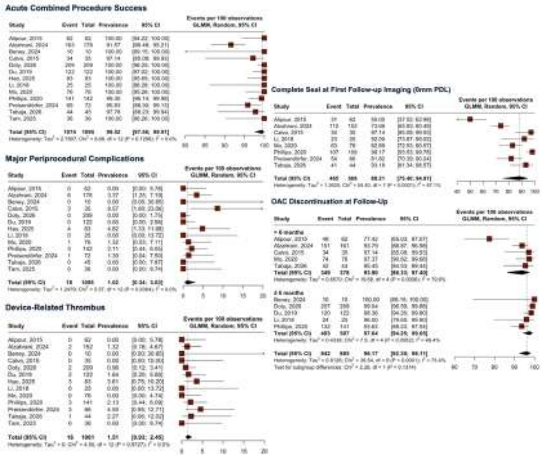
19319

SAFETY AND EFFICACY OF CONCOMITANT ATRIAL FIBRILLATION ABLATION AND LEFT ATRIAL APPENDAGE OCCLUSION: A SYSTEMATIC REVIEW AND SINGLE-ARM META-ANALYSIS

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(1) UNIVERSIDADE FEDERAL DE MINAS GERAIS - BELO HORIZONTE - MG - BRASIL; (2) CENTRO UNIVERSITARIO CESMAC - MACEIO - AL - BRASIL; (3) FACULDADE DE MEDICINA DA UNIVERSIDADE DE SAO PAULO - SÃO PAULO - SP - BRASIL; (4) NEW YORK UNIVERSITY - UNITED STATES; (5) INSTITUTO DANTE PAZZANESE DE CARDIOLOGIA - SAO PAULO - SP - BRASIL; (6) INCOR - INSTITUTO DO CORACAO DA UNIVERSIDADE DE SAO PAULO - SAO PAULO - MG - BRASIL; (7) INSTITUTO DANTE PAZZANESE DE CARDIOLOGIA - SAO PAULO - MG - BRASIL;

Background/Introduction: Catheter ablation (CA) and left atrial appendage occlusion (LAAO) address the two pillars of atrial fibrillation (AF) management: rhythm control and stroke prevention. Although both are well established individually, combining them in a single session has raised concerns about longer procedural duration, incremental procedural risk, device sealing performance, and device-related thrombus (DRT). Emerging evidence suggests that performing both during the same session is feasible and cost-effective, but pooled estimates across the growing literature remain lacking. Objectives: This systematic review and meta-analysis seeks to provide pooled estimates of procedural success, safety, device performance, and anticoagulation (OAC) discontinuation following same-session AF ablation and LAAO. Methods: We systematically searched PubMed, Embase, Web of Science, Scopus, and the Cochrane Central Register of Controlled Trials, following PRISMA guidelines. Eligible studies were prospective or retrospective cohorts that reported device-level outcomes of combined CA and percutaneous LAAO. The outcomes of interest included procedural success, major periprocedural complications, DRT at first follow-up imaging, complete seal (0 mm peri-device leak), and OAC discontinuation. Pooled prevalences with 95% confidence intervals (CIs) were estimated using generalized linear mixed models under random effects. Heterogeneity was assessed with the I² statistic. Analyses used the meta package in R (version 4.5.2). Results and Conclusions: After screening the records, fourteen studies met the inclusion criteria, and thirteen (n=1,095) provided device-level data for the meta-analysis. Acute procedural success was 99.5% (95% CI 97.6–99.9; I²=0%). Major periprocedural complications occurred in 1.0% (95% CI 0.3–3.0; I²=0%). DRT at first follow-up imaging was 1.5% (95% CI 0.9–2.5; I²=0%). The pooled analysis reported a complete seal (0mm PDL) at first follow-up of 88.2% (95% CI 75.4–94.8; I²=87.1%). OAC was discontinued in 96.2% (95% CI 92.4–98.1; I²=75.4%); the lower rate in longer-follow-up studies likely reflects reinitiation for AF recurrence. Same-session AF ablation and LAAO is feasible with high procedural success (99.5%), low rates of major complications (1.0%) and DRT (1.5%), and OAC discontinuation in over 96% of patients. Complete seal was achieved in 88.2% of patients, though definitions varied across studies. These findings support the combined approach for selected patients, but warrant confirmation through comparative trials.



16385

SWITCHING FROM VITAMIN K ANTAGONIST TO DOACS IN FRAIL ELDERLY PATIENTS WITH ATRIAL FIBRILLATION: A SYSTEMATIC REVIEW AND META-ANALYSIS

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(1) UNIVERSIDADE FEDERAL DOS VALES DO JEQUITINHONHA E MUCURI (UFVJM) - TEÓFILO OTONI - MG - BRASIL; (2) UNIVERSIDADE FEDERAL DO PIAUI - PIAUÍ - PI - BRASIL; (3) HOSPITAL DAS CLINICAS USP - SÃO PAULO - SP - BRASIL; (4) UNIVERSIDADE FEDERAL DE SANTA MARIA - SANTA MARIA - RS - BRASIL; (5) UNIVERSIDADE FEDERAL DOS VALES DO JEQUITINHONHA E MUCURI (UFVJM) - TEÓFILO OTONI - MG - BRASIL;

Background/Introduction: Introduction: Atrial fibrillation (AF) is associated with an increased risk of adverse outcomes, particularly in older patients and those with comorbidities. Recent studies have demonstrated the efficacy of switching from vitamin K antagonists (VKAs), such as warfarin, to direct oral anticoagulants (DOACs) in the treatment of patients with AF. However, the benefits of this transition in frail elderly patients are still unclear. Objectives: Objectives: This study aimed to evaluate the safety of switching from VKA to DOACs, compared with continued VKA use, in frail older patients with AF. Methods: Methods: PubMed, Embase, Cochrane and Web of Science were systematically searched from inception to January 2026. We included randomized controlled trials (RCTs) and cohort studies comparing switching from VKA to DOACs versus continued VKA use in frail older patients (≥60 years) with AF. The outcomes assessed were thromboembolic events, all-cause death, major bleeding, intracranial hemorrhage, and gastrointestinal bleeding. Risk ratios (RRs) with 95% confidence intervals (CIs) were pooled using a random-effects model, and statistical heterogeneity was assessed using the I² statistic. Results and Conclusions: Results: Three studies were included, totaling 267,746 patients (133,922 in the DOACs group and 133,824 in the VKA group), with a mean age ranging from 79.33 to 83.0 years. Switching to DOACs was associated with a significantly lower overall risk of intracranial hemorrhage (RR: 0.54; 95% CI: 0.31–0.95) and mortality (RR: 0.84; 95% CI: 0.75–0.93) compared with continued use of VKA. Furthermore, no significant differences were observed for thromboembolic events, major bleeding, and gastrointestinal bleeding. Conclusion: Switching from VKA to DOACs in frail older patients with AF was associated with a lower risk of intracranial hemorrhage and mortality, with no significant differences in thromboembolic events or bleeding compared with continued VKA use. These results suggest a potential safety in switching from VKAs to DOACs in this population.

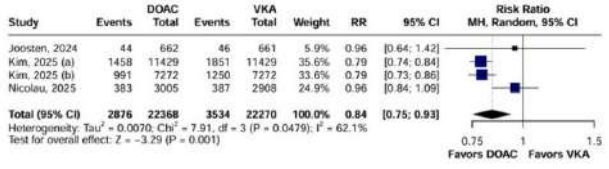


Figure 1. Forest Plot for the all-cause death.

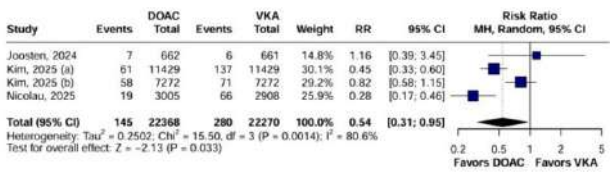


Figure 2. Forest Plot for the intracranial hemorrhage

22074

THYROTOXIC VERSUS NON-THYROID-RELATED ATRIAL FIBRILLATION, TIMING OF ISCHEMIC RISK, AND PROGNOSTIC IMPLICATIONS: A SYSTEMATIC REVIEW AND META-ANALYSIS

LARISSA KÁSSIA ROCHA SANTOS1; FELIPE LOPES DE LANA1; SOFIA TEIXEIRA GALLI1; ISAAC LIMA RODRIGUES2; LUDMILA DA COSTA DE CASTRO2; FABIO GONÇALVES FERREIRA3; NATALIA PANTA MATOS4; MAYSA DE CARVALHO DOMINGOS4; RUY RIBEIRO CAMPOS JR4;

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Background/Introduction: Historically, clinical guidelines have underestimated the thrombogenic risk of thyrotoxic atrial fibrillation (AF), based on the premise that the arrhythmia would be benign once euthyroidism is restored. However, evidence indicates that the acute risk is critical. This study proposes a paradigm shift: in the acute phase, hormonal imbalance acts as a potent prothrombotic and arrhythmogenic trigger. In the chronic phase, prolonged cardiotoxicity leads to atrial remodeling and persistent fibrosis, which perpetuate the arrhythmia and increase failure rates in ablation and cardioversion procedures, even after thyroid stabilization. Objectives: To compare the ischemic risk and prognostic outcomes of thyrotoxic AF versus non-thyroid AF. Methods: Systematic review following PRISMA(Fig. 1.D) guidelines, with a meta-analysis based on the random-effects model. The PICO(Fig. 1.A) protocol was used to assess outcomes (stroke, mortality, and AF) and descriptors(Fig. 1.B). On search platforms (Fig. 1.C) Longitudinal cohort studies were prioritized to ensure temporal validity, while cross-sectional studies were used only for narrative support. Hazard ratio (HR) and odds ratio (OR) data were standardized via logarithmic transformation and standard error. Heterogeneity was controlled using the I² statistic in the meta package (R software). The study is registered on the OSF platform. Results and Conclusions: A temporal difference in the risk profile was identified: Acute Ischemic Risk (<1 year) showed an HR of 1.14 [1.09; 1.19], confirming the first year post-diagnosis as a window of high thrombogenic vulnerability. In the Long-Term (>1 year), the risk declines (HR 0.74 [0.65; 0.85])(Fig. 2), suggesting an overlap of traditional comorbidities. Patients with a history of thyrotoxicosis exhibit greater resistance to interventions, evidencing permanent structural damage to the atrial myocardium. The data suggest a distinct progression of atrial remodeling; the window of opportunity observed in the data trends indicates that if reversion to sinus rhythm does not occur within the first 6 months post-euthyroidism, the probability of success in interventions drops drastically. Thus, anticoagulation should be immediate, without awaiting thyroid normalization. In late follow-up, decision-making should be based on the CHA2DS2-VASc score and patient comorbidities. The clinical challenge of thyrotoxic AF lies in its temporality: high acute risk and persistent atrial damage require protocol that consider the duration of disease.

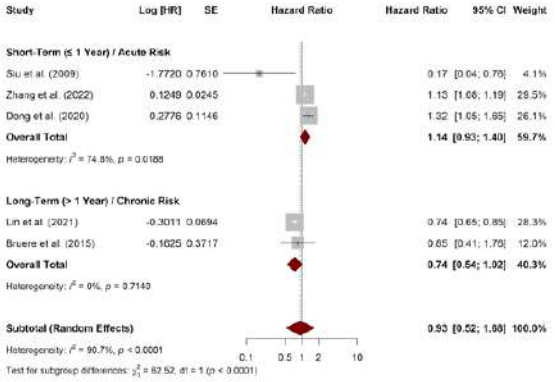


Figure 2. Ischemic Risk and MACE in Thyrotoxic vs. Non-Thyroidal Atrial Fibrillation.
Forest plot demonstrating the temporal dichotomy of ischemic risk. In the short-term phase (≤ 1 year), thyrotoxicosis acts as a severe arrhythmogenic trigger, significantly increasing the risk of adverse events (HR 1.14; 95% CI: 1.09–1.19). In the long-term phase (> 1 year), following the restoration of the euthyroid state, the relative risk decreases (HR 0.74; 95% CI: 0.65–0.85), indicating that chronic prognosis is primarily driven by traditional CHA2DS2-VASc comorbidities rather than baseline thyroid status.

19989

TRANSESOPHAGEAL ECHOCARDIOGRAPHY VERSUS FLUOROSCOPY-GUIDED LEFT BUNDLE BRANCH AREA PACING: A SINGLE-CENTER COMPARATIVE COHORT STUDY

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(1) BETH ISRAEL DEACONESS MEDICAL CENTER - UNITED STATES; (2) HOSPITAL DE CARDIOLOGIA SOS CARDIO - FLORIANOPOLIS - SC - BRASIL;

Background/Introduction: Left bundle branch area pacing (LBBAP) has emerged as a physiological alternative to conventional ventricular pacing. However, optimal intraseptal lead placement remains technically challenging, and the role of intraprocedural imaging guidance has not been systematically evaluated. Objectives: To determine whether transesophageal echocardiography (TEE) guidance improves procedural efficiency and electrical outcomes compared with conventional fluoroscopy-only guidance during LBBAP implantation. Methods: Single-center, retrospective, non-randomized cohort study enrolling 405 consecutive patients undergoing LBBAP between January 2018 and March 2025. The initial 198 patients were implanted under fluoroscopy guidance alone; the subsequent 207 patients underwent TEE-guided implantation. Primary endpoints included total procedure time, fluoroscopy time, post-procedural QRS duration, R-wave peak time in lead V6, and final lead impedance. Subgroup analysis was performed for patients with baseline wide QRS (<120 / 120-140 / >140 ms). Results and Conclusions: TEE-guided LBBAP was associated with significantly shorter total procedure time (65.5±25.2 vs. 89.9±37.9 min; p<0.001) and fluoroscopy time (12.8±9.9 vs. 15.8±10.5 min; p<0.001). Post-procedural QRS duration was narrower in the TEE group (108±16 vs. 116±15 ms; p<0.001), with a greater reduction in patients with baseline wide QRS (ΔQRS: −54±23 vs. −46±21 ms; p<0.001). Lead impedance was significantly lower with TEE guidance (523.6±115.6 vs. 611.3±155.9 Ω; p<0.001), while pacing thresholds and R-wave amplitudes were comparable. Complication rates were low and similar between groups. TEE-guided LBBAP implantation improves procedural efficiency and electrical resynchronization, supporting its incorporation into conduction system pacing protocols. Prospective randomized evaluation is warranted.

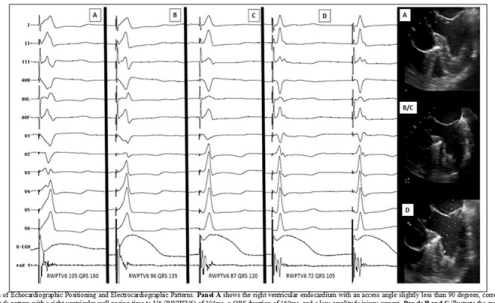
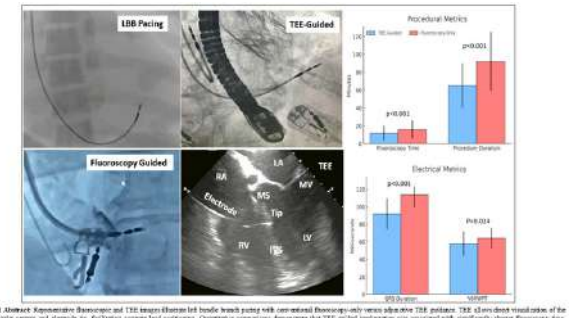


Fig 1 Correlation of Echocardiographic Positioning and Electrocardiographic Patterns. **Panel A** shows the right ventricular endocardium with an access angle slightly less than 90 degrees, corresponding to a left bundle-branch block pattern with a right ventricular wall pacing time to V6 (RWPTV6) of 105ms, a QRS duration of 160ms, and a low-amplitude injury current. **Panels B and C** illustrate the gradual narrowing of the QRS complex, shortening of the RWPTV6, and an increase in the injury current as the electrode advances through the mid-interventricular septum toward the left ventricular endocardium, without the development of an r wave in lead V1. **Panel D** depicts the final electrode position, with an access angle slightly less than 90 degrees and in intimate contact with the left ventricular endocardium. This position is associated with a QRS duration of 105ms and an RWPTV6 of 72ms. The electrode's proximity to the left ventricular outflow tract and the aortic root is noted.



Graphical Abstract Representative fluoroscopic and TEE images illustrate left bundle branch pacing with conventional fluoroscopy-only versus adjunctive TEE guidance. TEE allows direct visualization of the interventricular septum and electrode tip, facilitating accurate lead positioning. Quantitative comparisons demonstrate that TEE-guided implantation was associated with significantly shorter fluoroscopy time, comparable or reduced procedure duration, and improved electrical outcomes, including narrower QRS durations and shorter V6 R wave peak time. RA = right atrium; RV = right ventricle; LA = left atrium; LV = left ventricle; MV = mitral valve; MS = membranous septum; IVS = interventricular septum. TEE = transesophageal echocardiography; LBBP = left bundle branch pacing; RWPT = R-wave peak time.

13238

UNMASKING THE RISK: CLINICAL PROFILE AND OUTCOMES IN PATIENTS WITH MASQUERADING BUNDLE BRANCH BLOCK

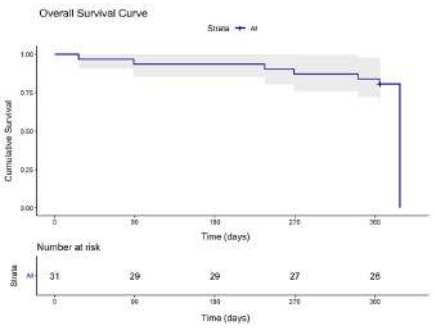
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Background/Introduction: Masquerading bundle branch block (MBBB) is a rare electrocardiographic pattern characterized by the concomitance of right bundle branch block (RBBB) and left anterior fascicular block (LAFB). Unlike classic RBBB, lead I presents with a pure and slurred R wave, mimicking the pattern observed in left bundle branch block (LBBB). Initially described by Richman and Wolff, MBBB usually reflects diffuse and advanced left ventricular impairment. Although recognized for decades, this condition remains poorly characterized in contemporary populations. Objectives: To determine the epidemiological, etiological, and prognostic profile of patients diagnosed with masquerading bundle branch block from July 2022 to December 2024. Methods: This is an observational, exploratory, and retrospective study. Consecutive patients meeting the electrocardiographic criteria for MBBB were included. A descriptive analysis of demographic, clinical, and echocardiographic variables was performed. Data normality was verified using the Shapiro-Wilk test. For the univariate association analysis with the outcome of death, Student's t-test or Fisher's exact test was used as appropriate. Overall survival was estimated using the Kaplan-Meier method. A p-value < 0.05 was considered statistically significant. Results and Conclusions: The sample consisted of 31 predominantly male patients (74.2%), with a mean age of 70.8 years. The predominant etiologies were ischemic heart disease (32.2%) and Chagas disease (29.0%). Baseline analysis showed a mean QRS duration of 150 ms and a mean LVEF of 38%. Overall 1-year survival was 80.6% (95% CI: 67.9% – 95.8%). In the univariate analysis, LVEF demonstrated a statistical association with mortality: patients who died had a significantly lower LVEF than survivors (21.8% vs. 42.8%; p < 0.001). There were no deaths among patients with an LVEF > 40%. Exploratory variables suggested a higher risk profile, although lacking statistical significance in this sample: Chagasic etiology (OR 4.02; p = 0.16), previous AMI (OR 3.80; p = 0.17), and longer QRS duration (169 ms in deaths vs. 147 ms in survivors; p = 0.17). Reduced LVEF was the main determinant of short-term mortality. Additionally, the high prevalence of ischemic and Chagasic etiologies, coupled with a potentially worse outcome associated with QRS widening, reinforces the need for rigorous clinical surveillance and early therapeutic optimization in these patients.

Demographics	
Age (years), mean ± SD	70.7 ± 13.1
Male Sex	23 (74.2%)
White Race	21 (67.7%)
Comorbidities and Medical History	
Systemic Arterial Hypertension	28 (90.3%)
Dyslipidemia	22 (71.0%)
Diabetes Mellitus	16 (51.6%)
Ischemic Cardiomyopathy	12 (40.0%)
Chagas Disease	9 (32.1%)
Previous AMI	10 (32.3%)
Smoking (Current or Former)	14 (45.2%)
Chronic Obstructive Pulmonary Disease	6 (19.4%)
Aortic Stenosis	3 (10.0%)
Previous Pacemaker or ICD	10 (32.2%)
Medications in Use	
Beta-blocker	25 (80.6%)
Amiodarone	10 (32.3%)
Calcium Channel Blocker	5 (16.1%)

Laboratory Data	
Creatinine Clearance (CrCl) (mL/min)	49.3 ± 28.9
Potassium (mEq/L)	4.7 ± 0.6
Echocardiogram	
LVEF (%), mean ± SD	38.2 ± 16.5
Reduced LVEF (< 40%)	18 (69.2%)
LVMI (g/m²)	154.0 ± 68.3
Left Atrial Volume Index (mL/m²)	56.1 ± 24.7
Electrocardiogram (ECG)	
Sinus Rhythm	25 (83.3%)
Atrial Fibrillation (AF)	3 (10.0%)
QRS Duration (ms), mean ± SD	152.4 ± 29.9
Heart Rate (bpm), mean ± SD	73.8 ± 24.3
PR Interval (ms), mean ± SD	217.4 ± 83.1
1-Year Follow-up	
Pacemaker Implantation	6 (19.3%)
Death	7 (22.5%)



21550

UPGRADING FROM DUAL-CHAMBER PACEMAKER TO MULTISITE PACING IN REFRACTORY HEART FAILURE: A 71-PATIENT COHORT STUDY

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Background/Introduction: Chronic right ventricular (RV) apical pacing in dual-chamber pacemaker recipients can induce electrical and mechanical dyssynchrony, culminating in pacing-induced cardiomyopathy, compromised systolic function, and symptomatic heart failure (HF). Upgrading to multisite pacing (MSP), or cardiac resynchronization therapy (CRT), is a physiological intervention designed to restore ventricular synchrony and optimize hemodynamics. Current evidence highlights its efficacy in improving left ventricular ejection fraction (LVEF) and functional capacity. Objectives: To evaluate the clinical and hemodynamic outcomes of patients undergoing an upgrade from a conventional dual-chamber pacemaker to MSP at a specialized tertiary center. Methods: A retrospective analysis was conducted on 71 patients out of 914 MSP implantations performed between March 2006 and October 2025. Inclusion criteria comprised patients upgraded from a dual-chamber pacemaker to MSP due to widened QRS complexes secondary to chronic RV pacing, ventricular dyssynchrony, and refractory HF symptoms despite guideline-directed medical therapy (GDMT). The surgical technique involved coronary sinus cannulation and left subclavian vein puncture, guided by venography for optimal left ventricular lead placement. Device programming was tailored to achieve the narrowest QRS duration. Baseline characteristics and follow-up echocardiographic data, specifically LVEF, were analyzed. Results and Conclusions: The study cohort (n=71) accounted for 7.8% of all MSP procedures. The mean patient age was 60.5 years (range: 45–76), with a male predominance (64.8%). The primary underlying etiologies were Chagas cardiomyopathy (47.9%), ischemic heart disease (22.5%), and valvular heart disease (11.3%). The procedural and clinical success rate was 77.5%, with no peri- or post-procedural complications reported. A majority of the cohort (77.5%) received a CRT-defibrillator (CRT-D) device. At the 12-month follow-up, a clinically significant improvement in LVEF was observed in 52 patients (73.2%). Upgrading from a dual-chamber pacemaker to MSP is a safe and effective intervention for patients with pacing-induced dyssynchrony and refractory heart failure. The procedure yields a high success rate and promotes significant echocardiographic improvement, evidenced by increased LVEF in 73.2% of patients, thereby conferring substantial hemodynamic and functional benefits.

21325

WARFARIN USE IS ASSOCIATED WITH WORSE BONE MARKERS COMPARED WITH DOACS

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(1) HOSPITAL DE CLINICAS DE PORTO ALEGRE - PORTO ALEGRE - RS - BRASIL;

Background/Introduction: Warfarin has been associated with impaired bone health, likely due to its antagonism of vitamin K, which plays a role in bone matrix formation. However, the impact of direct oral anticoagulants (DOACs) remains unclear. The main bone markers, obtained by densitometry, are the quantitative assessment by bone mineral density (BMD) and the qualitative assessment by trabecular bone score (TBS). Objectives: To evaluate bone markers in patients using DOACs and warfarin. Methods: Matched cross-sectional study design, including patients from Cardiology or Internal Medicine outpatient clinics of a tertiary hospital, aged 40 - 75 years, on anticoagulation for > 1 year, divided into DOAC and warfarin groups. A control group not receiving anticoagulation was included. The groups were matched by sex, age ± 4.0 years, and body mass index (BMI) ± 4.0 kg/m². Patients underwent BMD and TBS assessments. Results and Conclusions: A total of 108 patients were included (36 per group); mean age 65.3 ± 7.5 years; BMI 29.4 ± 3.7 kg/m²; 52.8% male; 78.7% with hypertension; 30.6% with diabetes; 25.9% with eGFR < 60 mL/min/1.73 m²; and 8.3% smokers. Baseline characteristics did not differ between groups. Warfarin users had lower lumbar spine BMD, both in absolute values (warfarin 1.141 ± 0.161; DOACs 1.265 ± 0.238; control 1.191 ± 0.179; p = 0.029) and in T-score assessment (warfarin 0.0 ± 1.3; DOACs +0.7 ± 2.0; control +0.1 ± 1.5; p = 0.029). There was no statistically significant difference in femoral neck or total hip BMD. No statistically significant difference was observed in TBS in the overall sample; however, in the female subgroup, warfarin users showed a trend toward lower TBS compared with controls. In conclusion, patients receiving warfarin exhibited worse bone-related markers, suggesting a potential increased risk of bone deterioration. Conversely, this study is among the first to evaluate bone markers in DOAC users, with findings that do not suggest a detrimental effect.

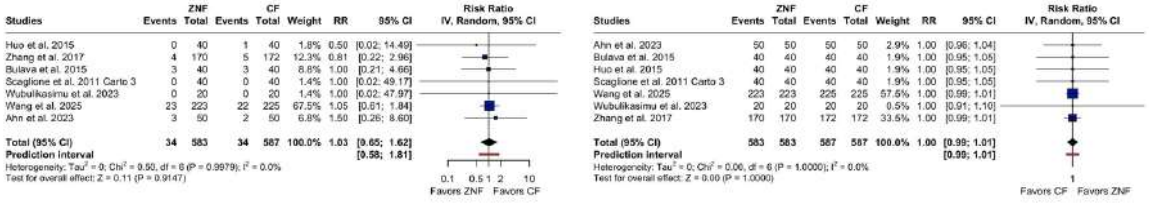
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ZERO OR NEAR-ZERO FLUOROSCOPY VERSUS CONVENTIONAL FLUOROSCOPY FOR ATRIAL FIBRILLATION ABLATION: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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Background/Introduction: Fluoroscopy reduction strategies during catheter ablation are increasingly adopted to minimize radiation exposure. However, it remains uncertain if reduced-fluoroscopy approaches maintain procedural efficacy and safety. Objectives: This study aimed to evaluate the efficacy and safety of zero- or near-zero fluoroscopy ablation compared with conventional fluoroscopy for atrial fibrillation. Methods: PubMed, Embase, Cochrane Central, and ClinicalTrials.gov were systematically searched through October 2025 for randomized controlled trials (RCTs) comparing reduced-fluoroscopy versus conventional ablation in atrial arrhythmias. To minimize clinical heterogeneity, only trials with ≤10-min fluoroscopy in the intervention arm were included. Subgroup analyses stratified trials by Energy and Map type. Analysis used risk ratio (RR) with 95% confidence intervals (CI) for dichotomous outcomes and mean differences (MD) for continuous outcomes were estimated using a random-effects model with the Restricted Maximum Likelihood estimator. Results and Conclusions: Seven randomized controlled trials comprising 1,170 patients were included, with 583 assigned to zero/near-zero fluoroscopy (ZNF) and 587 to conventional fluoroscopy (CF). Acute procedural success was identical between groups, with no difference observed (RR 1.00, 95% CI 0.99–1.01; p = 1.00; I² = 0%). Complication rates were also comparable (34/583 vs 34/587), with no significant difference between strategies (RR 1.03, 95% CI 0.65–1.62; p = 0.91; I² = 0%). Procedure time did not differ significantly between groups (MD −0.65 minutes, 95% CI −4.82 to 3.53; p = 0.72; I² = 25%). Across all predefined subgroup analyses (energy source, mapping strategy, and fluoroscopy duration), no evidence of effect modification was observed. Sensitivity analyses using a leave-one-out approach confirmed the robustness of all findings, with stable effect estimates and no relevant heterogeneity. ZNF ablation demonstrated equivalent efficacy, safety, and procedural efficiency compared with CF in atrial fibrillation. Given the well-established risks of ionizing radiation and occupational burden associated with lead apron use, these findings support the adoption of fluoroscopy-minimizing strategies as a contemporary standard in AF ablation workflows.



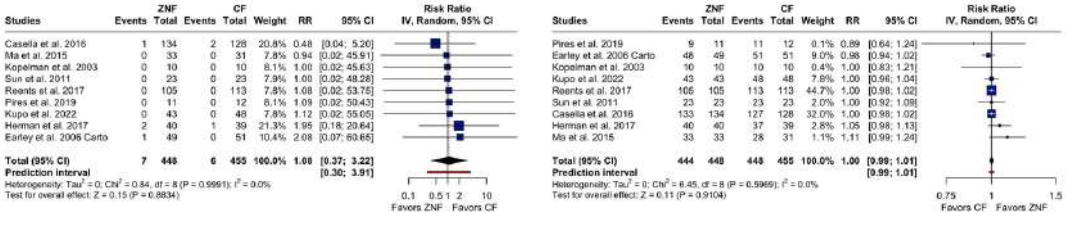
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ZERO OR NEAR-ZERO FLUOROSCOPY VERSUS CONVENTIONAL FLUOROSCOPY FOR SUPRAVENTRICULAR TACHYCARDIAS: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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Background/Introduction: Supraventricular tachycardias (SVTs), including atrioventricular nodal and atrioventricular reentrant tachycardias, are commonly treated with catheter ablation, a highly effective strategy. Fluoroscopy has traditionally been essential for catheter guidance; however, cumulative radiation exposure poses relevant risks to both patients and operators, including increased malignancy risk and occupational hazards Objectives: To evaluate the efficacy and safety of zero- or near-zero fluoroscopy compared with conventional fluoroscopy-guided catheter ablation in patients with supraventricular tachycardias. Methods: PubMed, Embase, Cochrane Central, and ClinicalTrials.gov were systematically searched through October 2025 for randomized controlled trials (RCTs) comparing reduced-fluoroscopy versus conventional ablation in atrial arrhythmias. To minimize clinical heterogeneity, only trials with ≤10-min fluoroscopy in the intervention arm were included. Subgroup analyses stratified trials by Energy and Map type. Analysis used risk ratio (RR) with 95% confidence intervals (CI) for dichotomous outcomes and mean differences (MD) for continuous outcomes were estimated using a random-effects model with the Restricted Maximum Likelihood estimator. Results and Conclusions: Nine randomized controlled trials comprising 903 patients undergoing catheter ablation for supraventricular tachycardias were included, with 583 assigned to zero/near-zero fluoroscopy (ZNF) and 587 to conventional fluoroscopy (CF). Acute procedural success was identical between groups, with no difference observed (RR 1.00, 95% CI 0.99–1.01; p = 0.91; I² = 0%). Complication rates were also comparable (7/448 vs 6/455), with no significant difference between strategies (RR 1.08, 95% CI 0.37–3.22; p = 0.88; I² = 0%). Procedure time did not differ significantly between groups (MD 0.07 minutes, 95% CI −13.72 to 13.86; p = 0.99; I² = 89%). Reduced-fluoroscopy ablation demonstrated equivalent success, safety, and procedure timecompared with conventional fluoroscopy in SVT. Given the known harms of radiation exposureand lead apron use, these findings support the use of reduced fluoroscopy techniques as a preferred ablation strategy.



Cardio-Oncology

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20914

BIOMARKER-GUIDED CARDIOPROTECTION FOR ANTHRACYCLINE-INDUCED CARDIOTOXICITY: A META-ANALYSIS OF RANDOMIZED TRIALS

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Background/Introduction: Anthracycline-induced cardiotoxicity remains a major limitation of cancer therapy and may lead to ventricular dysfunction and interruption of oncologic treatment. Universal prophylactic cardioprotection has yielded inconsistent results in randomized trials. Biomarker-guided initiation of neurohormonal blockade following early myocardial injury detection has emerged as a potential individualized strategy. Objectives: To evaluate whether biomarker-guided neurohormonal cardioprotection reduces ventricular dysfunction in patients with evidence of myocardial injury during anthracycline therapy. Methods: We performed a systematic review and meta-analysis of randomized controlled trials evaluating neurohormonal blockade initiated after biomarker-defined myocardial injury during anthracycline therapy. The primary outcome was ventricular dysfunction, defined in each trial by significant decline in global longitudinal strain or reduction in left ventricular ejection fraction. Risk ratios were pooled using a random-effects model. Heterogeneity was assessed using I² statistics, and leave-one-out sensitivity analyses were performed. Results and Conclusions: Three randomized trials including 280 patients were analyzed. Biomarker-guided neurohormonal cardioprotection was associated with a numerically lower risk of ventricular dysfunction; however, the pooled random-effects estimate was imprecise and did not reach statistical significance (RR 0.32, 95% CI 0.02–5.04; I²=78%). Leave-one-out analyses demonstrated instability of the pooled estimate, particularly influenced by the Cardinale trial. Biomarker-guided cardioprotection may represent a promising individualized strategy during anthracycline therapy, but current randomized evidence remains limited by substantial heterogeneity and imprecision. Larger contemporary randomized trials using standardized biomarker and imaging-based definitions are needed before routine implementation can be recommended.

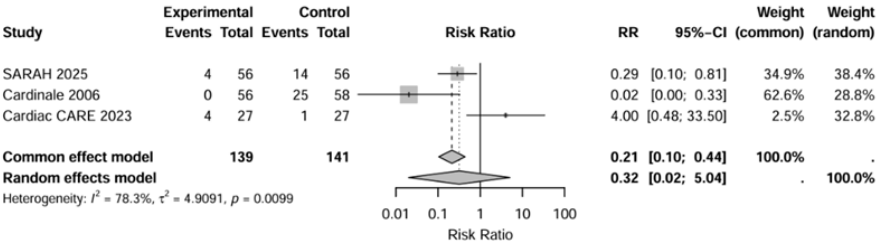


Figure 1. Exploratory random-effects meta-analysis of biomarker-triggered neurohormonal cardioprotection and ventricular dysfunction during anthracycline therapy

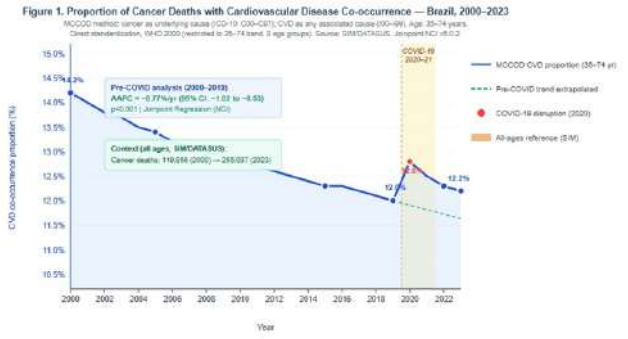
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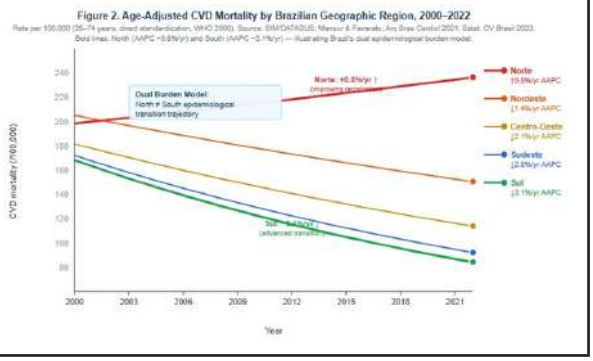
CARDIOVASCULAR DISEASE AS A CO-OCCURRING CAUSE OF DEATH IN CANCER PATIENTS IN BRAZIL (2000–2023): A NATIONWIDE MULTIPLE-CAUSE-OF-DEATH ANALYSIS

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Background/Introduction: As cancer survival improves globally, cardiovascular disease (CVD) has emerged as a major competing cause of death. However, nationwide multiple-cause-of-death (MCCOD) analyses in cardio-oncology remain scarce in middle-income countries, limiting understanding of mortality dynamics in these settings. Objectives: To quantify the proportion of cancer deaths with CVD as an associated cause and to analyze temporal trends and regional disparities in Brazil. Methods: Ecological time-series study using the Brazilian Mortality Information System (SIM/DATASUS), applying a MCCOD approach. We included individuals aged 35–74 years (2000–2023). The primary outcome was the proportion of cancer deaths (ICD-10 C00–C97) with CVD (I00–I99) listed as any associated cause. Age-standardized estimates (WHO 2000) were analyzed using joinpoint regression. A pre-specified primary period (2000–2019) and a sensitivity analysis (2020–2023) were defined to account for COVID-19-related disruptions. Analyses were stratified by geographic region. Results and Conclusions: The proportion of cancer deaths with CVD co-occurrence declined significantly from 14.2% (2000) to 12.0% (2019) (AAPC −0.77%/year; 95% CI −1.02 to −0.53; p<0.001), with a transient increase in 2020 (12.8%) and partial recovery by 2023 (12.2%). This decline reflects a structural shift in competing mortality risks rather than a direct improvement in cardiovascular outcomes. Concurrently, the population-level CVD-to-cancer mortality ratio decreased from 2.06 to 1.23, indicating progressive epidemiological convergence. Marked regional heterogeneity revealed a dual epidemiological burden: advanced decline in the South (AAPC −3.1%/year) versus increasing rates in the North (+0.8%/year). Ischemic heart disease and heart failure accounted for nearly half of CVD co-occurrence, consistent with established cardiotoxic mechanisms. Cardiovascular disease is a persistent and structurally integrated component of cancer mortality in Brazil. Despite a declining proportional trend, the coexistence of divergent regional patterns reveals a dual epidemiological burden unique to middle-income settings. These findings redefine the role of CVD in cancer mortality and support the urgent implementation of integrated, regionally tailored cardio-oncology strategies.





21392

CLINICAL IMPACT OF 5-FLUOROURACIL–ASSOCIATED CORONARY VASOSPASM IN GASTROINTESTINAL CANCER: A GLOBAL FEDERATED ANALYSIS

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Background/Introduction: Fluoropyrimidine-associated cardiotoxicity is a recognized complication of 5-fluorouracil (5-FU) therapy, with coronary vasospasm (CAS) representing the most common ischemic mechanism. Current cardio-oncology guidelines emphasize the importance of early recognition of 5-FU-related ischemic events because of their association with arrhythmias, hemodynamic instability, treatment interruption, and mortality. However, real-world data evaluating the prognostic impact of CAS in gastrointestinal cancer patients remain limited. Objectives: We aimed to evaluate the association between early CAS-related cardiotoxicity after 5-FU exposure and cardiovascular outcomes, intensive care unit (ICU) admission, and mortality in patients with digestive malignancies. Methods: We conducted a retrospective cohort study using the TriNetX Global Collaborative Network, including data from 173 healthcare organizations worldwide. Adult patients with digestive cancers (ICD-10 C15–C26) treated with 5-FU between January 1, 2016 and December 31, 2025 were identified. Patients were stratified according to the presence or absence of suspected CAS-related cardiotoxicity within 7 days after 5-FU exposure. CAS-related events were defined by ICD-10 codes consistent with acute ischemic presentations (I20, I21, R07) and/or troponin elevation ≥0.04 ng/mL. Propensity score matching was performed for age, sex, and cardiovascular comorbidities. Primary outcomes included 7-day incidence of arrhythmias (ICD-10 I47–I49), cardiac arrest (I46), and ICU admission. One-year all-cause mortality was evaluated as a secondary endpoint. Results and Conclusions: Among 99,845 patients receiving 5-FU for digestive malignancies, 1,357 (1.4%) developed CAS-related cardiotoxicity within 7 days. After propensity matching, patients with CAS-related cardiotoxicity had worse outcomes compared with those without CAS. Arrhythmias were more frequent in the CAS cohort (9.81% vs. 2.20%; RR 4.45; p<0.0001), as was cardiac arrest (0.84% vs. 0.00%; p=0.0009). ICU admission was significantly higher in the CAS cohort (4.79% vs. 0.84%; RR 5.73; p<0.0001). One-year all-cause mortality was also increased (34.27% vs. 28.56%; RR 1.20; p<0.0001). Early CAS-related cardiotoxicity following 5-FU exposure was associated with increased cardiovascular complications, greater healthcare utilization, and higher long-term mortality in patients with digestive cancers. These findings reinforce current recommendations advocating close surveillance during the first week after treatment.

18121

FUNCTIONAL PROFILE AND AUTONOMIC FUNCTION OF PATIENTS UNDERGOING CHEMOTHERAPY AT RISK OF CARDIOTOXICITY: PRELIMINARY RESULTS

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Background/Introduction: Background: Antineoplastic therapies show promising responses in cancer treatment. However, side effects can impair the functional physiological reserve of these patients due to the risk of cardiovascular changes during treatment. Little is known about the autonomic profile of these individuals. Objectives: Objective: To describe previously the autonomic function profile of patients undergoing chemotherapy at risk of cardiotoxicity and their functional frailty Methods: Methods: Patients from a reference oncology hospital (Rio de Janeiro, Brazil), diagnosed with lymphoma and designated for chemotherapy treatment with doxorubicin. They were evaluated before starting treatment. The cross-sectional protocol consisted of functional assessment with: measurement of respiratory muscle strength (RMS), spirometry, handgrip strength (HGS), 6-minute step test (6MST), time-domain heart rate variability (HRV) (SDNN; RMSSD), in addition to the Duke Activity Status Index (DASI) questionnaire and echocardiography. The applied statistics employed the t-test and Pearson correlation, p-value <0.05. Results and Conclusions: Results: Nine patients (5 men) were evaluated, 40±18 years old, BMI 29±3, baseline HR 92.9±14 bpm, BP 132.1±11.2 mmHg, LVEF 68±2.8%, estimated VO2 14.1±1.9 L/min. The functional assessment values were below the predicted values for FPM, dynamometry (27.2±11.7 vs. predicted 44.8±14) with FPM of 60.8±14.9%. In the FMR assessment, although PEmax was below the predicted value (84.4±23.7, predicted 91.1±10.9), it does not characterize an expiratory strength deficit, and PImax was preserved (measured -103.3±50.2, predicted -90.7±8.8). There was a restrictive response in spirometry, with reduced values for FEV1 (2.5±0.8, predicted 3.5±1.1) and FVC (2.9±1.2, predicted 3.7±1.7) with p<0.05, without altering the Tiffeneau index. Regarding the autonomic pattern, the SDNN was 58.3% of the predicted value adjusted for age (21.3 ± 8.5 vs 36.5±11.2 ms), and the RMSSD, 45% of the predicted value (17.2 ± 8.2 vs 37.5±11.5 ms). There was a correlation between FPM and the number of steps (r=0.759; p 0.018); FPM and DASI (r=0.868; p 0.002); DASI and number of steps (r= 0.733 p 0.025). Conclusion: Patients with lymphoma present with pre-treatment functional frailty, marked by muscle weakness, pulmonary restriction, resting tachycardia, and low VO2. Handgrip strength and the DASI questionnaire proved to be good predictors of physical fitness and the autonomic profile shows reduced HRV,

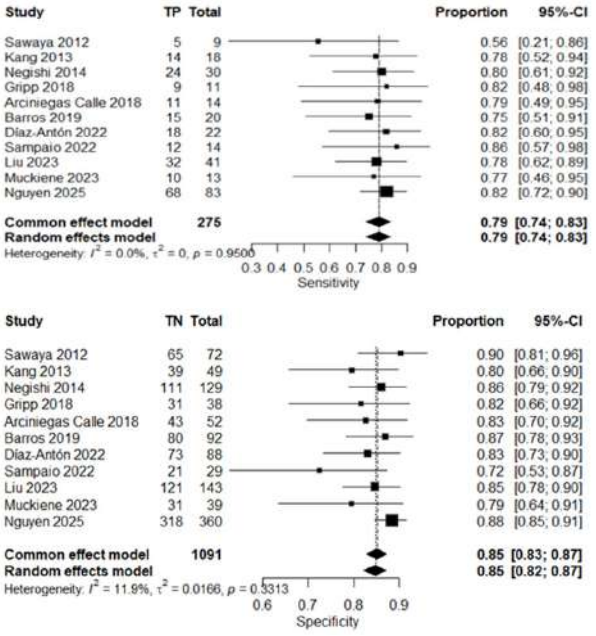
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GLOBAL LONGITUDINAL STRAIN AS AN EARLY PREDICTOR OF CHEMOTHERAPY-RELATED CARDIOTOXICITY: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background/Introduction: Chemotherapy-related cardiotoxicity remains a major limitation of cancer therapy, often detected only after significant myocardial injury when assessed by left ventricular ejection fraction (LVEF). Global longitudinal strain (GLS) has emerged as a sensitive marker of subclinical myocardial dysfunction, but its predictive value across different populations remains to be fully established. Objectives: To evaluate the predictive performance of early GLS reduction for the development of chemotherapy-related cardiotoxicity. Methods: A systematic review and meta-analysis were conducted according to PRISMA guidelines. Studies assessing GLS by speckle-tracking echocardiography in patients undergoing potentially cardiotoxic chemotherapy were included. Data were extracted to reconstruct 2×2 contingency tables. A random-effects model (DerSimonian–Laird) was used to estimate pooled sensitivity, specificity, and odds ratio (OR). Heterogeneity was assessed using the I² statistic, and publication bias by Egger's test. This systematic review and meta-analysis was conducted according to PRISMA 2020 guidelines and was prospectively registered in the PROSPERO database 2026 - CRD420261342425. Results and Conclusions: Eleven prospective studies (n = 1,366 patients) were included. Early GLS reduction was a strong predictor of cardiotoxicity, with pooled sensitivity of 0.79 (95% CI: 0.74–0.83) and specificity of 0.85 (95% CI: 0.82–0.87). The pooled OR was 18.25 (95% CI: 10.54–31.59), indicating a robust association between early strain impairment and subsequent cardiac dysfunction. No significant heterogeneity (I^2 = 0%) or publication bias (p = 0.45) was observed. The negative predictive value was high (94.6%), supporting its reliability in excluding cardiotoxicity. Conclusion: Early GLS reduction is a robust and clinically actionable predictor of chemotherapy-related cardiotoxicity. Its high negative predictive value supports a reliable rule-out strategy, allowing safer continuation of oncologic therapy in patients with stable strain parameters. Incorporation of GLS into routine surveillance protocols may improve early risk stratification and optimize clinical decision-making in cardio-oncology.



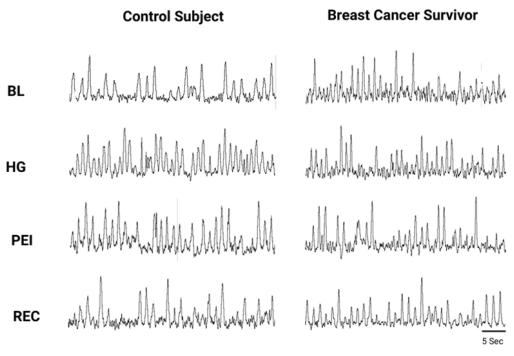
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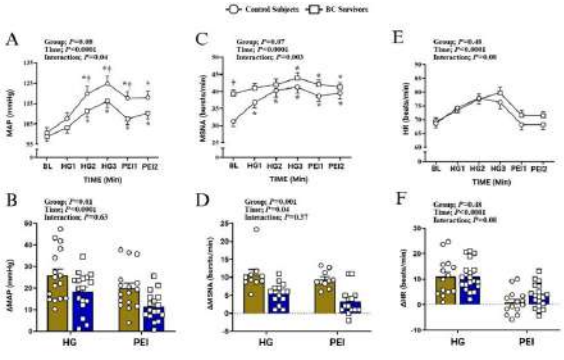
IMPAIRED MUSCLE METABOREFLEX BLUNTS SYMPATHETIC AND PRESSOR RESPONSES TO STATIC HAND GRIP EXERCISE IN LONG-TERM BREAST CANCER SURVIVORS

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Background/Introduction: Previous studies have reported blunted increases in blood pressure (BP) during physical exercise in cancer survivors treated with cardiotoxic chemotherapy. However, the sympathetic neural mechanisms underlying this attenuated response remain unknown Objectives: We hypothesized that long-term breast cancer (BC) survivors exhibit impaired muscle metaboreflex function, which would partially explain the reduced sympathetic–cardiovascular responses to exercise Methods: Nineteen BC survivors (age 49±2 years; body mass index [BMI] 27±1 kg/m²) and 14 sex-, age-, and BMI-matched controls (age 48±2 years; BMI 26±1 kg/m²) were studied. Muscle sympathetic nerve activity (MSNA, microneurography), mean arterial pressure (MAP, Finometer), stroke volume, cardiac output, and total peripheral resistance (SV, CO, and TPR; Modelflow), and heart rate (HR, ECG) were continually measured at baseline, during 3 min of static handgrip (HG) at 30% maximal voluntary contraction followed by post-exercise ischemia (PEI) to isolate muscle metaboreflex activation Results and Conclusions: BC survivors were evaluated ~ 9 years post-treatment. Changes in MAP during HG were attenuated in BC survivors versus controls, and this difference persisted during PEI (Δ12.0±2.0 vs. 21.0±2.0 mmHg, P=0.001). Similarly, the MSNA burst frequency response to HG was lower in BC survivors than controls, and the difference remained during PEI (Δ3.0±1.0 vs. 9.0±1.0 bursts/min, P=0.001). SV and CO were reduced during HG in BC survivors (P<0.05) but not during PEI. No group differences were observed in HR or TPR. Conclusion: Collectively, these findings indicate that the attenuated pressor and sympathetic neural responses to exercise in long-term BC survivors are explained, partially, by attenuated muscle metaboreflex control.





21622

RESCUE IMMUNOSUPPRESSION AND CORTICOSTEROID STRATEGIES FOR IMMUNE CHECKPOINT INHIBITOR-ASSOCIATED MYOCARDITIS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background/Introduction: Immune checkpoint inhibitor-associated myocarditis (ICI-M) is uncommon but frequently fulminant. Evidence for rescue immunosuppression beyond corticosteroids remains limited. Objectives: To synthesize comparative evidence on corticosteroid intensity/timing and abatacept-based rescue therapy for ICI-M. Methods: A PRISMA-oriented systematic review and exploratory meta-analysis included studies with extractable treatment-outcome data. The primary endpoint was major adverse cardiovascular events (MACE). Secondary endpoints were all-cause death, cardiac death, biomarker rebound/sustained troponin elevation, steroid reinitiation/escalation, and additional immunosuppression. Risk ratios (RR) with 95% confidence intervals (CI) were estimated using Mantel-Haenszel models. Heterogeneity was assessed using Q, I^2 and tau^2. Results and Conclusions: Five full texts were assessed; three provided quantitative comparative data. The main pooled analysis included 2 studies and 217 patients comparing high-dose versus low-dose corticosteroids for MACE. High-dose corticosteroids reduced MACE from 36.1% to 15.3% (15/98 vs 43/119; pooled RR 0.33, 95%CI 0.19-0.56; p<0.001), with no detected heterogeneity (Q=0.20, p=0.65; I^2=0%; tau^2=0). Study-level estimates were consistent: Man_2025, RR 0.27 (95%CI 0.10-0.73; p=0.010), and Zhang_2020, RR 0.36 (95%CI 0.19-0.66; p=0.001). Early corticosteroid initiation within 24 hours was associated with lower MACE than initiation after 72 hours (3/43 vs 37/43; RR 0.08, 95%CI 0.03-0.24; p<0.001). High-dose methylprednisolone was associated with less biomarker rebound/sustained troponin elevation (17/44 vs 56/81; RR 0.56, 95%CI 0.37-0.83; p=0.004) and less steroid reinitiation/escalation (2/48 vs 40/96; RR 0.10, 95%CI 0.03-0.40; p=0.001). Additional immunosuppression was not reduced (28/48 vs 63/98; RR 0.91, 95%CI 0.69-1.20; p=0.498). All-cause mortality numerically favored high-dose steroids (14/46 vs 43/93; RR 0.66, 95%CI 0.40-1.07; p=0.094). In the only direct abatacept comparison, cardiac death did not differ (1/7 vs 2/16; RR 1.14, 95%CI 0.12-10.63; p=0.907), and all-cause death was imprecise (5/7 vs 6/16; RR 1.90, 95%CI 0.87-4.19; p=0.109). Fulminant/steroid-refractory cases were more frequent with abatacept. Early high-dose corticosteroid therapy was associated with lower MACE and improved biochemical control. Abatacept remains promising for fulminant or steroid-refractory ICI-M, but evidence is underpowered.

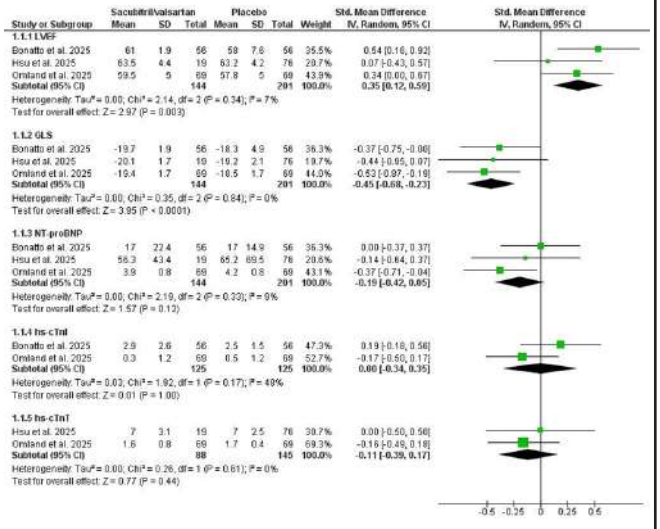
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SACUBITRIL/VALSARTAN AS A NOVEL CARDIOPROTECTIVE STRATEGY IN BREAST CANCER PATIENTS UNDERGOING CHEMOTHERAPY: A META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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Background/Introduction: Cancer therapy–related cardiac dysfunction (CTRCD) remains a major limitation of anthracycline-based chemotherapy in breast cancer. Although sacubitril/valsartan has demonstrated reverse remodeling and biomarker reduction in heart failure, its preventive role in early subclinical myocardial injury during chemotherapy remains uncertain. Objectives: To evaluate the cardioprotective efficacy of sacubitril/valsartan in preventing chemotherapy-related cardiac dysfunction in patients with breast cancer. Methods: A systematic search was conducted through January 9, 2026, to identify randomized controlled trials comparing sacubitril/valsartan versus placebo or standard care in breast cancer patients receiving cardiotoxic chemotherapy. Outcomes included left ventricular ejection fraction (LVEF), global longitudinal strain (GLS), N-terminal pro–B-type natriuretic peptide (NT-proBNP), high-sensitivity cardiac troponin I (hs-cTnI), and high-sensitivity cardiac troponin T (hs-cTnT). Standardized mean differences (SMDs) were pooled using a random-effects model. Heterogeneity was assessed using the I^2 statistic. Results and Conclusions: Three randomized controlled trials, including 365 patients (152 sacubitril/valsartan; 213 control), were analyzed. Sacubitril/valsartan significantly preserved myocardial deformation, with a pooled GLS SMD of −0.64 (95% CI −0.93 to −0.36; P < 0.00001; I^2 = 37%). No significant difference was observed in LVEF (SMD 0.57; 95% CI −0.14 to 1.28; P = 0.11; I^2 = 89%), reflecting substantial heterogeneity and the limited sensitivity of conventional systolic parameters in early cardiotoxicity. Similarly, no significant effects were found for NT-proBNP (SMD −0.88; 95% CI −2.08 to 0.31; P = 0.15; I^2 = 96%), hs-cTnI (SMD −0.06; 95% CI −0.30 to 0.18; P = 0.64; I^2 = 0%), or hs-cTnT (SMD −0.11; 95% CI −0.38 to 0.17; P = 0.45; I^2 = 0%). Sacubitril/valsartan demonstrated a significant protective effect on subclinical myocardial deformation, as evidenced by preserved GLS, without measurable impact on LVEF or circulating cardiac biomarkers. These findings suggest that neurohormonal modulation may attenuate early myocardial injury before overt systolic dysfunction develops. Larger, adequately powered trials with clinical endpoints are warranted to determine whether these mechanistic benefits translate into reduced CTRCD and improved long-term cardiovascular outcomes.



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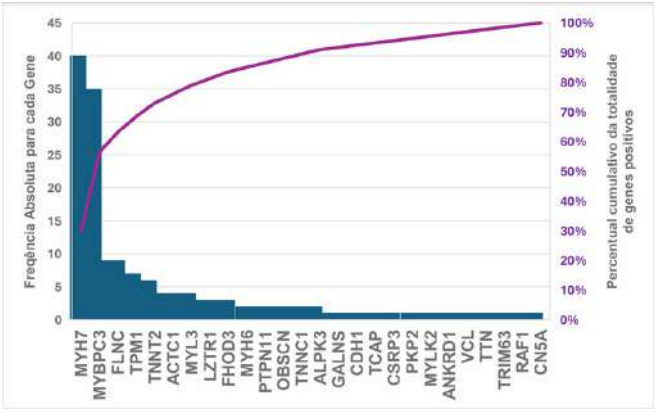
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GENOTYPE AND ATRIAL FIBRILLATION IN HYPERTROPHIC CARDIOMYOPATHY: ANALYSIS OF A BRAZILIAN COHORT IN A QUATERNARY CENTER

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BACKGROUND: Hypertrophic cardiomyopathy (HCM) is an autosomal dominant genetic disease characterized by clinical heterogeneity and variable expressivity. Although sarcomeric mutations, especially in MYH7 and MYBPC3, are frequent, the genotype-phenotype correlation remains uncertain. Atrial fibrillation (AF) is the most common sustained arrhythmia in HCM and is associated with worse prognosis. Studies suggest a relationship between genetic variants and AF risk, but results remain conflicting. Objectives: OBJECTIVES: To evaluate the association between genetic profile and occurrence of AF in patients with HCM followed at a Brazilian quaternary referral center. Methods: METHODS: Retrospective, single-center cohort including patients with HCM under specialized follow-up. Individuals were stratified according to the presence of documented AF and genetic testing results. Cases with alternative diagnoses or incomplete data were excluded. Statistical analysis was performed using the chi-square test, with significance defined as p<0.05. Results and Conclusions: RESULTS: Among 741 evaluated patients with HCM, genetic testing was performed in 169 patients. Mean age was 50.8 years (±16.4), and 50.9% were male. Mutations were identified in 140 patients (82.8%), involving 26 distinct genes. The most frequent mutations were MYH7 (27.8%) and MYBPC3 (25.0%). AF occurred in 144 patients (19.4%), of whom 26 had a positive genetic test. No significant association was observed between AF and genetic profile (RR 0.95; 95%CI 0.64–1.39; p=0.78). Only a non-significant trend toward higher prevalence of MYH7 mutations was observed in the AF group (34.6% vs. 26.3%; p=0.41). CONCLUSIONS: In this Brazilian cohort, sarcomeric mutations were predominant, especially MYH7 and MYBPC3. No significant association was demonstrated between genetic profile and AF, reinforcing the multifactorial nature of arrhythmic expression in HCM and the limitations of phenotype prediction based exclusively on genotype. Risk stratification should integrate clinical and structural factors in addition to genetic analysis.



20835

INCREMENTAL VALUE OF THE ACE I/D POLYMORPHISM FOR MAGGIC-BASED MORTALITY RISK STRATIFICATION IN HEART FAILURE PATIENTS

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Background/Introduction: The Meta-Analysis Global Group in Chronic Heart Failure (MAGGIC) score is widely used for mortality prediction in patients with heart failure (HF), despite performance variations across different populations. Genetic factors, including the insertion (I)/deletion (D) polymorphism of the angiotensin-converting enzyme (ACE) gene, have been associated with disease progression and adverse cardiovascular outcomes and may improve prognostic stratification. However, their incremental value when added to established risk models is not yet fully elucidated. Objectives: To evaluate whether the addition of the ACE I/D polymorphism improves mortality risk prediction based on the MAGGIC score in patients with HF. Methods: This longitudinal observational study included outpatients with HF (>18 years; diagnosis ≥3 months). ACE genotyping was performed by polymerase chain reaction followed by agarose gel electrophoresis. Patients were classified according to a dominant genetic model as D-allele carriers (DD+ID) or non-carriers (II), in addition to allele dosage analysis. Clinical data were collected to calculate the MAGGIC score and estimate 1-year mortality risk. The association between the number of D alleles and estimated risk was assessed using Spearman correlation. Exploratory survival analyses were performed using Firth penalized Cox regression, and prognostic discrimination was evaluated by the area under the ROC curve (AUC). Results and Conclusions: Ninety-six patients were included, with a mean age of 55 ± 13 years; 63% were male, and the median left ventricular ejection fraction was 32% (25–40). The genotype distribution was II 12%, ID 40%, and DD 48%. D-allele carriers showed higher estimated 1-year mortality risk according to the MAGGIC score compared with non-carriers [8.4% (5.8–11.1) vs. 5.8% (3.5–7.9)], with a significant positive correlation between the number of D alleles and estimated mortality risk (rho=0.203; p=0.047). In survival modeling, the MAGGIC score remained independently associated with mortality (HR 1.14; 95% CI 1.03–1.26; p=0.007). Incorporating the D allele improved model discrimination (AUC 0.781 vs. 0.803) with adequate model calibration (Brier score = 0.06). These findings suggest a potential contribution of the ACE D allele to a higher clinical risk profile in HF, supporting its role as a complementary marker in prognostic stratification.

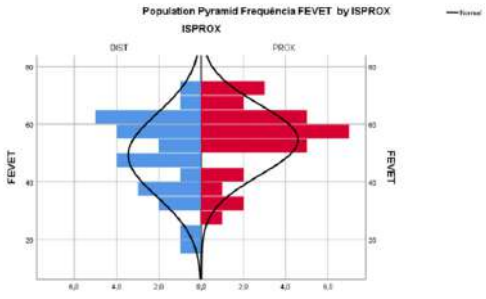
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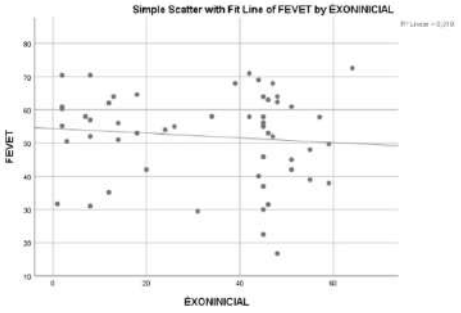
INFLUENCE OF EXONIC LOCATION OF DMD GENE MUTATIONS ON LEFT VENTRICULAR EJECTION FRACTION: A CROSS-SECTIONAL STUDY IN A BRAZILIAN DUCHENNE MUSCULAR DYSTROPHY COHORT

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Background/Introduction: Duchenne muscular dystrophy (DMD) is caused by mutations in the dystrophin gene, and cardiac involvement is the leading cause of death. The dystrophin protein contains functionally distinct domains encoded by different exonic regions, and it has been hypothesized that the location of the mutation along the gene may influence the cardiac phenotype. Mutations affecting proximal regions (exons 1–44) may disrupt the actin-binding domain, whereas distal mutations (exons 45–79) may compromise the dystroglycan-binding complex. However, data on the association between exonic location and left ventricular function remain scarce, particularly in Latin American populations. Objectives: To evaluate whether the exonic location of DMD gene mutations influences left ventricular ejection fraction (LVEF) in a Brazilian DMD cohort. Methods: Cross-sectional, single-center study including 53 genetically confirmed DMD patients followed at a Brazilian university hospital. The most recent LVEF was obtained by echocardiography (Teicholz method). Patients were classified according to the initial exon affected: proximal (exons 1–44; n=28) or distal (exons 45–79; n=25). LVEF was compared between groups using the independent-samples t-test and the Mann-Whitney U test. Linear correlation between the initial exon number and LVEF was assessed by scatter plot with fit line. Results and Conclusions: Mean LVEF was 54.57 ± 12.20% in the proximal group and 49.28 ± 14.45% in the distal group, a numerically lower value in distal mutations (mean difference: −5.29%; 95% CI: −12.64 to 2.06). This difference did not reach statistical significance by either the independent t-test (t=−1.445; p=0.155) or the Mann-Whitney U test (p=0.176). Linear regression of LVEF against the initial exon number showed negligible correlation (R^2=0.010). Despite the absence of statistical significance, the distal group exhibited a trend toward lower LVEF with wider dispersion, including all cases with LVEF below 30%. These findings suggest that exonic location alone, dichotomized at exon 45, does not significantly predict LVEF in this cohort. However, the observed trend toward worse function in distal mutations warrants further investigation in larger, multicenter studies with subgroup analysis by mutation type.





18284

MUCOPOLYSACCHARIDOSIS TYPE IVA: ECHOCARDIOGRAPHIC CHARACTERIZATION AFTER 4 YEARS OF ENZYME REPLACEMENT THERAPY

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Background/Introduction: Mucopolysaccharidosis IVA (MPS IVA) represents a rare genetic disorder which is characterized by deficient enzymatic activity in glycosaminoglycan (GAG) degradation. Multiple organ systems are involved, including the cardiovascular system, although the mechanisms behind its involvement are not completely known. Notably, cardiac manifestations of MPS includes valvular pathology and left ventricular hypertrophy (LVH), pathologies in which the effectiveness of Enzyme Replacement Therapy (ERT) remains poorly substantiated by scientific evidence. Objectives: To delineate echocardiographic changes in MPS IVA patients and their progression after four years having ERT, an observational longitudinal study was undertaken. Methods: This study entailed quantitative analysis of echocardiographic data from a cohort of 10 MPS IVA patients, averaging 28.3 years of age, comprising out of ten people: four males, seven people with identical genotypes, and all of them subjected to ERT. Results and Conclusions: Pre-ERT echocardiograms revealed z-scores ≥ 2 for Left Ventricular Mass (LVM) in 6/10 patients, a trend maintained post-ERT in 5/10 patients. Furthermore, Aortic Root Dilatation (ARD) was identified in 6/10 patients, with no appreciable divergence between pre and post-ERT evaluations. Although ejection fraction remained preserved across the cohort, diastolic dysfunction was prevalent, affecting 6/10 and 7/10 patients pre and post-ERT, respectively. No difference was observed between the sexes with statistical significance in the variables analyzed. Notably, after four years of ERT, left atrial diameter and aortic root diameter exhibited a positive correlation with patient age ($p < 0.05$). Valvular involvement was universal, albeit predominantly mild. The most affected valve in the sample was the aortic valve, and the main involvement was valve insufficiency, with tricuspid predominance (7/10). Despite the study sample having a higher average age compared to similar studies, which is important in the analysis of a progressive disease alongside genotypic homogeneity, we obtained consistent results, such as the predominantly diastolic involvement rather than systolic, and the lack of impact of ERT on aortic root dilatation and left atrial enlargement. Conversely, inconclusive outcomes, such as ERT impact on LVH parameters, may enrich comprehension of the evolving cardiac profile in MPS IVA patients receiving ERT, particularly if ratified with an expanded sample.

21041

PHENOTYPIC AND GENOTYPIC MAPPING OF DILATED CARDIOMYOPATHY IN A BRAZILIAN POPULATION

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Background/Introduction: Dilated cardiomyopathy (DCM) is an important cause of heart failure and sudden cardiac death, with a well-established genetic basis. However, data integrating phenotypic and genetic findings in Brazilian populations remain limited. Objectives: This study aimed to integrate phenotypic, genetic and family segregation data from Brazilian patients with dilated cardiomyopathy using whole-exome sequencing (WES). Methods: Ninety-five probands recruited from a high-complexity Brazilian heart disease center underwent clinical evaluation, cardiac imaging, WES and family segregation analysis. Variant interpretation followed ACMG recommendations. Results and Conclusions: The population showed male predominance and median age of 53 years. The study population reflected the highly admixed background characteristic of the Brazilian population. Clinical presentation was characterized by advanced heart failure symptoms and severe ventricular dysfunction. Mean left ventricular ejection fraction was 27.9%, indexed left ventricular end-diastolic diameter of 38.2 mm/m² and indexed left ventricular end-diastolic volume of 129.1 ml/m². Genetic yield was higher among probands with family history of DCM compared with apparently sporadic cases. Disease-associated variants were predominantly identified in genes with strong or definitive evidence for DCM, while family segregation analysis substantially improved variant interpretation by enabling the reclassification of two variants from uncertain significance to likely pathogenic (MYH7, c.709C>T; FLNC, c.850+1G>A). This study highlights the classical clinical presentation of DCM in a highly admixed Brazilian population, emphasizing the relevance of genetically diverse populations for improving the interpretation of disease-associated variants and expanding the global representation of cardiovascular genomic data. Furthermore, it reveals severe dysfunction and dilatation in this population. These findings emphasize the importance of integrating cardiac imaging, genetic testing and family history analysis for DCM evaluation in genetically heterogeneous populations.

PROBAND	GENE	VARIANT	TYPE OF VARIANT	CLASSIFICATION
3.17	DSP	NM_004415:c.2225T>G	*Nonsense*	PP
3.59	MYH7	NM_000257.4:c.709C>T	*Missense*	PP (reclassified)
3.118	FLNC	NM_001458.5:c.850+1G>A	*Nonsense*	PP (reclassified)
3.205	SCN5A	NM_198056.3: c.665G>A	*Missense*	PP
3.240	TTN	NM_001267550.2:c.7428del	*Nonsense*	VUS
3.285	DSP	NM_004415.4: c.2572del	*Nonsense*	VUS
3.321	LMNA	NM_170707.4: c.194A>T	*Missense*	VUS
	DES	NM_001927.4: c.635G>A	*Missense*	VUS
3.324	TNNT2	NM_001001430.3:c.415C>T	*Missense*	VUS
3.358	FLNC	NM_001458.5:c.2121+1G>A	*Nonsense*	VUS
3.369	FLNC	NM_001458.5: c.1895C>A	*Missense*	VUS
	TTN	NM_001267550.2:c.80762_80765del	*Nonsense*	VUS
3.395	SCN5A	NM_198056.3: c.4981G>A	*Missense*	VUS
3.522	JPH2	NM_020433.5: c.107del	*Nonsense*	VUS
	OBSCN	NM_052843.4: c.4531G>T	*Nonsense*	VUS
3.593	TTN	NM_001267550.2:c.42949C>T	*Nonsense*	PP
3.663	TPM1	NM_001018006.2:c.677A>C	*Missense*	VUS
3.711	LMNA	NM_170707.4 c.725C>T	*Missense*	PP
3.958	LMNA	NM_170707.4: c.135C>G	*Nonsense*	PP

STUDY	N	LVEF (%) (MEDIAN /MEAN)	LVEDD (MM OR MM/M²) (MEDIAN /MEAN)	LVEDV (ML OR ML/M²) (MEDIAN /MEAN)
Skowroński et al., 2025	34	34.5% (25-40%) / ND	64mm (59-70mm) / ND	ND / ND
Sousa et al., 2019	107	ND / 31±10%	ND / 64±9mm	ND / ND
Amorim et al., 2017	50	ND / 25.4±9.8%	ND / 34,2±40,5mm/m²	ND / 109.7±28.8ml/m²
Merlo et al., 2011	242	ND / 37±10%	SD / 37±5mm/m²	ND / 106±39ml/m²
Current study	LVEF = 61 LVEDD = 70 LVEDV = 66	27% (10-43%) / 27.91±7.94%	36.04mm/m² (24.49-61.98mm/m²) / 38.24±15.27mm/m²	128.38ml/m² (58.50-276.41ml/m²) / 129.15±39.84ml/m²

Legend: LVEF: left ventricular ejection fraction; LVEDD: left ventricular end-diastolic diameter; LVEDV: left ventricular end-diastolic volume; ND: no data.

Cardiovascular Imaging – Echocardiography



81º CONGRESSO BRASILEIRO DE CARDIOLOGIA together with WORLD CONGRESS OF CARDIOLOGY





16545

ADDITIVE EFFECT OF POINT-OF-CARE ULTRASOUND (POCUS) IN THE DIAGNOSIS OF CARDIOVASCULAR DISORDERS IN PATIENTS WITH SICKLE CELL DISEASE

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Background/Introduction: Sickle Cell Disease (SCD) is a genetic disorder with relevant cardiovascular involvement that impacts quality of life and survival. In Brazil, it remains under-recognized, with limited research investment. Accessible tools such as Point-of-Care Ultrasound (POCUS) may play a key role, particularly in low- and middle-income settings with restricted access to comprehensive echocardiography. This highlights the importance of evaluating its role as a complementary tool for the early detection of cardiovascular abnormalities in patients with SCD. Objectives: To evaluate the applicability of POCUS in outpatient individuals with SCD and to determine its incremental diagnostic value when added to the clinical examination for detecting cardiovascular abnormalities. Methods: This cross-sectional diagnostic accuracy study included 32 participants with SCD confirmed by hemoglobin electrophoresis. Imaging data were systematically acquired and independently analyzed by blinded examiners. Clinically relevant cardiac involvement was defined, in the left heart context, as diastolic dysfunction (DD), heart failure with preserved ejection fraction (HFpEF), and early sickle cell cardiomyopathy; and in the right heart context as pulmonary hypertension (PH), cor pulmonale (right ventricular overload/dysfunction), and systemic venous congestion. Agreement between POCUS findings and standard echocardiography was assessed using Cohen's kappa coefficient. Statistical significance was defined as a p-value < 0.05, with 95% confidence intervals. Results and Conclusions: In the context of hemodynamic assessment of the pulmonary circulation, the [LA + TR + IVC] protocol demonstrated a sensitivity of 96.7% and specificity of 100%, yielding a negative likelihood ratio (LR−) of 0.03 and a kappa coefficient of 0.78, supporting its role as an effective rule-out model in potentially decompensated patients. In the outpatient screening setting for chronic left-sided structural heart disease, the [LA + MR] model achieved a sensitivity of 100% and a specificity of 50%, with a kappa coefficient of 0.56 and an LR− approaching zero. As a screening tool, these findings support the safety of downgrading the priority of patients with negative FoCUS results in the queue for standard echocardiography. Therefore, POCUS may assist clinicians in prioritizing patients awaiting comprehensive echocardiographic evaluation, particularly in resource-limited healthcare systems.

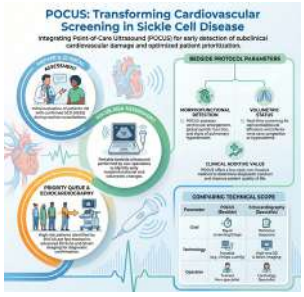


Table 1. Performance metrics for two multi-organ point-of-care ultrasound (FoCUS) protocols in different clinical contexts.

Diagnostic Parameters	Results
Method 1: LA + TR + IVC	
Sensitivity	96.7%
Specificity	100%
Kappa Coefficient (κ)	0.78
Negative Predictive Value (NPV)	100%
Positive Predictive Value (PPV)	96.7%
Method 2: [LA + MR]	
Sensitivity	100%
Specificity	50%
Kappa Coefficient (κ)	0.56
Negative Predictive Value (NPV)	100%
Positive Predictive Value (PPV)	50%

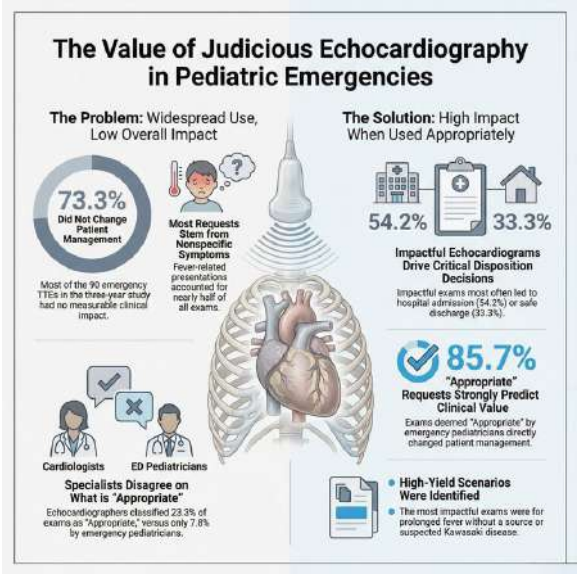
15449

APPROPRIATE USE OF ECHOCARDIOGRAPHY IN A PEDIATRIC EMERGENCY DEPARTMENT: THE VALUE OF JUDICIOUS ECHOCARDIOGRAPHY

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Background/Introduction: Transthoracic echocardiography (TTE) is an essential tool in the management of critically ill patients and is widely used in pediatric emergency departments (ED). However, the expanding use of TTE, particularly when indiscriminate, may lead to inefficient resource utilization and increased healthcare costs without proportional clinical benefit. In this context, robust evidence regarding the appropriateness and clinical impact of echocardiographic examinations in emergency care is critically needed Objectives: To evaluate the appropriateness of emergency TTE indications in pediatric patients according to appropriate use criteria (AUC) and to examine the association between appropriateness classification and clinical impact on patient management. Methods: This prospective observational study included pediatric patients who underwent emergency TTE in a tertiary pediatric ED between November 2019 and April 2023. Echocardiographic indications were independently classified as Appropriate, May Be Appropriate, or Rarely Appropriate by a pediatric echocardiographer and an emergency pediatrician, based on pediatric AUC. Clinical impact was defined as any change in patient management attributable to echocardiographic findings, including medication changes, additional diagnostic testing, hospital admission, or ED discharge. Interobserver agreement was assessed using Cohen's kappa coefficient. Results and Conclusions: A total of 90 emergency TTE were analyzed. The median age was 39 months, with a balanced sex distribution. Overall, 24 examinations (26.7%) resulted in a change in clinical management, most commonly hospital admission or discharge from the ED. Clinical impact was predominantly observed in patients presenting with prolonged fever without an identifiable source or with systemic inflammatory conditions, particularly suspected Kawasaki disease. Echocardiographers classified 23.3% of examinations as Appropriate, whereas emergency pediatricians classified only 7.8% as Appropriate. Conclusion: In a pediatric ED setting, most TTE were not aligned with AUC and did not significantly impact clinical management. However, when appropriately indicated, TTE frequently influenced critical decisions, particularly patient disposition. These findings highlight the importance of promoting rational, criteria-based use of echocardiography in pediatric emergency care. Integration of AUC into emergency decision-making pathways may improve diagnostic efficiency and reduce unnecessary imaging without compromising patient safety



20480

COMPARISON BETWEEN QUALITATIVE VISUAL ASSESSMENT (EYEBALLING) VIA POINT-OF-CARE ULTRASOUND (POCUS) AND QUANTITATIVE LINEAR MEASUREMENT ON STANDARD ECHOCARDIOGRAPHY FOR THE DIAGNOSIS OF LEFT ATRIAL ENLARGEMENT IN PATIENTS WITH SICKLE CELL DISEASE

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(1) PROGRAMA DE POS GRADUACAO EM CIENCIAS CARDIOVASCULARES - UFF - NITERÓI - RJ - BRASIL; (2) HUAP - RIO DE JANEIRO - RJ - BRASIL;

Background/Introduction: Sickle Cell Disease (SCD) is a genetic disorder with relevant cardiovascular involvement that significantly impacts quality of life and survival. In Brazil, cardiovascular complications in this population often remain under-recognized. Accessible tools such as Point-of-Care Ultrasound (POCUS) may play a key role, particularly in low- and middle-income settings with restricted access to comprehensive echocardiography. This highlights the importance of evaluating POCUS as a complementary triage tool for the early detection of structural cardiovascular abnormalities in patients with SCD. Objectives: To evaluate the diagnostic accuracy of qualitative visual assessment (eyeballing) using POCUS to estimate left atrial (LA) enlargement in outpatients with SCD, comparing it to the standard echocardiography (SE) quantitative linear measurement. Methods: This cross-sectional diagnostic accuracy study included 32 participants with SCD confirmed by hemoglobin electrophoresis. Imaging data were systematically acquired using Phillips Lumify S4-1 and independently analyzed by blinded examiners. The reference for LA enlargement was defined by an anteroposterior LA diameter ≥ 4.0 cm in SE. We calculated sensitivity, specificity, predictive values and Cohen's kappa coefficient (κ) for categorical agreement. The Mann-Whitney U test were used to compare qualitative POCUS categorization against continuous diameter values. McNemar's test was applied to assess systematic bias. Statistical significance was defined as a two-sided p-value < 0.05. Results and Conclusions: Among the 32 evaluated patients, SE identified 15 cases (46.8%) of LA enlargement (≥ 4.0 cm). Visual assessment by POCUS demonstrated a sensitivity of 100% (15/15) and a specificity of 52.9% (9/17) for detecting LA enlargement. Kappa was moderate (κ = 0.51). POCUS demonstrated NPV of 100%, compared to a PPV of 65.2%. Furthermore, patients classified with an enlarged LA by POCUS had a significantly higher mean diameter on SE compared to those classified as normal (4.23 cm vs. 3.24 cm; p = 0.0001). However, McNemar's test revealed a significant systematic bias (p = 0.007), indicating that examiners tended to overestimate LA size, resulting in 8 false-positive cases. Qualitative visual assessment of the left atrium using POCUS is a highly sensitive screening tool in patients with Sickle Cell Disease. However, due to its moderate specificity and systematic tendency to overestimate LA size, findings suggesting enlargement should be confirmed by SE.

Table 1. Performance metrics and statistical analysis of visual POCUS vs. linear diameter measurement for detecting left atrial enlargement.

Diagnostic Parameters	Results
POCUS Performance Metrics	
Sensitivity	100%
Specificity	53%
Predictive Values	
Negative Predictive Value (NPV)	100%
Positive Predictive Value (PPV)	65%
Inter-method Agreement	
Cohen's Kappa (κ)	0.51
Mann-Whitney U Test	$p = 0.0001$
Systematic Bias Assessment	
McNemar's Test	$p = 0.007$

Clinically relevant left atrial (LA) enlargement was defined by an anteroposterior LA diameter ≥ 4.0 cm. POCUS: Point-of-Care Ultrasound.

21051

CORRELATION BETWEEN REGURGITANT VOLUME AND EFFECTIVE REGURGITANT ORIFICE AREA IN MITRAL VALVE PROLAPSE-RELATED MITRAL REGURGITATION

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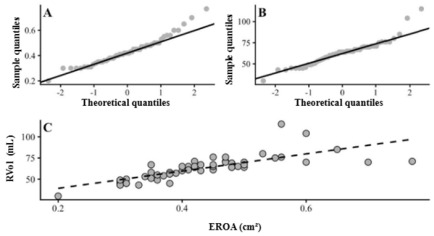
Background/Introduction: Quantification of mitral regurgitation (MR) in mitral valve prolapse (MVP) is challenging due to the dynamic behavior and eccentric geometry of regurgitant jets. Although effective regurgitant orifice area (EROA) and regurgitant volume (RVol) are physiologically related, the geometric assumptions of the proximal isovelocity surface area (PISA) method may be unreliable in MVP. Objectives: To evaluate the association between EROA and RVol in patients with MVP-related MR and explore potential nonlinear behavior between these parameters. Methods: This retrospective study included 55 adults with primary MR secondary to MVP who underwent transesophageal echocardiography with 2D and 3D acquisitions. EROA was calculated using the PISA method, and RVol was derived from EROA multiplied by the continuous-wave Doppler velocity-time integral, according to American Society of Echocardiography recommendations. Data were obtained from an institutional database linked to a previously approved research project. Due to non-normal distribution (Shapiro-Wilk: EROA p=0.043; RVol p=0.002), Spearman correlation, linear regression, residual analysis, quadratic regression, and Cook's distance analysis were performed. Results and Conclusions: Descriptive data and the linear regression model are detailed in Table 1. A strong positive correlation was observed between EROA and RVol (Spearman's rho=0.869; p<0.001). Linear regression showed EROA as a significant predictor of RVol (β=101.6; 95%CI 77.7-125.5; p<0.001), explaining 57.9% of RVol variability (R^2=0.579) (Figure 1). Residual analysis demonstrated increasing dispersion at higher MR severity, suggesting that jet geometry and dynamic flow characteristics influence RVol independently of orifice area. Addition of a quadratic term significantly improved model fit (R^2=0.830), supporting a nonlinear relationship between EROA and RVol. Sensitivity analysis after exclusion of one potentially influential observation identified by Cook's distance preserved the nonlinear pattern. These findings suggest that simplified geometric assumptions may inadequately reflect volumetric dynamics in MVP-related MR and reinforce the need for an integrated multiparametric approach. Three-dimensional methods may better represent MR severity in anatomically complex scenarios.

Table 1. Echocardiographic characterization and linear correlation parameters (N = 55)

Variable	Mean ± SD	Median (min–max)	p (Shapiro)	Spearman's ρ	p (Spearman)
EROA (cm²)	0.43 ± 0.11	0.42 (0.20–0.77)	0.043	—	—
RV (mL)	62.91 ± 14.21	64.00 (30.00–115.00)	0.002	0.869	< 0.001

Data are presented as mean ± standard deviation or median (min–max). The Shapiro-Wilk test was used to assess normality. The correlation between EROA and RV was evaluated using Spearman's correlation coefficient (ρ).

Figure 1. Assessment of normality and linear correlation between severity parameters



(A) Q-Q plot of residuals for the EROA variable; (B) Q-Q plot of residuals for the VR variable; (C) Scatter plot demonstrating the linear correlation between EROA and VR (R^2 = 0.579).

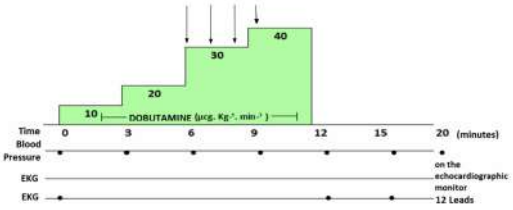
19882

EVALUATION OF PATIENTS WITH EXTENSIVE MYOCARDIAL CONTRACTILITY IMPAIRMENT AT REST AND POSITIVE DOBUTAMINE STRESS ECHOCARDIOGRAPHY FOR ISCHEMIA WITHOUT ANGINA.

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Background/Introduction: Myocardial ischemia without angina pectoris is called silent ischemia, can be detected by dobutamine stress echocardiography (DSE), and its severity can be estimated using the wall motion score index (WMSI). Patients with extensive ischemia and a high WMSI (above 1.7) are associated with a worse prognosis. Objectives: To evaluate patients with silent ischemia (SI) during DSE, considering the magnitude of the WMSI and the safety profile. Methods: Real-life patients with SI on DSE due to worsening contractility or biphasic response (improvement followed by worsening contractility) were compared from Group 1 (G1), with intermediate WMSI (between 1.1 and 1.7), and Group 2 (G2), with high WMSI (above 1.7). Results and Conclusions: There were 252 patients in G1 and 55 in G2, both homogeneous with respect to age, gender, risk factors for coronary artery disease, and therapy in use. G2 was associated with moderate correlation strength to the presence of biphasic response [52 (20%) vs. 26 (47.3%); p<0.001; Cramer's V: 0.235] and to altered resting contractility [126 (50%) vs. 55 (100%); p<0.001; Cramer's V: 0.390]. The double product (DP = systolic blood pressure x heart rate) at rest in G2 was higher (9914 ± 2117 bpm.mmHg vs 10591 ± 2334; p=0.036), ischemia occurred with lower systolic blood pressure values (160.8 ± 22.4 mmHg vs 153.3 ± 11.1 mmHg; p=0.024) and lower DP (23174 ± 425 vs 21460 ± 4801 bpm.mmHg; p=0.009) also in G2. Isolated ventricular ectopic beats [96 (38.1%) vs 23 (41.8%); p=0.068], paroxysmal supraventricular tachycardia (5.6% vs 3.6%; p= 0.562) and atrial fibrillation (1.6% vs 1.8%; p= 0.902) did not differ between the groups. The arrhythmias reversed spontaneously or after medication. No infarction, ventricular fibrillation, or death occurred. In patients with a positive examination for ischemia, without angina and with high WMSI, the DSE is a safe procedure. On DSE with SI, normal resting contractility is related to a less severe ischemia, while the presence of a biphasic response is related to more extensive ischemia.



Variables	Group 1	Group 2	p
Total sample	252 (100%)	55 (100%)	
Average age in years	64,8 ± 11,7	65,2 ± 12,8	0,633
Male gender	170 (82,5%)	36 (65,5%)	0,082
Hypertension	215 (85,3%)	37 (67,3%)	0,052
Dyslipidemia	185 (73,4%)	30 (54,5%)	0,170
Diabetes	129 (51,2%)	20 (36,4%)	0,108
Chronic renal failure	28 (11,1%)	9 (16,4%)	0,324
Family history of CAD	22 (8,7%)	3 (5,5%)	0,368
Smoking	14 (5,6%)	6 (10,9%)	0,128
Known CAD	140 (55,6%)	34 (61,8%)	0,397
Biphasic response	52 (20,6%)	26 (47,3%)	<0,001
Resting contractile alteration	126 (50%)	55 (100%)	<0,001
Resting heart rate (bpm)	74,3 ±12,0	82,1 ±13,8	<0,001
Heart rate during stress (bpm)	144,1 ±17,5	139,3 ± 19,5	0,072
Resting systolic BP (mmHg)	133,21 ± 16,5	128,54 ± 15,7	0,056
Resting diastolic BP(mmHg)	77,4 ± 11,3	77,4 ± 7,5	0,989
Systolic BP during stress (mmHg)	160,8 ± 22,4	153,3 ± 11,1	0,024
Diastolic BP during stress (mmHg)	84,8 ± 11,1	83,7 ± 25,7	0,519
Double product at rest (bpm.mmHg)	9914,6 ± 2117	10590,9 ± 2334	0,036
Double product during stress (bpm.mmHg)	23174,3 ± 4251	21460,2 ± 4801	0,009

20216

OVERWEIGHT AND OBESITY ASSOCIATED WITH SUBCLINICAL MYOCARDIAL DYSFUNCTION ASSESSED BY MYOCARDIAL STRAIN: A STUDY IN A BRAZILIAN ADULT POPULATION

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Background/Introduction: Obesity has a growing incidence worldwide. Brazilians already have a prevalence of overweight or obesity of approximately 60%, which are well-known cardiovascular risk factors, highlighting heart failure. Although subclinical cardiac dysfunction is well established in obesity, the impact on overweight remains underexplored. Objectives: To evaluate the relationship between overweight and obesity with early cardiac dysfunction assessed by myocardial deformation (strain), and to identify associated independent factors. Methods: A cross-sectional study of a random sample from the ELSA-Brazil cohort, with analysis of left ventricular (LV) and right ventricular (RV) global longitudinal strain (GLS). BMI categorized participants: eutrophic, overweight, and obese. Group comparisons and multiple linear regression models were performed, with statistical significance set at p<0.05. Results and Conclusions: The sample of 1,048 participants comprised 38.4% eutrophic (E), 42.5% overweight (OW), and 19.0% obese (OB) individuals. Overweight and obese individuals exhibited a higher prevalence of hypertension (HTN) and diabetes, along with worse parameters of cardiac remodeling and diastolic dysfunction. Strain values significantly worsened in overweight/obese individuals compared to eutrophic individuals, for both LV GLS (E:−19,1±2,3%, OW:−18,5±2,6%, OB:−18.0±2,7%; p<0.05) and RV GLS (E:−25,5±2.3%, OW:−25,1±2,2%, OB:−24,8±2,6%; p<0.05), with a higher prevalence of subclinical dysfunction among overweight/obese individuals (Figure). Regarding left ventricular ejection fraction (LVEF), a slight reduction was observed in the obese category. In the multivariate analysis, excess weight (overweight/obesity) remained an independent association with worse strain, even after adjusting for age, sex, race, educational level, study center, HTN, diabetes, and LVEF (Table). In addition to BMI, waist circumference and waist-to-hip ratio were also associated with worse ventricular strain, with a stronger association in men and more evident in the LV. Excess weight is independently associated with biventricular subclinical systolic dysfunction in the Brazilian adult population, with impairment already evident in overweight individuals. These findings reinforce the utility of strain as an early biomarker of myocardial function.

Figure: Prevalence of abnormal GLS according to BMI categories

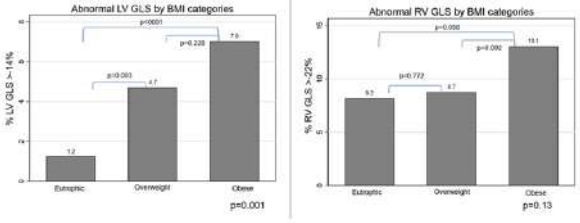


Table: Association between BMI categories and GLS

Characteristics	LV GLS				RV GLS		
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3
Eutrophic vs overweight/obese	0.79 p<0.0001	0.65 p<0.0001	0.53 p=0.001	0.33 p=0.006	0.524 p<0.0001	0.478 P=0.001	0.449 p=0.005
Age		0.00 p=0.658	-0.01 p=0.424	0.01 p=0.368		-0.004 p=0.623	-0.007 p=0.447
Male sex		1.24 p<0.0001	1.17 p<0.0001	0.88 p<0.0001		0.646 p<0.0001	0.628 p<0.0001
Race/color		-0.10 p=0.31	-0.05 p=0.573	-0.03 p=0.657		-0.039 p=0.672	-0.028 p=0.763
Educational level		-0.07 p=0.455	-0.02 p=0.83	0.12 p=0.122		0.013 p=0.889	0.023 p=0.811
ELSA-Brasil center		0.18 p<0.0001	0.18 p<0.0001	-0.02 p=0.558		-0.018 P=0.682	-0.017 p=0.703
HTN			0.40 p=0.019	0.20 p=0.127			0.164 p=0.321
Diabetes mellitus			0.58 p=0.008	0.24 p=0.153			0.038 p=0.858
LVEF (Simpson)				-0.26 p<0.0001			

Adjusted through multiple linear regression for the following:
LV GLS: Model 1: crude [R-Square (R2): 2.2%], Model 2: model 1 + sex, age (years), race/color, educational level, ELSA-Brasil center,(R2: 9.7%),Model 3: model 2 + HTN +Dm. (R2: 11%),Model 4: model 3 + LVEF. (R2: 47%).RV GLS: Model 1: crude. [R-Square (R2): 1.1%],Model 2: model 1 + sex, age (years), race/color, educational level, ELSA-Brasil center,(R2: 2.5%),Model 3: model 2 + HTN +Dm. (R2: 2.4%).

20716

VIDEOLARYNGOSCOPY FOR TRANSESOPHAGEAL ECHOCARDIOGRAPHY PROBE INSERTION IN PATIENTS UNDERGOING CARDIAC SURGERY: A SYSTEMATIC REVIEW AND META-ANALYSIS.

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Background/Introduction: Videolaryngoscopy (VL) has demonstrated utility in facilitating endotracheal intubation, but its role in aiding transesophageal echocardiography (TEE) probe insertion remains unclear. Difficult TEE probe insertion can lead to delays, trauma, and procedural failure. Objectives: This systematic review and meta-analysis aimed to evaluate the efficacy and safety of VL for TEE probe insertion in patients undergoing cardiac surgery. Methods: The MEDLINE, Embase, and Cochrane databases were searched for randomized controlled trials (RCTs) comparing VL-assisted TEE probe insertion with conventional direct laryngoscopy (DL) in adults and children undergoing cardiac surgery. A random-effects model was employed for all analyses. Dichotomous outcomes were analyzed using risk ratios (RR) with 95% confidence intervals (CI). Continuous outcomes were analyzed using mean differences (MD) with 95% CI. Heterogeneity was assessed using the I2 statistic. Meta-analysis was performed using the R Software, version 4.2.3. Results and Conclusions: Eight RCTs comprising 968 patients, 490 in the VL group, were included. The mean age of participants was 54 years for adults and 5.33 years for children. The most common procedure performed was elective coronary artery bypass grafting (CABG). VL-assisted TEE probe insertion was associated with a significantly higher first-attempt success rate compared to DL (RR 1.00;95% CI 1.04, 1.14; P < 0.05; I2 = 0%). Complication rates were lower in the VL group (RR 0.54; 95% CI 0.30, 0.96; P < 0.05; I2 = 54%). Insertion time was not significantly different between the VL and DL groups (MD -6.65 seconds; 95% CI -21.29, 7.99 seconds; P = 0.37; I2 = 97%). However, subgroup analysis in the pediatric population did not demonstrate a significant difference for VL regarding first-attempt success or lower complications. In this meta-analysis, VL was associated with a significant improvement in the first-attempt success rate and reduction in overall complications during TEE probe insertion in patients undergoing cardiac surgery, particularly in the adult population. While insertion time was not significantly different, the benefits of VL suggest it is a valuable technique for facilitating TEE probe placement.

Figure 1

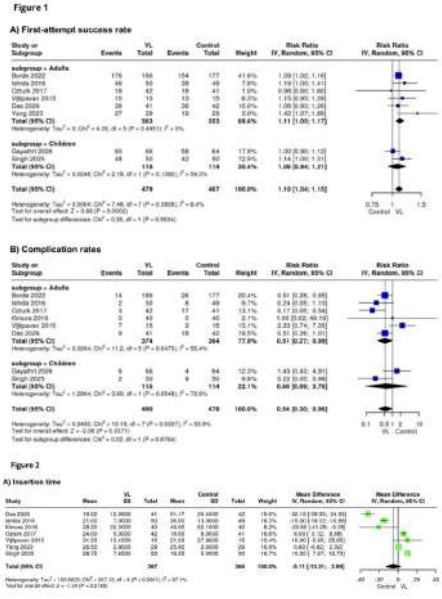


Figure 2

Cardiovascular Imaging – MRI and CT



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20119

CMR-BASED ASSESSMENT OF MYOCARDIAL INFLAMMATION FOLLOWING BENZNIDAZOLE THERAPY IN CHRONIC CHAGAS DISEASE

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Background/Introduction: Parasite persistence sustains myocardial inflammation and drives progression to Chagas cardiomyopathy. Etiologic therapy with benznidazole reduces parasitic burden and may attenuate myocardial injury, but early treatment response remains difficult to quantify using conventional measures. Objectives: To evaluate the impact of benznidazole therapy on myocardial inflammation using cardiac magnetic resonance (CMR) tissue characterization. Methods: In this prospective observational study, patients with chronic Chagas disease eligible for antiparasitic therapy underwent CMR with T1 and T2 mapping and extracellular volume fraction (ECV) quantification at baseline and 6 months after treatment. Treatment-related changes (ΔT1, ΔT2, ΔECV) were integrated using principal component analysis (PCA) to derive a composite myocardial response index (PC1). Patients were stratified into three groups according to PC1 scores: greatest, intermediate, and minimal/no response (Figure 1). Results and Conclusions: Results: Among 76 patients initiating therapy, 70 completed treatment and were included (age 57 ± 9 years; 63% women). Most patients were in the indeterminate (63%) or mild cardiac form (24%). Baseline ventricular size and systolic function were preserved. At 6 months, T1 and ECV decreased significantly (both $p < 0.05$), whereas T2 remained unchanged. PCA demonstrated marked heterogeneity in treatment response, with approximately one-third of patients showing minimal improvement or worsening tissue abnormalities. Greater reductions in T1 and ECV were observed in patients with higher baseline values. Conclusions: In chronic Chagas disease, benznidazole therapy is associated with measurable improvements in myocardial tissue characteristics by CMR. Integration of multiparametric imaging using PCA reveals substantial heterogeneity in treatment response, supporting the role of CMR as a sensitive tool for detecting early myocardial changes following therapy.

Figure 1

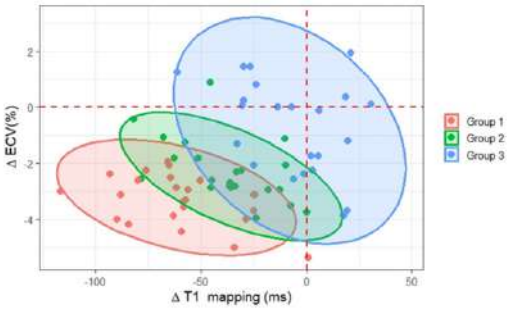


Figure 1. Distribution of treatment-related changes in myocardial tissue parameters. Scatter plot of ΔT1 (ms) versus ΔECV (%) following benznidazole therapy, with patients stratified according to the principal component–derived response groups. Ellipses represent the distribution of each group: Group 1 (greatest response), Group 2 (intermediate response), and Group 3 (minimal or no response). Dashed lines indicate the null change (Δ = 0) for each parameter. Greater reductions in both T1 and ECV are observed in Group 1, whereas Group 3 shows minimal change or worsening, highlighting heterogeneity in myocardial response to therapy.

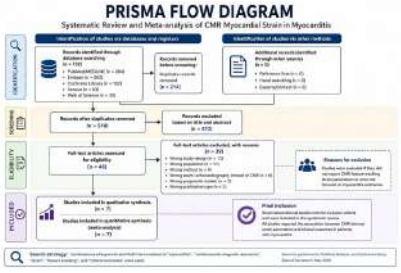
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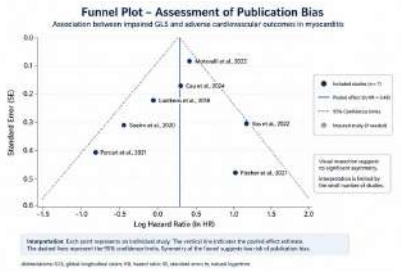
CMR-DERIVED LEFT VENTRICULAR GLOBAL LONGITUDINAL STRAIN FOR RISK STRATIFICATION IN ACUTE MYOCARDITIS: A SYSTEMATIC REVIEW

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Background/Introduction: Acute myocarditis has a heterogeneous clinical course, ranging from complete recovery to heart failure, ventricular arrhythmias, recurrent disease, transplantation, and death. Although left ventricular ejection fraction and late gadolinium enhancement are widely used for risk assessment, they may fail to identify subtle myocardial dysfunction. Cardiac magnetic resonance-derived left ventricular global longitudinal strain has emerged as a potentially more sensitive prognostic marker. Objectives: To evaluate the prognostic value of CMR-derived left ventricular global longitudinal strain in adult patients with acute myocarditis. Methods: A systematic review was conducted according to PRISMA principles. PubMed, Embase, and the Cochrane Library were searched in May 2026. Observational studies assessing CMR-derived left ventricular global longitudinal strain or left ventricular longitudinal strain in adults with acute myocarditis and reporting clinical or functional outcomes were included. Diagnostic-only studies, echocardiographic strain studies, pediatric cohorts, wrong populations, and non-original publications were excluded. Results and Conclusions: The search identified 732 records, and 7 observational studies were included. Five studies evaluated composite adverse cardiovascular outcomes, comprising 1,106 patients. Adverse events occurred in 169 patients overall: 29/162, 74/455, 24/256, 26/100, and 16/133 across the five cohorts. Across these studies, impaired CMR-derived left ventricular global longitudinal strain was consistently associated with poorer outcomes. In multiple cohorts, left ventricular global longitudinal strain remained independently associated with adverse events after adjustment for conventional markers, including left ventricular ejection fraction and late gadolinium enhancement. One additional study including 141 patients showed that left ventricular global longitudinal strain independently predicted ventricular arrhythmic events, which occurred in 17 patients. Another study including 69 patients demonstrated that baseline left ventricular longitudinal strain independently predicted functional recovery during follow-up. Overall, current evidence supports CMR-derived left ventricular global longitudinal strain as a clinically relevant prognostic marker in acute myocarditis, with potential incremental value beyond conventional CMR parameters. Further prospective studies are needed to validate standardized cutoff values and determine its role in guiding follow-up strategies.





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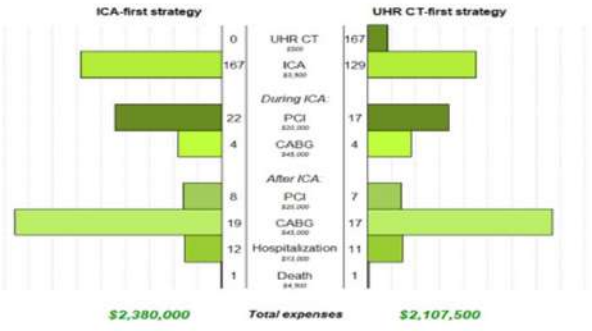
COST-EFFECTIVENESS AND CLINICAL IMPACT OF ULTRA-HIGH-RESOLUTION CORONARY CT PRIOR TO INVASIVE CORONARY ANGIOGRAPHY: INSIGHTS FROM THE CORE PRECISION STUDY

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Background/Introduction: Invasive coronary angiography (ICA) is widely used in patients with suspected coronary artery disease (CAD), but a significant proportion of procedures ultimately reveal non-obstructive findings. Ultra-high-resolution coronary computed tomography (UHRCT) may reduce unnecessary ICAs by serving as a noninvasive gatekeeper. Objectives: To evaluate the cost-effectiveness and clinical impact of a UHRCT-first strategy in patients referred for ICA due to suspected CAD using data from CORE PRECISION multicenter trial. Methods: A decision-tree model compared two strategies in 167 high-risk patients who underwent both UHR-CT and ICA: (1) direct ICA for all patients, and (2) UHRCT-first, in which all patients underwent UHR-CT, with ICA hypothetically performed only when ≥70% stenosis was identified. ICA served as the reference standard. Costs were assessed from a U.S. healthcare payer perspective and standardized to 2025 USD using Medicare and Healthcare Cost and Utilization Project (HCUP) sources. The primary outcome was the incremental cost-effectiveness ratio (ICER), defined as the cost per additional correct diagnosis. Secondary outcomes included total costs and ICA utilization. Nonparametric bootstrap resampling was used to estimate uncertainty. Results and Conclusions: Among 167 participants (121 males, 66 ±11 years), direct ICA was associated with a total 30-day cost of $2,380,000 ($14,251 per patient). The UHR-CT-first strategy reduced total cost to $2,107,500 ($12,620 per patient), resulting in an incremental cost difference of −$272,500 (−$1,631 per patient) (Fig 1B). Under the UHR-CT-first strategy, ICA utilization decreased from 100% (167/167) to 77% (129/167), avoiding 38 invasive procedures. However, 15 obstructive cases were not identified as ≥70% stenosis by UHRCT. Of these 15 patients, only 4 underwent coronary revascularization after ICA. The ICER was $18,167 per one additional correct diagnosis gained with the direct ICA strategy. In this 30-day cost-effectiveness analysis, a UHR-CT-first strategy reduced overall healthcare costs and the use of invasive coronary angiography compared with performing direct ICA in all patients. Although direct ICA provided greater diagnostic accuracy, it was associated with higher costs. These findings demonstrate a trade-off between diagnostic performance and cost and support the potential role of UHR-CT as a cost-effective initial triage strategy.

Figura 1 B



ICA = Invasive Coronary Angiography, PCI = Percutaneous Coronary Intervention, CABG = Coronary Artery Bypass Grafting, MI = Myocardial Infarction, UHRCT= Ultra-high-resolution coronary computed tomography.

18961

IMPACT OF CORONARY CALCIUM SCORE ON THE DIAGNOSTIC ACCURACY OF ULTRA-HIGH-RESOLUTION CT FOR DETECTING OBSTRUCTIVE CORONARY ARTERY DISEASE IN THE CORE PRECISION MULTICENTER STUDY

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Background/Introduction: Dense coronary calcification limits the use of conventional coronary CT angiography due to blooming artifacts that obscure the lumen and reduce its diagnostic accuracy. Ultra–high–resolution CT (UHR-CT), with improved spatial resolution, may mitigate this limitation and allow a more reliable assessment even in patients with high calcium score levels. Objectives: To investigate the influence of coronary artery calcium score (CACS) in the diagnostic accuracy of UHR-CT for detecting hemodynamically significant coronary artery disease (CAD) at patient level using quantitative flow ratio (QFR) as the reference standard, and to explore whether a clinically meaningful CACS threshold exists beyond which UHR-CT accuracy declines. Methods: In the CORE Precision study, participants with suspected obstructive CAD underwent non-contrast calcium scoring and UHR-CT prior to invasive coronary angiography. UHR-CT images were analyzed and stenosis ≥70% were deemed obstructive. Functional significance (reference standard) was defined by an abnormal QFR. CACS was analyzed both categorically (0–99, 100–399, 400–999, ≥1000) and as a continuous variable using a moving-threshold approach. Diagnostic accuracy was calculated across increasing CACS cutoffs, restricting analyses to thresholds where each subgroup comprised ≥10% of the cohort to ensure stability. Results and Conclusions: A total of 118 participants (mean age 67±11 years, 75% male) were included. The mean calcium score was 1,004 (± 1,108). The global diagnostic accuracy of UHR-CT was 80.3%. Diagnostic accuracy declined progressively across increasing CACS categories, measuring 90.9% for CACS 0–99, 88.5% for CACS 100–399, 83.8% for CACS 400–999, and 76.7% for CACS ≥1,000. Performance attenuation at very high CACS values was primarily driven by reduced specificity, while sensitivity remained preserved. Detailed diagnostic performance metrics and confidence intervals are presented in Figure 1A. In the continuous analysis, no abrupt cutoff point was identified. The accuracy remained stable, especially in patients with CACS <1,000, with a gradual decline with increasing calcium burden (Figure 1B). The histograms in Figure 1B illustrate correctly and incorrectly classified cases across CACS ranges. UHR-CT maintains robust diagnostic accuracy across a wide range of coronary calcium scores, particularly in patients with CACS <1000, a group previously considered unsuitable for the test, suggesting that UHR-CT may represent a noninvasive diagnostic alternative in this group.

A

CACS Range (n)	Accuracy (95% CI)	Sensitivity (95% CI)	Specificity (95% CI)
0-99 (11)	90.9 (58.7-99.8)	85.7 (42.1-99.6)	100.0 (39.8-100.0)
100-399 (26)	88.5 (69.8-97.6)	92.9 (66.1-99.8)	83.3 (51.6-97.9)
400-999 (37)	83.8 (68.0-93.8)	92.3 (74.9-99.1)	63.6 (30.8-89.1)
≥1000 (44)	76.7 (61.4-88.2)	88.2 (72.5-96.7)	33.3 (7.5-70.1)

Figure 1A. Patient-level diagnostic accuracy, sensitivity, and specificity of UHR-CT across CACS categories (reference standard: QFR ≤0.80). Values shown as % (95% CI). N= number of cases in each category.

B

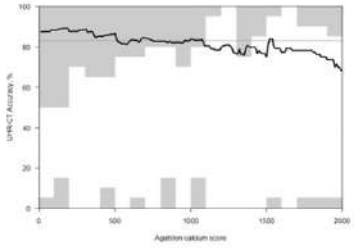


Figure 1B . Distribution of UHR-CT diagnostic accuracy according to CACS.
Solid black line shows the moving average of diagnostic accuracy calculated using a sliding CACS window of x ± 500 Agatston units. Gray horizontal line indicates the overall patient-level diagnostic accuracy for the cohort.
Upper histogram represents correctly classified cases (true positives and true negatives relative to QFR ≤0.80), and the lower histogram represents incorrectly classified cases (false positives and false negatives).

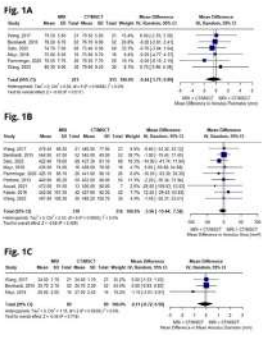
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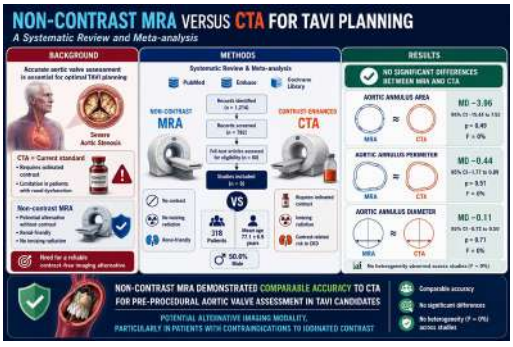
NON-CONTRAST-ENHANCED MAGNETIC RESONANCE ANGIOGRAPHY VERSUS CONTRAST-ENHANCED MULTISLICE COMPUTED TOMOGRAPHY FOR PRE-PROCEDURAL ASSESSMENT IN TRANSCATHETER AORTIC VALVE IMPLANTATION: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background/Introduction: Accurate aortic valve assessment is essential for optimal planning of transcatheter aortic valve implantation (TAVI). Contrast-enhanced multislice computed tomography (CTA) is the current reference standard; however, its use may be limited in patients with renal dysfunction. Non-contrast-enhanced magnetic resonance angiography (MRA) has emerged as a potential alternative, but evidence comparing both modalities remains inconsistent. Objectives: To systematically evaluate and compare the accuracy of non-contrast-enhanced MRA and contrast-enhanced CTA for aortic valve assessment prior to TAVI. Methods: A systematic search of PubMed, Embase, and Cochrane databases was performed to identify studies comparing non-contrast-enhanced MRA with contrast-enhanced CTA in patients with severe aortic stenosis undergoing TAVI evaluation. Pooled mean differences (MD) were calculated using a random-effects model. Statistical significance was set at $p<0.05$. Heterogeneity was assessed using the I^2 statistic. Results and Conclusions: Nine studies were included, comprising 318 patients (50.6% male) with a mean age of 77.1±6.9 years. No significant differences were observed between MRA and CTA in aortic annular measurements. Aortic annulus area was comparable between modalities (MD −3.96; 95% CI −15.44 to 7.52; p=0.49; I^2=0%). Similarly, aortic annulus perimeter (MD −0.44; 95% CI −1.77 to 0.89; p=0.51; I^2=0%) and diameter (MD −0.11; 95% CI −0.72 to 0.50; p=0.71; I^2=0%) showed no significant differences. Conclusion: In this meta-analysis with no observed heterogeneity between groups, non-contrast-enhanced MRA demonstrated comparable accuracy to contrast-enhanced CTA for pre-procedural aortic valve assessment in TAVI candidates. These findings support MRA as a feasible alternative imaging modality, particularly in patients with contraindications to iodinated contrast.





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ULTRA-HIGH-RESOLUTION CT VERSUS INVASIVE ANGIOGRAPHY FOR OBSTRUCTIVE CORONARY ARTERY DISEASE: REAL-WORLD AND CORE LABORATORY DIAGNOSTIC PERFORMANCE IN A MULTICENTER STUDY

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Background/Introduction: Imaging studies interpretation in clinical practice may differ substantially from centralized Core Laboratory assessment, particularly in complex patients with severe calcification or stents. In the CORE PRECISION study, ultra–high-resolution computed tomography (UHR-CT) and invasive coronary angiography (ICA) demonstrated similar diagnostic performance under standardized Core Lab conditions, although statistical non-inferiority was not formally met. Whether real-world interpretation narrows or widens this performance gap remains clinically relevant. Objectives: To compare the diagnostic performance of UHR-CT and ICA to detect hemodynamically significant stenosis according to local versus centralized core lab assessment. Methods: In a prospective multicenter study conducted in Brazil, Japan, and the United States, patients with a calcium score ≥400, known coronary stenosis ≥ 50% or stents underwent UHR-CT prior to ICA due to suspected obstructive coronary artery disease (CAD). UHR-CT and ICA images were analyzed locally at each site and by blinded and centralized Core Labs. Stenosis ≥70% on UHR-CT or ICA were deemed obstructive, and functional significance (reference standard) was defined by an abnormal quantitative flow ratio. The diagnostic accuracy of both tests for detecting significant stenosis was calculated based on both Core Lab and site-level assessments. Results and Conclusions: Among the 173 patients (mean age 65.2 years, 72% male), obstructive CAD was present in 115 (66%). The mean calcium score in patients without stents (n=115) was 1,004 (± 1,108). In real-world site-level readings, ICA accuracy decreased from 83.2% to 74.0% (p for difference=0.009), whereas UHR-CT showed a more modest decline, from 80.3% to 74.0% (p for difference=0.04). The reduction in performance was more pronounced for ICA specificity, resulting in convergence of diagnostic accuracy between modalities in routine practice (Fig 1A). Intercontinental variability further highlighted differences between controlled Core Lab conditions and real-world interpretation (Fig 1B). In real-world practice, UHR-CT has the same diagnostic accuracy as ICA in detecting patients with significant CAD, even among patients with severe coronary calcification or stents. With Core Lab adjudication, the accuracy gain was greater for ICA than for UHR-CT, suggesting that variability in routine ICA interpretation may influence comparative effectiveness more than variability in CT interpretation.

A

		Core Lab	Site Analysis (combined)	
UHR-CT	**Accuracy**	**80.3 (73.6-86.0)**	**74.0 (66.8-80.4)**	Δ Accuracy: 6.4 (p=0.04)
	Sensitivity	86.1 (78.4-91.8)	86.1 (78.4-91.8)	
	Specificity	69.0 (55.5-80.5)	50.0 (36.6-63.4)	
ICA	**Accuracy**	**83.2 (76.8-88.5)**	**74.0 (66.8-80.4)**	Δ Accuracy: 9.2 (p=0.009)
	Sensitivity	89.6 (82.5-94.5)	92.2 (85.7-96.4)	
	Specificity	70.7 (57.3-81.9)	37.9 (25.5-51.6)	

B

Accuracy	Core Lab	Site Analysis (per site)	Core Lab and site analysis agreement (p for difference)*
		USA	
UHR-CT	76.9%	70.5%	88.5
ICA	80.8%	69.2%	70.5
		Brazil	
UHR-CT	87.8%	85.4%	87.8 (p=0.91)
ICA	90.2%	80.5%	85.4 (p=0.049)
		Japan	
UHR-CT	79.6%	70.4%	72.3 (p=0.02)
ICA	81.5%	75.9%	83.3 (p=0.08)

*considering USA agreement as the reference

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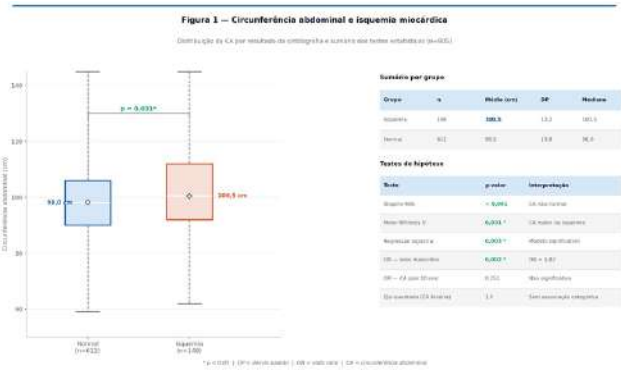
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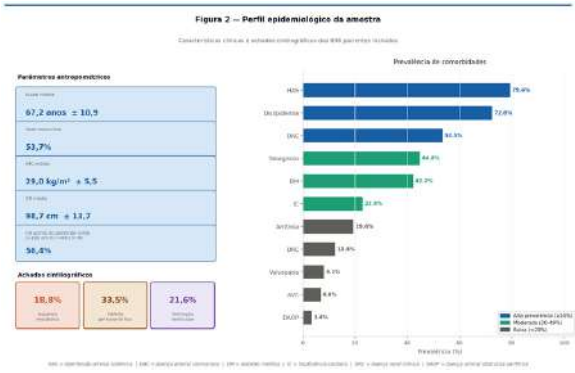
ABDOMINAL CIRCUMFERENCE AND MYOCARDIAL PERFUSION IMAGING FINDINGS: A RETROSPECTIVE HOSPITAL-BASED COHORT ANALYSIS

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Background/Introduction: Central adiposity is an established cardiometabolic risk marker; however, its association with myocardial perfusion abnormalities in patients referred for myocardial perfusion imaging (MPI) remains incompletely defined. Objectives: To evaluate the association between abdominal circumference (AC) and MPI findings after adjustment for demographic variables. Methods: This retrospective study included 805 patients with valid AC measurements. Shapiro-Wilk, Mann-Whitney U, chi-square, and multivariable logistic regression analyses adjusted for age and sex were performed. Results and Conclusions: Mean age was 67.2 ± 10.9 years, and 53.7% were male. Mean AC was 98.7 ± 13.7 cm, with elevated AC observed in 56.4% of patients. Myocardial ischemia was identified in 18.8%, fixed perfusion defects in 33.5%, and ventricular dysfunction in 21.6%. Patients with ischemia had higher AC values compared with those without ischemia (100.5 vs. 98.2 cm; p=0.031, Mann-Whitney test). However, AC was not independently associated with ischemia after multivariable adjustment (OR per 10 cm increase = 1.08; 95% CI 0.95–1.23; p=0.251). Male sex was the strongest predictor of ischemia (OR=1.82; p=0.002). Binary categorization of AC also showed no significant association with ischemia (p=1.0). Elevated AC was highly prevalent but was not independently associated with myocardial ischemia after adjustment for age and sex. Male sex emerged as the predominant predictor, suggesting that abdominal adiposity may represent part of a broader cardiometabolic risk profile with limited isolated discriminatory value in this hospital-based population.





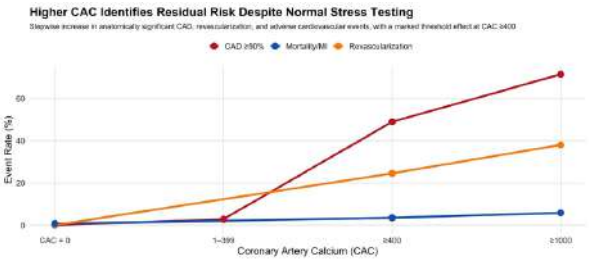
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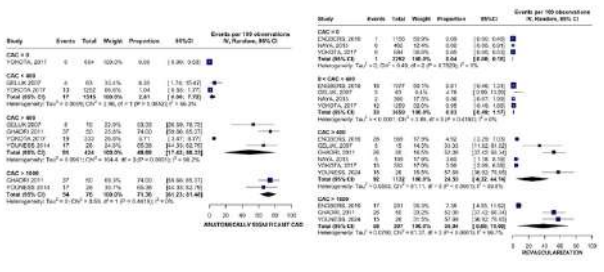
CORONARY ARTERY CALCIUM IDENTIFIES RESIDUAL RISK IN PATIENTS WITH NORMAL FUNCTIONAL TESTING: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background/Introduction: Background: Functional stress testing identifies inducible ischemia but does not exclude underlying atherosclerosis or future risk. Coronary artery calcium (CAC) quantifies atherosclerotic burden and may provide incremental prognostic value. Its role in symptomatic patients with negative stress tests remains uncertain. We evaluated the prognostic value of CAC in this setting. Objectives: Objective: To evaluate the prognostic value of coronary artery calcium (CAC) in symptomatic adults with negative functional stress tests, and to determine its association with residual cardiovascular risk and adverse clinical outcomes. Methods: Methods: Systematic review and single-arm meta-analysis including adults (≥18 years) with negative stress tests (SPECT, stress echocardiography, PET, or CMR). Random-effects models were used to estimate pooled proportions with 95% confidence intervals (CIs). Heterogeneity was assessed using Cochran's Q and I². Results and Conclusions: Results: Six studies (N = 7,269; mean age 61.3 years; 43% male) were included. Despite negative stress tests, increasing CAC burden was consistently associated with worse cardiovascular outcomes. The prevalence of anatomically significant coronary artery disease (≥50% stenosis) increased from 0% (CAC=0) to 2.8% for CAC 1–399, 48.9% (~1 in 2) for CAC ≥400, and 71.4% (~3 in 4) for CAC ≥1000. Coronary revascularization increased from 0.04% for CAC=0 to 24.5% (~1 in 4) for CAC ≥400 and 38.0% (~1 in 3) for CAC ≥1000. Myocardial infarction increased from 0.77% for CAC=0 to 3.46% for CAC ≥400. All-cause mortality also increased with CAC burden, reaching 5.77% for CAC ≥400, Figure. Conclusion: In symptomatic patients with negative stress tests, CAC reveals a marked gradient of residual risk not captured by ischemia assessment. These findings support its complementary role in risk stratification and potential to guide further evaluation and preventive strategies.





Cardiovascular Prevention / Atherosclerosis / Dyslipidemia / Cardiovascular Risk Factors / Immunotherapy and Vaccines



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20624

ARTERIAL LOAD AND ARTERIAL STIFFNESS ARE INCREASED IN CHILDREN WITH OBESITY: EVIDENCE OF EARLY HEMODYNAMIC IMPAIRMENT

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Background/Introduction: Childhood obesity is associated with early vascular and hemodynamic alterations, which may represent subclinical manifestations of increased cardiometabolic risk. In this context, Effective Arterial Elastance (Ea) has emerged as an integrative marker of global arterial load and ventricular–arterial coupling, providing a more comprehensive assessment of cardiovascular hemodynamics. Objectives: To compare Ea and arterial stiffness indices between healthy children (CTRL) and children with obesity (OB). Methods: This was a cross-sectional analytical observational study including 70 children allocated into a healthy control group (n = 35) and an obesity group (n = 35), matched for age (CTRL 10.60 ± 1.95 vs. OB 10.71 ± 1.94 years) and sex. The Mobil-O-Graph (IEM, Stolberg, Germany) was used to noninvasively estimate central and peripheral blood pressures, hemodynamic parameters, and pulse wave velocity (PWV) based on brachial blood pressure measurements. Effective arterial elastance (Ea) was estimated as the ratio of peripheral mean arterial pressure (MAP) to stroke volume (SV). Variables were compared using the unpaired Student's t-test or the Mann–Whitney test, as appropriate, with $p < 0.05$ considered statistically significant. Results and Conclusions: Body weight (65.92±13.98 kg), height (1.51±0,11m), and body mass index (28.36±3.46 kg/cm2) were significantly higher in the OB group in relation to CTRL group (34.56±8.89 kg; 1.41±0,12m; 16.85±1,86 kg/cm2 respectively). Ea and PWV were significantly higher in the OB group (1.81±0.36 mmHg/mL and 4.64±0.37 m/s, respectively) compared to the CTRL group (1.63 ± 0.21 mmHg/mL and 4.41±0.72 m/s). Central and peripheral blood pressures were also significantly higher in the OB group (37.12% normotensive, 25.7% elevated blood pressure, 34.2% stage 1 hypertension, and 2.8% stage 2 hypertension). Children with obesity exhibit increased Ea, PWV, and blood arterial pressure, reflecting higher global arterial load and arterial stiffness early in life. These findings suggest the presence of subclinical hemodynamic alterations with potential cardiovascular impact, highlighting the importance of early identification and intervention in this population.

20246

ASSOCIATION BETWEEN EXTREME TEMPERATURES AND CARDIOVASCULAR MORTALITY: A TIME-SERIES STUDY IN THE METROPOLITAN REGION OF CURITIBA, BRAZIL

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Background/Introduction: Climate change represents a major challenge for global public health, impacting both morbidity and mortality. The cardiovascular system is particularly vulnerable to thermal extremes, which exacerbate preexisting risks and may trigger acute events. Maintaining thermal homeostasis (36.5–37.5 °C) requires adaptive responses that, under environmental stress, impose physiological overload. Heat exposure promotes dehydration and reduced plasma volume, increasing blood viscosity. Conversely, cold exposure induces peripheral vasoconstriction, sympathetic activation, and elevated blood pressure, increasing hemodynamic load and the risk of ischemic events. Objectives: To analyze the association between climate variability and cardiovascular mortality in the Metropolitan Region of Curitiba (PR) from 2016 to 2023, characterize the sociodemographic profile of deaths, and identify patterns associated with temperature extremes. Methods: An ecological time-series study was conducted using cardiovascular mortality data (ICD-10) from SIM/DATASUS. Climate variables were extracted from INMET (station A807). The analysis employed Distributed Lag Non-linear Models (DLNM) to assess non-linear relationships and delayed effects (lags). Natural cubic splines modeled the dose–response relationship. Based on the literature, lags of 0–3 days for heat and 0–21 days for cold and thermal amplitude were considered. All analyses were performed using R software. Results and Conclusions: A total of 39,695 deaths were analyzed (13.58/day), predominantly in individuals aged ≥65 years (72.8%) and males (51.2%). Low temperatures were significantly associated with increased cardiovascular mortality. Compared to the median temperature (14.5 °C), temperatures at the 1st percentile (6.5 °C) increased risk by 57% (RR = 1.57; 95% CI: 1.29–1.91; $p < 0.001$), with cumulative effects over 21 days. No significant association was observed for high temperatures (33 °C; RR = 1.04; $p = 0.324$) or thermal amplitude. CONCLUSION: In the Metropolitan Region of Curitiba, cardiovascular mortality was associated with cold exposure, with a significant cumulative effect. No association was observed for heat or thermal amplitude, highlighting the influence of the local climate. These findings reinforce the need for public health policies addressing cold-related risks, particularly in vulnerable elderly populations.

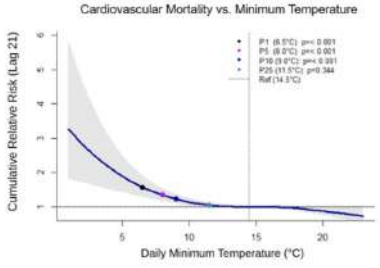


Figure 1: Cumulative relative risk of cardiovascular mortality associated with daily minimum temperatures. The non-linear exposure-response curve (Lag 0–21 days) demonstrates a statistically significant increase in mortality risk at extreme cold percentiles (P10 9.0°C; $p < 0.001$) when compared to the optimal reference temperature of 14.5°C.

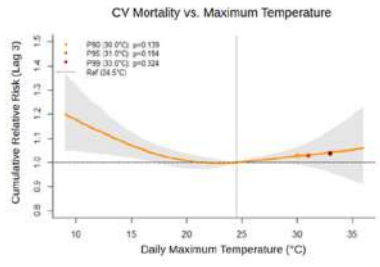


Figure 2: Cumulative relative risk of cardiovascular mortality associated with daily maximum temperatures. The exposure-response curve over a short-term 3-day lag period demonstrates no statistically significant increase in mortality risk during extreme heat events. Risk estimates at the highest temperature percentiles (P99 = 33.0°C) yielded p-values > 0.1 when compared to the 24.5°C reference threshold.

19349

ASSOCIATION BETWEEN HIGH LDL AND CARDIOVASCULAR RISK IN BRAZILIAN ADULTS ACCORDING TO SEX AND MACRO-REGIONS

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(1) FUNDAÇÃO DE AMPARO A PESQUISA DO ESTAODO DE MINAS GERAIS - BELO HORIZONTE - MG - BRASIL; (2) UNIVERSIDADE FEDERAL DE MINAS GERAIS - BELO HORIZONTE - MG - BRASIL;

Background/Introduction: Dyslipidemia, especially high LDL cholesterol, is a risk factor for cardiovascular diseases. Cardiovascular risk (CVR), estimated by scores such as Framingham, allows the identification of individuals more susceptible to cardiovascular events. In Brazil, there are gaps regarding the distribution of LDL and CVR related to regional inequalities in the macro-regions. Objectives: To analyze the association between high LDL and CVR in Brazilian adults according to sex and the country's macro-regions. Methods: A cross-sectional study using data from the National Health Survey (PNS) between 2014 and 2015, including 8,952 adults. Prevalences (%) and 95% confidence intervals (95% CI) for high LDL were estimated and stratified by sex and the 5 Brazilian macro-regions according to the Framingham risk score. High LDL was considered as levels ≥130 mg/dL. The CVR score was classified into low, intermediate, and high. Differences were evaluated using Pearson's chi-square test (p≤0,05). To verify the associations, logistic regression models were used to estimate Odds Ratios (OR) adjusted for age and race/skin color, with 95% CIs. Results and Conclusions: In women, a statistically significant association was observed between high LDL and cardiovascular risk in the Northeast and Southeast (p≤0,05). In the Northeast, the prevalence of high LDL was 4.2% (95% CI: 3.4–5.2) in low CVR, 8.0% (95% CI: 6.9–9.2) in intermediate, and 5.0% (95% CI: 4.2–5.8) in high risk, with high risk being associated with a greater chance of elevated LDL (OR 1.69; 95% CI: 1.08–2.63). In the Southeast, prevalences were 6.2% (95% CI: 5.4–7.1) in low risk, 8.6% (95% CI: 7.7–9.7) in intermediate, and 4.4% (95% CI: 3.8–5.2) in high risk, with a greater chance of elevated LDL among high-risk women (OR 3.11; 95% CI: 1.40–6.90). In men, a significant association between elevated LDL and cardiovascular risk was observed only in the Northeast (p≤0,05), with an elevated LDL prevalence of 3.7% (95% CI: 2.6–5.1) in low risk, 3.9% (95% CI: 2.9–5.1) in intermediate, and 3.4% (95% CI: 2.5–4.6) in high risk. In this region, high CVR was associated with a greater chance of elevated LDL (OR 2.19; 95% CI: 1.11–4.32)(p≤0,05). The association between elevated LDL and CVR was significantly observed only in the Northeast for both men and women, and in the Southeast for women, highlighting regional inequalities. This reinforces the need for cardiovascular health surveillance strategies with a territorial approach that is sensitive to regional and sex differences.

20871

ASSOCIATION BETWEEN NON-ALCOHOLIC FATTY LIVER DISEASE AND SUBCLINICAL ATHEROSCLEROSIS: A SYSTEMATIC REVIEW

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Background/Introduction: Non-alcoholic fatty liver disease (NAFLD), recently redefined under the spectrum of metabolic dysfunction-associated steatotic liver disease (MASLD), has emerged as one of the most prevalent chronic liver disorders worldwide. Beyond hepatic complications, growing evidence suggests that NAFLD represents a systemic metabolic condition strongly associated with cardiovascular disease, currently recognized as the leading cause of mortality among affected individuals. Subclinical atherosclerosis, characterized by early vascular alterations preceding overt cardiovascular events, may provide important insight into the cardiovascular burden associated with NAFLD. Objectives: To systematically evaluate the association between non-alcoholic fatty liver disease and markers of subclinical atherosclerosis in adult patients. Methods: A systematic review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The databases PubMed/MEDLINE, Embase, Scopus, and Cochrane Library were searched from inception until March 2026 using the descriptors: "non-alcoholic fatty liver disease", "NAFLD", "MASLD", "subclinical atherosclerosis", "carotid intima-media thickness", "coronary artery calcium", and "endothelial dysfunction". Observational studies evaluating adult patients with NAFLD and at least one marker of subclinical atherosclerosis were included. Studies involving significant alcohol consumption, viral hepatitis, pediatric populations, or insufficient cardiovascular assessment were excluded. Two independent reviewers performed study selection and data extraction. Results and Conclusions: The included studies consistently demonstrated a significant association between NAFLD and increased markers of subclinical atherosclerosis. Patients with NAFLD showed higher carotid intima-media thickness values, increased prevalence of carotid plaques, elevated coronary artery calcium scores, and greater arterial stiffness when compared to controls without hepatic steatosis. The association persisted even after adjustment for traditional cardiovascular risk factors in several studies, suggesting an independent contribution of NAFLD to atherosclerotic progression. Furthermore, more advanced hepatic fibrosis appeared to correlate with worse vascular outcomes and higher cardiovascular risk profiles.

20778

CARDIOMETABOLIC BENEFITS AND FAT FREE MASS PRESERVATION FOLLOWING A 12 WEEK MIXED-MACRONUTRIENT CALORIC RESTRICTION DIET IN HEALTHY WOMEN WITH OBESITY

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(1) BOND UNIVERSITY - AUSTRALIA; (2) UNIVERSITY OF TASMANIA - AUSTRALIA;

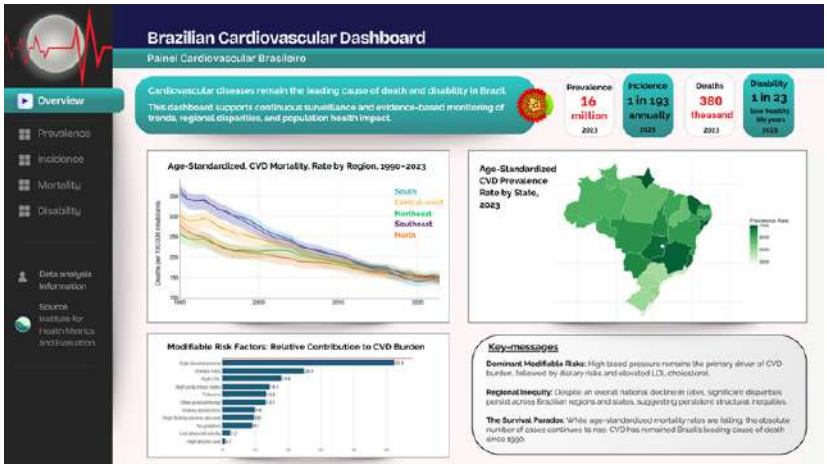
Background/Introduction: Caloric/energy restriction (ER) is an established strategy for reducing cardiovascular risk through weight loss; however, most trials demonstrate isolated benefits in single domains, and diet-only interventions frequently result in concurrent fat free mass loss of approximately 25% of total weight lost. The simultaneous impact of ER on fasting lipid, insulin, glucose profiles, blood pressure, and body composition within a single rigorously designed randomised controlled trial remains incompletely characterised. Objectives: Fifty-three women with obesity were randomised to 12 weeks of either: [1] continuous (CON), or [2] intermittent (INT) ER completed as 6×2-week blocks of ER alternating with 5×2-week blocks of energy balance (22 weeks total). Fifth-two participants completed a 4-week baseline phase and commenced the intervention (CON: N=24, 40.9±6.8 y, 96.9±12.4 kg, 35.4±3.8 kg.m 2; INT: N=28, 39.6±7.0 y, 98.9±11.8 kg, 35.7±3.5 kg.m-2). During ER, energy intake was equivalent to 67% of weight maintenance requirements in both groups. Macronutrient composition was matched across energy restricted diets (25–30% fat, 15–20% protein, 50–60% carbohydrate). Participants remained sedentary with no prescribed exercise. The primary outcome was weight loss; secondary outcomes included fasting lipids, glycaemic indices, ambulatory blood pressure, and body composition. Methods: For the N=17 CON and N=18 INT who completed the 12-week ER intervention and a 4-week post-intervention energy balance period, weight loss was greater for INT (8.5±1.8 vs 10.4±4.1 kg; P=0.02). Both groups demonstrated significant improvements in cardiometabolic domains: HOMA-IR but not lipids or blood pressure. Critically, fat free mass was preserved in both groups (mean change: -1.3±1.6 vs -0.7±1.0) with fat mass accounting for ≥ 84% to 94% of total weight lost, respectively; substantially exceeding the ~75% fat-fraction typically reported in diet-only ER trials. Results and Conclusions: A structured mixed-macronutrient ER intervention produced simultaneous improvements in HOMA-IR and body compostion over 12-weeks without prescribed exercise. Preservation of fat free mass despite 8.9-10.3% weight loss challenges view that exercise is essential for fat free mass maintenance during early dietary weight loss in women with obesity. Both continuous and intermittent energy restriction, without extreme macronutrient manipulation, yielded meaningful health benefits when adherence is supported, informing cardiovascular risk reduction strategy design.

15903

CARDIOVASCULAR HEALTH DASHBOARD IN BRAZIL: ESTIMATES FROM GLOBAL BURDEN OF DISEASE STUDY DATA (1990–2023)

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Background/Introduction: The increasing burden of cardiovascular disease, combined with the expansion of health data, challenges health systems due to fragmented sources and limited integration. Converting large-scale epidemiological data into actionable insights remains complex, highlighting the role of interactive dashboards and visual analytics in integrating and communicating patterns of disease burden and inequalities. Objectives: To develop an interactive dashboard for monitoring the burden of cardiovascular disease in Brazil using the Global Burden of Disease (GBD) study data. Methods: Methodological study based on secondary data from the GBD study (Institute for Health Metrics and Evaluation - IHME), covering 1990–2023. Four key metrics were selected: prevalence, incidence, mortality, and DALYs. Development included: (I) metric selection; (II) data import (CSV); (III) data cleaning and structuring in RStudio; and (IV) dashboard development in Microsoft Power BI. Four analytical panels (overview, prevalence, incidence, mortality, and disability) were created, comprising 13 interactive visualizations, including temporal trends, sex- and age-stratified analyses, regional and state comparisons, and DALY (Disability-Adjusted Life Years) decomposition into Premature mortality (YLL) and YLDs (Years Lived with Disability). The data analysis for the dashboard was performed using RStudio (version 3.11.1), and the dashboard was developed in Microsoft Power Business Intelligence (version 2.124.2028.0). Results and Conclusions: Age-standardized rates (per 100,000) decreased from 1990 to 2023: mortality (325.16 to 146.97), incidence (743.62 to 517.33), prevalence (7,613.42 to 6,369.14), and DALYs (7,302.92 to 3,503.29), despite an increase in absolute case numbers. YLL declined, while YLD remained stable, indicating improved survival with persistent morbidity. Higher CVD prevalence and mortality rates were observed in the North and Northeast regions. The dashboard enables multidimensional exploration, supporting the identification of patterns and inequalities. This tool has the potential to support evidence-based decision-making and cardiovascular health planning. This platform is available to clinicians, hospital managers, funders, industry, and the general public, and can be accessed at the following link: https://app.powerbi.com/view?r=eyJrIjoiOWQ1ZmViODgtODEzYS00ZDdmLWFhODYtMjlmMmI3MjM0OWRlIiwidCI6IjM5ZDExMjExLWY2MTktNDlmNy04ZjZkLTJmZWQ4NzkwNjc2ZSJ9. For the best experience, please rotate your phone.

20102

CARDIOVASCULAR OUTCOMES AFTER LIVER TRANSPLANTATION AT A REFERENCE CENTER IN BRAZIL

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Background/Introduction: Liver transplantation aims to improve survival in patients with irreversible hepatic disease; however, the procedure and postoperative period involve complex hemodynamic and metabolic changes. In the long term, normalization of the hyperdynamic circulation and the use of immunosuppressive agents may lead to the development of cardiovascular risk factors, which represent one of the leading causes of morbidity and mortality in this population. The objective of this study was to correlate cardiovascular outcomes with the development or reduction of comorbidities in liver transplant recipients. Objectives: This is a cross-sectional, retrospective, and descriptive study conducted through the analysis of medical records of 35 patients who underwent liver transplantation between 2017 and 2021 at a Reference Center in Brazil. Demographic data, MELD score, and clinical variables were collected for both pre and post-transplant periods, including Systemic Arterial Hypertension (SAH), Diabetes Mellitus (DM), Chronic Kidney Disease (CKD), Dyslipidemia, and Non-Alcoholic Steatohepatitis (NASH), as well as immunosuppression regimens. Statistical analysis employed binary logistic regression and 95% confidence intervals, with statistical significance set at p <= 0.05. Methods: The sample had a mean MELD score between 10 and 19. Prior to transplantation, the most prevalent comorbidity was Diabetes Mellitus (48.57%). In the post-transplant period, a statistically significant increase in the prevalence of SAH was observed, rising from 42.86% (pre-transplant) to 65.71% (post-transplant) (p = 0.025). Conversely, there was a significant reduction in NASH cases, from 14.29% to 0% (p = 0.027). No statistically significant changes were found for DM, CKD, or Dyslipidemia. The overall mortality rate was 42.86% (15/35); the majority of late deaths (53.33% of late-mortality cases) were of non-cardiac etiology, and no significant correlation was found between the variables studied and late cardiac death. Logistic regression analysis indicated that the use of the immunosuppressant Mycophenolate had a protective effect, reducing the probability of death. Results and Conclusions: Patients who underwent liver transplantation presented a high rate of cardiovascular complications during follow-up, with a notable increase in the prevalence of Systemic Arterial Hypertension. NASH did not recur or develop de novo in the analyzed sample. The use of Mycophenolate was identified as a protective factor for patient survival.

Table 2. Distribution of patients undergoing liver transplantation according to pre- and post-transplant comorbidities.

Variables	Occurred	Sample	%	95% CI	p-value
SAH	15	35	42.46%	0.1% to 45.6%	0.025
SAH post	23	35	65.71%		
DM	17	35	48.6%	–	0.406
DM post	16	35	45.7%		
CKD	2	35	5.71%	–	0.130*
CKD post	6	35	17.14%		
Dyslipidemia	6	35	17.14%	–	0.379
Dyslipidemia post	7	35	20.00%		
NASH	5	35	14.29%	2.7% to 25.9%	0.027*
NASH post	0	35	0%		
Metabolic syndrome	3	35	8.57%	–	0.5*
Metabolic syndrome post	3	35	8.57%		

SAH: Systemic Arterial Hypertension; DM: Diabetes Mellitus; CKD: Chronic Kidney Disease; NASH: Non-Alcoholic Steatohepatitis; CI: Confidence Interval. *Fisher's exact test.

Table 3. Distribution of patients undergoing liver transplantation according to the number and type of death.

DEATHS	n	%
Yes	15	42.86%
No	20	57.14%
Total	**35**	**100.00%**
Early		
Yes	5	33.33%
No	10	66.67%
Late-Cardiac		
Yes	2	13.33%
No	13	86.67%
Late-Non-Cardiac		
Yes	8	53.33%
No	7	46.67%
Total	**15**	**100.00%**

n: absolute frequency.

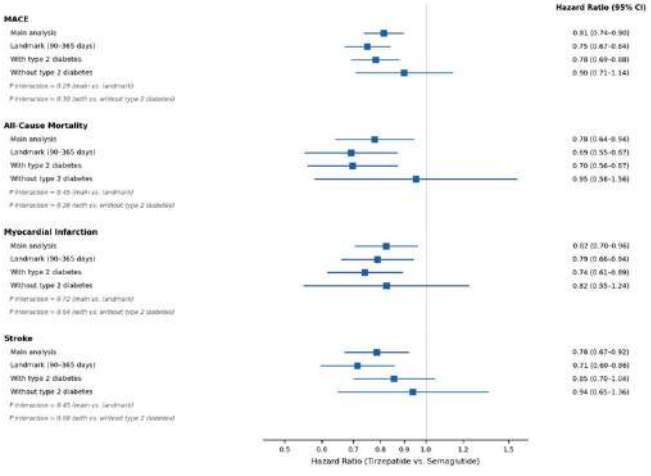
16423

CARDIOVASCULAR OUTCOMES OF TIRZEPATIDE VERSUS SEMAGLUTIDE IN PATIENTS WITH OVERWEIGHT AND OBESITY: A MULTINATIONAL RETROSPECTIVE COHORT STUDY

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(1) HOSPITAL DO CORACAO - HCOR - SAO PAULO - SP - BRASIL; (2) PROGRAMA DE POS GRADUAÇÃO EM CARDIOLOGIA, UNIVERSIDADE FEDERAL DO RIO GRANDE DO SUL - PORTO ALEGRE - RS - BRASIL;

Background/Introduction: Obesity is a chronic, multifactorial condition with a significantly increasing the risk of cardiovascular disease. Glucagon-like peptide-1 (GLP-1) and dual glucose-dependent insulinotropic polypeptide (GIP)/GLP-1 receptor agonists have emerged as transformative therapies for weight loss and cardiometabolic management. However, while clinical trials have demonstrated the efficacy of these agents individually, head-to-head real-world evidence comparing their effectiveness on cardiovascular adverse events remains limited. Objectives: This study aims to compare the risk of major adverse cardiovascular events (MACE) between Tirzepatide and Semaglutide using a large “real-world” evidence database with a diverse population of patients with overweight and obesity. Methods: We conducted a retrospective cohort study using TriNetX data from 113 healthcare organizations. We included patients ≥ 18 years with overweight/obesity (BMI ≥ 27 kg/m² or ICD-10 codes E66.01, E66.8, E66.9, Z68.3, Z68.4). The index date was the first prescription of Tirzepatide or Semaglutide, requiring at least 30 days of follow-up post-initiation. We excluded patients with prior bariatric surgery, acute pancreatitis, pregnancy, or previous MACE. The primary outcome was MACE (the composite of all-cause mortality, myocardial infarction, and ischemic stroke). A landmark analysis (days 90–365) and exploratory analyses for baseline type 2 diabetes were performed. Results and Conclusions: Propensity-score matching resulted in 91,219 patients in each cohort, with a mean age of 51 years. The mean follow-up was 229 ± 132 days in the Tizerpartide group and 283 ± 120 days in the Semaglutide group. Tizerpartide was associated with a significantly lower risk of MACE (HR 0,81: 95% CI 0.74-0.90 p<0,001), all-cause mortality (HR 0.78: 95% CI 0.64-0.94; p=0.001), myocardial infarction (HR 0,82: 95% CI 0.70-0.96 p=0,01) and stroke (HR 0,78: 95% CI 0.67-0.92 p=0,03) when compared to Semaglutide. Landmark analysis results were consistent with the primary findings. Subgroup analysis showed no significant interaction between baseline type 2 diabetes and the primary outcome (p-interaction > 0.05). In this large real-world cohort, Tirzepatide was associated with a significantly lower risk of MACE, all-cause mortality, myocardial infarction, and stroke compared to Semaglutide among patients with overweight and obesity. These findings suggest that dual GIP/GLP-1 receptor agonism may offer superior cardiovascular protection in this population.



20587

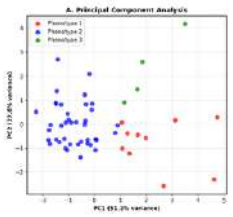
CLINICAL PHENOTYPES IN FAMILIAL HYPERCHOLESTEROLEMIA: IDENTIFICATION THROUGH CLUSTERING INTEGRATING GENETIC STRATIFICATION AND DUTCH MEDPED CRITERIA

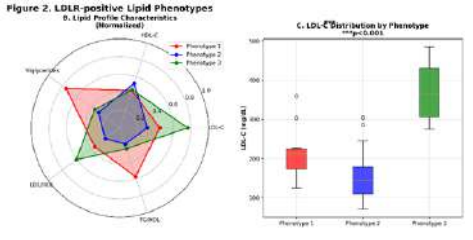
ROSA MARIA DE OLIVEIRA GALVÃO DA ROSA COSTA1; JOÃO VICTOR SAVOLDI1; PABLO EDUARDO CAMPERONI LUCIANO1; RIELLI GOMES FALCÃO1; IAGO MOURA AGUIAR1; LORENNA OLIVEIRA MENEZES1; PAULO ROBERTO NUNES FILHO1; LUISA LATADO BRAGA1; VICTOR FERRO E SILVA COLARES1; MAÍSA MARQUES DO VALE1; RAFAELA ANDRADE PENALVA FREITAS1;

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Background/Introduction: Familial hypercholesterolemia (FH) is a genetic dyslipidemia associated with elevated and premature cardiovascular risk. Despite advances in genetic diagnosis, substantial phenotypic variability exists among affected individuals, posing a significant challenge to treatment personalization. Artificial intelligence-based strategies, particularly consensus clustering, have emerged as promising tools for identifying clinically relevant subgroups and supporting more precise therapeutic decision-making in hereditary dyslipidemias. Objectives: To identify distinct clinical phenotypes among genetically confirmed FH patients through the integration of genetic and clinical data using machine learning techniques, aiming to provide a foundation for individualized therapeutic strategies in preventive cardiology. Methods: Observational study including 164 genetically confirmed FH patients from a tertiary care registry in Brazil. Patients were stratified by genetic profile (variants in LDLR, PCSK9, or genetically negative) prior to consensus clustering. Derived lipid variables (LDL/HDL ratio, TG/HDL ratio, and non-HDL cholesterol) and clinical variables (Dutch MEDPED score, premature cardiovascular events, and physical manifestations) were used. Cluster robustness was assessed through bootstrap validation (500 iterations, 10 seeds), leave-one-out validation, sensitivity threshold analysis, and false discovery rate correction for multiple comparisons. Results and Conclusions: Three distinct clinical phenotypes were identified: hypertriglyceridemia (n=10; 10% with CV events), classic FH (n=40; 17.5% with CV events), and extreme phenotype (n=4; 50% with xanthomas) (Figure 1). Integration of Dutch MEDPED criteria with genetic stratification yielded a silhouette score of 0.731 — representing a 41.4% improvement over approaches based solely on genetic-lipid data (Figure 2). Patients carrying LDLR variants demonstrated high diagnostic certainty (97.4%), with explicable discordances observed in genetically negative severe phenotypes (7.3% of the cohort). Genetic stratification prior to clustering proved to be a methodologically robust approach for identifying clinically relevant lipid phenotypes in FH. These findings establish a methodological framework for precision medicine in hereditary dyslipidemias and support the development of phenotype-guided therapeutic protocols in preventive cardiology.







20386

COMPARATIVE EFFECTIVENESS OF ATORVASTATIN AND ROSUVASTATIN ON INFLAMMATORY AND LIPID MARKERS IN PATIENTS WITH TYPE 2 DIABETES: A META-ANALYSIS OF RANDOMISED TRIALS

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Background/Introduction: Statins are a cornerstone therapy for cardiovascular risk reduction in patients with type 2 diabetes mellitus (T2DM). While their lipid-lowering effects are well established, comparative data on their impact on systemic inflammatory markers remain limited. Objectives: To evaluate and compare the effects atorvastatin and rosuvastatin on inflammatory and lipid markers in patients with T2DM. Methods: We conducted a systematic review and meta-analysis of randomised controlled trials comparing atorvastatin and rosuvastatin at moderate to high doses in patients with T2DM. PubMed, Embase, and Cochrane library were searched. Analyses were performed at the study-arm level, yielding up to 12 comparisons. For outcomes with substantial baseline variability, pooled ratios of means (ROM) were calculated, while pooled mean differences (MD) were used for outcomes reported in uniform units. The primary outcomes were high-sensitivity C-reactive protein (hsCRP), low-density lipoprotein cholesterol (LDL-C), total cholesterol, and triglycerides. Subgroup analyses were conducted according to statin type and dose intensity. Random-effects models were applied, and heterogeneity was assessed using the I² statistic. Statistical analysis was performed using R (RStudio version 2026.01.0, Build 392). Results and Conclusions: Five randomized clinical trials including 752 participants with treatment durations ranging from 8 weeks to 6 months were included. Overall, statin therapy significantly reduced hsCRP levels (ROM 0.67; 95% CI 0.60–0.75; p<0.0001), corresponding to a 32.6% reduction from baseline (Figure 1). LDL-C (MD −43.31 mg/dL; 95% CI −55.52 to −31.09; p<0.0001), total cholesterol (MD −38.41 mg/dL; 95% CI −47.54 to −29.28; p<0.0001), and triglycerides (ROM 0.88; 95% CI 0.82–0.94; p<0.001) were also significantly reduced (Figure 2). No significant differences were observed between atorvastatin and rosuvastatin or across dose-intensity subgroups for any outcome. In patients with T2DM, atorvastatin and rosuvastatin provide comparable and significant reductions in inflammatory and lipid markers, with no evidence of superiority of one statin over the other. These findings support the use of either agent to address both dyslipidaemia and systemic inflammation in this high cardiovascular risk population. Further trials with standardised dosing, longer follow-up, and clinical cardiovascular endpoints are warranted.

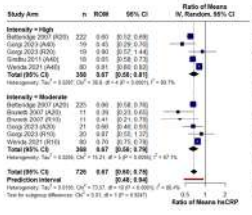


Figure 1A. hsCRP

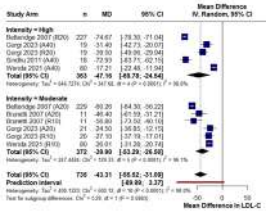


Figure 1B. LDL-C

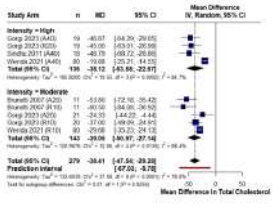


Figure 2A. Total Colesterol

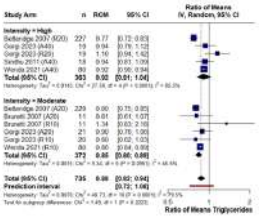


Figure 2B. Triglycerides

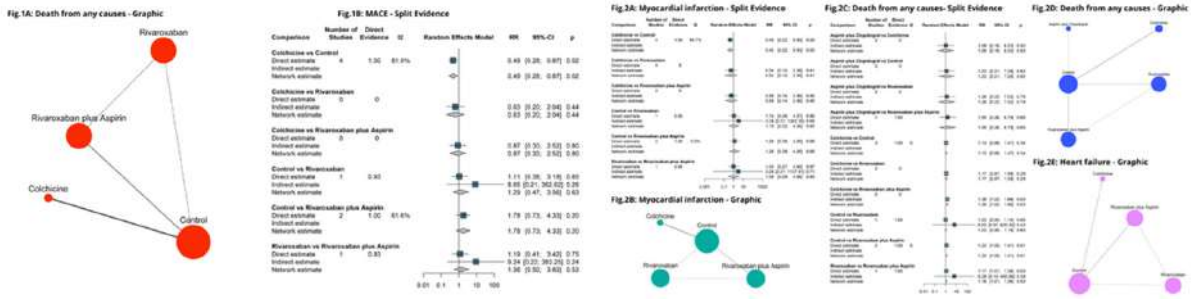
20369

COMPARING RIVAROXABAN, COLCHICINE AND ASPIRIN IN PATIENTS WITH STABLE CORONARY ARTERY DISEASE: A NETWORKING META-ANALYSIS

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(1) UNIVERSIDADE POSITIVO - CURITIBA - PR - BRASIL; (2) UNIVERSIDADE FEDERAL FLUMINENSE - NITEROI - RJ - BRASIL; (3) UNIVERSIDADE CATOLICA DE PERNAMBUCO - RECIFE - PE - BRASIL; (4) UNIVERSIDADE DE PERNAMBUCO - RECIFE - PE - BRASIL;

Background/Introduction: Despite advances in medical therapy, patients with established coronary artery disease (CAD) continue to experience a significant burden of recurrent ischemic events, highlighting the presence of persistent “residual risk”. Colchicine (COL), a well-known anti-inflammatory agent, exerts its cardiovascular effects primarily through inhibition of inflammatory mechanisms that are central to the initiation, progression and destabilisation of atherosclerotic plaques. In parallel, rivaroxaban (RXA), an oral direct factor Xa inhibitor, targets the thrombotic arm of atherosclerosis by attenuating thrombin generation, thereby reducing fibrin formation and platelet activation. Although both COL and RXA have independently shown efficacy in reducing cardiovascular events, they target distinct yet interrelated mechanisms: vascular inflammation and thrombosis. The absence of direct head-to-head comparisons creates uncertainty regarding their relative efficacy. Objectives: Compare the efficacy and safety of COL versus RXA, based regimens in the prevention of recurrent cardiovascular events in patients with CAD. Methods: Systematic review and meta-analysis performed according to PRISMA guidelines. PubMed, Cochrane, and Embase were systematically searched for randomised clinical trials of patients with stable CAD, to compare with RXA, RXA plus Aspirin, RXA plus Clopidogrel and COL for event prevention. Primary outcomes were MACE, myocardial infarction and death from any cause, secondary outcomes were: cardiovascular death, stroke and heart failure. We estimated summary risk ratio (RR) using pairwise and network meta-analysis with random effects, with 95% confidence intervals (CI) for each strategy. All analyses were performed using the software R (version 4.5.3). Results and Conclusions: Seven studies comprising 38,821 patients with coronary artery disease were included. In the network comparison, COL alone reduced the risk of MACE (RR 0.49; 95% CI 0.28-0.87; p=0.02) and MI (RR 0.45; 95% CI 0.22-0.93; p=0.03) compared to control, both driven exclusively by direct evidence. The remaining comparisons MACE nor MI, including COL vs RXA, control vs RXA, and control vs RXA plus ASA were not statistically significant . Heterogeneity for these contrasts were substantial (I^2 = 81% and I^2 = 84.7%, respectively). CONCLUSION: In patients with CAD, COL was associated with lower rates of myocardial infarction and MACE, while RXA demonstrated no significant benefit compared with standard therapy.



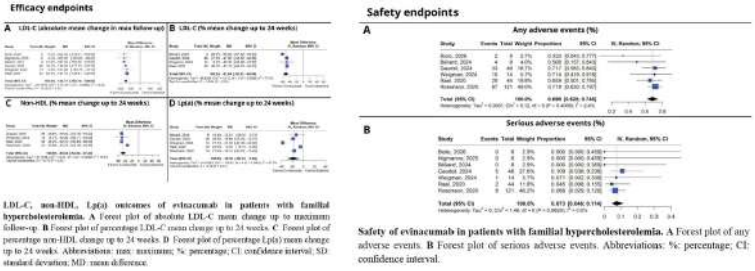
21287

EFFICACY AND SAFETY OF EVINACUMAB IN PATIENTS WITH FAMILIAL HYPERCHOLESTEROLEMIA: A SYSTEMATIC REVIEW AND SINGLE-ARM META-ANALYSIS

ARTUR MAIA CASTRO MIRANDA1; THEODORA CRISTINA CRUZ ASSIS2; ANISIO UCHOA LEITE SANTANA3; FLÁVIA BERNARDES MORAIS4; NATANAEL PAULA PORTILHO5;

(1) SEM VÍNCULO INSTITUCIONAL - BELO HORIZONTE - MG - BRASIL; (2) UNICAMP - CAMPINAS - MT - BRASIL; (3) FACULDADE DE MEDICINA DA UNIVERSIDADE DE SAO PAULO - SÃO PAULO - SP - BRASIL; (4) HOSPITAL ISRAELITA ALBERT EINSTEIN - SAO PAULO - SP - BRASIL; (5) CORPO DE BOMBEIROS MILITAR DO DISTRITO FEDERAL - BRASILIA - DF - BRASIL;

Background/Introduction: Familial hypercholesterolemia [FH] is a genetic disorder related to impaired or absent low-density lipoprotein [LDL]-receptor activity. Given its impact on both homozygous and heterozygous presentations, evinacumab has emerged as a novel lipid-lowering and monoclonal antibody against angiopoietin-like 3 [ANGPTL3], focusing on this population. Early clinical studies have demonstrated the drug’s effectiveness, but an updated comprehensive synthesis of available data is lacking. Objectives: To assess the efficacy and safety of evinacumab in patients with FH. Methods: We performed a single-arm meta-analysis of studies reporting efficacy and safety outcomes of evinacumab, according to the PRISMA statement. PubMed, Embase, and Cochrane were searched through April/2026. Studies evaluating evinacumab at dosages of 15mg/kg and 5mg/kg every 4 weeks were eligible for inclusion. Primary outcomes included percentage changes from baseline up to 24 weeks and absolute changes from baseline up to 48 weeks of follow-up for LDL, non-high-density lipoprotein [non-HDL], and lipoprotein(a) [Lp(a)]. Additionally, percentage changes were reported for apoprotein [Apo] B, and total cholesterol [TC] at 24 weeks. Random effects models were used to pool event rates and mean differences [MDs] with 95% confidence intervals [CIs] using R software [version 4.4.1]. Heterogeneity was assessed using I^2 statistics. Results and Conclusions: We included 197 patients (47% male; mean age 40 ±19 years) from 7 studies, of which 2 were RCTs. Evinacumab demonstrated reductions in lipid biomarkers, including LDL (MD -51.04%; 95% CI -58.21 to -43.86; I^2 = 77.1% / MD -144.17 mg/dL; 95% CI -158.74 to -129.60; I^2 = 12.2%), non-HDL (MD -45.53%; 95% CI -53.83 to -37.23; I^2 = 75.5% / MD -146.24 mg/dL; 95% CI -166.11 to -126.38; I^2 = 0.0%), and Lp(a) (MD -18.38%; 95% CI -29.33 to -7.42; I^2 = 97.7% / MD -12.18 mg/dL; 95% CI -26.96 to 2.60; I^2 = 78.6%). Additional changes were observed in ApoB (MD -38.83%; 95% CI -45.93 to -31.73; I^2 = 78.4%), and TC (MD -46.17%; 95% CI -54.84 to -37.50; I^2 = 85.3%). Evinacumab reported safety outcomes, including any adverse events [AEs] (69%; 95% CI 62.8 to 74.6; I^2 = 2.4%), serious AEs (7.3%; 95% CI 4.6 to 11.4; I^2 = 0%), treatment-emergent AEs leading to discontinuation (2.2%; 95% CI 0.9 to 5.5; I^2 = 0%) and death (1.8%; 95% CI 0.7 to 4.8; I^2 = 0%). In summary, evinacumab demonstrated a favorable efficacy and safety profile in patients with FH, with a sustained reduction in lipid profile over long term follow-up.



Efficacy endpoints. LDL-C, non-HDL, Lp(a) outcomes of evinacumab in patients with familial hypercholesterolemia. **A** Forest plot of absolute LDL-C mean change up to maximum follow-up. **B** Forest plot of percentage LDL-C mean change up to 24 weeks. **C** Forest plot of percentage non-HDL change up to 24 weeks. D Forest plot of percentage Lp(a) mean change up to 24 weeks. Abbreviations: max: maximum; %: percentage; CI: confidence interval; SD: standard deviation; MD: mean difference.

Safety of evinacumab in patients with familial hypercholesterolemia. **A** Forest plot of any adverse events. **B** Forest plot of serious adverse events. Abbreviations: %: percentage; CI: confidence interval.

19393

FACTORS ASSOCIATED WITH LOW HDL CHOLESTEROL IN BRAZILIAN ADULTS: EVIDENCE FROM THE NATIONAL HEALTH SURVEY (2014-2015)

ELTON JUNIO SADY PRAES1; ANA CAROLINA MICHELETTI GOMIDE NOGUEIRA DE SÁ1; TÉRCIA MOREIRA RIBEIRO DA SILVA1; MARCELLA RIBEIRO DA CUNHA PEIXOTO1; RAISSA MOURÃO MARQUES DA SILVA1; GABRIEL SOARES DAMACENO1; MARIANA PIMENTA SOUZA MELO SATIRO1; LUIZ FELIPE SANTIAGO CAMPOLINA VIANA1; FILIPPE LIMA CAVALCANTE1; MARIA VITÓRIA LUIZ DA SILVA1; LUDMILA COSTA FARIA1; DEBORAH CARVALHO MALTA1;

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Background/Introduction: Dyslipidemia refers to alterations in blood lipid levels, and reduced high-density lipoprotein (HDL) is a risk factor for atherosclerotic diseases. Given the high burden of cardiovascular diseases in Brazil, investigating factors associated with low HDL is relevant. Objectives: To analyze factors associated with low HDL cholesterol in Brazilian adults. Methods: A cross-sectional study was conducted using data from 8,952 adults from the National Health Survey (2014–2015). The outcome variable was low HDL, defined as ≤40 mg/dL. Explanatory variables included sociodemographic characteristics (sex, age group [18–29, 30–44, 45–59, ≥60 years], education level, race/skin color, and Brazilian regions), anthropometric measures (body mass index), lifestyle factors (binge drinking, smoking, and sufficient leisure-time physical activity), noncommunicable chronic diseases (diabetes, hypertension, chronic kidney disease, and self-reported anemia), and self-rated health. Associations were assessed using Poisson regression with robust variance, estimating adjusted prevalence ratios (PR) and 95% confidence intervals (95% CI). Variables with p≤0.05 were considered statistically significant. Results and Conclusions: Factors associated with low HDL included male sex (PR 2.00; 95% CI: 1.84–2.16), education level of complete primary or incomplete secondary (PR 1.23; 95% CI: 1.10–1.37), overweight (PR 1.46; 95% CI: 1.33–1.61), obesity (PR 1.72; 95% CI: 1.54–1.91), diabetes (PR 1.18; 95% CI: 1.06–1.32), chronic kidney disease (PR 1.22; 95% CI: 1.06–1.41), and hypertension (PR 1.18; 95% CI: 1.08–1.29). Protective factors included age ≥60 years (PR 0.84; 95% CI: 0.72–0.97), Black race/skin color (PR 0.85; 95% CI: 0.72–0.99), higher education (PR 0.91; 95% CI: 0.83–1.00), residence in the Southeast (PR 0.79; 95% CI: 0.72–0.88), South (PR 0.65; 95% CI: 0.57–0.73), and Central-West (PR 0.87; 95% CI: 0.79–0.97) regions, and binge drinking (PR 0.72; 95% CI: 0.63–0.82). In conclusion, low HDL cholesterol was associated with sociodemographic factors, unhealthy lifestyle behaviors, and noncommunicable chronic diseases.

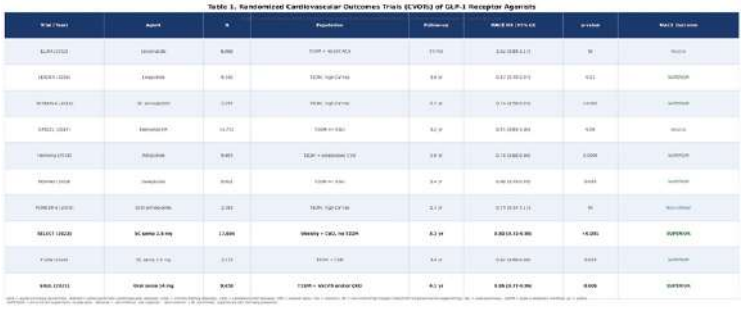
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GLP-1 RECEPTOR AGONISTS AND CARDIOVASCULAR OUTCOMES IN PATIENTS WITH OBESITY AND ESTABLISHED CARDIOVASCULAR DISEASE: A NARRATIVE REVIEW OF RANDOMIZED CONTROLLED TRIALS

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Background/Introduction: GLP-1 receptor agonists (GLP-1 RAs) have transformed cardiometabolic pharmacotherapy, demonstrating cardioprotective effects that extend well beyond glucose lowering. A decade of dedicated cardiovascular outcomes trials (CVOTs) now covers patients with type 2 diabetes (T2DM), obesity without diabetes, heart failure, and chronic kidney disease. Objectives: We aimed to synthesize the randomized controlled trial evidence on cardiovascular outcomes — including major adverse cardiovascular events (MACE), heart failure hospitalizations, cardiovascular mortality, and renal endpoints — across the GLP-1 RA class, encompassing liraglutide, subcutaneous and oral semaglutide, albiglutide, dulaglutide, lixisenatide, exenatide, tirzepatide, orforglipron, and cagrisema, and to evaluate whether cardiovascular efficacy represents a class effect or reflects molecular heterogeneity within the class. Methods: We performed a narrative review of phase 3 randomized trials and dedicated CVOTs identified through searches of PubMed/MEDLINE, Embase, Cochrane CENTRAL, and ClinicalTrials.gov, without date restriction, with final searches in March 2026. Two reviewers independently screened titles and abstracts; we manually searched reference lists to identify additional studies. Results and Conclusions: We identified ten CVOTs enrolling more than 97,000 participants. A clinically meaningful structural dichotomy emerged: agents with homology to native human GLP-1 — liraglutide (HR 0.87), subcutaneous semaglutide (HR 0.74), albiglutide (HR 0.78), dulaglutide (HR 0.88), and oral semaglutide (SOUL, NEJM 2025; HR 0.86) — consistently achieved MACE superiority over placebo, while exendin-4-based agents (lixisenatide and exenatide) did not. The SELECT trial demonstrated cardiovascular superiority of semaglutide 2.4 mg in 17,604 obese patients without T2DM (HR 0.80; p<0.001) — the first such result in a non-diabetic population — with benefits independent of glycaemic control and weight loss. Across trials, semaglutide reduced heart failure hospitalizations by 31% (HR 0.69) in patients with preserved ejection fraction, renal composite endpoints by 22–24%, and all-cause mortality by 14–19%. GLP-1 RAs with human GLP-1 structural homology consistently reduce MACE, heart failure hospitalizations, cardiovascular mortality, and renal progression, independently of glycaemic control. SELECT and SOUL establish obesity and oral administration as sufficient indications for GLP-1 RA cardioprotection — a paradigm shift that reshapes preventive cardiology.



16919

HEART RATE VARIABILITY AND CARDIOVASCULAR HEALTH: AN UMBRELLA REVIEW

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Background/Introduction: Heart rate variability (HRV) refers to the variation in the time interval between heartbeats and is a marker of autonomic nervous system function, capturing the balance between sympathetic and parasympathetic activity. Substantial evidence has linked HRV with both physical and mental health outcomes. Objectives: To our knowledge, no umbrella review has comprehensively synthesised evidence on the bidirectional relationship between HRV and cardiovascular health. This study aimed to collate and evaluate evidence from meta-analyses examining associations between HRV and cardiovascular outcomes. Methods: We conducted a systematic umbrella review of published meta-analyses, adhering to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Databases searched included Embase, Scopus, Web of Science, and the Cochrane Database of Systematic Reviews. Eligible studies were meta-analyses comprising adults aged 18 years and over that examined HRV as either an exposure or outcome in relation to cardiovascular health. Abstract screening was conducted in duplicate. Full-text screening and data extraction were conducted using the artificial intelligence software Elicit. Extracted data and screening decisions were validated by one reviewer. The methodological quality of included systematic reviews and meta-analyses was assessed using AMSTAR 2. Results and Conclusions: The search identified 11 studies meeting the inclusion criteria (n = >50 000 participants). Lower HRV was consistently associated with an increased risk of cardiac mortality and cardiovascular events across diverse populations, including individuals without prior cardiovascular disease, those with established cardiovascular disease, and those with other comorbid health conditions. However, substantial heterogeneity was observed across studies, reflecting differences in measuring HRV, patient populations, and analytic approaches. No universally accepted clinical threshold for HRV has been established, and assessment methods vary. Overall, reduced HRV appears to be a promising marker of cardiovascular risk, although greater standardisation in measurement is needed.

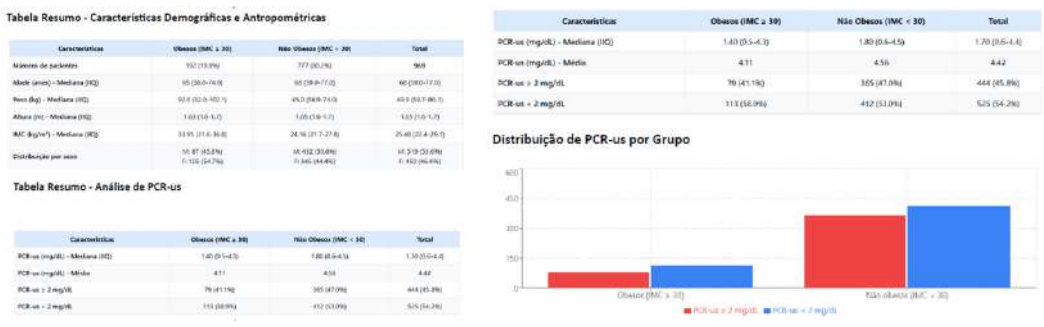
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HIGH-SENSITIVITY C-REACTIVE PROTEIN (HS-CRP) LEVELS IN PATIENTS WITH AND WITHOUT OBESITY FOLLOWED AT A CARDIOMETABOLIC OUTPATIENT CLINIC: A CROSS-SECTIONAL OBSERVATIONAL STUDY

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Background/Introduction: Chronic inflammation plays a key role in atherosclerosis and residual cardiovascular risk. High-sensitivity C-reactive protein (hs-CRP) is a validated inflammatory biomarker, including in patients with adequate LDL-cholesterol control. Obesity is a heterogeneous condition, and different adiposity phenotypes may be associated with variable inflammatory responses. Thus, hs-CRP may contribute to a more individualized cardiovascular risk assessment. Objectives: To evaluate the association between elevated hs-CRP levels (≥2 mg/L) and obesity defined as body mass index (BMI) ≥30 kg/m² in patients followed at a tertiary cardiometabolic outpatient clinic. Methods: Cross-sectional observational study based on electronic medical records from a specialized cardiometabolic clinic. Eligible patients had established atherosclerotic disease, chronic kidney disease, dyslipidemia, diabetes mellitus, and/or obesity. Participants were classified into two groups according to BMI (<30 vs. ≥30 kg/m²) and high-sensitivity C-reactive protein was analyzed categorically (≤2 vs. >2 mg/dL). Categorical variables were compared using the chi-square test. Odds ratios (OR) with 95% confidence intervals (95% CI) were calculated, adopting p<0.05 as statistically significant. Results and Conclusions: A total of 969 patients were included; 19.8% (n=192) had obesity, and 54.7% were women. In the BMI ≥30 kg/m² group, median age was 65 years (IQR 56–74) and median BMI was 33.95 kg/m² (IQR 31.6–36.8). Obese patients more frequently presented diabetes mellitus (50.0% vs. 39.5%; p=0.010) and systemic arterial hypertension (83.3% vs. 73.8%; p=0.007). No significant differences were found regarding cerebrovascular disease or coronary artery disease. Median hs-CRP levels were lower in obese versus non-obese patients (1.4 vs. 1.8 mg/L). Elevated hs-CRP (≥2 mg/dL) occurred in 41.1% of obese and 47.0% of non-obese individuals, without significant association (OR 0.79; 95% CI 0.57–1.09; p=0.17). In this high cardiovascular risk population, obesity was not associated with higher hs-CRP levels. These findings suggest a complex and non-linear relationship between adiposity and systemic inflammation, supporting individualized cardiovascular risk assessment.



17259

IMPACT OF PHYSICAL CONDITIONING, SLEEP PATTERNS, AND BMI ON STRESS LEVELS AMONG MEDICAL UNDERGRADUATES: A CROSS-SECTIONAL ANALYSIS

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Background/Introduction: The prevalence of psychological distress among medical students is a major concern, given the established link between chronic stress and impaired quality of life. As underscored by the WHO, lifestyle habits such as regular exercise, restorative sleep, and healthy weight maintenance serve as critical buffers for both mental and cardiovascular well-being. Despite these known benefits, evidence suggests that many students fail to meet the physical activity benchmarks. Objectives: This cross-sectional study investigates how physical exertion, sleep duration, and Body Mass Index (BMI) correlate with the stress profiles of individuals undergoing medical training. Methods: A cross-sectional study was conducted with medical students (1st to 12th periods) at a higher education institution in Juiz de Fora, MG, Brazil. Inclusion criteria: age ≥18 years, currently enrolled, and no physical limitations. Sociodemographic data, BMI, sleep duration, physical activity (IPAQ-short version), stress (DASS-21), and substance use (WHO-ASSIST) were collected via self-administered questionnaires (October-December/2023). Statistical analyses (SPSS v20.0) included linear and logistic regression to evaluate associations between variables, with a significance level of α=5%. The study was approved by the Ethics Committee (CAAE: 70685023.7.0000.5103). Results and Conclusions: In a sample of 396 medical students (66.4% female; mean age 22.0 ± 3.5 years), analysis revealed that highly active students presented stress scores 12.5% lower (β=-3,1; p=0,021) compared to sedentary individuals, while active individuals showed no significant difference (β=-0,8; p=0,535). Females presented higher scores than males, scoring 8.129 points higher on the stress scale (β=-8,1; p<0,001), highlighting marked vulnerability. Each additional hour of sleep reduced stress by 1.636 (β=-1,6; p=0,001), reinforcing its importance as a protective factor. Higher BMI levels were identified as an aggravating factor, with each additional unit resulting in a 0.29-point increase in the stress score (β=0,3; p=0,032). Variables such as study hours and course period did not significantly influence stress levels (p>0,05). Vigorous physical activity, sufficient sleep, and maintaining a BMI within healthy parameters are significantly associated with reduced stress levels in the medical student population, potentially offering a protective effect on cardiovascular health.

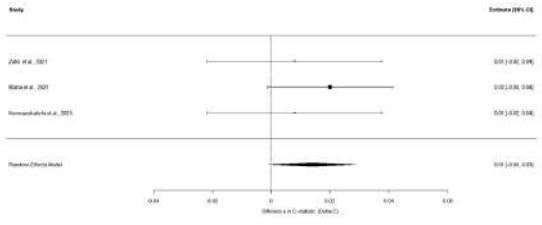
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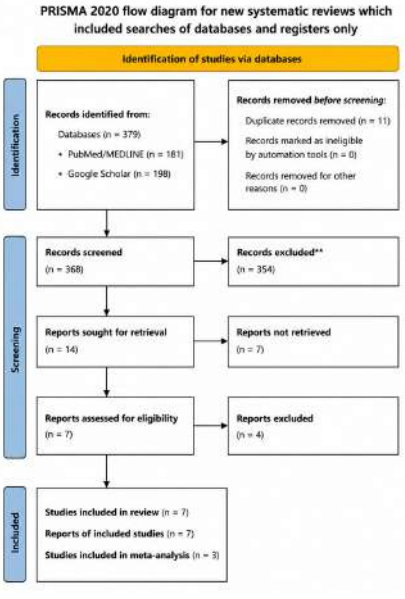
INCREMENTAL VALUE OF CORONARY ARTERY CALCIUM ADDED TO THE POOLED COHORT EQUATIONS FOR CARDIOVASCULAR EVENT PREDICTION IN PRIMARY PREVENTION: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background/Introduction: Pooled Cohort Equations (PCE) are widely used to estimate 10-year cardiovascular risk; however, they present limitations in the discrimination and reclassification of individuals. In this context, coronary artery calcium (CAC), a marker of subclinical atherosclerosis, has demonstrated potential to improve cardiovascular events (CEs) prediction. Objectives: To evaluate whether the addition of CAC to PCE improves CEs prediction in individuals undergoing primary prevention (PP) compared with PCE alone. Methods: Research was conducted in the MEDLINE and Google Scholar databases from April to May 2026, using the entry terms “PCE”, “CAC”, and “incremental value”, as well as their MeSH variations. Observational studies published from 2013 onwards, including adult patients without a prior history of CEs, and comparing PCE to PCE + CAC (in Agatston units), were included. Studies with missing data or not meeting the inclusion criteria were excluded. The outcome analyzed was cardiovascular risk discrimination (CRD), evaluated through the difference in C-statistics (ΔC-statistic), by adding CAC to PCE. The PRISMA 2020 statement was used to guide the reporting of this review. Zotero software was used for reference management, and Rayyan software was used for screening studies. Meta-analysis was performed using RStudio software. Results and Conclusions: Initial research revealed 379 studies, of which 11 were first excluded due to duplicates on Zotero, and 361 were then excluded in subsequent abstract and full-text screening on Rayyan. Seven studies were selected for review, but only three met the criteria to be included in the quantitative synthesis, comprising 61001 patients. Zafrir et al. reported an increase from 0.615 to 0.696 (IC95% 0.642-0.749) in CRD; Kermanshahchi et al., from 0.797 to 0.805 (IC95% 0.826-0.784); and Blaha et al, from 0.780 to 0.800 (IC95% 0.790-0.820). Overall ΔC-statistic demonstrated an improvement in CRD of ≅ 0.01, with IC95% near the null effect. Four other studies not included in meta-analysis showed an increase in CRD when CAC was added to PCE (ΔC-statistics of 0.024, 0.012, 0.015, and 0.018), with Razavi et al. (p < 0.001) and Akintoye et al. (p = 0.01) showing statistical significance. In conclusion, the addition of CAC to PCE was associated with a small, but consistent improvement in CRD across included studies. These findings support the potential incremental prognostic value of CAC in PP populations.





16535

INFLUENCE OF SMOKING ON THE BENEFICIAL EFFECT OF STATINS ON ENDOTHELIAL FUNCTION

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(1) HOSPITAL UNIVERSITARIO PEDRO ERNESTO - RIO DE JANEIRO - RJ - BRASIL;

Background/Introduction: Smoking is an important modifiable risk factor for cardiovascular diseases. In the context of cardiovascular prevention, statins are well-known and widely used drugs; however, the relationship between smoking and statin efficacy remains unclear. Objectives: To evaluate the influence of smoking on the effects of statins on vascular function. Methods: This prospective study was conducted in two visits: baseline (V1) and after 12 weeks of atorvastatin use (V12), at doses of 20 or 40 mg according to cardiovascular risk. Non-diabetic patients of both sexes, aged 40 to 70 years, were included. Clinical and laboratory assessments were performed, along with pulse wave analysis by oscillometry using the Mobil-O-Graph® device and endothelial function assessment by flow-mediated dilation (FMD) of the brachial artery using ultrasound (Philips Affinity70®). Patients (n=38) were divided according to smoking status: 17 non-smokers (NS) and 21 smokers (S). Results and Conclusions: The groups were similar regarding mean age (54±7 vs 54±7 years, p=0.758), BMI (29.3±4.5 vs 30.2±4.9 kg/m², p=0.629), systolic blood pressure (126±12 vs 122±19 mmHg, p=0.154), and diastolic blood pressure (87±8 vs 82±14 mmHg, p=1.286). After 12 weeks of atorvastatin use, the NS group showed a significant improvement in endothelial function, with increased FMD (4.8±1.8 vs 6.5±2.9%, p=0.034), whereas the S group showed a smaller, non-significant increase (2.9±2.1 vs 4.3±2.2%, p=0.502). Similarly, central systolic blood pressure significantly decreased in the NS group (120±12 vs 112±10 mmHg, p=0.043), but not in the S group (118±12 vs 118±4 mmHg, p=0.880). Pulse wave velocity (PWV) decreased more in the NS group (8.7±3.6 vs 7.4±1.1 m/s, p=0.236) compared to the S group (8.8±4.2 vs 7.8±1.0 m/s, p=0.335), although neither reached statistical significance. In conclusion, Atorvastatin improved endothelial function and reduced central blood pressure in non-smokers, with no significant effect in smokers. These findings suggest that smoking ma

17276

INTENSIVE GLYCEMIC FOLLOW-UP AND DIABETES REEDUCATION IN A PUBLIC CARDIO-METABOLIC OUTPATIENT CLINIC: REAL-WORLD EVIDENCE FROM THE AGIR PROGRAM

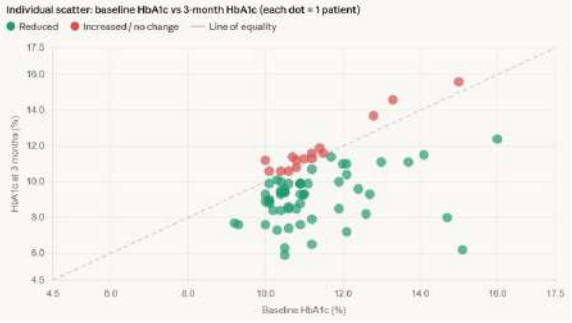
CATHERINE MENEZES COSTA1; FERNANDA ANICETO PEREIRA RABELO1; GUSTAVO FREITAS CARDOSO FAGUNDES1; DANIEL BRANCO ARAUJO1; DANIEL MAGNONI1; PAMELA NOGUEIRA CAVALCANTE1; KLEBER GOMES FRANCHINI1; GIULLIA SARABANDO CURY CORDEIRO PEREZ1; HENRI PAULO ZATZ1; FERNANDA LADEIA ABAD1; NEUSA ELI RODRIGUES PORTELA1; RAFAELA ANDRADE PENALVA FREITAS1;

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Background/Introduction: Type 2 diabetes mellitus (T2DM) affects 16.6 million adults in Brazil, with nearly 50% undiagnosed and high rates of poor glycemic control despite treatment. Patients with glycated hemoglobina (HbA1c) above 10% face substantially elevated risks of cardiovascular and microvascular complications, evidence suggests that each 1% absolute reduction in HbA1c is associated with a reduction of 14% in myocardial infarction risk and 37% in microvascular complications. Objectives: The AGIR Program (Acompanhamento Glicêmico Intensivo e Reeducação) was designed with the goal of reducing HbA1c in low-income, high-complexity patients in a public cardiology outpatient setting in São Paulo - Brazil, through a low-cost hybrid care model. Methods: Prospective observational cohort of consecutively enrolled patients in the AGIR Program (August–December 2025). Inclusion criteria: confirmed T2DM, HbA1c > 10% at baseline, age ≥ 18 years and classic hyperglycemia symptoms. The AGIR intervention consisted of: (1) monthly structured telephone contacts in months 1–2, including remote capillary glucose monitoring and diabetes education; and (2) a structured 30-minute in-person consultation at 3 months. HbA1c was measured at baseline and at 3 months. Statistical analysis: paired Wilcoxon signed-rank test (primary, given non-normal baseline distribution confirmed by Shapiro-Wilk W = 0.841, p < 0.001) and paired t-test (sensitivity analysis). Effect size: Cohen's d. Significance level: p < 0.05. Software: Python/SciPy. Results and Conclusions: Seventy patients with complete paired HbA1c data were analyzed. The mean baseline HbA1c was 11.26% (SD ± 1.38%; range 9.2–16.0%). In 3 months follow-up, mean HbA1c fell to 9.68% (SD ± 1.83%), yielding a mean absolute reduction of 1.58 percentage points (median −1.15 pp; range −8.9 to +1.3 pp). This reduction was highly statistically significant (Wilcoxon W = 175.0, p < 0.001; paired t = 7.235, p < 0.001) and reached a large effect size (Cohen's d = −0.865), a magnitude rarely reported in real-world public health interventions. Nearly 80% of patients responded positively, demonstrating the program's effectiveness across a heterogeneous, vulnerable population. These results were achieved through a low-cost, telephone-based hybrid model readily scalable within public health infrastructure provide. Real-world findings from this study provide strong preliminary evidence supporting the integration of structured telemedicine into intensive glycemic management in public cardio-metabolic outpatient care.

Parameter	Baseline HbA1c	3-Month HbA1c	Change (Δ)
N	71	70	70 paired
Mean ± SD	11.26 ± 1.38%	9.68 ± 1.83%	−1.58 ± 1.83 pp
Median	10.90%	9.55%	−1.15 pp
Min – Max	9.2 – 16.0%	5.9 – 15.6%	−8.9 to +1.3 pp
95% CI (mean)	[10.94–11.59%]	[9.25–10.11%]	—
p-value (Wilcoxon)*	—	—	**< 0.001**
p-value (paired t-test)	—	—	**< 0.001**
Cohen's d	—	—	**−0.865 (large)**
Patients with reduction	—	—	**55/70 (78.6%)**

**Primary analysis. pp = percentage points; SD = standard deviation; CI = confidence interval.*



18164

LIPOPROTEIN(A) AND CARDIOVASCULAR AND LIMB OUTCOMES IN PERIPHERAL ARTERY DISEASE: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background/Introduction: Lipoprotein(a) [Lp(a)] is a genetically determined risk factor for atherosclerotic cardiovascular disease, but its prognostic role in peripheral artery disease (PAD) remains uncertain. Evidence linking elevated Lp(a) to cardiovascular and limb outcomes in PAD is inconsistent, with heterogeneous thresholds and study designs. Objectives: OBJECTIVE: To evaluate the association between elevated Lp(a) levels and the risk of cardiovascular and limb outcomes in patients with peripheral artery disease. Methods: METHODS: We conducted a systematic review and meta-analysis of randomized and non-randomized studies evaluating the association between Lp(a) levels and outcomes in adults with peripheral artery disease. Searches were performed in PubMed, Web of Science, and Cochrane databases. Elevated Lp(a) was defined according to study-specific thresholds or categories. Primary outcomes included major adverse limb events (MALE), major adverse cardiovascular events (MACE), all-cause mortality, and cardiovascular mortality. Pooled hazard ratios (HRs) were estimated using random-effects models (REML). Heterogeneity was assessed using the I^2 statistic, and subgroup analyses were performed according to elevated Lp(a), in mg/dl, thresholds. Sensitivity analyses were conducted using leave-one-out approaches. Results and Conclusions: Seven studies (n = 40,395) were included, with 18,448 were male. Mean age ranged from 68 to 75.1 years. Elevated Lp(a) levels was not associated with all-cause mortality (HR 1.48, 95% CI 0.01–179.38; I^2 = 96.6%), cardiovascular mortality (HR 2.04, 95% CI 0.44–9.50; I^2 = 85.6%), MACE (HR 1.55, 95% CI 0.13–18.82; I^2 = 82.0%), or MALE (HR 2.36, 95% CI 0.46–12.12; I^2 = 96.6%). Continuous analyses also showed no associations for MACE (HR 1.04, 95% CI 0.62–1.74; I^2 = 71.3%) or MALE (HR 1.02, 95% CI 0.70–1.49; I^2 = 90.9%). Heterogeneity was high but decreased for cardiovascular mortality after excluding Tomoi et al. (I^2 = 0%) and for MALE after excluding McClintick et al. (I^2 = 12.6%) CONCLUSION: In this meta-analysis, elevated Lp(a) levels compared with lower levels were not significantly associated with cardiovascular or limb outcomes in patients with peripheral artery disease, with wide intervals, highlighting the need for further large studies to clarify its prognostic role in this population.

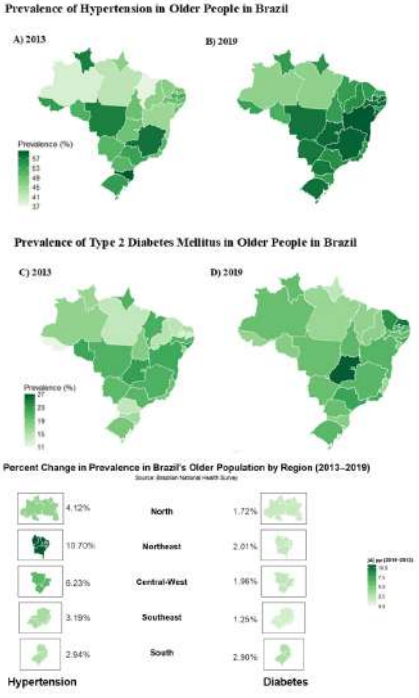
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MAPPING CARDIOVASCULAR RISK IN OLDER BRAZILIANS: HYPERTENSION AND DIABETES — A POPULATION-BASED ANALYSIS OF REGIONAL DISPARITIES

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Background/Introduction: Population aging represents a major global transition that has profoundly influenced the epidemiology of cardiovascular disease. This shift is closely associated with the rising burden of cardiometabolic risk factors, such as type 2 diabetes mellitus (T2DM) and systemic arterial hypertension (SAH). Despite the increasing prevalence of these conditions in adults, little is known about the predictors and their impact on older people. Objectives: The objective of this study was to investigate the prognostic factors, such as age, sex, and geographical context, associated with the prevalence of T2DM and SAH in noninstitutionalized older people in Brazil. Methods: This study used data from the 2013 and 2019 editions of the Brazilian National Health Survey (PNS), a nationally representative household survey. The prevalence of self-reported SAH and T2DM among individuals aged 60 years and older, and their prevalence ratio (PR) were estimated via a Poisson regression model with robust variance adjusted by age group, sex, and Brazilian geographic region, and considering the complexity of the sampling plan. Results and Conclusions: A total of 11,177 participants were included in 2013, and 22,728 were included in 2019. In 2013, the prevalence of self-reported hypertension was 51.2% (95% CI: 50.2-52.3) and 56.4% in 2019 (95% CI: 56.0-56.8), with regional differences: 44.2% in the North and 54.1% in the South. The increase was significant only in the northeast (PRa=1.23; 95% CI: 1.15-1.31; p<0.001) and Midwest (PRa=1.12; 95% CI: 1.01-1.22; p<0.001) regions when adjusted for age and sex. In 2019, the prevalence of SAH varied between 48.3% in the north region and 57% in the south region. With respect to T2DM, in 2013, the prevalence of self-reported diabetes was 19.1 (95% CI: 17.9-20.4), and in 2019 it increased to 20.8 (95% CI: 20.2-21.5). The lowest prevalence is consistently observed in the North, and the highest prevalence is in the Midwest. All the regions showed a significant increase in the prevalence of T2DM. The rising prevalence of hypertension and T2DM among older adults indicates an expanding burden of cardiovascular risk in Brazil, disproportionately affecting certain regions. Addressing these disparities is essential to prevent future cardiovascular events and reduce inequities in aging populations.



18981

PHYSICAL ACTIVITY AND CARDIOVASCULAR RISK ASSESSED BY THE FRAMINGHAM RISK SCORE IN BRAZILIAN ADULTS: ANALYSIS OF THE NATIONAL HEALTH SURVEY LABORATORY (2014-2015)

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Background/Introduction: Physical inactivity is associated with the development of cardiovascular diseases (CVD). Cardiovascular risk (CVR) can be assessed using the Framingham Risk Score (FRS), which incorporates clinical and laboratory variables. Given the magnitude of CVD, investigating the association between physical activity (PA) and CVR is relevant. Objectives: To analyze the association between PA and the FRS and its components in Brazilian adults. Methods: A cross-sectional study was conducted using data from 8,941 adults from the National Health Survey Laboratory (2014–2015). The FRS was calculated separately for men and women, considering both the overall score and its components: age, total cholesterol (TC), high-density lipoprotein (HDL), systolic blood pressure (SBP) (treated and untreated), smoking, and diabetes. The outcome variable was PA, stratified by sex and classified as low or ideal. An ideal level was defined as 150 minutes of light/moderate intensity per week or 75 minutes of vigorous intensity. The explanatory variables were the FRS categories (low, intermediate, high) and its components. Socioeconomic variables were used to characterize the population. Associations between PA and the FRS and its components were assessed using logistic regression models, estimating age-adjusted odds ratios (OR) with 95% confidence intervals (95% CI). Variables with p≤0.05 were considered statistically significant. Results and Conclusions: Ideal PA was associated with lower odds of intermediate and high CVR in men (OR 0.34; 95% CI: 0.26–0.43 and OR 0.28; 95% CI: 0.21–0.37) and in women (OR 0.68; 95% CI: 0.54–0.85 and OR 0.53; 95% CI: 0.36–0.76). Both sexes showed lower odds of smoking (men: OR 0.66; 95% CI: 0.49–0.90; women: OR 0.39; 95% CI: 0.27–0.57). In men, PA decreased progressively after age 30 and was associated with lower odds of untreated SBP ≥160 mmHg (OR 0.50; 95% CI: 0.26–0.96). In women, ideal PA was positively associated with HDL ≥60 mg/dL (OR 1.70; 95% CI: 1.12–2.43) and with lower odds of untreated SBP at 130–139 mmHg (OR 0.65; 95% CI: 0.44–0.98) and 150–159 mmHg (OR 0.33; 95% CI: 0.12–0.93), as well as treated SBP at 130–139 mmHg (OR 0.49; 95% CI: 0.25–0.96) and 140–149 mmHg (OR 0.37; 95% CI: 0.18–0.80). Lower PA levels were observed among women aged ≥75 years (OR 0.46; 95% CI: 0.26–0.79). Overall, physical activity in Brazilian adults was associated with lower odds of intermediate and high cardiovascular risk in both sexes.

19120

PREVALENCE OF HDL CHOLESTEROL IN BRAZILIAN ADULTS ACCORDING TO THE NATIONAL HEALTH SURVEY

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(1) FUNDAÇÃO DE AMPARO A PESQUISA DO ESTADO DE MINAS GERAIS - BELO HORIZONTE - MG - BRASIL; (2) UNIVERSIDADE FEDERAL DE MINAS GERAIS - BELO HORIZONTE - MG - BRASIL;

Background/Introduction: Dyslipidemia corresponds to alterations in blood lipid levels. With the increase in chronic non-communicable diseases (NCDs), such as obesity, diabetes, and metabolic syndrome, the prevalence of low high-density lipoprotein (HDL) tends to grow. Considering its role as an important cardiovascular risk marker, it is essential to investigate, through laboratory tests, the prevalence of low HDL in the Brazilian adult population. Objectives: To analyze the prevalence of low HDL cholesterol in Brazilian adults Methods: A cross-sectional study using laboratory data from 8,952 adults from the National Health Survey (PNS) between 2014 and 2015. The outcome variable was low HDL-cholesterol, considering ≤ 40 mg/dL as low and >40 mg/dL as the ideal value. Explanatory variables were: Sex (male and female); Age group in years (18 to 29, 30 to 44, 45 to 59, and 60 or older); Education (illiterate and incomplete elementary school, complete elementary school and incomplete high school, complete high school or more); Race/skin color (White and others, corresponding to Asian and Indigenous; Black and Brown); Regions of Brazil (North, Northeast, Southeast, South, and Midwest); anthropometric variables: body mass index (BMI), heavy alcohol consumption, smoking, NCDs, and self-rated health. Prevalences and 95% confidence intervals (95% CI) were estimated, and differences were evaluated using Pearson's χ^2 test (p≤ 0,05) Results and Conclusions: The prevalence of low HDL in Brazil was 34.81% (95% CI: 33.46–36.18), being higher in men (46.11%; 95% CI: 43.90-48.33), individuals with low education (42.18%; 95% CI: 38.53-45.92), Black race/skin color (36.97%; 95% CI: 35.08-38.89), smokers (39.82%; 95% CI: 36.09-43.67), individuals with obesity (42.99%; 95% CI: 39.99-46.04), diabetes (45.03%; 95% CI: 40.85-49.28), chronic kidney disease (41.74%; 95% CI: 36.71-46.95), hypertension (40.66%; 95% CI: 37.96-43.41), and worse self-rated health (38.76%; 95% CI: 34.17-43.56). Regarding the regions of Brazil, the lowest prevalences occurred in the South (28.75%; 95% CI: 25.90-31.78) and Southeast (33.53%; 95% CI: 30.98-36.18), and the highest in the North (39.88%; 95% CI: 37.66-42.14) and Northeast (38.37%; 95% CI: 36.54-40.23) (p≤ 0,05). Low HDL cholesterol affects 1 in 3 Brazilian adults and is associated with sociodemographic factors, unhealthy lifestyles (smoking), the presence of overweight and obesity, and NCDs.

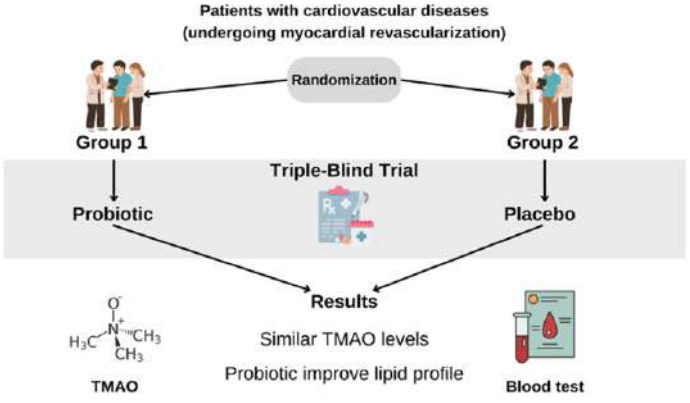
17828

PROBIOTIC BLEND IMPROVES TRIGLYCERIDE LEVELS BUT DOES NOT AFFECT TMAO CONCENTRATIONS IN PATIENTS UNDERGOING CORONARY ARTERY BYPASS GRAFTING SURGERY

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Background/Introduction: Cardiovascular disease (CVD) remains one of the leading causes of mortality worldwide. Among nutrient-derived metabolites, trimethylamine N-oxide (TMAO) has been associated with adverse cardiovascular outcomes. Evidence demonstrates a direct association between elevated circulating TMAO concentrations and an increased risk of major adverse cardiovascular and cerebrovascular events, suggesting a contributory role in CVD pathophysiology. Although the mechanistic basis of this relationship remains incompletely understood, modulation of the gut microbiota has been proposed as a potential strategy to influence TMAO-related pathways. Therefore, this study investigated the effects of a commercially available probiotic blend on circulating TMAO concentrations and lipid parameters in patients undergoing CABG, testing the hypothesis that probiotic supplementation could favorably modulate TMAO levels and improve postoperative lipid profiles. Objectives: To evaluate the effects of a probiotic blend on circulating TMAO and cardiometabolic outcomes in patients undergoing coronary artery bypass grafting (CABG). Methods: In this randomized, placebo-controlled, triple-blind trial, adults undergoing CABG received a probiotic blend or placebo for 90 days. Outcomes were assessed at baseline, 30, and 90 days and analyzed using intention-to-treat linear mixed-effects models. Results and Conclusions: Longitudinal analyses based on linear mixed-effects models showed no significant time × group interaction for circulating TMAO, indicating that probiotic supplementation did not meaningfully alter this metabolite over the follow-up period. In contrast, triglyceride concentrations exhibited a significant time × group interaction, with a progressive reduction observed in the probiotic group and minimal temporal variation in the placebo group. C-reactive protein decreased markedly in both groups, without differential effect between arms, while HDL cholesterol, waist circumference, and left ventricular ejection fraction showed significant time effects without evidence of differential trajectories. In conclusion, probiotic supplementation did not significantly modify TMAO levels in CABG patients but was associated with a distinct longitudinal reduction in triglycerides, supporting a potential adjuvant role in postoperative lipid metabolism and warranting further investigation.



Central Illustration

18410

PROGNOSTIC AND INCREMENTAL PREDICTIVE VALUE OF CIRCULATING BIOMARKERS FOR CARDIOVASCULAR RISK IN ASYMPTOMATIC ADULTS: A SYSTEMATIC REVIEW

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Background/Introduction: Cardiovascular diseases (CVD) remain the leading cause of global morbidity and mortality, reinforcing the importance of risk stratification (RS) in asymptomatic adults (AA) for guiding primary prevention. Traditional clinical scores are widely used but have limited predictive (PD) capacity and do not fully capture disease pathophysiology. In this context, circulating biomarkers (CB), reflecting inflammation, myocardial injury, and endothelial dysfunction, have shown association with major adverse cardiovascular events (MACE). However, it remains unclear whether CB, beyond prognostic value, significantly improve risk prediction when added to traditional models. Objectives: This study aims critically evaluate the available evidence on the prognostic value and the potential incremental PD value of CB in CV risk stratification for AA, highlighting their applicability in clinical practice. Methods: The literature search was performed in PubMed/MEDLINE, Embase, and SciELO databases using the descriptors “cardiovascular risk”, “novel biomarkers”, and “asymptomatic adults” combined with Boolean operators. Of the 807 initial records, 43 were selected for full-text review, and 15 studies published within the last 10 years were ultimately included for data extraction, following PRISMA guidelines. Results and Conclusions: The analysis demonstrated that the TyG Index is associated with increased CV risk, including MACE incidence and higher estimated risk in hypertensive populations. Its PD improves when combined with central obesity parameters, suggesting incremental value over isolated metabolic CB. High-sensitivity cardiac troponins (hs-cTnI and hs-cTnT) showed strong independent associations with coronary events and CV mortality, improving risk discrimination and reclassification beyond traditional models. NT-proBNP emerged as a robust independent predictor of MACE, improving risk stratification when added to clinical models. sST2 showed prognostic value, with longitudinal increases associated with higher MACE rates and superior PD compared to natriuretic peptides in some populations, particularly in higher-risk groups. Additionally, multimarker approaches incorporating proteomic panels and genetic scores improved discrimination (AUC up to 0.803) and risk reclassification, supporting their role in precision cardiology and individualized risk assessment. Despite these findings, heterogeneity, limited validation, and high costs remain barriers to clinical implementation in routine practice.

Biomarker Predictive Value Summary

Biomarker	Studies	Predictive value
TyG index	Xue Xia 2024; Piskorz 2024	Associated with ASCVD; better with obesity markers; linked to higher risk in hypertension
hs-cTnI / hs-cTnT	Iribarren 2016; Wu 2022; Raymondi 2019	Strong predictor of coronary events; improves risk classification; detects subclinical injury
NT-proBNP	Wu 2022; Ballo 2016	Predicts CV events and heart failure; improves risk stratification
sST2	Watson 2020; Harmon 2021	↑ MACE risk (~8% per unit); may outperform BNP; independent predictor
hs-CRP	Kurt 2025; Li 2025	Predicts CV risk; additive effect with metabolic markers
Proteomic panels	Hoogeveen 2020; Royer 2024; Sun 2023; Madizi 2024	Improve AUC (up to 0.803); improve reclassification

19693

PROGNOSTIC VALUE OF THE NEUTROPHIL-TO-LYMPHOCYTE RATIO AND C-REACTIVE PROTEIN IN CARDIAC PATIENTS HOSPITALIZED FOR COMMUNITY-ACQUIRED PNEUMONIA

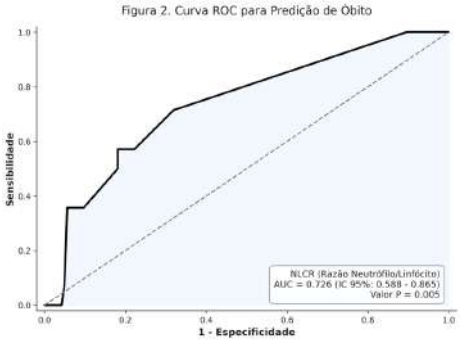
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(1) INSTITUTO DANTE PAZZANESE DE CARDIOLOGIA - SAO PAULO - SP - BRASIL; (2) HOSPITAL DE CLINICAS DE PORTO ALEGRE - PORTO ALEGRE - RS - BRASIL;

Background/Introduction: Community-Acquired Pneumonia (CAP) acts as a potent trigger for decompensation in patients with prior cardiovascular disease. In this subgroup, risk stratification is challenging. Traditional scores such as CURB-65 and markers like C-Reactive Protein (CRP) may have reduced accuracy in cardiac patients due to factors such as intrinsic renal dysfunction and chronic low-grade inflammation. The Neutrophil-to-Lymphocyte Ratio (NLR) emerges as a promising and integrated index, combining the neutrophilia of the innate immune response and the lymphopenia of sympathetic neurohormonal stress. Objectives: To evaluate the prognostic value of NLR as an independent predictor of in-hospital mortality in cardiac patients admitted for CAP, comparing its accuracy with isolated CRP and the CURB-65 clinical score. Methods: A single-center retrospective cohort study involving 158 patients with underlying cardiovascular disease (Heart Failure, Acute Myocardial Infarction, or Essential Hypertension) admitted for CAP. The primary outcome was in-hospital mortality. Statistical analysis included non-parametric tests for continuous variables and multiple logistic regression adjusted for confounding variables (age, sex) and comorbidities (COPD, neoplasms, diabetes). Results and Conclusions: The cohort was characterized by advanced age (68.4% elderly) and an overall mortality rate of 8.9%. Median NLR was significantly higher in non-survivors compared to survivors (13.13 vs. 5.86; p=0.005). In contrast, CRP (p=0.126) and the CURB-65 score (p=0.112) failed to discriminate the outcome. In the multivariable analysis, NLR remained an independent predictor of mortality, as did female sex. In conclusion, NLR is a superior prognostic tool to CRP and CURB-65 in this setting. As a universally available, low-cost biomarker, it more accurately captures integrated systemic stress and should be incorporated into the admission assessment to allow for earlier interventions in this vulnerable population.

Variável	Total (N=158)	Não Óbito (n=144)	Óbito (n=14)	Valor P*
Dados Demográficos				
Idade ≥ 65 anos, n (%)	108 (68.4%)	98 (68.1%)	10 (71.4%)	0,99
Sexo Feminino, n (%)	81 (51.3%)	70 (48.6%)	11 (78.6%)	0,04
Comorbidades, n (%)				
Neoplasias	46 (29.1%)	41 (28.5%)	5 (35.7%)	0,55
Diabetes Mellitus	26 (16.5%)	23 (16.0%)	3 (21.4%)	0,7
Doença Renal Crônica	24 (15.2%)	22 (15.3%)	2 (14.3%)	0,99
DPOC	38 (24.1%)	38 (26.4%)	0 (0.0%)	0,02
Asma	19 (12.0%)	19 (13.2%)	0 (0.0%)	0,22
Transplante	9 (5.7%)	9 (6.3%)	0 (0.0%)	0,99
AVC Prévio	1 (0.6%)	1 (0.7%)	0 (0.0%)	0,99
Marcadores Laboratoriais e Escores Clínicos, Mediana (IQR)				
PCR (mg/L)	32.75 (12.0–119.4)	31.30 (11.0–109.6)	81.75 (16.4–233.1)	0,12
NLCR (Razão Neutrofílio/Linfócito)	6.00 (3.6–11.6)	5.86 (3.5–10.7)	13.13 (4.8–22.3)	0,005
Escore CURB-65	2.00 (1.0–2.0)	2.00 (1.0–2.0)	2.00 (1.0–3.0)	0,11

Tabela 1. Caracteristicas demográficas, clinicas e laboratoriais da população estratificadas por desfecho



21357

RELATIONSHIP BETWEEN SLEEP DEPRIVATION AND CARDIOVASCULAR RISK IN THE PEDIATRIC POPULATION: A SYSTEMATIC REVIEW

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(1) UNIVERSIDADE CHRISTUS - FORTALEZA - CE - BRASIL; (2) UNIVERSIDADE CHRISTUS - FORTALEZA - CE - BRASIL; (3) UNIVERSIDADE CHRISTUS - AFGHANISTAN;

Background/Introduction: Sleep is an essential physiological state for the regulation of metabolic, hormonal, and cardiovascular functions, playing a fundamental role in childhood growth. However, reduced sleep duration has become increasingly prevalent in the pediatric population. Consequently, there is an increased risk for the development of cardiovascular diseases, such as arrhythmias and elevated blood pressure (BP), representing an important health concern. Objectives: To analyze the evidence regarding the association between sleep deprivation and cardiovascular risk in the pediatric population, evaluating the impact of sleep duration and quality on the cardiometabolic profile. Methods: A systematic review guided by PRISMA 2020 was conducted using searches in the PubMed, SciELO, and EMBASE databases. The descriptors “sleep deprivation,” “pediatrics,” “children,” “obesity,” “hypertension,” and “heart rate” were combined using Boolean operators (AND/OR). Articles published within the last 10 years involving pediatric populations and evaluating the association between sleep deprivation and cardiovascular risk were included. Study selection was performed using the Rayyan platform. Of the 90 studies identified, 11 were selected for analysis. Results and Conclusions: The analysis of 11 studies resulted in a sample of 38,455 children and adolescents. In the ABCD study (n = 3,498), only 18.4% of overweight participants achieved an adequate body mass index (BMI) during follow-up, a difficulty associated with poor sleep hygiene and excessive screen time. A Canadian analysis (n = 4,169) identified sleep as a protective factor against obesity and hypertension ($p < 0.02$). In the hemodynamic spectrum, the IDEFICS cohort (n = 16,228) associated sleep restriction with elevated blood pressure levels, particularly in individuals with irregular sleep routines. Finally, the clinical relevance extends into adulthood, as demonstrated by the Add Health study (n = 4,151), in which late sleep schedules and the absence of regular sleep patterns during adolescence significantly increased cardiovascular risk at 30 years of age (OR 2.32). The analyzed evidence demonstrates that sleep deprivation, irregular sleep patterns, and delayed sleep are associated with obesity, elevated blood pressure, and metabolic dysfunctions in the pediatric population, contributing to increased cardiovascular risk.

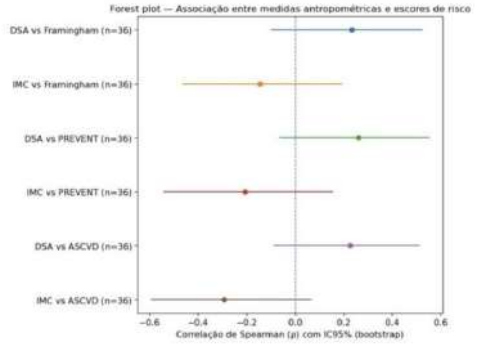
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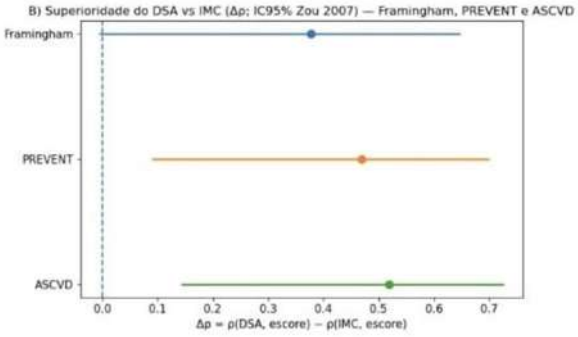
SAGITTAL ABDOMINAL DIAMETER VERSUS WAIST CIRCUMFERENCE IN CARDIOVASCULAR RISK PREDICTION AMONG OVERWEIGHT AND OBESE ADULTS

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(1) FAMENE - JOÃO PESSOA - PB - BRASIL;

Background/Introduction: Visceral adiposity is a key determinant of cardiovascular risk, and traditional anthropometric measures such as body mass index (BMI) and waist circumference (WC) have limitations in accurately estimating this compartment. The sagittal abdominal diameter (SAD) has been proposed as a more specific marker of visceral fat and may improve cardiovascular risk stratification. Objectives: To compare the association of sagittal abdominal diameter and waist circumference with cardiovascular risk scores (Framingham, ASCVD, and PREVENT) in overweight and obese adults. Methods: Cross-sectional analytical study including 36 adults (BMI ³25 kg/m²) in primary prevention. Anthropometric measures (SAD, WC, BMI) were obtained, and cardiovascular risk scores were calculated. Associations were assessed using Spearman correlation, and dependent correlations were compared using Zou's method (95% CI). Results and Conclusions: SAD showed weak positive correlations with ASCVD (r=0.23), PREVENT (r=0.26), and Framingham (r=0.23), while WC showed correlations close to zero. Comparisons favored SAD over BMI for ASCVD (Dr=0.52; 95% CI: 0.14–0.72) and PREVENT (Dr=0.47; 95% CI: 0.09–0.70), with similar trends for Framingham. However, confidence intervals for comparisons with WC included the null value. Overall, associations were weak. SAD demonstrated a more consistent pattern of association with cardiovascular risk scores, suggesting potential as a marker of visceral adiposity, although no clear statistical superiority was established.





16371

TIRZEPATIDE AND CARDIOVASCULAR RISK REDUCTION IN TYPE 2 DIABETES AND OBESITY: A META-ANALYSIS

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Background/Introduction: Type 2 diabetes mellitus (T2DM) and obesity increase cardiovascular disease risk. Tirzepatide, a dual GIP/GLP-1 receptor agonist, has demonstrated superior metabolic effects. Objectives: Evaluate the effects of Tirzepatide on cardiovascular risk markers and adverse events in patients with T2DM or obesity. Methods: We searched PubMed, Embase, and the Cochrane Library up to March 2025 for randomized controlled trials. A random-effects meta-analysis was conducted using mean differences (MD) or odds ratios (OR) with 95% confidence intervals (CI). Heterogeneity was assessed with the I² statistic. The study protocol was registered in PROSPERO (registration number CRD420251007910). Results and Conclusions: Results: Four trials comprising 5,143 patients were included. Tirzepatide reduced systolic blood pressure compared to placebo or insulin across all doses (MD: -5.52 mmHg; 95% CI: -6.27 to -4.78; p<0.00001), with consistent reductions at 5 mg (MD: -5.15 mmHg; p<0.00001), 10 mg (MD: -6.37 mmHg; p<0.0001), and 15 mg (MD: -5.8 mmHg; p<0.00001). Diastolic blood pressure also decreased with 5 mg (MD: -2.85 mmHg; p=0.02) and 15 mg (MD: -2.53 mmHg; p=0.005), and in pooled analysis (MD: -1.77 mmHg; p<0.00001). Tirzepatide reduced body mass index (pooled MD: -5.27 kg/m²; 95% CI: -5.89 to -4.66; p<0.00001), with greater reductions at higher doses. Fasting serum glucose decreased significantly at 15 mg (MD: -9.31 mg/dL; p<0.00001) and in pooled analysis (MD: -6.59 mg/dL; p=0.0004). Low densisty lipoprotein cholesterol (LDL-c) levels also declined (pooled MD: -7.51 mg/dL; p=0.0002), with the 15 mg dose showing the largest reduction (MD: -12.48 mg/dL; p<0.0001). HDL increased in pooled analysis (MD: 1.42 mg/dL; p=0.03). Conclusion: Tirzepatide demonstrated significant improvements in multiple cardiovascular risk markers in patients with T2DM or obesity, including reductions in blood pressure, body mass index, fasting serum glucose and LDL. These findings support the role of Tirzeptide as a promising therapeutic strategy for cardiovascular risk reduction in the studied population. However, placebo-controlled outcome trials are needed to definitively establish its independent cardiovascular benefit.

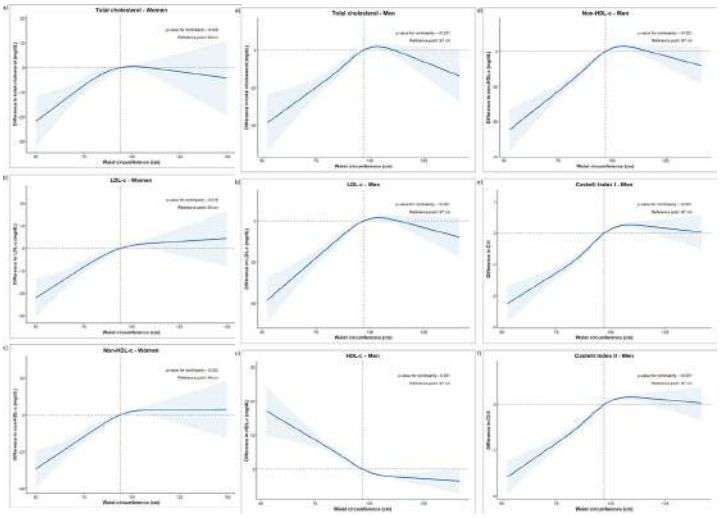
20381

WAIST CIRCUMFERENCE AND ATHEROGENIC LIPID PROFILE IN BRAZIL: EVIDENCE OF SEX-SPECIFIC NONLINEAR ASSOCIATIONS

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Background/Introduction: Waist circumference (WC) is an important marker of abdominal adiposity and cardiovascular risk. Although increases in abdominal adiposity are classically associated with progressive worsening of the lipid profile, evidence suggests that this relationship may present different effect magnitudes across the distribution of WC, with possible thresholds and nonlinear patterns, particularly according to sex. However, population-based studies evaluating these nonlinear associations in the Brazilian population remain scarce. Objectives: To evaluate sex-specific nonlinear associations between WC and lipid biomarkers of cardiovascular risk in Brazilian adults. Methods: This cross-sectional study used data collected between 2014 and 2015 from the laboratory subsample of the 2013 Brazilian National Health Survey (PNS). A total of 8,405 adults with valid waist circumference (WC) and lipid profile data were included. Total cholesterol (TC), high-density lipoprotein cholesterol (HDL-c), low-density lipoprotein cholesterol (LDL-c), non-high-density lipoprotein cholesterol (non-HDL-c), and Castelli Index I (CI-I) and II (CI-II) were evaluated. Analyses accounted for the complex sampling design. Restricted cubic splines and segmented linear regression were used to investigate nonlinear associations. Models were adjusted for sociodemographic and behavioral variables. Results were expressed as beta coefficients (β), 95% confidence intervals (95%CI), and p-values. Analyses were performed using R version 4.4.2. The 2013 PNS was approved by the National Research Ethics Commission (CONEP) of the Brazilian National Health Council (approval number 328,159). Results and Conclusions: Among women, nonlinear associations were observed between WC and TC (p=0.006), LDL-c (p=0.016), and non-HDL-c (p=0.002), with slope changes around 94 cm (figure 1). Below this point, each 10-cm increase in WC was associated with increases of 4.5 mg/dL in TC, 4.8 mg/dL in LDL-c, and 6.8 mg/dL in non-HDL-c (all p<0.001). Among men, all biomarkers showed nonlinear behavior, with an inflection point around 97 cm (figure 2). Below this value, each 10-cm increase in WC was associated with higher TC (+9.9 mg/dL), LDL-c (+10.2 mg/dL), non-HDL-c (+15.3 mg/dL), CI-I (+0.61), and CI-II (+0.42), as well as lower HDL-c (-4.1 mg/dL) (all p<0.001). Above the inflection points, attenuation of the associations was observed. These findings indicate that abdominal adiposity is associated with a worse lipid profile in a heterogeneous manner according to sex and WC level.



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19695

ASSESSMENT OF GRAFTS IN PATIENTS IN PATIENTS WITH KAWASAKI DISEASE UNDERGOING CORONARY ARTERY BYPASS GRAFT SURGERY: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background/Introduction: Kawasaki disease (KD) represents the leading cause of acquired heart disease in childhood in developed countries, often resulting in coronary aneurysms that may require Coronary Artery Bypass Grafting (CABG). Despite the severity of that complication, there is still no definitive consensus on the choice of surgical conduit, as most revascularization guidelines are based on the adult population Objectives: Evaluate long-term coronary graft patency and prevalence of affected vessels in KD undergoing CABG. Methods: A systematic review and meta-analysis of observational studies evaluating patients with Kawasaki disease undergoing CABG was performed. Studies reporting graft type, graft patency, or angiographic distribution of coronary involvement were included. Case series, reviews and non-original studies were excluded. The defined primary outcomes were arterial and saphenous vein graft patency and the number of vessels involved. Pooled analyses were conducted using random-effects models, continuous outcomes were summarized as pooled means and prevalence outcomes were estimated using generalized linear mixed models, both with 95% confidence intervals. Statistical heterogeneity was assessed using I2. Analyses were performed using the software R (version 4.5.3). Results and Conclusions: Arterial grafts showed higher patency compared to saphenous vein grafts (mean difference 34.9%; 95% CI 20.7-49.1; I2=96.9%). Arterial patency was 84.35% (95% CI 77.15-92.22) at 10 years and 87.00% (95% CI 35.12-64.70) at 20 years, whereas SVG patency was 47.48% (95% CI 35.12-64.18; I2=96.8%). Single-, double-, and triple-vessel disease were observed 34.28% (95% CI 12.92-64.70), 62.33% (95% CI 27.89-87.62), and 14.67% (95% CI 7.47-26.80), respectively. Giant aneurysms were most frequent in the right coronary artery (70.44%), followed by the left anterior descending (60.61%), left main (41.85%) and left circumflex (23.45%). CONCLUSION: In Kawasaki disease patients undergoing CABG, arterial grafts demonstrate superior long-term patency compared to saphenous vein grafts, supporting their preferential use. Coronary disease was found to be frequently multivessel, with giant aneurysms predominantly affecting the right coronary and left anterior descending arteries. However, the observational nature of current evidence, along with the high heterogeneity identified, highlights the need for prospective studies to better establish these findings.

Fig.1A: CABG: arterial grafts vs SVG in patients with Kawasaki disease

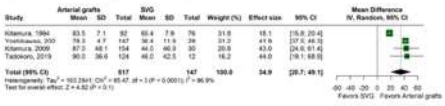


Fig.2A: 10-years CABG arterial patency in patients with Kawasaki disease

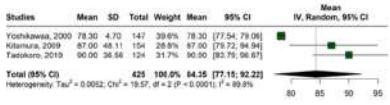


Fig.1B: CABG SVG patency in patients with Kawasaki disease

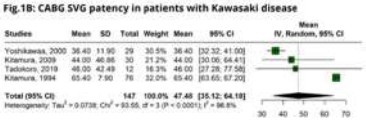
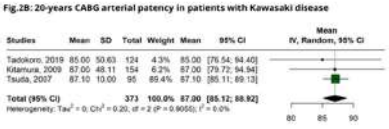


Fig.2B: 20-years CABG arterial patency in patients with Kawasaki disease



21770

DOES BODY MASS INDEX INFLUENCE OUTCOMES AFTER CARDIAC SURGERY? A SINGLE-CENTER REGISTRY

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Background/Introduction: The prevalence of obesity has increased over recent decades and is associated with higher cardiovascular risk. In cardiac surgery, excess body weight may influence perioperative management and increase the risk of complications. However, some studies have suggested lower morbidity and mortality in obese patients, a phenomenon known as the “obesity paradox”. Objectives: To evaluate the association between overweight and obesity and postoperative complications and mortality in patients undergoing cardiac surgery. Methods: A retrospective, single-center registry was conducted between February 2019 and January 2026, including adult patients (≥18 years) who underwent cardiac surgery in a high-complexity private institution. Overweight was defined as body mass index (BMI) 25–29.9 kg/m² and obesity as BMI ≥30 kg/m². Results and Conclusions: A total of 229 patients were included, 36.2% were female; the median age was 70 years (interquartile range [IQR] 67–73). Overall, 18.3% of patients had normal weight, 50.7% were overweight, and 31.0% were obese. A total of 81.2% had hypertension, 35.3% diabetes, and 55% dyslipidemia. Baseline characteristics of the population are summarized in Table 1. A total of 86.4% of procedures were elective, 11.7% were urgent, and 1.7% were emergent. Among coronary surgeries, 15.7% were off-pump. Median hospital stay was 7 days (IQR 5–11). Procedures are shown in Figure 1. Regarding postoperative complications, 5.7% required reintubation, 3.4% experienced perioperative myocardial infarction, 5.2% cardiac arrest, 4.3% transient ischemic attack or stroke, 0.8% required dialysis, 3.4% respiratory distress, 3% respiratory infection, 5.2% sternal wound infection, and 1.3% saphenectomy site infection. Additionally, 6.1% required sternal reopening and 3.5% reoperation. Cardiac mortality was 6.6%; 4.8% in normal weight, 6.0% in overweight, and 8.5% in obesity (p=0.709). Overall, 30.6% of patients presented at least one of the previously described complications. The proportion of patients who developed at least one complication was higher in those with overweight or obesity: 16.7% in normal-weight individuals, 31.9% in overweight, and 36.6% in obesity (p=0.030). Our data suggest that overweight and obesity are associated with increased postoperative complications, along with a trend toward higher mortality with increasing BMI. Further studies are needed to better clarify this association in cardiac surgery.

Figure 1. Surgical procedures performed.



CABG = Coronary Artery Bypass Grafting.

Table 1. Baseline Characteristics of the Registry Participants.

Characteristics	Total (n=229)
Male	63.7%
Female	36.2%
Mean age, years	70 (67–73)
Body Mass Index (kg/m²)	28.8 ± 5.9
– Normal weight	18.3%
– Overweight	50.7%
– Obesity	31.0%
Hypertension	81.2%
Type 2 diabetes	35.3%
Current smoker	17.0%
Former smoker	42.3%
Dyslipidemia	55.0%
Hyperuricemia	2.1%
Prior heart failure	31.8%
Prior myocardial infarction	17.9%
Prior cardiac surgery	1.7%
Prior coronary angioplasty	1.2%
Prior atrial fibrillation	7%

17740

IMPACT OF CARDIOPULMONARY BYPASS ON POSTOPERATIVE OUTCOMES IN CORONARY ARTERY BYPASS GRAFTING

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Background/Introduction: Cardiopulmonary bypass (CPB) facilitates the performance of complex cardiac procedures; however, it has been associated with increased postoperative morbidity due to systemic inflammatory response, hemodynamic alterations, and organ dysfunction when compared to off-pump techniques. Objectives: To compare postoperative outcomes in patients undergoing coronary artery bypass grafting (CABG) with and without CPB. Methods: This retrospective observational study analyzed 72 adult patients who underwent CABG and were admitted to the ICU between August and December 2024. Patients were stratified according to CPB use. Outcomes included mechanical ventilation duration, ICU length of stay, postoperative complications, and hospital mortality. Non-parametric tests were used for group comparisons, with statistical significance set at $p<0.05$. Results and Conclusions: Patients in the CPB group had longer ICU length of stay (median 5 vs 3 days; $p=0.002$) and mechanical ventilation duration (median 1.0 vs 0.25 days; $p<0.001$). They also showed higher rates of arrhythmias (47.2% vs 19.4%; $p=0.024$) and infections (30.6% vs 5.6%; $p=0.014$). Hospital mortality did not differ significantly between groups. CPB use in CABG is associated with increased postoperative morbidity and delayed recovery, despite similar mortality rates. These findings support careful selection of surgical technique to optimize patient outcomes.

18533

IMPACT OF IMMUNOMODULATORY THERAPIES TARGETING ON ATHEROSCLEROTIC PLAQUE PROGRESSION AND CARDIOVASCULAR OUTCOMES

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Background/Introduction: Atherosclerosis is fundamentally a chronic inflammatory disease, and patients frequently experience recurrent ischemic events due to residual inflammatory risk despite optimal lipid-lowering therapies. This residual risk is heavily mediated by the NLRP3 inflammasome, which triggers the cleavage of interleukin-1β (IL-1β) and subsequently stimulates the production of interleukin-6 (IL-6), a crucial cytokine in the inflammatory cascade. Objectives: This study aims to evaluate the impact of therapies targeting the NLRP3/IL-1β/IL-6 inflammatory pathway on cardiovascular outcomes and inflammatory biomarkers in patients with atherosclerosis. Methods: To evaluate interventions targeting this axis, researchers conducted a systematic review of databases including PubMed and Cochrane Library for studies published up to 2026, focusing on clinical trials and cohorts that assessed cardiovascular outcomes and inflammatory biomarkers. Results and Conclusions: The analysis highlighted that IL-1β inhibitors, specifically canakinumab, significantly reduced the composite endpoint of non-fatal infarction, stroke, or cardiovascular death by 15% while notably lowering high-sensitivity C-reactive protein (hs-CRP) levels. However, other agents like the IL-1 receptor antagonist anakinra showed only transient effects, suggesting insufficient efficacy for chronic atherosclerosis management. Conversely, direct IL-6 inhibitors demonstrated profound biological potency; ziltivekimab produced dose-dependent hs-CRP reductions of up to 92% while maintaining a favorable lipid profile, thereby avoiding the metabolic complications often seen with tocilizumab. Mechanistically, modulating this pathway reduces leukocyte recruitment, suppresses endothelial adhesion molecules, and promotes the structural stabilization of atherosclerotic plaques. Crucially, analyses revealed that achieving IL-6 levels below 1.65 ng/L is associated with a 32% reduction in major cardiovascular events, positioning IL-6 as a highly potent therapeutic target. CONCLUSION. Despite these clinical gains, implementing these biological therapies requires caution due to high costs and the increased risk of fatal infections caused by the dampening of acute inflammatory responses. While cost-effective alternatives like colchicine remain viable, the successful application of targeted IL-1β and IL-6 immunomodulation heavily depends on the rigorous stratification of patients using hs-CRP biomarkers and careful clinical monitoring to safely mitigate residual cardiovascular risk.

19696

OUTCOMES AFTER CORONARY ARTERY BYPASS GRAFT SURGERY IN PATIENTS WITH KAWASAKI DISEASE: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background/Introduction: Kawasaki disease (KD) is characterized as a febrile systemic vasculitis that, in severe cases, progresses to giants coronary aneurysms and arterial stenoses, often requiring high-complexity interventions to restore myocardial flow. Although Coronary Artery Bypass Graft Surgery (CABG) is an established management strategy for critical cases, there remains a gap in consolidated evidence regarding graft durability and the incidence of cardiac events over time in this population. Objectives: To evaluate the survival rate, the occurrence of cardiovascular events and prevalence of new coronary interventions after CABG in patients with KD Methods: A systematic review and meta-analysis of observational studies was conducted to evaluate clinical outcomes after CABG in patients with Kawasaki disease. Eligible studies included patients undergoing surgical myocardial revascularization with reported follow-up data. Case series, reviews, and non-original studies were excluded. The main outcomes were 10-year cardiac event-free survival, and prevalence of new coronary interventions. Pooled analyses were performed using random-effects models. Time-related outcomes were summarized as pooled means and prevalence outcomes were estimated using generalized linear mixed models, both with 95% confidence intervals. Heterogeneity was evaluated with I2. Analyses were performed using the software R (version 4.5.3). Results and Conclusions: A total of studies including patients with Kawasaki disease undergoing CABG were analyzed. The pooled 10-year cardiac event-free survival rate was 78.59% (95%CI 71.81-86.01), with high heterogeneity across studies (I2=93.5%) (Figure 1B). The 10-year overall survival rate was high, with a pooled estimate of 97.62% (95% CI 97.16-98.08) and no significant heterogeneity (I2=0%) (Figure 2). The prevalence of new coronary interventions after CABG was 11.14% (95% CI 4.83-23.64), with substantial heterogeneity among studies (I2=75.9%) (Figure 1A). CONCLUSION: Patients with Kawasaki disease undergoing CABG demonstrate excellent long-term survival. However, reduced event-free survival and the need for repeat interventions reflect a sustained cardiovascular burden. These findings support tailored management and structured long-term follow-up. Nevertheless, these results must be interpreted with caution due to a considerable heterogeneity among the current literature.

Fig.1A Prevalence of new coronary interventions in patients submit to CABG with Kawasaki disease

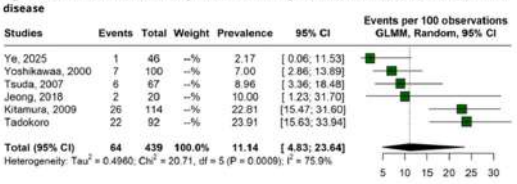


Fig.1A: 10 years cardiac events free after CABG in patients with Kawasaki disease

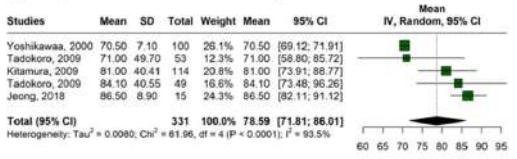
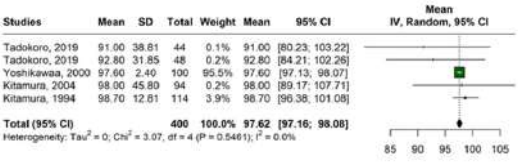


Fig.2: 10-years survival rate of CABG in patients with Kawasaki disease



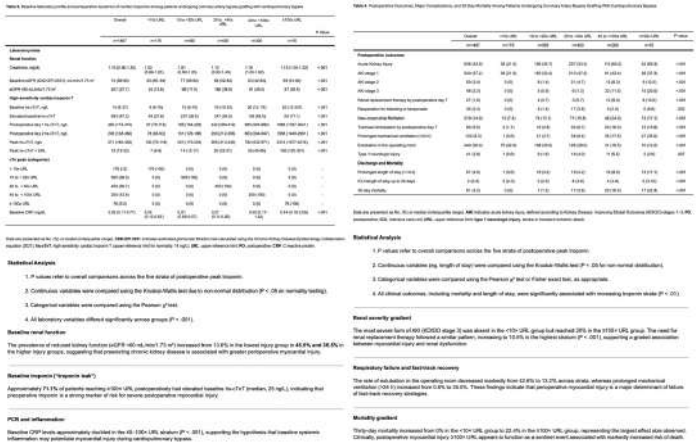
15704

POST-REVASCULARIZATION MYOCARDIAL INJURY WITH CARDIOPULMONARY BYPASS: THE DOSE–RESPONSE GRADIENT OF TROPONIN T AS A PREDICTOR OF ACUTE KIDNEY INJURY AND 30-DAY MORTALITY

CYNTHIA SPERANDIO1; MAURÍCIO DE NASSAU MACHADO1; RAPHAEL FERNANDES CARDOSO VIANNA ALVES1; JÚLIA DE OLIVEIRA MACHADO1; LUDMILA SOUZA DA CUNHA1; RENATO DE FARIAS VIGOLO1; GUILHERME CUSTODIO GERMANO1; PAULO GONCALVES MARTIN1; LAURA DE OLIVEIRA MACHADO1; ATTILIO CARETTA BASTREGHI2;

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Background/Introduction: Perioperative myocardial injury, detected by elevation of high-sensitivity cardiac troponin T (hs-cTnT), is common after coronary artery bypass grafting (CABG) with cardiopulmonary bypass (CPB). Although extreme elevations suggest a poor prognosis, the epidemiological distribution of these patients and the independent contribution of each elevation stratum to renal and mortality outcomes require further characterization. Objectives: To assess the distribution of myocardial injury severity and its independent impact on acute kidney injury (AKI) and 30-day mortality, correlating the frequency of each stratum with the observed risk. Methods: This retrospective cohort study included 1,467 adult patients undergoing isolated CABG with CPB. Postoperative peak hs-cTnT levels were stratified according to multiples of the upper reference limit (URL): <10×, 10–20×, 20–40×, 40–100×, and ≥100× URL. Multivariable logistic regression was performed adjusting for age, baseline renal function (CKD-EPI 2021), CPB duration, and use of intra-aortic balloon pump (IABP). Results and Conclusions: Results: Most of the cohort presented with moderate levels of myocardial injury: <10× (n=176; 12%), 10–20× (n=565; 38.5%), and 20–40× (n=450; 30.7%). Higher levels were less frequent: 40–100× (n=200; 13.6%) and ≥100× (n=76; 5.2%). Despite its low prevalence (5.2%), the ≥100× URL group exhibited the highest relative risk. In multivariable analysis, a clear dose–response gradient was observed: (1) AKI (Reference: <10× URL): Risk increased from OR 1.60 (10–20×) to OR 5.11 (≥100×; 95% CI 2.62–9.94; p<0.001). (2) Mortality (Reference: <20× URL): Mortality risk tripled in the 20–40× stratum (OR 3.00; p=0.017) and reached a critical impact in the ≥100× group, with an adjusted OR of 19.71 (95% CI 7.25–53.59; p<0.001). While patients with mild injury (<10×) had zero mortality, the ≥100× group exhibited a 22.4% mortality rate. Age (OR 1.06) and baseline renal function (OR 0.84) remained independent predictors (p<0.05). Conclusion: Although extreme myocardial injury (≥100× URL) occurs in only 5.2% of post-CPB patients, it identifies a highly vulnerable subgroup with nearly a 20-fold increased risk of death. The cohort distribution demonstrates that while most patients experience mild-to-moderate injury, systematic monitoring of hs-cTnT is essential to early identify the high-risk minority requiring aggressive hemodynamic support and nephroprotective strategies.



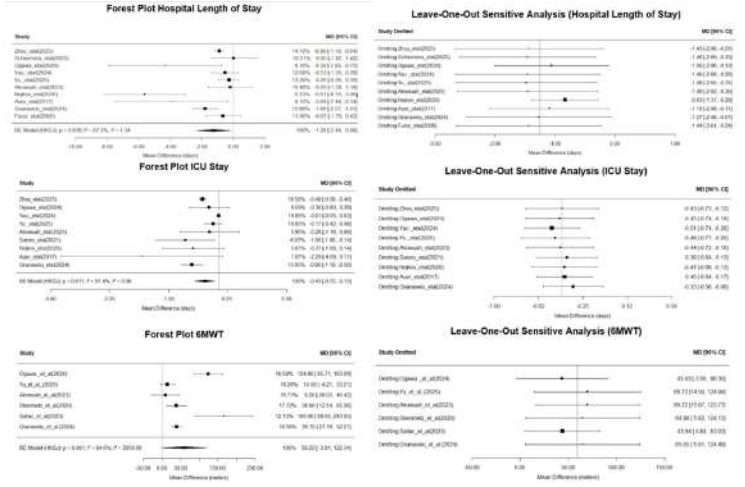
18082

PREOPERATIVE PREHABILITATION FOR ADULTS UNDERGOING ELECTIVE CARDIAC SURGERY: EFFECTS ON FUNCTIONAL RECOVERY AND POSTOPERATIVE OUTCOMES - A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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Background/Introduction: Cardiovascular disease remains the leading cause of death worldwide, and many patients require cardiac surgery. Cardiac prehabilitation, including exercise, respiratory training, nutritional optimization, and psychological support, has been proposed to improve postoperative outcomes. Although individual studies have shown promising results, a synthesis of available data is lacking. Objectives: To evaluate the impact of cardiac prehabilitation on postoperative outcomes in adults undergoing cardiac surgery. Methods: We performed a systematic review and meta-analysis of studies evaluating the association between prehabilitation strategies and clinical outcomes in adults undergoing elective cardiac surgery. PubMed, Embase, and Cochrane were searched. Outcomes of interest were hospital length of stay (LOS), intensive care unit (ICU) LOS, and 6-minute walk test (6MWT) distance. Random-effects models were used to estimate mean differences (MDs) with 95% confidence intervals (CIs). Leave-one-out (LOO) sensitivity analyses were performed. Analyses were conducted in R version 4.1.0 in accordance with PRISMA guidelines. Results and Conclusions: Thirteen studies, including 1,743 patients, were included. Mean age was 61.29±13.14 years, and 67.95% were male. Prehabilitation was associated with shorter hospital LOS (MD, -1.26 days; 95% CI, -2.44 to -0.08; p=0.04; I²=87.30%) and shorter ICU LOS (MD, -0.43 days; 95% CI, -0.72 to -0.13; p=0.01; I²=91.40%) compared with standard care. For 6MWT, prehabilitation did not improve walking distance compared to usual care (MD, 59.22 m; 95% CI, -3.91 to 122.34; p=0.06; I²=94.61%). Sensitivity analyses confirmed the robustness of our findings. Cardiac prehabilitation was associated with significant reductions in ICU and hospital LOS. These findings suggest that prehabilitation may be a valuable addition to surgical planning for patients undergoing elective cardiac surgery, as it may enhance postoperative recovery and healthcare resource utilization. Limitations include the low certainty of evidence and high heterogeneity across trials, highlighting the need for further research to optimize prehabilitation protocols.



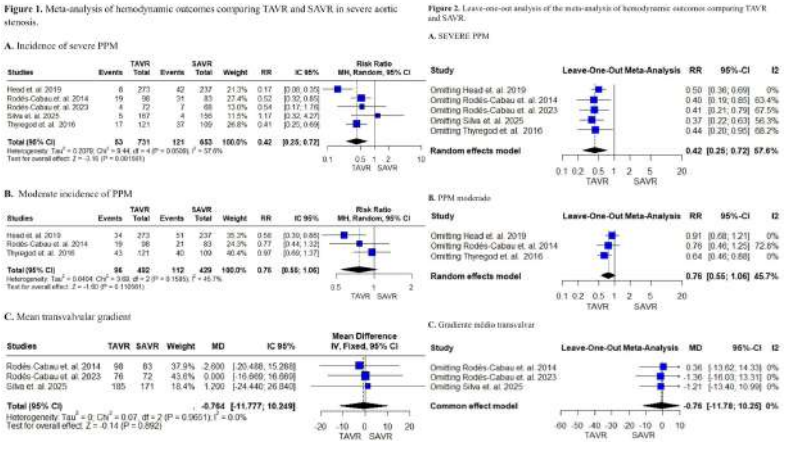
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PROSTHESIS–PATIENT MISMATCH AFTER TRANSCATHETER VERSUS SURGICAL AORTIC VALVE REPLACEMENT IN SEVERE AORTIC STENOSIS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background/Introduction: Patient–prosthesis mismatch (PPM) after aortic valve replacement is associated with impaired prosthetic hemodynamic performance and may adversely affect prognosis. Although previous studies suggest a lower rate of severe PPM with transcatheter implantation, the consistency of this benefit compared with surgery remains uncertain. Objectives: To compare transcatheter aortic valve replacement (TAVR) versus surgical aortic valve replacement (SAVR) regarding the incidence of PPM, with emphasis on severe PPM, in adults with severe aortic stenosis undergoing aortic valve replacement. Methods: This systematic review and meta-analysis was registered in PROSPERO (CRD420261336092) and conducted in accordance with PRISMA 2020. PubMed, Cochrane Library, EMBASE, Web of Science, and Scopus were searched. Randomized clinical trials and trial-derived comparative analyses directly comparing TAVR and SAVR and reporting PPM were included. The primary outcome was early post-procedural severe PPM; secondary outcomes were moderate PPM and mean transvalvular gradient. Risk ratios (RRs) were calculated for dichotomous outcomes and mean differences (MDs) for continuous outcomes, both with 95% confidence intervals (95% CIs). Risk of bias was assessed using RoB 2.0, certainty of evidence using GRADE, and sensitivity analyses were performed with a leave-one-out approach. Results and Conclusions: 2,688 identified records, 5 studies were included. TAVR significantly reduced the incidence of severe PPM compared with SAVR (53/731 vs. 121/653; RR, 0.42; 95% CI, 0.25–0.72; I²=57.6%). For moderate PPM, a nonsignificant trend favoring TAVR was observed (96/492 vs. 112/429; RR, 0.76; 95% CI, 0.55–1.06; I²=45.7%). No significant difference was found in mean gradient between the 2 strategies (MD, -0.76 mmHg; 95% CI, -11.78 to 10.25; I²=0%). Leave-one-out analyses confirmed the robustness of the severe PPM result, whereas the moderate PPM estimate was less stable and mean gradient findings remained unchanged. Certainty of evidence was moderate for severe PPM, low for moderate PPM, and very low for mean gradient. In patients with severe aortic stenosis undergoing aortic valve replacement, TAVR was associated with a lower incidence of early severe PPM compared with SAVR. This benefit was not conclusively demonstrated for moderate PPM, and no consistent difference was observed in mean gradient. These findings suggest that the main hemodynamic advantage of TAVR lies in reducing severe prosthesis–patient mismatch.



22090

SAPHENOUS VEIN GRAFT REMAINS THE MOST RELIABLE CONDUIT FOR NONSELECTED RIGHT CORONARY TERRITORY REVASCULARIZATION: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background/Introduction: Background: The optimal conduit for right coronary artery (RCA) territory bypass remains controversial. Although the right gastroepiploic artery (RGEA) is an attractive arterial option, its performance appears to depend heavily on target-vessel stenosis and competitive flow. Objectives: We compared RGEA and saphenous vein graft (SVG) for RCA territory revascularization. Methods: Methods: We performed a systematic review and meta-analysis of comparative studies evaluating RGEA versus SVG for RCA territory bypass in patients undergoing coronary artery bypass grafting. The search strategy included major biomedical databases, manual review of key references, and citation tracking. To avoid duplicate populations, only one report per cohort was retained in the primary quantitative analysis, prioritizing the longest available follow-up. The primary endpoint was graft patency. Pooled estimates were calculated using a random-effects model. Results and Conclusions: Results: Twelve comparative studies were identified for qualitative review. Three studies provided extractable patency data for the primary meta-analysis. In the pooled analysis, SVG showed a numerical advantage over RGEA, but the difference did not reach statistical significance (risk ratio 1.19, 95% confidence interval 0.90-1.56; I²=82.6%). Across the available literature, randomized evidence favored SVG, whereas the apparent benefit of RGEA in observational series was largely confined to highly selected patients with severe native RCA stenosis and minimal competitive flow. Conclusions: Current comparative evidence does not demonstrate a statistically significant overall patency advantage of SVG over RGEA, although the direction of effect favors SVG. For routine, nonselected RCA targets, SVG appears to remain the most reliable conduit, whereas RGEA may be best reserved for carefully selected anatomical settings.

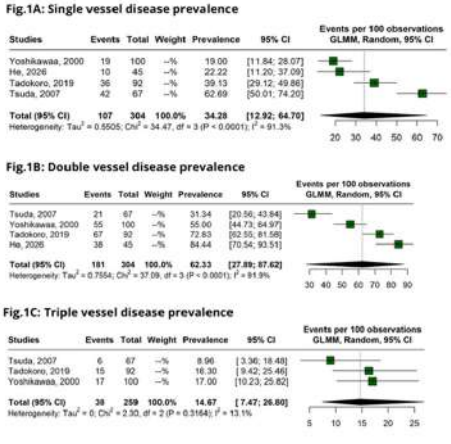
19719

THE ANATOMY OF CORONARY ARTERY INVOLVEMENT IN KAWASAKI DISEASE: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background/Introduction: Kawasaki disease (KD) is a systemic vasculitis that primarily affects small and medium-sized blood vessels. Its main and most serious complication is coronary aneurysm. Knowledge of the anatomy of the affected vessels is an extremely important tool for both prognostic evaluation and as a guide for invasive approaches in these patients. Objectives: To evaluate the prevalence of multi-vessel involvement of Kawasaki disease and the main locations of giant coronary aneurysms. Methods: A systematic review and meta-analysis of observational studies evaluating the anatomical pattern of coronary artery involvement in patients with Kawasaki disease was performed. Studies reporting the number of coronary vessels involved and/or the location of giant coronary aneurysms were included. Case reports, reviews and non-original studies were excluded. The primary outcomes were the prevalence of single-, double-, and triple-vessel disease and main anatomical locations of giant coronary aneurysms. Pooled analyses were conducted using random-effects models, and prevalence estimates were calculated using generalized linear mixed models with 95% confidence intervals. Statistical heterogeneity was assessed with I2. Analyses were performed in R (version 4.5.3). Results and Conclusions: Double vessel disease showed the highest prevalence at 62.33% [95% CI 27.89-87.62; I²=91.9%], but with the greatest heterogeneity among the studies. Single vessel disease and triple vessel disease showed prevalences of 34.28% [CI 12.92-64.70; I²=91.3%] and 14.67% [7.47-26.80; I²=13.1%], respectively. The most prevalent location of giant coronary aneurysm was in the right coronary artery (RCA), with a prevalence of 70.44% [CI 59.87 - 79.9; I²=4.0%], and the least prevalent was in the left circumflex artery (LCX) with 23.45% [CI 14.65-35.36; I²=0.0%], heterogeneity was low in both cases. Involvement of the left anterior descending (LAD) and left main trunk (LMT) was 60.61% [CI 44.36-74.81; I²=64.7%] and 41.85% [CI 33.33 - 50.9; I²=0.0%], respectively. CONCLUSION: The type of vascular involvement in Kawasaki disease shows a higher prevalence of double vessel disease. However, heterogeneity among studies should be noted. The prevalence of giant coronary aneurysms showed a more homogeneous distribution, mainly affecting the right coronary artery (RCA). These findings may aid clinical follow-up and intervention planning, but should be interpreted with caution.



20974

THORACOABDOMINAL NORMOTHERMIC REGIONAL PERFUSION VERSUS EX SITU MACHINE PERFUSION IN DONATION AFTER CIRCULATORY DEATH HEART TRANSPLANTATION: IMPACT ON EARLY OUTCOMES — A SYSTEMATIC REVIEW AND META-ANALYSIS

ANTONIO JHONATA ALVES LIMA1; JAMES NOBRE DE SENA2; MARIA CLARA AGUIAR TOMAZ3; YURI FÉLIX BRANDÃO2; NEWTON DIÓGENES PINHEIRO NETO2; AILTON CÉSAR DE ARAÚJO FILHO1; ROBERTO VICTOR PAIVA CAMURÇA4; ANNA LETÍCIA ALVES BOMFIM4; BENJAMIM ANTÔNIO PINHEIRO VIEIRA4;

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Background/Introduction: The expansion of heart transplantation with donation after circulatory death (DCD) has shifted the focus from feasibility to optimizing safety and reproducibility. The graft retrieval method significantly impacts the severity of primary dysfunction and the early need for advanced support. Specifically, thoracoabdominal normothermic regional perfusion (TA-NRP) and direct procurement with ex situ machine perfusion differ in reperfusion control and ischemia exposure. Given that evidence is largely observational, a synthesis strategy is required to avoid cohort overlap and effect overestimation. Objectives: To compare TA-NRP versus direct procurement with ex situ machine perfusion in DCD heart transplantation regarding severe primary graft dysfunction (PGD) requiring venoarterial extracorporeal membrane oxygenation (VA-ECMO) and selected early outcomes. Methods: A systematic review was conducted with multi-stage screening and standardized extraction. The primary analysis included only non-overlapping cohorts, prioritizing standardized early definitions (up to 30 days or discharge). We performed a random-effects meta-analysis using restricted maximum likelihood with Hartung–Knapp adjustment, estimating relative risk (RR) with a 95% confidence interval (CI). Heterogeneity was assessed by I^2. Sensitivity analysis with an additional study evaluated finding stability. Results and Conclusions: In the primary analysis (2 studies; 580 patients), TA-NRP reduced the risk of severe PGD requiring VA-ECMO (RR 0.37; 95% CI 0.17–0.79; $I^2 \approx 0\%$), suggesting a 63% relative reduction in high-impact events. TA-NRP also reduced treated rejection (RR 0.52; 95% CI 0.46–0.58; $I^2 \approx 0\%$). No consistent difference was found for renal replacement therapy. Sensitivity analysis maintained a favorable direction for VA-ECMO, albeit with higher uncertainty. In this synthesis of non-overlapping cohorts, TA-NRP was associated with a lower need for VA-ECMO and reduced treated rejection. This benefit is relevant for centers of excellence, potentially reducing severe complications and improving post-transplant predictability. While evidence remains observational and limited, these results support the standardization of protocols and prospective multicenter evaluation to confirm the magnitude of benefit and ensure safe, reproducible adoption.

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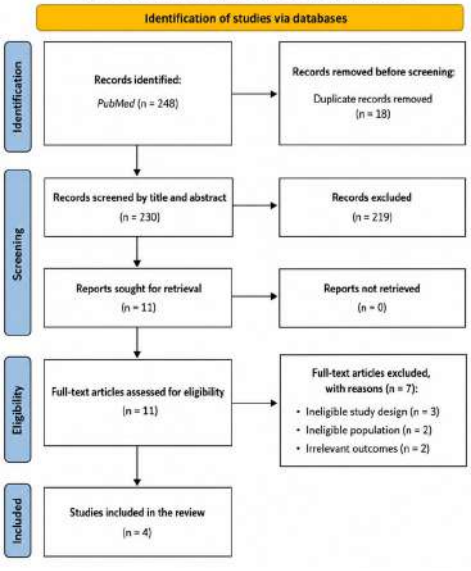
THROMBUS ASPIRATION IN PRIMARY PERCUTANEOUS CORONARY INTERVENTION IN PATIENTS WITH ST-SEGMENT ELEVATION MYOCARDIAL INFARCTION: A SYSTEMATIC REVIEW OF RANDOMIZED CLINICAL TRIALS

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Background/Introduction: ST-segment elevation myocardial infarction (STEMI) requires immediate restoration of coronary blood flow. Primary percutaneous coronary intervention (PCI) is the gold standard treatment; however, thrombus burden can lead to distal embolization and microvascular reperfusion failure. Manual thrombus aspiration was proposed to mitigate these effects and optimize flow, but recent evidence from large-scale trials has generated controversy regarding its clinical efficacy and, notably, its neurological safety. Objectives: To evaluate the impact of manual thrombus aspiration on angiographic and clinical outcomes in (STEMI) patients undergoing primary (PCI), through a systematic review of clinical trials. Methods: This is a systematic review of randomized clinical trials (RCT) conducted under the (PICO) strategy. The search was performed in the PubMed database using the descriptors: "STEMI", "thrombus aspiration", and "primary PCI". Inclusion criteria selected (RCT) that compared manual thrombus aspiration to conventional angioplasty. The analysis was qualitative and descriptive, focusing on microvascular reperfusion parameters (ST-segment resolution and TIMI flow) and hard clinical outcomes (mortality and safety). Results and Conclusions: Four (RCT) were included, totaling more than 18,000 patients. Smaller studies (n≈200) indicated immediate benefit in myocardial reperfusion. However, large-scale multicenter trials demonstrated that thrombus aspiration did not reduce all-cause mortality or reinfarction rates. In one of the main trials, a statistically significant increase in the incidence of stroke (STK) at 30 days was observed in the aspiration group (0.7% vs 0.3%). Conclusions: Manual thrombus aspiration improves immediate angiographic parameters; however, this effect does not translate into relevant clinical benefit. Given the lack of impact on mortality and the elevated risk of (STK), the routine use of this technique is not justified in current clinical practice and should be considered only in selected scenarios.

Figure 1. PRISMA flow diagram of the study selection process.



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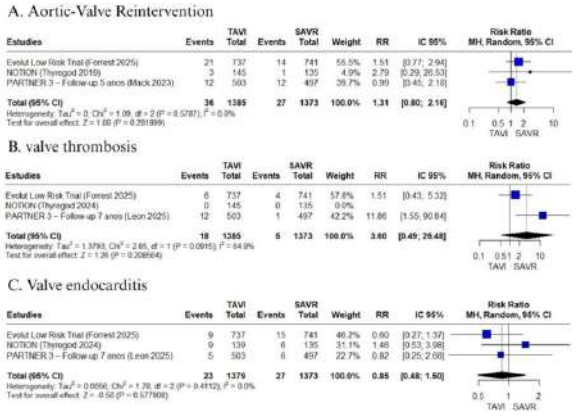
TRANSCATHETER VERSUS SURGICAL AORTIC VALVE REPLACEMENT IN LOW-RISK ELDERLY PATIENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS OF VALVE-RELATED COMPLICATIONS AT 5 YEARS

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Background/Introduction: Transcatheter aortic valve implantation (TAVI) has expanded to elderly patients at low surgical risk; however, uncertainty remains regarding prosthesis durability and valve-related complications compared with surgical aortic valve replacement (SAVR) at mid-term follow-up. Objectives: To evaluate aortic valve reintervention, valve thrombosis, and prosthetic valve endocarditis at approximately five years in randomized controlled trials comparing TAVI and SAVR in low-risk elderly patients. Methods: This systematic review and meta-analysis followed PRISMA 2020 and was registered in PROSPERO (CRD420251241177). PubMed, Embase, Cochrane, Web of Science, and Scopus were searched through February 25, 2026. Eligible studies were head-to-head randomized controlled trials enrolling elderly patients (mean age ≥70 years) with severe aortic stenosis at low surgical risk (STS-PROM <4% or EuroSCORE II <4%, or equivalent assessment). Outcomes were assessed at five years. Pooled risk ratios (RR) with 95% confidence intervals (CI) were calculated using a Mantel–Haenszel random-effects model. Heterogeneity was evaluated using I² statistics. Certainty of evidence was assessed using GRADE. Results and Conclusions: Three randomized trials including 2,758 patients (TAVI 1,385; SAVR 1,373) were analyzed. For aortic valve reintervention, the pooled RR was 1.31 (95% CI 0.80–2.16; I² = 0.0%). For valve thrombosis, the pooled RR was 3.60 (95% CI 0.49–26.48; I² = 64.9%). For prosthetic valve endocarditis, the pooled RR was 0.85 (95% CI 0.48–1.50; I² = 0.0%). Statistical significance was not reached for any outcome. Certainty of evidence was ⊕◯◯◯ (Very low) for reintervention, ⊕◯◯◯ (Very low) for valve thrombosis, and ⊕⊕◯◯ (Low) for endocarditis. In low-risk elderly patients followed for approximately five years, randomized evidence did not demonstrate statistically significant differences between TAVI and SAVR for reintervention, valve thrombosis, or endocarditis. Certainty of evidence ranged from very low to low, indicating substantial uncertainty in the comparative estimates within this follow-up period.

Figure 1. Meta-analysis of valve-related outcomes comparing TAVI versus SAVR at approximately 5 years.



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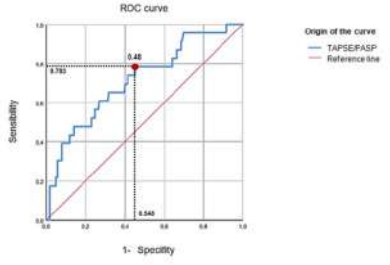
VENTRICULO-ARTERIAL COUPLING INDEX AS A PREDICTOR OF EARLY ADVERSE OUTCOMES IN PATIENTS UNDERGOING MITRAL VALVE SURGERY FOR PRIMARY MITRAL REGURGITATION

CAMILA TELES NOVAIS1; ANA LUIZA DE PAULA DOURADO1; GUSTAVO PEREIRA SANTANA1; NATALIA SANTOS BONFIM1; BRUNA APARECIDA REIS BRITO1; LAILA GABRIELY SOUZA MOTA1; JULIA ANDRADE MOUTINHO1;

(1) HOSPITAL ANA NERY - SALVADOR - BA - BRASIL;

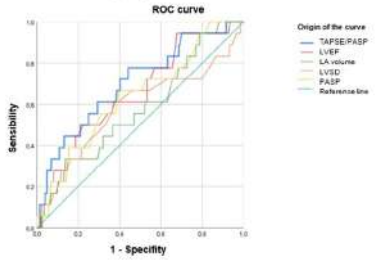
Background/Introduction: Primary mitral regurgitation (MR) may lead to pulmonary hypertension and right ventricular (RV) dysfunction, both associated with worse surgical outcomes. The tricuspid annular plane systolic excursion to pulmonary artery systolic pressure ratio (TAPSE/PASP) reflects RV–pulmonary arterial coupling and may serve as an early prognostic marker beyond conventional parameters. Objectives: To evaluate the prognostic value of the TAPSE/PASP ratio in predicting early postoperative complications in patients undergoing surgery for severe primary MR. Methods: This prospective single-center cohort included 424 adult patients with severe primary MR who underwent mitral valve surgery between July 2023 and April 2025. Preoperative echocardiographic parameters, including TAPSE, PASP, and left ventricular ejection fraction (LVEF), were collected. The primary outcome was a composite of in-hospital death, cardiogenic shock, or prolonged mechanical ventilation (>24 hours). Associations were assessed using univariate logistic regression and receiver operating characteristic (ROC) curve analysis. Results and Conclusions: The TAPSE/PASP ratio was significantly associated with adverse outcomes (RR = 0.02; 95% CI: 0.01–0.26; p < 0.01). ROC analysis identified a cutoff ≤0.48, with an AUC of 0.71 (p < 0.01), sensitivity of 78%, and specificity of 55%. The TAPSE/PASP ratio outperformed conventional markers such as LVEF and PASP in predicting early postoperative risk. These findings suggest that ventriculo-arterial coupling assessment provides incremental prognostic value and may enhance preoperative risk stratification. However, given its moderate accuracy and limited specificity, this parameter should be integrated into a multimodal assessment and validated in larger multicenter studies.

Figure 1. ROC curve of ventriculo-arterial coupling index versus death, cardiogenic shock and prolonged time in mechanical ventilation (>24h)



ROC curve estimating 0.48mm/mmHg as the TAPSE/PASP cutoff point with greater precision for surgical complications and to aid decision-making in clinical practice (area 0.714, *p* 0.001).

Figure 2. ROC curve of ventriculo-arterial coupling index, LVEF, LA volume, LVSD and PASP versus death, cardiogenic shock and prolonged time in mechanical ventilation (>24h)



ROC curve estimating the AUC. Ventriculo-arterial coupling index (AUC 0.714; *p* 0.001), LVEF (AUC 0.555; *p* 0.029), LA volume (AUC 0.578; *p* 0.273), LVSD (AUC 0.582; *p* 0.247) and PASP (AUC 0.639; *p* 0.028).

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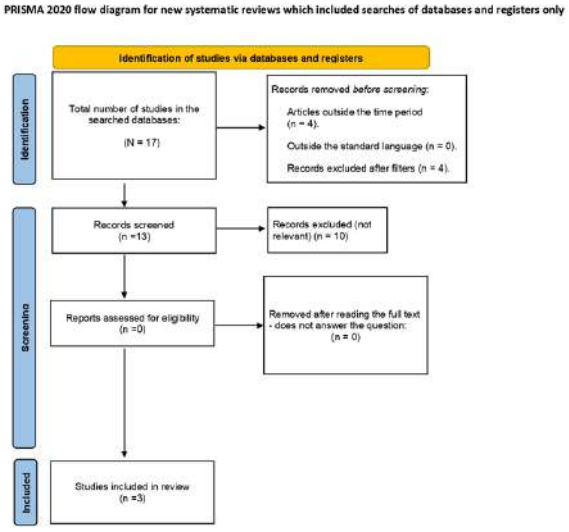
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ARTIFICIAL INTELLIGENCE APPLIED TO FETAL ECHOCARDIOGRAPHY: A SYSTEMATIC REVIEW ON DIAGNOSTIC ACCURACY IN CONGENITAL HEART DISEASE

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(1) UNIVERSIDADE CHRISTUS - FORTALEZA - CE - BRASIL; (2) FACULDADE DE MEDICINA ESTACIO DE CANINDE - CANINDE - CE - BRASIL;

Background/Introduction: Congenital heart diseases (CHDs) are the most common structural malformations at birth and represent a major cause of neonatal morbidity and mortality. Fetal echocardiography is essential for prenatal diagnosis and therapeutic planning; however, its accuracy depends on the examiner's expertise, which may result in diagnostic variability, particularly in settings with limited access to specialists. In this context, Artificial Intelligence (AI) has emerged as a promising tool for image analysis, with the potential to improve diagnostic accuracy. Nevertheless, it remains unclear whether these technologies can match the performance of specialists, and their accuracy in detecting CHDs in fetal echocardiography is still uncertain. Objectives: To evaluate the diagnostic performance of AI in detecting CHDs compared to specialists. Methods: This systematic review was conducted in accordance with the PRISMA guidelines. Literature searches were performed in PubMed, SciELO, Cochrane Library, and Biblioteca Virtual de Saúde, using the descriptors "artificial intelligence" AND "heart defects, congenital" AND "fetal echocardiography." A total of 17 studies were identified. Full-text articles published in the last five years in English or Portuguese were included. After screening, filtering, and final assessment, three studies were included in the analysis. Results and Conclusions: The synthesis of the included studies demonstrates that AI application in fetal cardiology shows good diagnostic performance. In the prenatal context, AI achieved sensitivity rates of up to 93% for CHD detection in certain scenarios, with a mean area under the curve (AUC) ranging from 0.91 to 0.98. In complex structural anomalies, such as hypoplastic left heart syndrome, sensitivity reached 95%, comparable to specialists and superior to general ultrasonographers (approximately 70%). Studies also indicate that AI reduces screening time by approximately 35% and improves the identification of standard axial views. However, limitations were observed in cases involving anomalous venous connections and complex Doppler flow patterns, where specialist clinical judgment remains essential. AI shows potential as a complementary tool to conventional diagnosis, improving screening accessibility and reducing false negatives. Although it does not replace physicians, it supports clinical decision-making. Its implementation requires ethical standards and integration into real-world workflows to ensure diagnostic safety in fetal cardiology.



Source: Prepared by the authors.

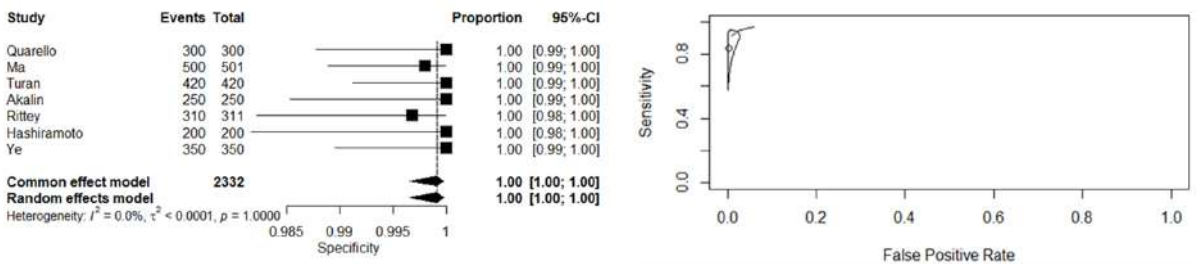
15683

DIAGNOSTIC ACCURACY OF FIRST-TRIMESTER FETAL ECHOCARDIOGRAPHY IN DETECTING MAJOR CONGENITAL HEART DEFECTS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background/Introduction: Early detection of congenital heart disease (CHD) is essential to optimize perinatal outcomes, yet standard diagnosis is typically performed in the second trimester. First-trimester fetal echocardiography has emerged as a potential early diagnostic tool, but its accuracy remains uncertain. Objectives: To evaluate the diagnostic accuracy of first-trimester fetal echocardiography for detecting major CHD. Methods: A systematic review and meta-analysis were conducted according to PRISMA guidelines. Studies evaluating fetal echocardiography between 11 and 14 weeks of gestation were included. Diagnostic data were extracted to construct 2×2 contingency tables. A bivariate random-effects model (Reitsma) was used to estimate pooled sensitivity and specificity. Overall performance was assessed using hierarchical summary receiver operating characteristic (HSROC) analysis. This study was prospectively registered in PROSPERO (CRD420261379243). Results and Conclusions: Results: Seven studies (n = 778 fetuses) were included. The pooled sensitivity was 0.82 (95% CI: 0.68–0.91), and specificity was 0.99 (95% CI: 0.97–1.00). Specificity was highly consistent (I^2 = 0%), while sensitivity showed significant heterogeneity (I^2 = 70.2%). HSROC analysis demonstrated excellent diagnostic performance (AUC = 0.979). The false-positive rate was low (1.4%), supporting high diagnostic reliability for confirming CHD in early gestation. Conclusion: First-trimester fetal echocardiography demonstrates excellent specificity and high diagnostic accuracy, supporting its role as a reliable rule-in diagnostic tool. However, its moderate and heterogeneous sensitivity limits its use as a standalone screening modality. In practical terms, this modality should be interpreted as an early confirmatory (rule-in) strategy rather than a primary screening tool, given its near-perfect specificity and limited sensitivity. These findings suggest a paradigm shift from early screening to early confirmation in prenatal cardiac evaluation.



17403

FETAL CARDIOLOGY IN THE AMAZON: EARLY EXPERIENCE AND CHALLENGES IN IMPLEMENTING A REFERRAL SERVICE IN A RESOURCE-LIMITED SETTING

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Background/Introduction: Congenital heart disease (CHD) remains one of the leading causes of neonatal morbidity and mortality worldwide, and outcomes are closely tied to how early a diagnosis is made and whether families can actually reach specialized care. In regions like the Brazilian Amazon, a geographically vast and chronically underserved, these conditions are rarely met. Access to fetal echocardiography is scarce, and the quality of prenatal screening varies considerably across the territory. Objectives: To describe referral patterns, diagnostic yield, and the practical challenges encountered in establishing a fetal cardiology service in the Amazon region. Methods: This cross-sectional study included pregnant women referred for fetal echocardiography at a tertiary public hospital in Manaus, Brazil, from March 2023 to March 2024. We analyzed maternal characteristics, indications for referral, and echocardiographic findings, while also documenting system-level obstacles observed throughout service implementation. Results and Conclusions: Seventy-four patients were included. Mean maternal age was 31 years. The majority of referrals were driven by maternal risk factors (54.1%), with diabetes accounting for 87.5% of those cases. Nearly all patients (92.4%) had previously undergone morphological ultrasound — yet only 5% had any suspected cardiac abnormality flagged at that stage. Fetal echocardiography identified cardiac alterations in 8.2% of cases, including structural defects such as ventricular septal defects and functional findings such as myocardial hypertrophy. On the implementation side, several recurring challenges stood out: the low sensitivity of routine prenatal screening for cardiac abnormalities; a referral logic driven more by maternal comorbidities than by fetal findings; a shortage of trained professionals outside the capital; and the geographic and logistical barriers that delay or outright preventing access to specialized care for many families. Fetal echocardiography in this high-risk group yielded a significant diagnostic return, likely due to referral bias. The difference between routine ultrasound flags and actual echo findings highlights limitations in current prenatal cardiac screening. This experience underscores the difficulty of establishing a fetal cardiology service in the Amazon. Improving outcomes requires better sonographer training, smarter referral criteria, and expanded specialized care access, favoring a coordinated regional network over isolated efforts.

18680

LACTATE KINETICS AND VASOACTIVE-INOTROPIC SCORE AS PREDICTORS OF MORTALITY IN CHILDREN UNDERGOING CARDIAC SURGERY

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Background/Introduction: Lactate is a well-established biomarker of tissue hypoperfusion in critically ill patients. In pediatric cardiac surgery, postoperative outcomes are influenced by both metabolic disturbances and hemodynamic instability. The vasoactive-inotropic score (VIS) quantifies the intensity of cardiovascular support and may enhance risk stratification when evaluated alongside lactate kinetics. However, the combined prognostic value of lactate and VIS remains incompletely understood. Objectives: To evaluate the association between lactate levels, VIS, and in-hospital mortality in children under 2 years undergoing cardiac surgery, and to determine a lactate cutoff associated with increased mortality. Methods: This retrospective cohort study included children under 2 years of age who underwent cardiac surgery between 2018 and 2024. Lactate levels were measured at the immediate postoperative period (POI), postoperative day 1 (POD1), and postoperative day 2 (POD2). The vasoactive-inotropic score (VIS) was calculated at the same time points. The primary outcome was in-hospital mortality. Continuous variables were expressed as mean ± standard deviation or median (interquartile range), as appropriate, and compared using the Mann–Whitney U test. Multivariable logistic regression adjusted for surgical complexity (RACHS-1) and weight was used to identify independent predictors. ROC curve analysis was performed to evaluate discriminatory ability and determine the optimal lactate cutoff. Results and Conclusions: Non-survivors had consistently higher lactate levels across all time points (3.50 vs 2.42 mmol/L immediately postoperatively, $p<0.001$) and required higher vasoactive support (VIS 18.0 vs 12.5, $p<0.001$). Lactate remained an independent predictor of mortality after adjustment (OR 1.24 per mmol/L increase, $p<0.001$). A lactate threshold of 3.2 mmol/L identified high-risk patients early.Lactate showed better discrimination than VIS alone (AUC 0.69 vs 0.64). A combined model improved prediction (AUC 0.70), suggesting complementary prognostic value. Lactate is a strong early predictor of mortality after pediatric cardiac surgery. VIS provides complementary information on hemodynamic support, and their combined use improves risk stratification. An integrated metabolic-hemodynamic approach may allow earlier identification of high-risk patients and guide postoperative management.

Digital Health / Innovation / Artificial Intelligence



81º CONGRESSO BRASILEIRO DE CARDIOLOGIA together with WORLD CONGRESS OF CARDIOLOGY





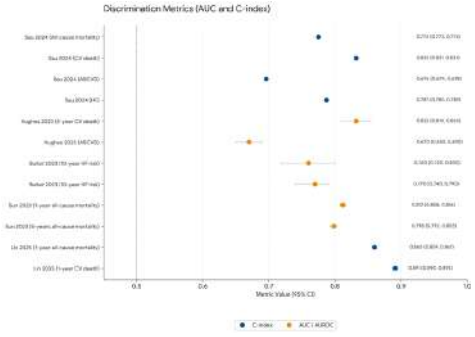
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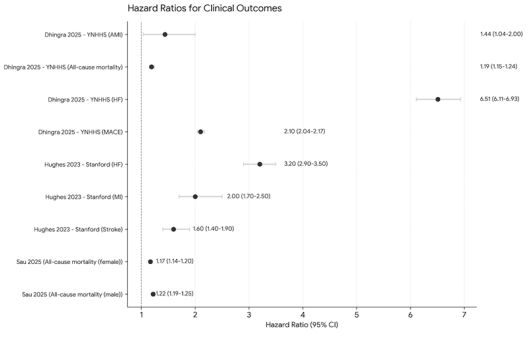
ARTIFICIAL INTELLIGENCE APPLIED TO ELECTROCARDIOGRAM-BASED CARDIOVASCULAR RISK ASSESSMENT: A SYSTEMATIC REVIEW

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Background/Introduction: Cardiovascular diseases are the leading cause of mortality worldwide, underscoring the need for effective risk prediction and early detection. The electrocardiogram (ECG) is a widely available, low-cost diagnostic tool, but its traditional interpretation is limited by subjectivity. Artificial intelligence (AI) has emerged as a tool to extract previously inaccessible prognostic information from ECG signals. Objectives: This systematic review aimed to evaluate original studies applying AI-based models to ECG signals for cardiovascular risk prediction and mortality outcomes. Methods: A systematic review was conducted in accordance with PRISMA guidelines. Four databases were searched for studies published between 2020 and 2025 that used AI models with ECG signals as the sole input to predict cardiovascular risk in adult populations. Primary outcomes included all-cause mortality, cardiovascular death, heart failure (HF), myocardial infarction (MI), stroke, atherosclerotic cardiovascular disease (ASCVD), and major adverse cardiovascular events (MACE). Two reviewers independently performed study selection and data extraction. Data were synthesized narratively. The protocol was registered in PROSPERO. Results and Conclusions: A total of 11 studies were included, most of which were retrospective cohorts. Convolutional neural networks were the predominant architecture (90.9%). Sample sizes ranged from 238 to over 4 million ECGs. Mean age varied from 54 to 65 years, and follow-up ranged from 2 to 34 years. Model interpretability techniques were reported in 9 studies, with saliency maps being the most commonly used method. Reported AUROC values ranged from 0.63 to 0.96 in training datasets, with some models outperforming traditional risk scores. AI-ECG demonstrated the ability to detect subclinical disease and enable early risk stratification, even in individuals with apparently normal ECGs. However, important challenges remain, including limited population diversity, suboptimal interpretability, and lack of prospective validation. In conclusion, the application of AI to ECG analysis represents a promising advancement in personalized cardiovascular risk assessment. Nonetheless, further research is needed to ensure the safety, effectiveness, and equitable clinical integration of these technologies.





19460

ARTIFICIAL INTELLIGENCE IN PUBLIC HEALTH POLICIES: GOVERNANCE AND EFFECTIVENESS IN PUBLIC MANAGEMENT

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Background/Introduction: The digital transformation of the state has driven the adoption of data-driven technologies in public administration, particularly in health. Artificial intelligence (AI) emerges as a strategic tool for evidence-based decision-making, epidemiological surveillance, and resource optimization. However, its incorporation involves ethical, institutional, and regulatory challenges, especially in developing countries marked by regional inequalities and fragmented information systems. Objectives: To analyze AI application in public health policies, focusing on governance and governmental effectiveness. Specific objectives include: mapping AI initiatives in public health (2015–2025); comparing domestic and international experiences (United Kingdom and Canada); identifying institutional and ethical barriers; and proposing recommendations for an AI governance ecosystem in public health. Methods: Qualitative and analytical-descriptive research with comparative elements. A systematic bibliographic review followed PRISMA guidelines across Scopus, Web of Science, SciELO, and PubMed (2015–2025). Documentary analysis covered national health digitalization programs and international reports (NHS AI Lab, AI4Health). A multiple-case comparative study examined three variables: institutional maturity of AI governance, systems interoperability, and observed policy effectiveness. Thematic content analysis was applied throughout. Results and Conclusions: AI contributes positively to public health policy effectiveness in epidemiological monitoring, hospital resource optimization, and identification of vulnerable populations, but only when integrated into the full policy cycle. Comparison with the United Kingdom and Canada showed that performance differentials are primarily institutional: consolidated governance frameworks and algorithmic audit mechanisms explain superior outcomes. In the analyzed national context, structural fragmentation, lack of data interoperability, insufficient technical capacity, and the absence of a national AI governance policy are the main limiting factors. An unanticipated finding concerns the risk of reinforcing regional and racial inequalities through biased algorithmic systems. Responsible AI adoption in public health requires simultaneous investment in technology, governance, equity, and institutional culture.

21108

ARTIFICIAL INTELLIGENCE METHODS IN CARDIOVASCULAR HEALTH RISK ASSESSMENT

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Background/Introduction: Artificial intelligence (AI) has been increasingly applied to cardiovascular risk assessment, offering new opportunities for individualized prediction, early identification of high-risk patients, and clinical decision support. However, the relative performance, interpretability, and implementation readiness of different AI approaches remain heterogeneous across studies. Objectives: To systematically review AI-based methods used for cardiovascular health risk assessment, comparing traditional machine learning, ensemble methods, and deep learning approaches in terms of predictive performance, clinical applicability, interpretability, and implementation requirements. Methods: A systematic search was conducted in MEDLINE/PubMed, Embase, Cochrane Library and SciELO from inception to February 2025. Eligible studies evaluated AI-based models for cardiovascular risk prediction or risk stratification in adult populations and reported at least one measure of model performance, validation, or clinical utility. Two independent reviewers screened studies, extracted data, and assessed methodological quality using PROBAST. Findings were synthesized narratively according to model class, data source, outcome, validation strategy, discrimination, calibration, interpretability, and implementation feasibility. Results and Conclusions: A total of 10 studies met the inclusion criteria. Traditional machine learning methods demonstrated practical utility in structured clinical datasets, particularly when interpretability and ease of implementation were priorities. Ensemble methods, including random forests, gradient boosting, and Random Survival Forests, generally improved the ability to capture non-linear relationships and interactions among predictors, although transparency and calibration reporting were variable. Deep learning models, including neural survival models such as DeepSurv and architectures using imaging, electrocardiographic, or electronic health record data, showed the greatest potential in large-scale, high-dimensional datasets. However, their use was limited by higher computational demands, lower interpretability, inconsistent external validation, and limited evidence of prospective clinical impact. Across model classes, reporting of calibration, fairness, explainability, and decision-curve or clinical utility analyses was inconsistent.

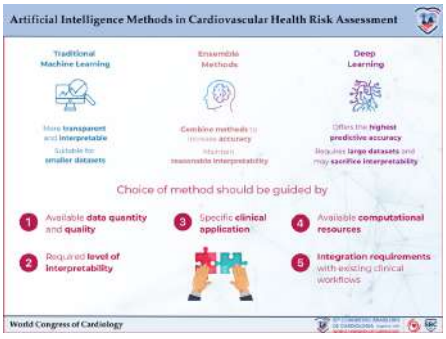


Table 1 – Predictive Performance Metrics for Cardiovascular Risk Assessment Models

Study	Disease type	Best performed method	Performance Metrics	Dataset size	Follow-up period (years)
Aljaaf 2015[57]	HF	Decision Tree	ACC: 86.5%	297	NA
Ambale-Venkatesh 2017[30]	CVD, Stroke and HF	RSF	C-index: 0.80 Brier score: 0.079	6,814	11.2 (10.6-11.7)
Barbieri 2022[64]	CVD	DeepSurv	C-index: 0.771-0.813 Brier score: 0.0176-0.00971	2,164,872	4.75
Blanchard 2022[78]	MACE	DeepConvSurv	C-index: 0.788 AUC: 0.823	5,506	6.0 (3.9-8.7)
Dinesh 2018[70]	CVD	Logistic Regression	ACC: 91.61%	920	NA
Gulshan 2016[18]	Diabetic retinopathy	CNN	AUC: 0.991	11,711	NA
Princy 2020[37]	CVD	Decision Tree	ACC: 73%	NA	NA
Shanfirazi 2022[40]	Myocarditis	CNN	ACC: 97.41%	98,898	NA
Xie 2019[69]	Stroke	GBM	AUC: 0.877	512	0.4
Zhao 2005[22]	LBBB, RBBB, PVC, PAC	SVM	ACC: 98.66%, 100%, 99.66%, 100%	11,343	6.6

HF: Heart failure, ACC: Accuracy, NA: Not available, CVD: Cardiovascular disease, RSF: Random survival forest, C-index: Concordance index, MACE: Major adverse cardiovascular events, DeepConvSurv: Deep survival convolutional neural networks, AUC: Area under the receiver operating characteristic curve, CNN: Convolutional neural network, CAD: Coronary artery disease, GBM: Gradient boosting machines, LBBB: Left bundle branch block, RBBB: Right bundle branch block, PVC: Premature ventricular contraction, PAC: Premature atrial contraction, SVM: Support vector machine

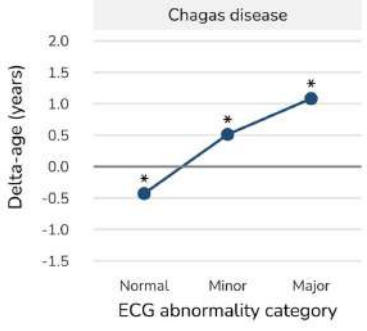
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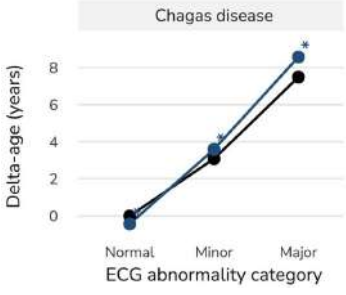
CHAGAS DISEASE AND AI-DERIVED ECG-AGE

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Background/Introduction: Artificial intelligence-derived electrocardiographic age (ECG-age) has emerged as a biomarker of cardiovascular risk and biological cardiac aging. However, its behavior in diseases that directly affect the cardiac conduction system, such as Chagas disease (ChD), remains poorly understood. Objectives: To assess how Chagas disease affects ECG-age. Methods: This retrospective cross-sectional study included adult patients whose ECGs were analyzed by a nationwide Brazilian telehealth network between 2019 and 2022. ECGs were interpreted by certified cardiologists and classified into standardized diagnostic categories and abnormality severity (normal, minor, and major, based on the Minnesota Code). ECG-age was estimated using a convolutional neural network, and delta-age was defined as ECG-age minus chronological age. Clinical data were self-reported or inferred from the use of condition-specific medications (diabetes mellitus, hypertension, coronary artery disease, ChD, and dyslipidemia). Multivariable linear regression models adjusted for age, sex, and comorbidities were used to evaluate the association between ECG abnormalities and delta-age, and to assess interactions with comorbidities. Results and Conclusions: A total of 2,045,601 ECGs from individual patients were analyzed. Median age was 54.2 years [IQR 40.9–66.3]; 40.8% were male. 21,825 (1.1%) participants reported ChD. Overall, ECG abnormalities were associated with progressively higher delta-age. Interaction analyses indicated effect modification by comorbidities. In contrast with other clinical diseases evaluated, a significant interaction between ECG abnormality severity and Chagas disease was observed, showing that ChD amplified this association. Both minor and major ECG abnormalities were associated with higher delta-age values among individuals with Chagas disease [β = 0.94 (95% CI 0.59-1.28) and β = 1.51 (95% CI 1.19-1.84), respectively]. Marginal effects plot showing delta-age across ECG abnormality categories for individuals with and without ChD and the marginal differences plot are shown in Figures 1 and 2. These findings suggest greater cardiac aging in the presence of structural and conduction system involvement, such as Chagas disease, and the sensitivity of delta-age under those circumstances. This reinforces its potential role as a biomarker even in populations with endemic cardiomyopathies.





16701

CUSTO-BENEFÍCIO DO TELEMONITORAMENTO NA INSUFICIÊNCIA CARDÍACA

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Background/Introduction: A insuficiência cardíaca (IC) é principal causa de internação por doenças cardiovasculares com custos elevados associados às internações. Evidências de ensaio clínico indicam redução de 44% nas reinternações em pacientes sob telemonitoramento adicionado ao cuidado usual, sugerindo potencial para reduzir custos hospitalares. Objectives: Estimar o custo benefício do telemonitoramento para pacientes com IC sob a perspectiva do Sistema Único de Saúde (SUS) e projetar seu impacto econômico para o estado de Minas Gerais (MG). Methods: Análise econômica baseada em ensaio clínico com horizonte de 180 dias, adotando microcusteio pelo SUS. Custos incluíram materiais, equipamentos, remuneração profissional e despesas de telessaúde; valores atualizados para dez/2024. Os benefícios foram estimados a partir da redução de reinternações observada no estudo (26% tratamento vs 46% controle). Avaliou se quatro cenários de valoração de internações: três níveis DRG Brasil (gravidade 1–3) e média do SIH/SUS. DRG Brasil estima valores de internação segundo diagnóstico e complexidade; SIH/SUS reflete a média de valores de internação por repasses federais. O benefício para MG foi projetado a partir da média anual de internações por IC (2022–2024). Realizada análise de sensibilidade probabilística considerando variações na remuneração profissional e preço de equipamentos. Results and Conclusions: Resultados: O custo de implementação estimado foi R$426,00 por paciente. O benefício líquido incremental esperado foi positivo em todos os cenários, variando de R$47,00 por paciente (média SIH/SUS) a R$2.396,00 (DRG Brasil, gravidade 3). Para Minas Gerais (média anual 27.439 internações), o benefício líquido anual projetado variou entre R$1,3 milhões e R$65,7 milhões. Na análise probabilística, os intervalos de credibilidade de 95% incluíram o zero, porém com um perfil assimétrico: perdas potenciais limitadas (R$−490,00 a R$−451,00), e probabilidade de benefício líquido positivo entre 34,1% e 48,1% conforme o cenário. Conclusões: O telemonitoramento para pacientes com IC demonstrou favorecimento econômico sob a perspectiva do SUS em todos os cenários avaliados, apoiando sua adoção e escalonamento no setor público.

17613

DEVELOPMENT, IMPLEMENTATION, AND EVALUATION OF A CLINICAL DECISION SUPPORT SYSTEMS FOR ANTICOAGULATION MANAGEMENT IN PRIMARY CARE

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Background/Introduction: Stroke is one of the leading causes of death and disability worldwide, with a growing impact in low- and middle-income countries. In these settings, warfarin remains widely used for the prevention of thromboembolic events, despite its complex management. Clinical decision support systems (CDSS) have emerged as promising strategies to improve care, particularly in primary care. Objectives: To develop and implement a CDSS for anticoagulation management in primary care, and to evaluate its usability and user satisfaction among healthcare professionals. Methods: Four-phase mixed-methods study based on the Medical Research Council framework. Phase 1 consisted of a cross-sectional assessment of primary care units. Phase 2 involved the development of an initial web-based prototype with structured patient data entry and tools for monitoring anticoagulation quality, but without decision-support messages. A formative evaluation was conducted with 514 patients across 4,022 consultations to assess system functionality, usability, and data entry processes. Phase 3 focused on developing individualized decision-support messages. Phase 4 consisted of a pilot implementation during routine outpatient consultations, in which pharmacists used the CDSS. Usability and acceptability were evaluated through semi-structured interviews, and qualitative data were analyzed using thematic analysis. Results and Conclusions: The final CDSS included 210 recommendations targeting anticoagulation indication, dose adjustment, drug–drug interactions, and bleeding management. Internal testing identified minor issues that were corrected, confirming the logical consistency of the algorithms and appropriate recommendation triggering, supporting the CDSS internal validity. The system was adopted by all pharmacists, who reported high usability, intuitive navigation, and perceived usefulness of the graphical tools. The CDSS improved consultation organization, standardized decision-making, and supported follow-up, but faced barriers such as time constraints, competing demands, technical issues, and lack of integration with electronic health records. These findings confirm the feasibility and acceptability of the CDSS in primary care settings with limited resources. Future studies should evaluate its clinical impact and further advance integration, scalability, and sustainability.

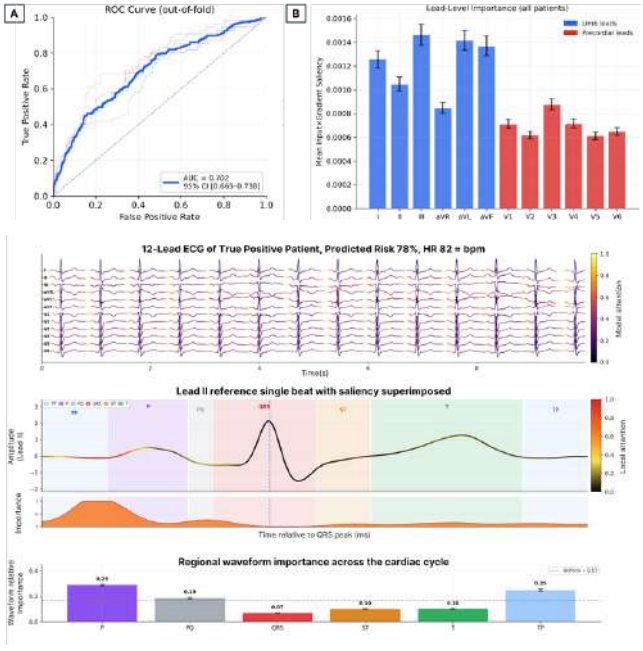
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EXPLAINABLE DEEP LEARNING PREDICTS 1-YEAR ATRIAL FIBRILLATION RECURRENCE FROM ECG TAKEN AFTER SUCCESSFUL CATHETER ABLATION

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Background/Introduction: Atrial fibrillation (AF) recurrence after catheter ablation remains high, affecting 30-50% of patients within 1 year. However, post-procedural risk stratification is limited, and current follow-up does not leverage patient-specific electrophysiology information. Artificial intelligence applied to routine electrocardiograms (ECGs) may provide a scalable approach for post-ablation prognosis, with its interpretability constituting an essential factor in the clinical translation. Objectives: This work aims to develop and evaluate an explainable deep learning (DL) model that uses a single 12-lead ECG taken post-ablation to predict AF recurrence within 1 year. Methods: We analysed 968 patients undergoing AF ablation from the MIMIC-IV dataset (recurrence rate 28%), each represented by a single 12-lead ECG acquired at a mean of 74.5 days post-procedure. DL model was trained on this dataset, with each ECG labelled recurrent or non-recurrent, to predict AF recurrence. The model performance was evaluated using stratified 5-fold cross-validation with out-of-fold predictions, using the standard metrics (area under the receiver operating characteristic curve, ROC AUC). Model interpretability was examined using gradient-based saliency maps at both ECG waveform and individual lead levels. Results and Conclusions: The model achieved an AUC of 0.70 (95% CI 0.665–0.738) for predicting 1-year AF recurrence (Figure 1A), demonstrating robust discrimination from a single ECG. Saliency analysis showed that predictions were driven predominantly by atrial activation and the overall cardiac repolarisation features, with the highest relative importance assigned to the P-wave (~0.29) and TP segment (~0.25) (Figure 2). This suggests that recurrence risk is primarily encoded in atrial substrate, while the elevated TP segment may reflect subtle atrial ectopy or rate-related changes. At the lead level, the most informative leads were III, aVL, aVF, and I (Figure 1B), indicating a non-uniform spatial contribution across the 12-lead ECG. Patient-level visualisations (Figure 2) further showed consistent localisation of model attention to specific ECG features across individuals. A single ECG routinely collected post-ablation contains clinically relevant prognostic information about AF recurrence. Explainable DL highlights atrial substrate and baseline repolarisation dynamics as key drivers of risk, supporting the feasibility of ECG-based post-ablation risk stratification and its potential integration into clinical workflows.



21572

EXTERNAL VALIDATION PERFORMANCE OF DEEP LEARNING ALGORITHMS APPLIED TO SINUS-RHYTHM ELECTROCARDIOGRAMS FOR PREDICTION OF INCIDENT ATRIAL FIBRILLATION: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background/Introduction: Artificial intelligence-enabled electrocardiography (AI-ECG) has emerged as a promising strategy for identifying individuals at increased risk of atrial fibrillation (AF) before overt arrhythmia develops. However, the reproducibility and external validation performance of deep learning models across heterogeneous populations and ECG platforms remain uncertain. Objectives: To evaluate the prognostic discrimination and external validation performance of deep learning algorithms applied to sinus-rhythm ECGs for prediction of incident AF. Methods: A systematic review and meta-analysis were conducted according to PRISMA 2020 recommendations. PubMed/MEDLINE, Embase, Scopus, Web of Science, and Cochrane Library were searched for studies evaluating deep learning models applied to sinus-rhythm ECGs for prediction of future AF. The primary outcome was pooled discrimination performance measured by AUROC/C-index. Random-effects meta-analysis with REML and Hartung-Knapp adjustment was performed after logit transformation of AUROC values. Prespecified subgroup analyses included external validation cohorts, 12-lead ECG studies, handheld/single-lead ECG studies, and short-term or occult AF detection studies. Results and Conclusions: Seventeen quantitative estimates from 10 studies involving more than 520,000 participants were included. Seven primary estimates evaluating incident AF were synthesized in the main analysis. The pooled AUROC/C-index for prediction of incident AF was 0.745 (95% CI 0.682–0.799), with substantial heterogeneity (I^2=99.2%; tau^2=0.108; p<0.0001) and a 95% prediction interval of 0.552–0.874. External or independent validation cohorts demonstrated preserved discrimination, with pooled AUROC/C-index of 0.725 (95% CI 0.689–0.758). Studies using 12-lead ECGs yielded pooled AUROC/C-index of 0.767 (95% CI 0.727–0.803). Models targeting short-term, occult, or paroxysmal AF demonstrated higher discrimination (AUROC/C-index 0.839; 95% CI 0.769–0.891), although these represented distinct clinical targets from long-term incident AF prediction. Across studies reporting longitudinal risk estimates, high-risk AI-ECG strata were associated with significantly increased incident AF risk (pooled HR 2.845; 95% CI 1.815–4.459). Deep learning analysis of sinus-rhythm ECGs provides clinically meaningful discrimination for future AF and may enable scalable cardiovascular screening strategies.

20535

FINE-TUNING PRE-TRAINED ECG AND CMR WITH COMPREHENSIVE EVALUATION FOR CARDIOVASCULAR DIAGNOSTICS

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Background/Introduction: Cardiovascular diseases (CVDs) are leading cause of death worldwide, accounting for about one-third of global deaths. In this regard, there are various ways to establish a diagnosis of CVDs, including electrocardiograms (ECGs) and imaging test, such as cardiac magnetic resonance imaging (CMR). The growth of artificial intelligence (AI) applications have been contributing to improvements in health area. Objectives: This study investigates how fine-tuning pre-trained ECG and MRI encoders, originally developed on predominantly healthy populations, can improve the identification and representation of pathological cardiac conditions. Methods: This study was approved by ethical committee (CAE 42370821910015272). Three publicly available datasets are used—two ECG (Chapman and PTB-XL) and one CMR (ACDC)—to assess whether fine-tuning yields, clearer disease-related clusters, how demographic information (age, sex) influences the embedding space, and whether these refined representations remain robust when tested on new data. The selected ECG datasets consist of 12-lead recordings sampled at 500Hz with a minimum duration of 10 seconds. Rhythm conditions are especially well represented in the chosen ECG datasets. MRI dataset provides a structural and functional view of the heart, focusing on anatomical characteristics rather than electrical activity. Results and Conclusions: The quantitative results indicate that fine-tuning on pathology-rich datasets substantially increases silhouette scores (Chapman=436.75%, PTB-XL=2120.17%, ACDC increased from -0.117 ± 0.110 to 0.055 ± 0.106) suggesting more coherent clustering of arrhythmias and cardiomyopathies. Qualitative embedding analyses reveal the formation of subclusters for conduction abnormalities while showing limited imprint of demographic factors. Testing with an additional ECG dataset (PTB-XL) demonstrates satisfactory cross-domain alignment, although the small size of the ACDC dataset constrains CMR conclusions. These findings highlight that domain-adaptive fine-tuning can guide large-scale encoders toward clinically meaningful discriminations, without overtly amplifying demographic biases. A flexible, reproducible deep learning framework developed as part of this work facilitates further experimentation, including multimodal fusion and validation on larger, more diverse cohorts. This approach offers a step toward robust transfer learning in cardiovascular imaging, enabling better generalization across patient populations and clinical environments.

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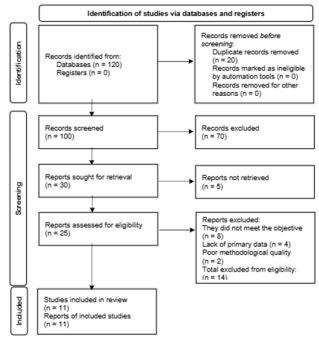
GEOGRAPHICAL INEQUALITIES IN CARDIOVASCULAR CARE IN THE BRAZILIAN AMAZON: TELEMEDICINE AS A STRATEGY FOR EQUITY IN REMOTE POPULATIONS — A SYSTEMATIC REVIEW

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Background/Introduction: Cardiovascular diseases are the leading cause of global morbidity and mortality, with a disproportionate impact on rural and remote populations. In the Brazilian Amazon, factors such as vast distances, low population density, shortage of specialists, and structural limitations compromise access to diagnosis and treatment, contributing to worse clinical outcomes. Objectives: To analyze the impact of inequalities in access to cardiovascular care and to evaluate the role of telemedicine in expanding healthcare delivery to remote populations. Methods: Systematic review conducted in accordance with PRISMA 2020 guidelines, with searches performed in the PubMed, Scopus, Web of Science, and SciELO databases (2015–2025). MeSH/DeCS descriptors and free-text terms were combined using the Boolean operators AND, OR, and NOT: (“cardiovascular diseases” OR “heart disease”) AND (“telemedicine” OR “telehealth”) AND (“rural population” OR “remote areas”) AND (“health access”). A total of 120 studies were identified, of which 11 were included after eligibility assessment. Studies with primary data on access to cardiovascular care or telemedicine in rural/remote areas were included. Reviews, editorials, duplicates, and studies without relevant outcomes or involving urban populations were excluded. Methodological quality was assessed using the Newcastle-Ottawa Scale, with analysis of effect measures (RR and OR) and p < 0.05. Results and Conclusions: Among the included studies, 73% reported reduced access to specialized services, 64% longer time to diagnosis, and 55% higher incidence of adverse cardiovascular outcomes. In Brazil, more than 80% identified additional structural barriers, particularly in the Amazon region. Telemedicine interventions demonstrated a 22% reduction in the risk of hospitalization (RR = 0.78; 95% CI: 0.68–0.89; p < 0.01) and an 85% increase in access to specialists (OR = 1.85; 95% CI: 1.42–2.41; p < 0.001). Approximately 60% of the studies reported improvements in clinical follow-up. Despite these benefits, limitations related to connectivity, infrastructure, and professional training still restrict large-scale implementation. These findings reinforce telemedicine as an essential strategic tool to reduce inequities in cardiovascular health in remote regions.

PRISMA 2020 flow diagram for new systematic reviews which included searches of databases and registers only



Source: Authors, 2026.

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71

Table 1 – Characteristics of the studies included in the systematic review on telecardiology and inequalities in cardiovascular care in remote regions.

Article Title	Author/Year	Country	Study Design	Main Finding / Result
Effect of Telemedicine Interventions on Heart Failure Hospitalizations	Ribeiro et al., 2025	Brazil	Randomized clinical trial	Telemonitoring reduced hospitalizations due to heart failure
Telemedicine Support in Acute Coronary Syndrome Decision-Making	Rocon et al., 2025	Brazil	Observational	Teleconsultation supported clinical decision-making in acute coronary syndrome
Telehealth Support for Heart Failure Treatment in Brazil	Graever et al., 2025	Brazil	Mixed-methods study	Telemonitoring improved follow-up of heart failure patients
Tele-ICU Implementation in Northern and Northeastern Brazil	Dal Col et al., 2025	Brazil	Observational	Tele-ICU improved clinical support in regions with shortage of specialists
Telemedicine and Healthcare Access in Rural Brazil	Oliveira & Lima, 2023	Brazil	Qualitative	Reduced travel time for access to specialized care
Telecardiology Services in Rural India	Patel et al., 2021	India	Observational	Telecardiology expanded access to diagnosis in rural areas
Rural Disparities in Cardiovascular Health	Zhang et al., 2020	China	Population-based	Rural populations have lower access to cardiovascular care
Cardiovascular Disease in Rural Populations	Brown et al., 2020	Australia	Observational	Higher cardiovascular mortality in rural areas
Health Disadvantage in Rural Populations	Smith et al., 2021	Australia	Population-based	Geographic barriers affect access to healthcare
Cardiovascular Health in the Brazilian Amazon	Silva et al., 2022	Brazil	Epidemiological	Shortage of specialists in the region
Telehealth for Chronic Disease Management in Rural Areas	Ahmed et al., 2023	Africa	Observational	Telehealth improves chronic disease management

Source: Authors, 2026.

21141

HIGH REPERFUSION RATE AND LOW MORTALITY IN A STEMI NETWORK WITH LESS THAN 12 MONTHS OF OPERATION IN A RESOURCE-LIMITED REGION: A PROOF OF CONCEPT FROM NORTHEASTERN BRAZIL

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Background/Introduction: In the Brazilian public health system (SUS), national registries report 30-day mortality from ST-elevation myocardial infarction (STEMI) of 11.9% to 15.0% and reperfusion rates of 40% to 67%, with wide regional variability and the worst indicators concentrated in the North and Northeast regions. The feasibility of structured telemedicine-coordinated STEMI networks in this context remains poorly documented. Objectives: To describe the outcomes of a telemedicine-coordinated regional STEMI network during its first 10 months of operation, positioning the findings as a proof of concept for formal evaluation and scalability of the model. Methods: Prospective registry of consecutive STEMI patients admitted between June 2025 and April 2026 across eight emergency units without percutaneous coronary intervention (PCI) capability, integrated with a single 24/7 primary PCI reference center. Platform activation was restricted to suspected STEMI cases; patients without qualifying criteria were not enrolled, characterizing a population defined by system activation. Diagnosis was confirmed remotely by a cardiologist via real-time electrocardiogram analysis. Descriptive analysis without risk adjustment. External benchmarks (VICTIM, RESISST, ACCEPT, EORP STEMI) were used as contextual references, not as adjusted comparisons. Results and Conclusions: A total of 168 patients were included (age 60.7±13.0 years; 73.8% male). Reperfusion rate: 79.8% (primary PCI 70.8%, pharmacoinvasive strategy 1.8%, fibrinolysis alone 7.1%). In-network mortality: 3.0% (5/168), with 2.2% among reperfused and 7.4% among non-reperfused patients. For contextual reference, Brazilian SUS registries reported 30-day mortality of 11.9% to 15.0% and reperfusion rates of 40% to 67% in populations without structured STEMI networks, with regional data from the Northeast derived from the ACCEPT registry. Within less than 12 months of operation, a telemedicine-coordinated STEMI network in a resource-limited region demonstrated operational feasibility, with reperfusion and mortality outcomes that justify formal evaluation in risk-adjusted studies with long-term follow-up. These findings support the hypothesis that telemedicine can enable effective STEMI networks and expand access to reperfusion in low- and middle-income settings.

20809

HIGH REPERFUSION RATE IN A TELEMEDICINE-COORDINATED STEMI NETWORK IN A RESOURCE-LIMITED REGION OF NORTHEASTERN BRAZIL: A 10-MONTH REGISTRY

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Background/Introduction: Regional networks for ST-elevation myocardial infarction (STEMI) management remain insufficiently implemented in resource-limited settings. Telemedicine platforms represent a promising strategy for diagnostic integration and care flow activation in contexts with restricted access to percutaneous coronary intervention (PCI). Objectives: To describe the first 10 months of operation of a telemedicine-coordinated regional STEMI network, evaluating reperfusion rates, system delays, and in-network mortality. Methods: Retrospective observational study with prospective registry of consecutive patients admitted between June 2025 and April 2026 across eight emergency units without PCI capability, integrated with a single 24/7 primary PCI reference center. Telemedicine platform activation was restricted to suspected STEMI cases. Diagnosis was confirmed by a remote cardiologist via real-time electrocardiogram analysis. Reperfusion was defined as PCI or fibrinolysis. Results and Conclusions: A total of 168 patients were included (age 60.7±13.0 years; 73.8% male). Comorbidities: hypertension 49.1%, diabetes 30.1%, smoking 11.0%. Reperfusion was performed in 134 patients (79.8%): primary PCI 119 (70.8%), pharmacoinvasive strategy 3 (1.8%), and fibrinolysis alone 12 (7.1%). Median door-to-ECG time was 10 min (IQR 2–33), with 50.3% achieving ≤10 min. Median symptom-to-door time was 134 min (IQR 60–260). Median door-to-transfer time in PCI patients was 133 min (IQR 111–196), with 33.3% within the 120-min target. In-network mortality was 3.0% (5/168): 2.2% among reperfused and 7.4% among non-reperfused patients. Implementation of a telemedicine-coordinated regional STEMI network proved feasible in a resource-limited setting, achieving a reperfusion rate of 79.8% and in-network mortality of 3.0%. Pre-hospital delay and door-to-transfer time represent the main targets for system improvement.

21222

IMPACT OF TELEHEALTH INTERVENTIONS ON ORAL ANTICOAGULATION INDICATION AND MANAGEMENT: A SYSTEMATIC REVIEW AND META-ANALYSIS OF EFFICACY AND SAFETY OUTCOMES

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Background/Introduction: Anticoagulation is essential for primary and secondary prevention of thromboembolic events in patients with atrial fibrillation. In this context, telehealth has the potential to improve indication, management and access to care. Objectives: To synthesize the safety and efficacy of telehealth strategies in the indication and management of oral anticoagulation in patients with cardiovascular disease. Methods: A systematic review using five databases up to January/2026 was conducted. Eligible studies included randomised clinical trials evaluating the use of telehealth in anticoagulation indication or management versus usual care. Efficacy outcomes included change in the proportion of eligible patients receiving therapy, mortality, thromboembolic events and quality of anticoagulation (time in therapeutic range [TTR] of patients using warfarin), while major bleeding events were the safety outcome. Study selection and data extraction were conducted independently by two reviewers. Inconsistencies were solved by a third. Analyses were conducted in R software (meta, version 8.0-2). Effect measures were relative risk (RR) and mean difference (MD), with 95% confidence intervals. Heterogeneity was assessed using the inconsistency measure (I^2). Results and Conclusions: Our search identified 13,177 studies. After removing duplicates and screening, 49 clinical trials were selected and evaluated (124,572 patients, with 43% men and the average age 68 years-old). Of those, 11 referred to the use of telehealth to indicate anticoagulation, and 38 were about the use of telehealth in the management of oral anticoagulants. Telehealth was associated with an increase in the proportion of eligible patients receiving anticoagulant therapy (Δ= 0.02, 95%-CI [0.01; 0.03], I2 80.2%), and an increase in TTR (MD 5.1, 95%-CI [2.42; 7.78], I2 95.6%) in those using warfarin, when compared to control. No differences were observed regarding thromboembolic events (RR 0.91, 95%-CI [0.79; 1.04], I2 0%), in the mortality risk (RR 0.94, 95%-CI [0.85; 1.03], I2 11.8%) and major bleeding risk (RR 0.92, 95%-CI [0.77; 1.09], I2 13.1%). Telehealth may increase the proportion of patients using oral anticoagulants and the management of these medications, without increasing major bleeding risk or mortality.

21309

INTERPRETABLE XGBOOST WITH MORPHOLOGICAL AND RHYTHM FEATURES FOR ARRHYTHMIA CLASSIFICATION IN SINGLE-LEAD ECG: INTER-PATIENT VALIDATION PER AAMI EC57

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Background/Introduction: Automated beat-level arrhythmia classification from single-lead ECG holds significant clinical potential for wearable cardiac monitoring. However, most published models rely on intra-patient splits that inflate performance metrics and lack the interpretability required by cardiac monitoring software regulations. Objectives: To develop and evaluate an automated machine learning model for beat-level arrhythmia classification from single-lead ECG recordings, aiming to support future implementation in wearable and ambulatory cardiac monitoring systems. Methods: The MIT-BIH Arrhythmia Database (48 recordings, ~100,000 annotated beats) was used. An inter-patient split following the AAMI EC57 protocol was applied (DS1: 22 patients for training; DS2: 22 patients for testing — no overlap). Signals were preprocessed with a zero-phase Butterworth filter (0.5–40 Hz) and resampled to 130 Hz. One-second windows were extracted centered on each R-peak and z-score normalized. Two models were compared: a 5-block 1D Convolutional Neural Network (1D-CNN) trained with class-weighted cross-entropy loss, and an XGBoost classifier trained on 28 features (24 morphological + 4 RR interval features), with SMOTE oversampling applied to minority classes. SHAP values were computed for interpretability analysis. Results and Conclusions: XGBoost achieved F1-macro = 0.54 versus 0.45 for 1D-CNN across four AAMI beat classes (N/S/V/F). For clinically critical ventricular ectopic beats (class V), XGBoost reached F1 = 0.94 compared to 0.78 for 1D-CNN. RR interval features drove a 55% relative improvement in supraventricular classification (F1-S: 0.10 → 0.17). SHAP analysis identified QRS amplitude and morphological asymmetry as the primary discriminators for ventricular beats, and RR interval ratio as the dominant feature for supraventricular premature beats — consistent with established clinical electrophysiology criteria. An interpretable XGBoost model with morphological and rhythm features outperformed 1D-CNN for single-lead ECG arrhythmia classification under rigorous inter-patient conditions. SHAP-based explanations aligned with standard clinical criteria for arrhythmia recognition, supporting regulatory transparency for cardiac monitoring software.

19897

LIFE-COURSE SOCIAL GRADIENTS IN CARDIOVASCULAR AGING: EVIDENCE FROM AI-ESTIMATED ECG AGE IN THE ELSA-BRASIL

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Background/Introduction: Artificial intelligence applied to 12-lead electrocardiograms (ECGs) enables the estimation of biological age (ECG-age), a biomarker of cardiovascular aging associated with increased risk of cardiovascular events and mortality. Individuals in disadvantaged socioeconomic positions (SEP) and exposed to adverse social conditions tend to experience accelerated aging; however, the relationship between these determinants and ECG-age remains poorly understood. Objectives: To investigate the association between race/skin color, racial discrimination, and socioeconomic position (SEP) across the life course—including accumulation of disadvantage and intergenerational social mobility—and accelerated ECG-age in participants from the ELSA-Brasil cohort. Methods: We included 13,592 participants with valid ECG data from the ELSA-Brasil baseline (2008–2010). The difference between ECG-age and chronological age (Δage) was calculated, and individuals were classified as having accelerated aging (Δage > 8 years) or normal/decelerated aging (Δage ≤ 8 years), based on the model's mean absolute error. Logistic regression models adjusted for age, sex, race/skin color, and study center were used to estimate odds ratios (OR) and 95% confidence intervals (95% CI). Results and Conclusions: The prevalence of accelerated ECG-age was 7.8%. After adjustment, lower maternal education in childhood was associated with higher odds of accelerated ECG-age, particularly among participants whose mothers had incomplete primary education (OR=1.21; 95% CI: 1.02–1.43) or no formal education (OR=1.37; 95% CI: 1.09–1.73). In adulthood, lower educational (high school: OR=1.44; 95% CI: 1.23–1.69; primary education: OR=1.45; 95% CI: 1.14–1.82), lower occupational class (middle: OR=1.32; 95% CI: 1.12–1.55; low: OR=1.52; 95% CI: 1.26–1.83), and routine manual occupations (OR=1.28; 95% CI: 1.06–1.53) were also associated with the outcome. Accumulation of disadvantage (OR=1.47; 95% CI: 1.12–1.92) and unfavorable intergenerational mobility patterns—both educational (downward: OR=1.50; 95% CI: 1.20–1.86; stable low: OR=1.51; 95% CI: 1.27–1.80) and occupational (stable low: OR=1.42; 95% CI: 1.17–1.73)—were associated with accelerated ECG-age. No associations were observed with sex, race/skin color, or racial discrimination. These findings indicate that socioeconomic disadvantage across the life course and unfavorable social trajectories are associated with accelerated cardiovascular aging, highlighting ECG-age as a sensitive marker of social inequalities.

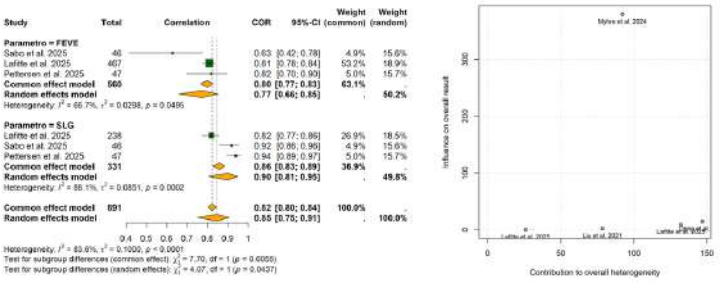
21388

PERFORMANCE OF FULLY AUTOMATED ARTIFICIAL INTELLIGENCE MODELS VERSUS EXPERTS IN THE MEASUREMENT OF EJECTION FRACTION AND STRAIN: AN ACCURACY META-ANALYSIS

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Background/Introduction: Echocardiographic assessment of Left Ventricular Ejection Fraction (LVEF) and Global Longitudinal Strain (GLS) is essential in cardiology but is subject to significant interobserver variability and is highly time-consuming. Fully automated Artificial Intelligence (AI) software based on Deep Learning promises to mitigate these issues. However, proving strict clinical non-inferiority to human experts requires rigorous validation, free from publication bias. Objectives: To evaluate the systematic bias (accuracy) and reproducibility of fully automated AI tools in measuring LVEF and GLS compared to the clinical gold standard (expert echocardiographers), while adjusting for potential publication biases in the medical literature. Methods: A systematic review and meta-analysis (PRISMA methodology) of recent clinical trials and external validation cohorts was conducted. Systematic bias was assessed by Bland-Altman mean difference (MD), and reproducibility by the Intraclass Correlation Coefficient (ICC), utilizing random-effects statistical models. Subgroup analysis compared performance across LVEF and GLS. Publication bias was analytically investigated via funnel plot asymmetry and corrected using the non-parametric Duval and Tweedie's trim-and-fill method. Results and Conclusions: In the primary analysis (n=5,140 patients across 5 studies), AI slightly underestimated measurements compared to humans (MD -0.99%; 95% CI: -1.86 to -0.12; p=0.024). This underestimation was primarily driven by LVEF (MD -1.63%), whereas GLS showed no significant systematic bias (MD -0.62%). Overall inter-method reproducibility was high (ICC 0.84) and statistically superior in GLS quantification (ICC 0.90) compared to LVEF biplane volumetry (ICC 0.77). Funnel plot assessment revealed strong literature asymmetry. Following mathematical correction for publication bias via the trim-and-fill method (imputing three theoretical studies), the underestimation bias completely disappeared (Adjusted MD 0.30%; 95% CI: -1.05 to 1.65; p=0.664). We conclude that fully automated AI algorithms are strictly non-inferior to expert echocardiographers, exhibiting exceptional precision in GLS calculation. The initial apparent underestimation reflects a publication failure in the literature (omission of overestimations) rather than a clinical algorithmic flaw.



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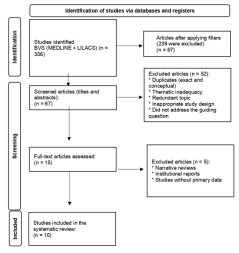
RETINA: THE WINDOW TO THE HEART. OCULOMICS AND ARTIFICIAL INTELLIGENCE IN THE PREDICTION OF CARDIOVASCULAR DISEASES — A SYSTEMATIC REVIEW

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Background/Introduction: Cardiovascular diseases require early risk detection strategies. The retina acts as a non- invasive biomarker of these alterations, and artificial intelligence has enhanced its predictive analysis. However, limitations remain that require further investigation. Objectives: To evaluate the potential of artificial intelligence applied to retinal imaging as a tool for early prediction and stratification of cardiovascular risk. Methods: Systematic review conducted in accordance with PRISMA 2020 guidelines, with searches performed in the Virtual Health Library (VHL), including the MEDLINE and LILACS databases, in March 2026. DeCS/MeSH descriptors were used with the AND operator: (“Retina” AND “Cardiovascular Diseases”), (“Retina” AND “Cardiovascular Diseases” AND “Artificial Intelligence”), and their Portuguese equivalents. Observational, diagnostic, or predictive studies involving artificial intelligence applied to retinal data correlated with cardiovascular risk were included. Reviews, editorials, case reports, duplicates, and studies without relevant data or without clear association were excluded. Study selection was conducted in three stages (titles, abstracts, and full texts) by independent reviewers. Methodological quality was assessed using the Newcastle-Ottawa Scale, and the level of evidence was classified according to the Oxford Centre for Evidence-Based Medicine (OCEBM), considering $p < 0.05$ Results and Conclusions: A total of 306 studies were identified, and 10 studies (2011–2023) were included after screening and application of eligibility criteria, with a predominance of cohort designs and the use of techniques such as OCT, OCT-A, and fundus photography. A consistent association was observed between retinal alterations and increased cardiovascular risk, including arteriolar narrowing, vascular tortuosity, and thinning of retinal layers. Quantitative measures indicated an increased risk of cardiovascular events (HR ≈ 1.11; OR ≈ 2.56), while better cardiovascular health was associated with a lower occurrence of retinopathy. Artificial intelligence models demonstrated good predictive performance (AUC ≈ 0.80–0.90), particularly in multimodal approaches. Oculomics combined with artificial intelligence appears promising as a non-invasive tool for early risk stratification. However, limitations such as methodological heterogeneity, lack of standardization, and absence of external validation restrict its immediate clinical application.

PRISMA 2020 flow diagram for new systematic reviews which included searches of databases and registers only



From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71

Table 1 - Characteristics of studies included in the integrative review on oculomics associated with artificial intelligence algorithms as predictors of cardiovascular diseases.

Article Title	Author/Year	Country	Study Design	Main Finding / Result
Retinal arteriolar tortuosity and cardiovascular risk factors in a multi-ethnic population study of 10-year-old children (SCAMP).	Owen CG et al., 2011	United Kingdom	Cross-sectional observational	Greater arteriolar tortuosity was associated with higher blood pressure, adiposity and adiposity, indicating early cardiovascular risk.
Artificial intelligence-driven retinal age as a single-layer to predict risks of mortality and cardiometabolic diseases.	Yang S et al., 2023	China	Cohort	Retinal nerve fiber layer patterns were associated with a higher risk of mortality and cardiometabolic diseases, with high predictive accuracy using AI.
Prediction of major adverse cardiovascular events from retinal, clinical, and genomic data in individuals with type 2 diabetes.	Mordi IR et al., 2021	India	Cohort	Integration of retinal, clinical and genomic data increased the accuracy of predicting major cardiovascular events in diabetic patients.
Cardiovascular disease diagnosis from DNA scan and retinal images using deep learning	Al-Absi HRH et al., 2022	Qatar	Cohort	Deep learning algorithms identified patterns associated with cardiovascular disease, with high diagnostic performance when imaging data were combined
Prognostic value of retinal vessel fractals and rate of retinal arteries in patients with end-stage chronic kidney disease	Faure C et al., 2021	France	Cohort	Increased wall-to-lumen ratio was associated with worse cardiovascular prognosis, reflecting systemic vascular remodeling.
Photoreceptor layer thinning as biomarker for circulatory premature mortality: UK Biobank cohort study.	Yusufu M et al.,2022	United Kingdom	Observational	Teleradiology expanded access to diagnosis in rural areas
Causal effects between retinal characteristics and cardiometabolic diseases: Mendelian randomization	Cui X et al., 2023	China	Mendelian randomization	Evidence of a causal relationship between retinal changes and cardiovascular diseases.
Association between cardiovascular health and retinopathy in US adults aged 2003-2008	Liu X et al., 2019	United States	Cross-sectional observational	Poorer cardiovascular health was associated with a greater prevalence of retinopathy in the general population
Progression of retinopathy and incidence of cardiovascular disease: CRIC Study	Grunwald JE et al., 2012	United States	Cohort	Progression of retinopathy was associated with a higher incidence of cardiovascular events over time.
Artificial intelligence-based prediction of cardiovascular risk factors from retinal swept-source optical coherence tomography-angiography	Germanese C et al., 2023	France	Cross-sectional observational	An AI model applied to OCT-angiography estimated cardiometabolic risk based on retinal microvasculature.

Source: Authors, 2026

20202

SIGNAL QUALITY MATTERS: IMPACT OF NOISE ON THE ACCURACY OF AI-DERIVED ECG AGE

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Background/Introduction: The electrocardiogram-derived age (ECG age) by artificial intelligence (AI) is a biological marker associated with cardiovascular risk, predicting higher mortality when the age is ≥8 years above the chronological age and lower mortality when it is ≤8 years below the chronological age. Despite its good performance and extremely relevant clinical findings, it is unknown whether ECG age maintains this performance on noisy ECGs, which are common in daily clinical practice (approximately 2%). Objectives: To evaluate the performance of AI-based ECG age estimation when applied to noisy 12-lead ECG recordings classified as uninterpretable due to technical interference. Methods: We analyzed noisy 12-lead ECGs from a large Brazilian telehealth network that were classified as uninterpretable due to technical interference by expert cardiologists. Only recordings from individuals aged 18 years or older were included. Signal-to-noise ratio (SNR) was calculated using the Noise Automatic Classification Algorithm (NACA) method. The deep neural network model proposed by Lima et al. was employed to predict ECG age. Results and Conclusions: A total of 572 ECGs were included; 57% were from females, with a mean age of 56 years. The mean SNR was 1.8. When applied to these recordings, the model exhibited markedly reduced performance, yielding a mean predicted ECG age of 61 years and a mean absolute error (MAE) of approximately 16 years, twice the error reported in the original study. Furthermore, the Pearson correlation between chronological age and predicted ECG age dropped to 0.30, compared with 0.70 reported by Lima et al., indicating a weaker association than the strong correlation previously reported in the literature. In conclusion, AI-derived ECG age estimation showed a systematic decline in accuracy when applied to low-quality ECGs. Although robust performance has been reported for high-quality recordings, reliability is substantially compromised in noisy ECGs. These findings underscore the critical importance of enforcing minimum signal quality criteria for the deployment of deep learning models in real-world clinical settings.

21174

TEMPORAL CHANGES IN AMI OUTCOMES FOLLOWING IMPLEMENTATION OF A STRUCTURED CHEST PAIN PROTOCOL: BASELINE DATA FOR THE SALVA CORAÇÃO STEMI NETWORK

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Background/Introduction: Structured AMI care networks supported by telemedicine have the potential to reduce cardiovascular mortality in resource-limited settings. In August 2024, a structured chest pain protocol was implemented across emergency units in São Luís (MA). Subsequently, in June 2025, a STEMI telemedicine network was launched under the Salva Coração Program, highlighting the need for pre-telemedicine baseline indicators for future impact assessment. Objectives: To describe temporal changes in AMI hospital indicators before and after implementation of a structured chest pain protocol, establishing baseline data for future evaluation of the Salva Coração STEMI telemedicine network. Methods: Ecological before-after study using data from the Brazilian Hospital Information System (SIH/SUS), municipality of São Luís, January 2022–May 2025, using the SIH/SUS category 'Acute myocardial infarction'. Two periods were compared: Phase 0 (pre-protocol: Jan/2022–Jul/2024, 31 months) and Phase 1 (post-protocol: Aug/2024–May/2025, 10 months). Outcomes: in-hospital mortality, hospitalization volume, and mean length of stay. The analysis is subject to uncontrolled temporal confounders and lacks risk adjustment. The SIH/SUS does not allow isolation of STEMI cases, potentially underestimating the impact of STEMI-focused interventions. Results and Conclusions: A total of 3,435 hospitalizations and 294 deaths were recorded. Phase 0: 2,282 hospitalizations, 204 deaths (mortality 8.94%; 73.6 admissions/month; mean stay 11.0 days). Phase 1: 1,153 hospitalizations, 90 deaths (mortality 7.81%; 115.3 admissions/month; mean stay 8.5 days). In-hospital mortality decreased by 1.13 percentage points (relative reduction 12.7%), alongside a 56.6% increase in monthly admissions and a 23.2% reduction in length of stay. Implementation of a structured chest pain protocol was temporally associated with reduced AMI mortality, increased hospitalization volume, and shorter length of stay in São Luís. These findings support continued implementation of the STEMI telemedicine network launched in June 2025 and establish the pre-telemedicine baseline for future evaluation of the Salva Coração Program. Further studies with analytical designs and risk adjustment are needed for better characterization of the program's impact.

18071

VALIDATION OF A DEEP LEARNING ALGORITHM FOR ATRIAL FIBRILLATION DETECTION USING A HOME SLEEP APNEA TEST COMPARED WITH HOLTER MONITORING IN HIGH-RISK PATIENTS

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Background/Introduction: Atrial fibrillation (AF) is common among patients with obstructive sleep apnea (OSA) and represents a major risk factor for stroke. However, early detection of AF remains a challenge. We developed a deep neural network (DNN) model to detect AF using pulse-to-pulse intervals (PPIs) derived from photoplethysmography (PPG) signals acquired during a home sleep apnea test (HSAT). Objectives: To validate a DNN algorithm against the clinical gold standard (12-lead Holter electrocardiography [ECG]) in a high-risk prospective cohort, and to assess agreement between ECG-derived RR intervals (RRIs) and PPG-derived PPIs. Methods: Consecutive patients with hypertrophic cardiomyopathy underwent simultaneous Holter monitoring (SEER™ 12, GE Healthcare, USA) and HSAT (Biologix Sleep Test®, Biologix Sistemas S.A., Brazil). The DNN was applied to both RRIs and PPIs, and AF classifications were compared with Holter annotations as the reference standard. Beat-to-beat correspondence between RRIs and PPIs was evaluated using positive predictive value (PPV), sensitivity, and F1-score, with a 150-ms matching tolerance. Heart rate (HR) agreement was assessed per second and per minute using Bland-Altman analysis (mean bias, 95% limits of agreement [LoA]) and Pearson correlation (r). Results and Conclusions: We analyzed 27 patients (age: 51±14 years; 63% male; body mass index: 28±5 kg/m²). Mild OSA was present in 52% (oxyhemoglobin desaturation index: 9.2±2.5 events/h). AF prevalence was 14.8% (4/27). At the patient level, the DNN's classifications from PPIs and RRIs were fully concordant with Holter annotations (23 non-AF, 4 AF), yielding 100% accuracy, sensitivity, and specificity. Beat-matching performance was strong: PPV=0.858 (95% CI: 0.854-0.861), sensitivity=0.816 (0.811-0.820), and F1-score=0.830 (0.826-0.835). Second-to-second HR agreement showed r=0.815, bias=1.77 bpm, and LoA=-12.19 to 15.72 bpm. Minute-level agreement achieved r=0.939, bias=1.45 bpm, and LoA=-5.97 to 8.87 bpm. The proposed deep learning algorithm demonstrated strong concordance with Holter monitoring, supporting its potential role in AF screening using HSAT.

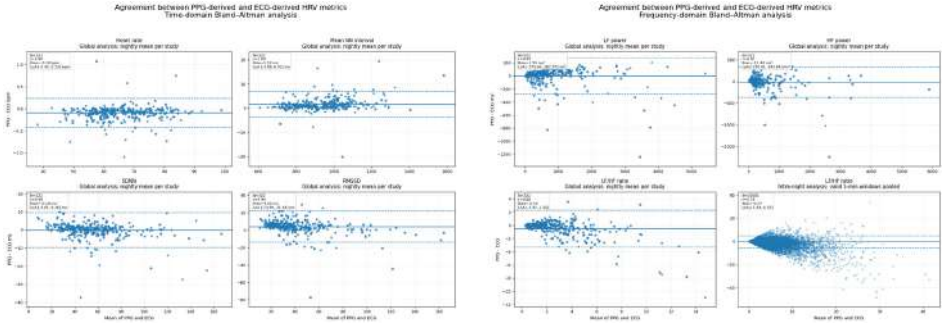
18632

VALIDATION OF HEART RATE VARIABILITY METRICS DERIVED FROM PHOTOPLETHYSMOGRAPHY IN HOME SLEEP APNEA TEST COMPARED WITH ELECTROCARDIOGRAPHY

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Background/Introduction: Heart rate variability (HRV) is an autonomic marker associated with sleep disorders and cardiovascular risk. Home sleep apnea tests (HSAT) based on photoplethysmography (PPG) enable prolonged acquisition of physiological signals, but require validation against the gold-standard electrocardiography (ECG). Objectives: To evaluate the agreement between HRV metrics derived from PPG-based HSAT and ECG obtained during simultaneous polysomnography (PSG). Methods: Patients simultaneously underwent full PSG with ECG (EMBLA N7000, Natus Medical; Alice 5, Phillips Respironics) and HSAT with PPG (Oxistar®, Biologix Sistemas). Overnight recordings were analyzed using a standardized protocol, including beat-to-beat synchronization, artifact exclusion, and segmentation into 5-minute windows, excluding wakefulness or segments with <80% valid coverage. Metrics included time-domain markers (heart rate, mean NN interval, SDNN, RMSSD) and frequency-domain markers (LF, HF, and LF/HF ratio). Global analysis used the nightly mean per study. Agreement was assessed using Pearson correlation (r) and Bland-Altman analysis (bias). An intra-night analysis was performed to evaluate temporal tracking of the LF/HF ratio, a marker of autonomic balance throughout the night. Results and Conclusions: A total of 322 patients were included (55±13 years; 53% male; body mass index: 30.6±5.7 kg/m²), totaling 20,005 valid 5-minute windows. In the global analysis, high agreement was observed for heart rate (r=1.00; bias -0.10 bpm) and mean NN interval (r=1.00; bias +1.52 ms). SDNN showed r=0.98 (bias -0.18 ms), while RMSSD showed r=0.94 (bias +4.03 ms). Among spectral metrics, LF showed r=0.99 (bias +1.30 ms²), and HF showed r=0.97 (bias -13.48 ms²). The LF/HF ratio showed strong agreement for the nightly mean (r=0.88; bias -0.53). In the intra-night analysis, the LF/HF ratio demonstrated stable temporal tracking, with a median correlation of 0.80 [0.62-0.91] and a median bias of -0.18 per study. HRV metrics derived from PPG showed high agreement with ECG, particularly for heart rate, mean NN interval, SDNN, LF, and HF. Despite greater variability in the LF/HF ratio, its performance remained consistent for both nightly mean and intra-night analyses. These findings support the use of PPG-derived HRV in autonomic assessment using HSAT.



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16549

EARLY INTEGRATION OF PALLIATIVE CARE IN ADVANCED HEART FAILURE: AN INTEGRATIVE REVIEW OF SHARED DECISION-MAKING

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Background/Introduction: Advanced heart failure (HF) remains a leading cause of morbidity and mortality, with five-year survival rates around 50%, comparable to advanced malignancies. Patients experience a severe symptom burden, yet palliative care (PC) remains significantly underutilized. Recent epidemiological data (2024-2025) indicate that fewer than 18% of eligible HF patients receive PC. In low- and middle-income countries (LMICs), such as Brazil, where the BREATHE registry shows 1-year readmission rates of 46.4%, delayed integration of PC compromises shared decision-making regarding advanced therapies, highlighting a critical gap between clinical guidelines and real-world practice. Objectives: To synthesize real-world evidence on the clinical impact of early PC integration on quality of life (QoL), symptom burden, and the adequacy of shared decision-making in patients with advanced HF. Methods: An integrative review was conducted analyzing observational studies, registries, and meta-analyses published between 2024 and 2026 across PubMed and Embase. The analysis focused on quantifiable outcomes related to QoL (measured by KCCQ), psychological distress (anxiety/depression), hospital readmission rates, and documented advance care planning (ACP) in advanced HF populations. Results and Conclusions: Analysis of recent pooled data, including a 2026 meta-analysis of 2,165 patients, demonstrated that PC integration significantly improves QoL (SMD=1.12, p=0.009) and alleviates anxiety and depression (p<0.0001). Real-world cohorts indicate that PC interventions reduce hospital readmissions (RR=0.70, p=0.02) without adversely affecting mortality (RR=1.29, p=0.28). Despite these benefits, observational data from 2025 reveal that even when PC is consulted, ACP documentation remains alarmingly low, with only 3% of patients completing advance directives. Early PC integration in advanced HF provides substantial symptomatic and psychological relief while decreasing healthcare utilization. However, systemic barriers persistently hinder its implementation and the formalization of shared decision-making. Addressing these gaps is imperative to ensure therapeutic adequacy and align medical interventions with patient values.

20157

EMPOWERING COMMUNITIES: SIGNIFICANT GAINS IN CONFIDENCE AND COMPETENCE FOLLOWING CPR TRAINING FOR NON-HEALTHCARE PROFESSIONALS IN PAKISTAN

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Background/Introduction: Out-of-hospital cardiac arrest survival rates are heavily dependent on immediate bystander Cardiopulmonary Resuscitation (CPR). In low-resource settings, equipping non-healthcare professionals with these skills is critical. this study evaluated the effectiveness of a CPR training program for laypersons in Pakistan. Objectives: To evaluate the effectiveness of a Cardiopulmonary Resuscitation (CPR) training program for non-healthcare professionals in Pakistan and assess its role in improving community preparedness for out-of-hospital cardiac arrest emergencies. Methods: A cross-sectional survey was conducted following a standardized CPR training course offered by Tabba Heart Institute under the Pakistan Life Saver Program (PLSP). From February to September 2025, a total of 164 non-healthcare professionals were trained. A post-training survey was administered to assess participant perceptions of the training's relevance, utility, and impact on their confidence and skills. Results and Conclusions: The post-training survey revealed an overwhelmingly positive reception of the CPR training program. An absolute majority of participants strongly agreed that the training content was relevant to their needs (110/164, 67.1%), with an additional 43 (26.2%) agreeing, bringing the total agreement to 93.3%. Furthermore, the training's perceived utility was exceptionally high, as 136 participants (82.9%) strongly agreed that it would be useful in their work, culminating in a 95.7% total agreement rate. The effectiveness of the course delivery was also confirmed, with 94.5% of respondents (116 strongly agreeing, 39 agreeing) affirming that the training objectives were met. Finally, the program successfully aligned with participant expectations, with 96.3% (127 strongly agreeing, 31 agreeing) reporting that the training met or exceeded their expectations, underscoring a high level of overall satisfaction.

21826

PROGNOSTIC FACTORS AND DIAGNOSTIC ACCURACY IN CONSTRICTIVE PERICARDITIS: MULTIMODAL INTEGRATION UNDER THE 2025 GUIDELINES

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Background/Introduction: Constrictive pericarditis is a restrictive syndrome resulting from the loss of pericardial elasticity, which leads to impaired ventricular filling. Although curable via pericardiectomy, diagnosis is often delayed due to a pathophysiology that mimics liver disease and other forms of heart failure. In light of the 2025 guidelines, inflammatory phenotyping through advanced imaging methods has become the cornerstone for guiding personalized therapies and preventing progression to definitive constriction Objectives: To evaluate clinical traits, the precision of imaging exams and predictors of mortality in patients with constrictive pericarditis undergoing surgical treatment. Methods: A retrospective study analyzing 84 patients who underwent pericardiectomy between 2002 and 2015. Clinical variables (signs of right-sided heart failure), laboratory data (Hemoglobin, B-type natriuretic peptide, and C-reactive protein), and imaging findings (transthoracic echocardiography and cardiac magnetic resonance) were analyzed. Mortality prediction was determined by univariate analysis using the Cox proportional hazards model (p < 0.05). Results and Conclusions: The mean age of the sample was 44 years, with a male predominance (77.4%). Idiopathic etiology was the most prevalent (69.1%), followed by tuberculosis (21.4%). Clinically, signs of right heart failure predominated, such as jugular venous distention (89%), edema (89%), and ascites (62%). Cardiac magnetic resonance (CMR) showed higher diagnostic sensitivity (95.9%) compared to echocardiography (53.6%). The overall lethality rate was 10.7%. Risk factors associated with death included: anemia (Hb < 13 g/dL), atrial fibrillation, pulmonary hypertension > 55 mmHg, and elevated levels of C-reactive protein (>7.4 mg/dL) and B-type natriuretic peptide (> 157 pg/dL). Constrictive pericarditis manifests as right-sided heart failure with low B-type natriuretic peptide levels. CMR is the method of choice due to its high sensitivity. Prognosis is associated with inflammatory and hemodynamic markers. According to the 2025 updates, the integration of imaging and biomarkers is crucial for early phenotyping, allowing for steroid-sparing strategies (such as interleukin-1 inhibitors) and surgical optimization.

Variáveis da ressonância nuclear magnética cardíaca

Variáveis	Nº	%
Ressonância nuclear magnética		
Não fizeram	11	13,10%
Sugestiva de PC	70	95,80%
Não sugestiva de PC	3	4,10%
Realce pericárdico	14	19,20%
Realce miocárdico	9	12,30%
"Bouncing septal" (Ressalto septal)	64	87,60%
Dilatação aortocava	70	95,90%
Átrio esquerdo aumentado	58	79,50%
Função ventricular esquerda (%)		
mediana (mín – máx)	60	(25 – 82)
Espessamento pericárdico (mm)		
mediana (mín – máx)	5	(0 – 20)

Óbitos em pacientes com diagnóstico de pericardite constritiva segundo características demográficas, clínicas e laboratoriais.

Variáveis	Total	Óbitos	HR	IC 95%	p§
Óbito precoce*	-	6 (66,6%)	-	-	-
Sexo					98
Masculino	65	7 (10,7%)	Ref.	-	
Feminino	19	2 (10,5%)	98	0,20 – 4,75	
Idade (anos)					484
< 44	41	3 (7,13%)	Ref.	-	
≥ 44	43	6 (13,9%)	193	0,48 – 7,75	
Etiologia					626
Idiopática	58	7 (12,06%)	-	-	
Tuberculose	18	1 (5,55%)	-	-	
Pós-cirurgia cardíaca	5	1 (20,0%)	-	-	
Radioterapia	1	0	-	-	
Doença sistêmica	2	0	-	-	
Fibrilação atrial					5
Sim	29	6 (20,6%)	387	1,01 –16,23	
Não	55	3 (5,4%)	Ref.	-	
NYHA ≥ 2					1
Sim	68	7 (10,29%)	93	0,19 – 4,51	
Não	16	2 (12,5%)	Ref.	-	
Tempo sintomas(dias)†					356
< 24	28	5 (17,8%)	Ref.	-	
≥ 24	29	4 (13,7%)	51	0,12 – 2,13	
Tempo UTI ≥ 3 dias‡					454
Sim	28	3 (10,7%)	91	0,70 – 1,16	
Não	43	5 (11,6%)	Ref.	-	
Internação PO ≥ 10 dias					503
Sim	47	4 (10,8%)	54	0,14 – 2,05	
Não	37	5 (13,5%)	Ref.	-	
PSAP > 55 mmHg					46
Sim	8	3 (37,5%)	45	1,38 – 24,2	
Não	60	5 (8,3%)	Ref.	-	
Hemoglobina pré-op.					3
< 13 g/dL	33	8 (24,2%)	Ref.	-	
≥ 13 g/dL	33	0	0	-	
Proteína C Reativa					0
≥ 7,4 mg/dL	26	7 (87,3%)	85	1,04–69,33	
< 7,4 mg/dL	26	1 (3,8%)	Ref.	-	
BNP					11
≥ 157 pg/dL	32	7 (21,8%)	NP	-	
< 157 pg/dL	32	0	Ref.	-	

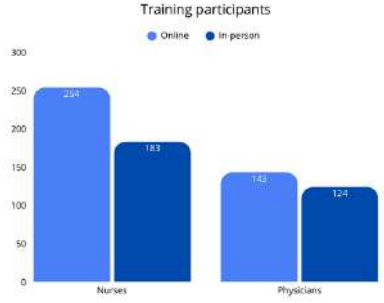
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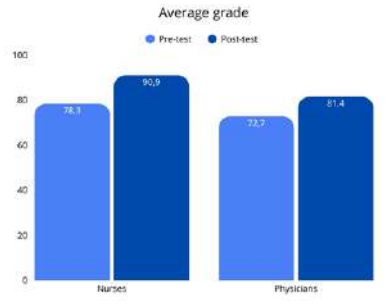
TRAINING OF PREHOSPITAL HEALTHCARE PROFESSIONALS AS A STRATEGY FOR IMPLEMENTING AN ACUTE MYOCARDIAL INFARCTION CARE PATHWAY IN BRAZIL

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Background/Introduction: Coronary artery disease remains a leading cause of mortality in Brazil. The implementation of structured care pathways is essential to ensure timely diagnosis and rapid myocardial reperfusion in acute myocardial infarction (AMI). In this context, prehospital care teams play a pivotal role, as they are often the first point of contact. Therefore, targeted training is a key component for the effective implementation of such public health strategies. Objectives: To describe and evaluate a training program for healthcare professionals as a strategy to support the implementation of an AMI care pathway within the Brazilian public health system. Methods: As part of a national initiative to implement an AMI care pathway, a structured educational intervention was conducted involving physicians and nurses from ambulance services in 2 Brazilian states. The training program was structured in 2 phases: (1) an online module, comprising theoretical content delivered via a digital platform, including educational materials and an evidence-based clinical guide developed by the project team; and (2) an in-person module, including lectures and five hands-on training stations. Clinical stations incorporated simulation techniques using case-based scenarios of patients with chest pain. Knowledge was assessed using identical pre- and post-tests based. Paired comparisons were performed using the paired t-test (significance level of 5%). Results and Conclusions: Among 444 eligible nurses and 197 physicians, 254 nurses (57.2%) and 143 physicians (72.6%) completed the online module. Of these, 183 nurses (72,1%) and 124 physicians (86,7%) attended the in-person training and completed the tests. Among nurses, mean test scores increased from 76.8±18.9 to 91.2±12.7 (p<0.001), and the most frequently incorrect answer was related to patient care during and after thrombolytic administration (16.9%). Among physicians, mean test scores increased from 73.5±17.6 to 85.9±13.1 (p<0.001), and the most frequent incorrect answer involved a clinical case about the initial management of atypical chest pain and the interpretation of an electrocardiogram (86,3%). In conclusion, the observed improvement in test scores suggests that the training intervention was associated with increased knowledge related to AMI management in the prehospital setting. These findings support the role of structured training as a key component in the implementation of care pathways for AMI within public health systems.





16105

TRANSCULTURAL ADAPTATION AND VALIDATION OF THE SELF-CARE OF CORONARY HEART DISEASE INVENTORY (SC-CHDI) FOR BRAZILIAN PORTUGUESE IN PATIENTS WITH CORONARY ARTERY DISEASE

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Background/Introduction: Knowledge, treatment adherence, and daily self-care practices are essential for maintaining clinical stability among patients with coronary artery disease (CAD). The Self-Care of Coronary Heart Disease Inventory (SC-CHDI) is the only instrument that directly assesses self-care in CAD patients. Due to the importance of this tool, this study was proposed. Objectives: To perform the cross-cultural adaptation and clinical validation of version 3.0 of the SC-CHDI for Brazilian Portuguese. Methods: Methodological research that followed the steps of cross-cultural adaptation according to Guillemin; Bombardier; Beaton (1993) and validation. In the pre-test, the instrument was applied to 40 patients and in the validation to 230. To assess face and content validity, the content validity index (CVI) was used. For reliability, Cronbach's alpha and McDonald's Omega were used. For construct validity, confirmatory factor analysis was performed, and for criterion validity, Pearson's correlation was performed between the SC-CHDI and the Cardiovascular Risk Factors Knowledge Questionnaire (Q-FARCS). Project approved under number CAEE 67651823.7.0000.5327. Results and Conclusions: In the cross-cultural adaptation stages, the main changes involved terms or expressions to facilitate understanding and ensure cultural equivalence. The instrument was named ""Avaliação do Autocuidado para Doença Arterial Coronariana". In face and content validation, the instrument obtained a total CVI of 0.94. Cronbach's alpha for section B was 0.87 and McDonald's omega for section A was 0.8 and for section C 0.66. Pearson's correlation coefficient showed a weak correlation between the Q-FARCS and sections A (r=0.34) and C (r = 0.36) and a moderate correlation with section B (r = 0.59). Factor analysis demonstrated excellent fits (Section A - χ^2 (24, n= 230) = 32.403, p= 0.117, CFI = 0.996, TLI = 0.94, RMSEA = 0.03 (90% CI [0.000, 0.070]), P = 0.681 and SRMR = 0.04; Section B - χ^2 (17, n= 230) = 28.593, p= 0.003, CFI = 0.992, TLI = 0.986, RMSEA = 0.054 (90% CI [0.013, 0.088]), p= 0.380 and SRMR = 0.01; Section C - χ^2 (7, n= 230) = 7.510, p= 0.378, CFI = 0.997, TLI = 0.994, RMSEA = 0.018 (90% CI [0.000, 0.084]), p= 0.710 and SRMR = 0.036). The SC-CHDI was adapted for Brazilian Portuguese. The evaluation of its psychometric properties suggests that the instrument is valid for measuring the self-care of Brazilian patients with CAD in institutions with a similar profile.

Epidemiology and Health Policy / Global Health



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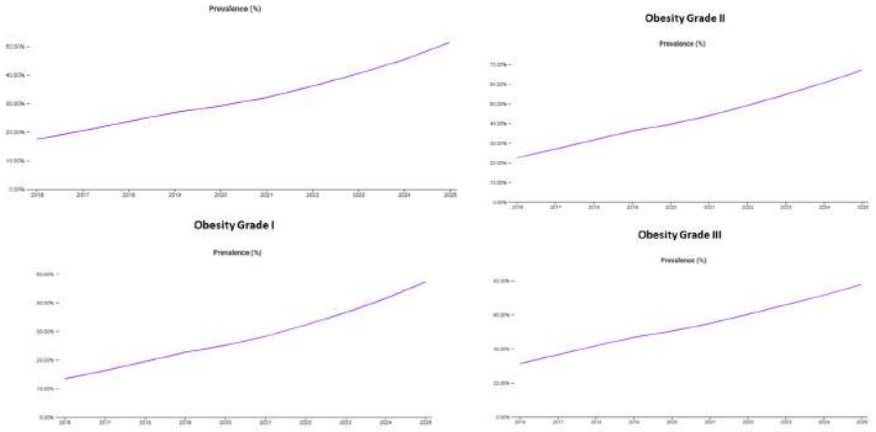


21276

10-YEAR TREND ANALYSIS OF THE OBESITY ICD-10 CODE UNDERREPORT IN PARTICIPANTS WITH CONFIRMED BODY MASS ≥30KG/M²: A REAL-WORLD STUDY.

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Background/Introduction: Background: It has been estimated that 1 billion people have obesity Worldwide. Despite considerable advancements in the pharmacological treatment in recent years, obesity is still an overlooked condition. Underreporting of obesity code may be high in patients with obesity, contributing to our understanding of the real burden of this chronic condition. Objectives: Objective: To evaluate the 10-year trend report of obesity ICD-10 code among participants with confirmed body mass index ≥30Kg/m2 in a large sample of adults. Methods: Methods: We conducted a retrospective cohort analysis using the TriNetX Global Health Research Network, based on anonymized electronic medical records. We identified all adult patients (>18 years) with at least 2 reports of a body mass index (BMI) ≥ 30 Kg/m2 from 2016 to 2025. We used the International Classification of Diseases, 10th edition code E66. We defined the frequency of obesity code reporting during the whole period and by year. Stratified analysis by sex, ethnicity, and grade of obesity was performed. Results and Conclusions: Results: A total of 15,301,768 participants were included in the analysis (59.6% females, 66% self-reported whites, mean BMI: 34.4± 6.5 Kg/m²). The overall prevalence of obesity code reports during the period was only 46.7%. We observed a progressive increase in the obesity report during the 10-year period (Figure 1). However, in 2025, nearly 50% of adults with at least 2 BMI ≥ 30 Kg/m2 remained without a formal obesity diagnosis. Stratified analysis revealed that men, Asians and obesity grade 1 had lower obesity code reports than their counterparts (Figure 2). Conclusion: Despite considerable improvements in the obesity code report in the last 10 years, around 50% remained underreported. Particular attention should be devoted to the subgroup of adults according to sex, ethnicity and grade of obesity. Underreporting obesity may undermine its management across the board, from public health policies to therapeutic inertia.

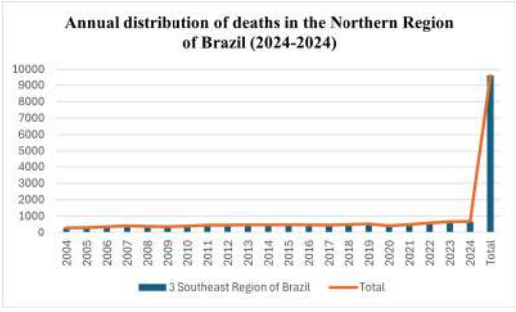
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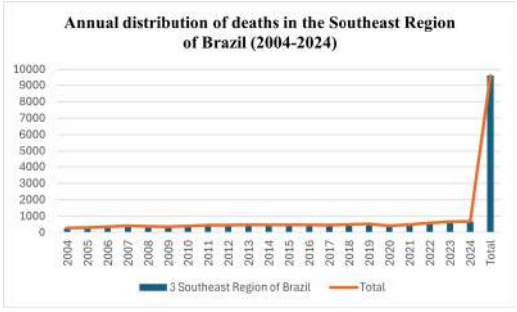
A COMPARATIVE STUDY ON MORTALITY FROM ACUTE AND SUBACUTE ENDOCARDITIS IN THE NORTH AND SOUTHEAST REGIONS OF BRAZIL (2004-2024)

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Background/Introduction: Endocarditis is an inflammation of the inner lining of the heart, known as the endocardium, with diverse etiologies, including bacterial and viral causes. The bacterial form is classified as acute or subacute, most commonly caused by Staphylococcus and Streptococcus, respectively. Treatment consists of antimicrobial therapy aimed at controlling infection and preventing systemic complications (KAMDE; ANJANKAR, 2022) Objectives: To comparatively analyze mortality due to acute and subacute endocarditis in the North and Southeast regions of Brazil over a 20-year period. Methods: This is a retrospective, quantitative epidemiological study of acute and subacute endocarditis cases (ICD-10: I33), based on data from the Mortality Information System (SIM/SUS), from 2004 to 2024. The mean mortality rate was calculated as the ratio between the number of deaths and the population, expressed per 100,000 inhabitants. Percentage variation was calculated as the relative difference between the highest and lowest values during the study period, divided by the lowest value and multiplied by 100. The rate ratio (RR) was used to assess the temporal trend, based on initial and final values. Other variables were analyzed using absolute frequencies (deaths by region/state, age group, and sex). Data were organized using Microsoft Excel™ Results and Conclusions: A total of 10,239 deaths were recorded, with 614 (5.9%) in the North and 9,625 (94.0%) in the Southeast, the mean annual mortality rates were 30.7 and 481.25 per 100,000 inhabitants, respectively. There was a percentage increase of 206.7% in the North (from 15 to 46 deaths) and 73.9% in the Southeast (from 387 to 673 deaths). The rate ratio indicated an increasing trend in both regions, with RR = 1.057 (5.7% increase) in the North and RR = 1.028 (2.8% increase) in the Southeast. The states of Pará (278; 2.7%) and São Paulo (5,188; 50.7%) showed the highest number of deaths. The most affected age group was 40-49 years in the North (90; 14.7%) and 50-59 years in the Southeast (1,680; 17.4%). Males were predominant in both regions, accounting for 403 (65.6%) in the North and 5,817 (60.4%) in the Southeast. The concentration of deaths in the Southeast may reflect population size and better reporting systems (NUNES MARINHO et al.,2025). Limitations include potential underreporting and inconsistencies in secondary data. The observed increase highlights the need for strengthened epidemiological surveillance and targeted public health actions.





19255

A DECADE OF SEX DISPARITIES IN HEART FAILURE OUTCOMES IN BRAZIL (2014–2025): A NATIONWIDE ANALYSIS

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Background/Introduction: Heart failure (HF) remains a leading cause of cardiovascular morbidity and mortality, placing a substantial burden on healthcare systems. Despite therapeutic advances, nationwide long-term temporal trends in sex-specific HF outcomes remain underexplored in Latin America. Objectives: The primary objective of this study was to investigate whether patient sex influences in-hospital mortality outcomes among individuals admitted with HF, analyzing a decade of nationwide trends in Brazil. Methods: An ecological time-series study (2014–2025) was conducted using the Brazilian Hospital Information System (SIH/DATASUS) and Census-adjusted demographic projections (IBGE). HF admissions were identified via ICD-10 (I50). Annual Percentage Change (APC) in hospitalization rates and in-hospital mortality was calculated using log-linear regression. Sex disparities were assessed via Relative Risk (RR) and chi-square tests ($p<0.05$). Results and Conclusions: A total of 2,428,167 HF hospitalizations were analyzed. Admissions steadily declined for both sexes (men: 115.2 to 106.3/100,000; women: 106.3 to 90.6/100,000). Paradoxically, in-hospital mortality increased, disproportionately affecting women. Female mortality rose from 10.1% to 12.1% (APC: +1.7%), whereas male mortality grew from 9.6% to 11.1% (APC: +1.6%). Overall, women exhibited a significantly higher risk of in-hospital death (RR 1.08; 95% CI 1.07–1.09; $p<0.001$), despite lower admission volumes. Brazil faces a critical paradox of declining HF hospitalizations and rising in-hospital mortality, predominantly among women. This trend is partially influenced by statistical denominator adjustments following the 2022 Census, as well as the 2020-2021 COVID-19 pandemic, which drastically reduced routine admissions while exacerbating lethality among hospitalized HF patients. A primary limitation is the reliance on administrative data, precluding the adjustment for major clinical confounders such as left ventricular ejection fraction and individual comorbidities. Nonetheless, these findings underscore an urgent need to investigate female-specific gaps in HF care and disease severity.

15988

ACUTE MYOCARDIAL INFARCTION IN EMERGENCY CARE: TRENDS AND MORTALITY IN BRAZIL AND GERMANY (2010–2022)

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Background/Introduction: Acute myocardial infarction (AMI) remains one of the leading causes of death worldwide and a central challenge in emergency cardiovascular care. Survival and long-term outcomes after AMI are highly dependent on early recognition, rapid access to emergency services, timely reperfusion therapy, and the organization of integrated care networks. Objectives: To compare Brazil and Germany regarding mortality associated with acute myocardial infarction, analyzing temporal trends from 2010 to 2022, sex differences, and health-system factors related to emergency care and access to reperfusion therapy. Methods: This retrospective, ecological, comparative study evaluated population-level mortality from acute myocardial infarction in Brazil and Germany between 2010 and 2022. Data were obtained from international mortality estimates reported by the World Health Organization and complemented by evidence from the Global Burden of Disease (GBD) framework and national cardiovascular statistics. Mortality rates were age-standardized and expressed per 100.000 inhabitants. Temporal trends were assessed descriptively. Sex-specific mortality patterns were analyzed when available. Differences in emergency care organization were discussed based on published data on reperfusion access, emergency medical services, and acute coronary syndrome networks. Results and Conclusions: Throughout the study period, both countries showed a decline in AMI mortality; however, Germany consistently exhibited lower mortality rates compared with Brazil. The reduction in mortality was more pronounced and stable in Germany, particularly in the earlier years of the series, reflecting widespread availability of percutaneous coronary intervention (PCI), efficient prehospital triage, and shorter door-to-balloon times. In Brazil, although AMI mortality declined over time, rates remained higher, with greater heterogeneity across regions. Mortality was higher among men in both countries. The persistence of higher mortality in Brazil suggests ongoing barriers to timely reperfusion, unequal access to catheterization laboratories, and delays in emergency presentation. Acute myocardial infarction mortality declined in both Brazil and Germany between 2010 and 2022; however, substantial disparities persist. Lower mortality in Germany underscores the impact of well-organized emergency cardiovascular systems and universal access to reperfusion therapy.

17407

ADMISSION SERUM POTASSIUM ABNORMALITIES ARE STRONG PREDICTORS OF 30-DAY MORTALITY IN HOSPITALIZED PATIENTS FROM LATIN AMERICA

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Background/Introduction: Dyskalemia is a frequent and potentially modifiable abnormality in hospitalized patients, yet data from Latin America (LATAM) remain scarce. Whether admission serum potassium levels can serve as an early predictor of short-term mortality in this population is not well established. Objectives: We aimed to evaluate the association between potassium disturbances at admission and 30-day mortality in a large LATAM cohort. Methods: We conducted a retrospective cohort study using the TriNetX global federated database, including 31 healthcare organizations from the LATAM Collaborative Network. Adults hospitalized between January 2016 and December 2025 with at least one major comorbidity (diabetes, hypertension, heart failure, or chronic kidney disease) and an available admission serum potassium measurement were included. Patients were stratified into four groups: ≤3.4 mmol/L (hypokalemia), 3.5–5.0 mmol/L (normokalemia), 5.1–5.9 mmol/L (hyperkalemia), and ≥6.0 mmol/L (severe hyperkalemia). Propensity score matching was performed for age, sex, and comorbidities. The primary endpoint was 30-day mortality. Results and Conclusions: A total of 14,883 patients were included. After matching, any deviation from normal potassium levels was associated with a significant increase in short-term mortality. Severe hyperkalemia conferred the highest risk of death (8.3% vs. 3.1%; RR 2.67; p<0.001), followed by hyperkalemia (5.8% vs. 2.9%; RR 1.97; p<0.001) and hypokalemia (5.0% vs. 2.8%; RR 1.74; p<0.001). A clear gradient of risk was observed across potassium strata, with progressively higher mortality at more extreme values. Admission serum potassium is a powerful and readily available predictor of 30-day mortality in hospitalized patients in Latin America. Both hypo- and hyperkalemia nearly double the risk of death, while severe hyperkalemia is associated with a near threefold increase. These findings position dyskalemia as an early, actionable biomarker of risk, underscoring the need for prompt recognition and correction as a potential strategy to improve clinical outcomes.

16953

AGE-SPECIFIC DIVERGENCE IN INFECTIVE ENDOCARDITIS MORTALITY IN BRAZIL: A NATIONWIDE JOINPOINT ANALYSIS, 2000–2019

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Background/Introduction: Infective endocarditis (IE) is associated with high morbidity and mortality, yet nationwide epidemiological trends in Brazil remain insufficiently characterized. Objectives: To assess temporal trends in IE-related mortality in Brazil from 2000 to 2019, focusing on age-specific patterns. Methods: Ecological time-series study using the Brazilian Mortality Information System. Deaths with mention of IE were identified from underlying or associated causes on death certificates. Age-standardized mortality rates (per 100,000 inhabitants) were calculated and stratified (0–29, 30–59, 60–79, ≥80 years). Temporal trends were analyzed using Joinpoint regression, estimating annual percent change (APC) and average annual percent change (AAPC) with 95% confidence intervals. Results and Conclusions: A total of 52,055 deaths with IE-related deaths were identified. Mortality increased markedly with age, reaching rates 9.3-fold higher than the national average in individuals ≥80 years and ~4-fold higher in those aged 60–79 years. Individuals aged 0–29 years had the lowest mortality (0.24/100,000), less than one-fifth of the national rate. Overall mortality showed a modest upward trend (AAPC: +0.74%; 95% CI: 0.32–1.11). Age-stratified analyses revealed heterogeneous patterns: mortality declined in individuals aged 0–29 years (AAPC: −2.53%; 95% CI: −3.20 to −1.86), remained stable in those aged 30–59 years, and increased in older groups (60–79 years: +1.75%; ≥80 years: +2.25%). Joinpoint analysis identified distinct inflection patterns across age groups. IE mortality in Brazil reveals a true age-specific divergence in mortality trends rather than a pattern driven solely by population aging. Increasing trends within older populations alongside sustained declines in younger groups suggest shifts in risk exposure, comorbidity burden, and disease profile. These findings support age-targeted strategies and reinforce the importance of stratified analyses to avoid misinterpretation of trends driven by population structure. Although based on administrative data subject to potential misclassification and reporting variability, the large-scale, nationwide nature of this analysis enables comprehensive assessment of temporal trends, providing evidence that would be challenging to obtain within the time frame of conventional prospective cohort studies.

21180

BURDEN OF ACUTE MYOCARDIAL INFARCTION HOSPITALIZATIONS AMONG YOUNG ADULTS IN BRAZIL, 2008–2025: A NATIONWIDE ANALYSIS

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Background/Introduction: Hospitalization rates for acute myocardial infarction (AMI) among young adults have been rising in high-income countries, but contemporary nationwide trends in Brazil remain incompletely characterized. Whether this pattern extends across all young adult age strata, sexes, and regions has not been systematically examined. Objectives: To characterize nationwide temporal trends in acute myocardial infarction (AMI) hospitalizations among young adults in Brazil from 2008 to 2025. Methods: We analyzed all hospital admissions with a principal diagnosis of AMI (ICD-10 I21–I22) among adults aged 20–49 years from Brazil's Hospital Information System (SIH-SUS), 2008 through 2025. Age-adjusted hospitalization rates per 100,000 adults aged 20–49 years were calculated by direct standardization using the 2022 Brazilian Census population as the reference. Temporal trends were assessed by linear regression of annual age-adjusted rates on calendar year, stratified by age group (20–29, 30–39, and 40–49 years) and sex; statistical significance of the annual slope was evaluated by two-tailed t-test, with P<0.05 considered significant. In-hospital case fatality rates and mean length of hospital stay were examined as secondary outcomes. Results and Conclusions: Between 2008 and 2025, hospitalizations for AMI among adults aged 20–49 years increased from 11,186 to 26,062 (+133.0%). The overall age-adjusted hospitalization rate rose from 13.9 to 24.9 per 100,000 (+79.2; R^2=0.90; P<0.001). Increases were observed across all three age strata and were most pronounced among adults aged 20-29 years (1.53 to 3.82 per 100,000; +149.1%; R^2=0.88; P<0.001), followed by 30-39 years (7.17 to 14.37; +100.4%; R^2=0.90; P<0.001) and 40-49 years (36.15 to 61.75; +70.8%; R^2=0.89; P<0.001). Absolute hospitalizations rose by 131.9% in men and 135.6% in women, with a stable male-to-female ratio of approximately 2.3:1. Despite the rising admission burden, in-hospital case fatality declined: among women aged 20–29 years, fatality fell from 7.5% to 2.4%, and from 5.6% to 2.7% among men aged 40–49 years. Mean length of hospital stay also shortened over the period. From 2008 through 2025, hospitalizations for AMI among young Brazilian adults more than doubled, with the steepest relative rise occurring in the youngest stratum (20–29 years). The paradox of markedly rising hospitalizations alongside declining in-hospital case fatality suggests improvements in acute care quality set against a growing underlying disease burden.

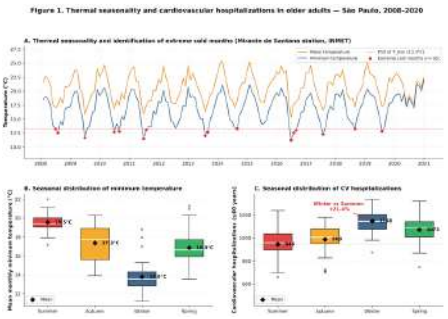
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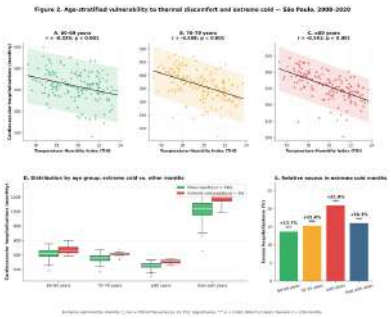
COLD SPELLS DRIVE A 21% SURGE IN CARDIOVASCULAR HOSPITALIZATIONS AMONG THE OLDEST OLD: A 13-YEAR TIME-SERIES IN SÃO PAULO, BRAZIL

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(1) UNIVERSIDADE ESTADUAL PAULISTA - BOTUCATU - SP - BRASIL; (2) UNIFUNEC - SANTA FÉ DO SUL - SP - BRASIL; (3) HAVARD T. CHAN SCHOOL PUBLIC HEALTH - UNITED STATES;

Background/Introduction: Climatic variability is a recognized cardiovascular risk factor, particularly in older adults. In São Paulo, the largest urban center in Latin America, few studies have quantified the effect of habitual seasonality and extreme cold events on emergency cardiovascular hospitalizations, stratified by age group. Objectives: To quantify the effect of thermal seasonality and extreme cold months on emergency cardiovascular hospitalizations among older adults residing in the city of São Paulo (2008–2020), with age stratification Methods: Ecological time-series study with monthly data from January 2008 to December 2020 (156 months). Meteorological variables from the Mirante de Santana station (INMET) were used to calculate Effective Temperature (ET), Discomfort Index (DI), and Temperature–Humidity Index (THI). Emergency hospitalizations for acute myocardial infarction, arrhythmias, and heart failure in adults ≥60 years were obtained from DATASUS/SIH-SUS, stratified into 60–69, 70–79, and ≥80 years. Extreme cold months were defined as those with monthly minimum temperature ≤ P10 of the series (≤13.3 °C). Analyses included Pearson's correlation and Welch's t-test. Results and Conclusions: A total of 162,028 emergency cardiovascular hospitalizations were recorded among older adults (mean: 1,039/month). Hospitalizations were negatively correlated with all thermal indices (r between −0.49 and −0.58; p<0.001), with the strongest association for minimum temperature (r=−0.58). Winter showed 21.4% more hospitalizations than summer (1,148 vs. 946/month). In 16 extreme cold months (all in June–August), there was a 16.1% excess in hospitalizations among adults ≥60 years compared to other months (1,186 vs. 1,022; p<0.001). Vulnerability increased with age: 60–69 years (+13.7%), 70–79 years (+15.4%), and ≥80 years (+21.0%; r=−0.58 with THI). These findings demonstrate that cold — not heat — is the main climatic driver of cardiovascular hospitalizations among older adults in São Paulo, with a clear age-dependent vulnerability gradient. Seasonal climate alerts should be incorporated into health surveillance, focusing on June–August and adults aged ≥80 years. Limitations include monthly aggregation and absence of adjustment for confounders such as air pollution; future analyses with daily data and DLNM are warranted.





21071

EPIDEMIOLOGICAL PROFILE OF HOSPITALIZATIONS AND MORTALITY DUE TO CONGENITAL HEART DISEASES IN YOUTHS, ADULTS, AND OLDER ADULTS IN BRAZIL: A TEMPORAL ANALYSIS FROM 2021 TO 2025

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Background/Introduction: Congenital heart diseases (CHD) are cardiac malformations present at birth, caused by alterations in embryonic development. They can range from asymptomatic cases to severe conditions requiring early intervention, being the most frequent congenital anomaly and an important cause of infant morbidity and mortality. Objectives: To compare the epidemiological profile of hospitalizations and mortality due to congenital heart disease in Brazil between 2021 and 2025, analyzing possible associations with sex, age group, number of deaths, and mortality rate. Methods: This analytical, descriptive, retrospective epidemiological study used data from the Brazilian Unified Health System Hospital Information System on hospitalizations and deaths due to congenital heart disease (ICD-10: Q20–Q28) from 2021–2025. Descriptive analyses, Shapiro-Wilk, Student's t-test, and chi-square (χ^2) tests were performed, adopting $p<0.05$ in SPSS. Results and Conclusions: Between 2021 and 2025, 102,438 hospitalizations and 5,879 deaths due to congenital heart disease were recorded in Brazil. The Southeast region concentrated the highest number of hospitalizations (42.4%) and deaths (37.6%), followed by the Northeast (27.5% and 25.4%). The highest incidence of hospitalizations occurred in children under 1 year old (46.6%), followed by the 1 to 4 year age group (15.9%) and the 5 to 9 year age group (7.7%). Regarding deaths, higher mortality was observed in children under 1 year old (73.4%). There was a statistically significant difference between age groups regarding hospitalizations and deaths ($p<0.001$), as well as a significant association between age and mortality ($p<0.001$), highlighting a greater impact of congenital heart disease on the pediatric population. In relation to sex, a slight predominance of hospitalizations was observed in females (50.8%), while deaths were more frequent in males (52.1%). Males had a higher average number of deaths ($p<0.001$), with a strong association between sex and death outcome ($\chi^2=5879.00$; $p<0.001$). Congenital heart disease constitutes a significant public health problem, especially in the first year of life, highlighting the need to strengthen prenatal care, expand early diagnosis, and improve neonatal and pediatric care within the health system to reduce hospitalizations and deaths.

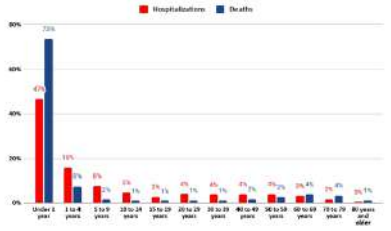


Figure 1 - Percentage of hospitalizations and deaths by age group with a diagnosis of congenital heart disease in Brazil from 2021 to 2025.

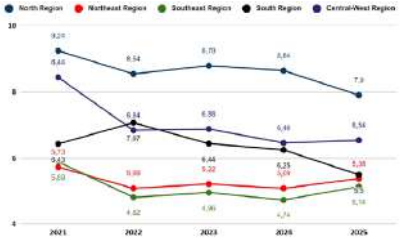


Figure 2 - Trend in the mortality rate from congenital heart disease in Brazil from 2021 to 2025.

16506

EPIDEMIOLOGICAL PROFILE OF HOSPITALIZATIONS FOR RHEUMATIC FEVER AND CHRONIC HEART DISEASE IN CEARÁ, BRAZIL: A 10-YEAR ANALYSIS (2015–2025)

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Background/Introduction: Rheumatic Fever (RF) and its main sequela, Chronic Rheumatic Heart Disease (CRHD), remain significant public health challenges in developing countries, directly reflecting socioeconomic vulnerabilities and failures in primary care. In Brazil, despite the decline in the incidence of infectious diseases, hospitalization rates for rheumatic complications remain significant, with a direct impact on the quality of life and work capacity of the young population. In the state of Ceará, the healthcare network organization and the local demographic profile impose specific challenges for disease control and adherence to secondary prophylaxis. Objectives: The present study aims to analyze the epidemiological profile of hospitalizations for RF and CRHD in Ceará between 2015 and 2025 to support regional surveillance strategies and clinical management. Methods: This is a descriptive, retrospective, and quantitative study based on data from the Information Technology Department of the Unified Health System (DATASUS/TABNET). The study population comprised patients hospitalized in the state of Ceará with primary diagnoses classified according to ICD-10 in groups I00-I02 (Acute Rheumatic Fever) and I05-I09 (Chronic Rheumatic Heart Diseases). The analysis period covered January 2015 to December 2025. The variables analyzed were: sex, age group, and color/race. Results and Conclusions: Hospitalizations for rheumatic fever and its sequelae in Ceará (2015-2025) reveal a bimodal profile. Analysis showed 56% of occurrences in females and 44% in males, a disparity that widens in chronic cases, possibly due to greater biological susceptibility and the search for valve repairs. The age distribution confirmed two critical peaks: 5-19 years (acute) and 30-59 years (chronic), with the presence of the elderly (60+). This scenario suggests failed control of pharyngotonsillitis in childhood, culminating in severe valvulopathies in productive adulthood. Regarding color/race, the predominance of Pardo (74%), followed by White (12%), Black (3%), and Asian/Indigenous (1%), reflects Ceará's demographics and the socioeconomic vulnerability associated with the disease. However, the 10% of ignored data points to a weakness in surveillance. The pathology imposes a high burden on the SUS, centered in hubs like Fortaleza. The transition from sick youth to disabled adults reinforces the urgency of policies prioritizing secondary prophylaxis and early diagnosis in primary care to break the rheumatic heart disease progression cycle.

15873

GEOGRAPHIC DISPARITIES IN ICU ACCESS, INTERMUNICIPAL TRANSFERS, AND IN-HOSPITAL MORTALITY IN ACUTE MYOCARDIAL INFARCTION: A COHORT STUDY IN SÃO PAULO, BRAZIL (2015–2025)

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Background/Introduction: In large middle-income countries such as Brazil, the uneven distribution of intensive care unit (ICU) beds can strongly influence how patients with acute myocardial infarction (AMI) are managed and their clinical outcomes. However, it is still unclear whether intermunicipal transfers interact with ICU availability at the receiving hospital to affect in-hospital mortality. Objectives: We tested the hypothesis that the effect of intermunicipal transfer on mortality in AMI patients varies according to the presence of ICU beds at the destination hospital, using data from São Paulo state. Methods: This retrospective cohort study analyzed 410,297 hospitalizations for AMI (ICD-10 I21 and I22) in São Paulo from 2015 to 2025, extracted from the SIH-SUS/DATASUS database. Intermunicipal transfer was defined as any distance >0 km between the patient's municipality of residence and the hospital. We performed multivariable logistic regression with a prespecified interaction term between transfer status and ICU availability at the destination. Adjusted predicted mortality probabilities were estimated, and geospatial analyses (including choropleth maps, flow mapping for transfers >50 cases, global Moran's I, and local LISA) were used to examine care flows and spatial clustering of adjusted mortality by municipality of residence. Results and Conclusions: Overall in-hospital mortality was 9.4%. ICU admission occurred in 39.2% of cases and intermunicipal transfers in 28.3%. Higher mortality was independently associated with age ≥65 years (OR 2.61; 95% CI 2.55–2.67), ICU admission (OR 1.50; 95% CI 1.47–1.53, likely due to indication bias), and lack of ICU in the municipality of origin (OR 1.09; 95% CI 1.04–1.14). Reperfusion therapy remained strongly protective (OR 0.31; 95% CI 0.30–0.32). There was a significant interaction between transfer and ICU availability at destination (OR 1.18; 95% CI 1.12–1.25; p<0.001). Adjusted mortality probabilities ranged from 7.99% in non-transferred patients in municipalities without ICU to 9.31% in those admitted locally to hospitals with ICU. Geospatial analysis revealed centripetal flows toward tertiary centers and clear spatial clustering of higher adjusted mortality by municipality of origin (Moran's I = 0.52; p<0.001), particularly in less structured regions. We conclude that geographic disparities in ICU access shape transfer patterns and influence in-hospital mortality in AMI through their interaction with the structure of the receiving hospital.

Tabela 1. Multivariable logistic regression for in-hospital mortality in patients with acute myocardial infarction (2015–2025)

Variables	P value	Adjusted OR	95% CI
Age (categorized)	<0.001	2.61	2.55–2.67
Gender	<0.001	0.82	0.80–0.84
Legal nature of institution	<0.001	1.11	1.09–1.13
Reperfusion	<0.001	0.31	0.30–0.32
ICU admission	<0.001	1.50	1.47–1.53
Municipality of origin	<0.001	1.09	1.04–1.14
Intermunicipal transfer	<0.001	0.90	0.85–0.94
Municipality of destination	<0.001	1.08	1.04–1.11
Interaction (Transfer × Destination)	<0.001	1.18	1.12–1.25

Note: AUC = 0.70, Brier score = 0.08, and calibration plot showed good agreement between predicted and observed probabilities, with no evidence of systematic deviation.

Figure 1A. Interaction between Transfer Status and ICU availability at destination

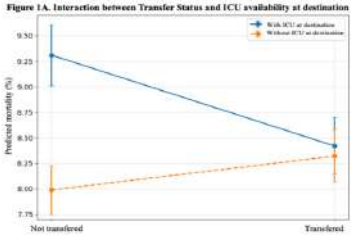


Figure 1B. Acute myocardial infarction death in intensive care units and intermunicipal flows in the state of São Paulo, 2015–2025 (flows >50 cases)

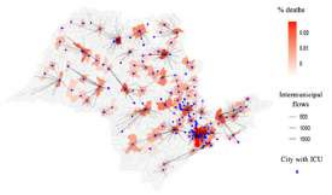
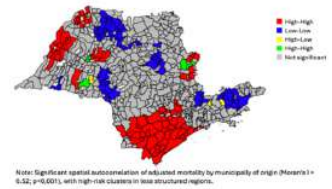


Figure 1C. Local spacial autocorrelation analysis (LISA) of adjusted mortality from acute infarction in municipalities of São Paulo State



Note: Significant spatial autocorrelation of adjusted mortality by municipality of origin (Moran's I = 0.52; p<0.001), with high-risk clusters in less structured regions.

18073

GEOGRAPHIC INEQUALITY IN CORONARY ANGIOPLASTY PROVISION FOR ACUTE MYOCARDIAL INFARCTION IN BRAZIL: A NATIONWIDE ECOLOGICAL TIME-SERIES STUDY, 2015-2025

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Background/Introduction: Acute myocardial infarction remains a major cause of cardiovascular morbidity and mortality and requires timely access to reperfusion therapy, particularly coronary angioplasty. In Brazil, nationwide analyses comparing the burden of myocardial infarction hospitalizations with the regional provision of interventional treatment remain scarce. Objectives: To assess regional inequalities in coronary angioplasty provision relative to acute myocardial infarction hospitalizations in Brazil from 2015 to 2025. Methods: Ecological time-series study using secondary data from the Brazilian Unified Health System Hospital Information System from 2015 to 2025. Hospitalizations for acute myocardial infarction, classified according to ICD-10, and coronary angioplasty procedures were analyzed nationwide and stratified by geographic region and year. The angioplasty-to-hospitalization ratio was used as an indirect indicator of the balance between care demand and interventional treatment supply. Ethics committee review was waived because only public, aggregated, non-identifiable data were used. Results and Conclusions: The national angioplasty-to-hospitalization ratio was 68.68% over the study period, with substantial regional variation. The South showed the highest mean ratio (101.16%), with peaks in 2017 and 2018, whereas the North had the lowest mean (43.26%) and a further decline in 2020. The Northeast remained persistently low, with a mean of 53.88%. The Central-West showed a declining trend, and the Southeast maintained an intermediate mean ratio of 64.95%, with yearly oscillations. These findings reveal persistent regional inequality in the provision of interventional cardiovascular care in Brazil. Although this metric does not account for clinical indication, timing, or angioplasty subtype, it highlights the need to strengthen regional cardiovascular care networks and expand equitable access to hemodynamic services.

16185

GLOBAL TRENDS IN CARDIOVASCULAR RISK FACTORS: A JOINPOINT ANALYSIS ACROSS WHO REGIONS (1990–2022)

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Background/Introduction: Cardiovascular disease (CVD) is largely driven by modifiable risk factors. However, less is known about how these risk factors have evolved over time across regions, and whether progress has been consistent. Understanding these trends helps to inform targeted prevention strategies and guide policy prioritisation across diverse health system contexts. Objectives: To examine temporal trends and quantify changes in prevalence of major CVD risk factors (diabetes, hypertension, cholesterol, physical activity, tobacco smoking) across the six World Health Organization (WHO) regions. Methods: We accessed noncommunicable disease risk factor data from the WHO Global Health Observatory, a comprehensive global database that compiles health indicators from 190+ countries. We extracted prevalence (%) estimates for key CVD risk factors from 1990 to 2022. Joinpoint regression analysis was used to calculate the annual percentage change (APC) for each segment and the average annual percentage change (AAPC) with 95% confidence intervals across the entire time trend. Results and Conclusions: Global trends in CVD risk factors showed a mixed pattern, with improvements in some areas while showing worsening trends in others. Favourable trends were observed for hypertension, tobacco use, and cholesterol. Hypertension prevalence declined in most regions between 1990 and 2019, with the greatest reduction in Europe (AAPC=−1.54, 95% CI: −1.55 to −1.53), although the Western Pacific showed a slight increase (AAPC=0.10, 95% CI: 0.08 to 0.12). Tobacco use decreased across all regions between 2000 and 2020, most markedly in South-East Asia (AAPC=−3.50, 95% CI: −3.56 to −3.43), from 54.1% to 26.6%. Total cholesterol declined modestly in several regions, but increased slightly in the Western Pacific (AAPC=0.25, 95% CI: 0.07 to 0.43). In contrast, diabetes prevalence increased across all regions between 1990 and 2022, highest increase in the Eastern Mediterranean (AAPC=2.58, 95% CI: 2.57 to 2.59) and lowest in Africa (AAPC=1.58, 95% CI: 1.55 to 1.61). Insufficient physical activity also increased in five regions between 2000 and 2022, Africa being the only exception (AAPC=−1.10, 95% CI: −1.19 to −1.01). Global trends in CVD risk factors were mixed. Rising diabetes prevalence and increasing physical inactivity signal ongoing and emerging challenges. These divergent patterns highlight the need for region-specific prevention strategies that address multiple risk factors and support sustained, system-level approaches to cardiovascular health.

Average Annual percent change (AAPC), 95%CI, and p-value for five risk factors among 6 WHO regions

WHO Region	Diabetes prevalence 1990-2022	Hypertension prevalence 1990-2019	Mean crude total cholesterol (mmol/l) 1990-2018	Insufficient physical activity prevalence 2000-2022	Tobacco smoking 2000-2020
Africa	1.58 (1.55 to 1.61)^	-0.26 (-0.27 to -0.25)^	0.085 (0.085 to 0.085)^	-1.10(-1.19 to -1.01) ^	-2.66(-2.84 to -2.48)^
Western Pacific	2.29 (2.26 to 2.32)^	0.10 (0.08 to 0.12)^	0.25 (0.07 to 0.43), p=0.005	1.15 (0.98 to 1.31) ^	-0.96 (-1.04 to -0.88)^
Americas	1.94 (1.92 to 1.96)^	-0.75(-0.77 to -0.73)^	-0.26 (-0.55 to 0.02), p=0.068	0.98 (0.93 to 1.02) ^	-3.05(-3.11 to -2.98^
South-East Asia	2.15 (2.13 to 2.18)^	-0.21 (-0.23 to -0.19)^	-0.05 (-0.05 to -0.05)^	3.32 (3.24 to 3.41) ^	-3.50(-3.56 to -3.43)^
Eastern Mediterranean	2.58 (2.57 to 2.59)^	-0.27(-0.29 to -0.25)^	-0.13(-0.43 to 0.16), p=0.384	1.46 (1.41 to 1.51) ^	-1.79 (-1.99 to -1.58)^
Europe	1.78 (1.76 to 1.80)^	-1.54 (-1.55 to -1.53)^	-0.38 (-0.40 to -0.36)^	-0.22 (-0.29 to -0.15)^	-1.55 (-1.64 to -1.46)^

^p<0.0001

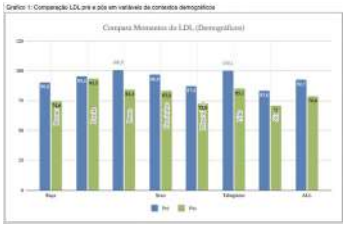
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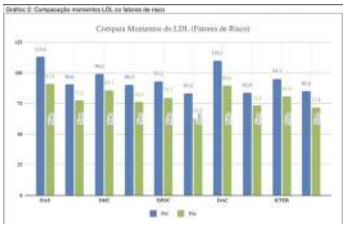
IMPACT OF INSTITUTIONAL EZETIMIBE PROVISION ON THE LIPID PROFILE OF PATIENTS WITH HIGH/INTERMEDIATE CARDIOVASCULAR RISK IN A TERTIARY CARDIOMETABOLISM OUTPATIENT CLINIC

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Background/Introduction: LDL-c reduction is the cornerstone of secondary cardiovascular prevention, with the relationship between low levels and the reduction of ischemic events being causal and dose-dependent. The Brazilian Society of Cardiology (SBC) guidelines establish strict targets for patients with this risk profile; however, the unavailability of ezetimibe in the National List of Essential Medicines (RENAME) of the Brazilian Unified Health System (SUS) imposes access barriers that compromise adherence and lipid control in this vulnerable population. Objectives: To evaluate the impact of direct outpatient dispensing of ezetimibe 10mg on the reduction of LDL-c levels and the successful achievement of therapeutic targets in these patients followed at a tertiary cardiometabolism outpatient clinic. Methods: A retrospective analytical study was conducted with adult patients using statins who received ezetimibe institutionally between August 2025 and February 2026. Paired demographic and laboratory data (pre- and post-intervention) were analyzed. The Wilcoxon test was used to compare means, the McNemar test for the proportion of targets, and Spearman's correlation. A 5% significance level was adopted. Inclusion criteria comprised patients ≥18 years old with prior statin use who received institutional ezetimibe 10mg and had LDL-c measurements available pre- and post-intervention. Exclusion criteria were incomplete medical records, medication suspension due to intolerance/adverse effects, and any record of poor adherence. Results and Conclusions: Results: The sample (mean age 66.8±1.2 years; 55.8% women) showed a statistically significant reduction in LDL-c, from an initial mean of 92.7 mg/dL to 78.8 mg/dL post-treatment (p < 0.001). The mean absolute Delta LDL was -13.9±3.7 mg/dL, representing a percentage drop of -11.5%. Patients who achieved the target post-intervention recorded a mean LDL-c reduction of -27.5% (p < 0.001). The intervention was decisive for clinical success: the rate of patients meeting the strict target (< 50 mg/dL) doubled, jumping from 22% to 45% (p < 0.001), with a significant association with comorbidities such as CAD, T2DM, and HTN (p < 0.001). Conclusion: The direct provision of ezetimibe at the tertiary level circumvents access barriers in the SUS, ensures adherence, and doubles the efficacy in achieving lipid targets. It is statistically proven that institutional access is the definitive strategy for effective cardiovascular protection in high-risk patients.







18069

IMPACT OF SOCIAL VULNERABILITY ON HEART FAILURE HOSPITALIZATIONS IN BRAZIL: A REGIONAL AND TEMPORAL ANALYSIS (2019–2025)

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Background/Introduction: Heart failure (HF) remains a major public health challenge in Brazil, accounting for a substantial burden of hospitalizations and healthcare costs within the Unified Health System (SUS). Although regional disparities are well documented, the relationship between social vulnerability and HF outcomes remains poorly defined. The Social Vulnerability Index (SVI) provides a multidimensional framework to assess these inequalities. This study explores the paradoxical relationship between social vulnerability and HF hospitalization rates, particularly during the post-pandemic recovery period. Objectives: To analyze temporal trends and regional disparities in HF hospitalizations in Brazil from January 2019 to April 2025, and to evaluate their correlation with SVI and Family Health Strategy (FHS) coverage across macro-regions. Methods: We conducted an ecological retrospective time-series study using data from the Brazilian Hospital Information System (SIH/DATASUS) between January 2019 and April 2025. Outcomes included HF hospitalizations, hospitalization rates per 100,000 inhabitants, in-hospital mortality, and mean costs, stratified by macro-region. These indicators were correlated with SVI (used as a proxy for regional social vulnerability) and FHS coverage rates. Spearman's rank correlation (ρ) and linear regression were applied. Given the ecological design, findings were interpreted at the population level. Results and Conclusions: Between 2019 and 2025, Brazil recorded over 1.2 million HF hospitalizations. A persistent regional paradox emerged: lower-SVI regions (South and Southeast) had higher hospitalization rates (e.g., South: 148.93/100,000), whereas higher-SVI regions (North and Northeast) showed lower rates but higher in-hospital mortality and case fatality, a disparity that intensified in 2024–2025. SVI was inversely correlated with hospitalization rates ($\rho = -0.75$; $p<0.05$) and positively correlated with in-hospital mortality ($\rho = 0.80$; $p<0.05$). Mean hospitalization costs increased by ~60%, reaching BRL 2,395.44 in 2024. HF hospitalization patterns in Brazil reveal a structural mismatch between healthcare utilization and outcomes. The inverse association between SVI and hospitalization rates likely reflects underdiagnosis and limited access to care in vulnerable regions, masking true disease burden. The post-pandemic rise in mortality and costs reinforces the need for strategies that address structural inequities and expand equitable access to cardiovascular care.

17752

MORTALITY FROM ISCHEMIC HEART DISEASE IN BRAZIL BEFORE, DURING, AND AFTER THE COVID-19 PANDEMIC

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Background/Introduction: The COVID-19 pandemic raised global concern about a potential sustained increase in cardiovascular mortality, whether through direct viral effects or through disruption of health care systems. Questions remain regarding a possible postpandemic legacy in the incidence of ischemic heart disease, including hypotheses of a prolonged effect after mass vaccination. Objectives: We aimed to evaluate the trajectory of mortality from ischemic heart disease in Brazil before, during, and after the pandemic, and to assess the presence of excess mortality and any persistent effect in the postpandemic period. Methods: We conducted an ecologic time-series study using data from the Brazilian Mortality Information System (SIM/DATASUS). Deaths with an underlying cause coded as ischemic heart disease (ICD-10 I20–I25) were retrieved, and annual crude mortality rates were calculated by sex and age group. Mortality rates (per 100,000 inhabitants) were standardized for age and sex by the direct method, using the 2020 Brazilian population as the reference. The study period was stratified into pre-pandemic (2010–2019), pandemic (2020–2022), and post-pandemic (2023–2024) phases. The average annual percent change (AAPC) was estimated by linear regression on the natural logarithm of the standardized rates, under a log-linear assumption over time. Results and Conclusions: Age- and sex-adjusted rates declined progressively during the pre-pandemic period, from 92.95 per 100,000 inhabitants in 2010 to 79.96 in 2019 (AAPC, −1.7%). During the pandemic, the downward trajectory was maintained, with rates of 72.04 in 2020, 73.60 in 2021, and 74.31 in 2022, with no evidence of a sustained increase relative to the historical pattern (AAPC, −2.3%). In the post-pandemic period, the decline continued, with rates of 70.46 in 2023 and 69.14 per 100,000 inhabitants in 2024 — the lowest values of the series (AAPC, −3.6%). As compared with the final pre-pandemic year (2019), the absolute reduction was approximately 13.5% by 2024. This pattern was consistent across both sexes. Mortality from ischemic heart disease in Brazil showed a continuous decline between 2010 and 2024, with no evidence of an increase during the pandemic or of an adverse legacy in the post-pandemic period. These findings suggest that, at the population level and after adjustment for age and sex, there was no excess cardiovascular mortality attributable to the pandemic or post-vaccination periods.

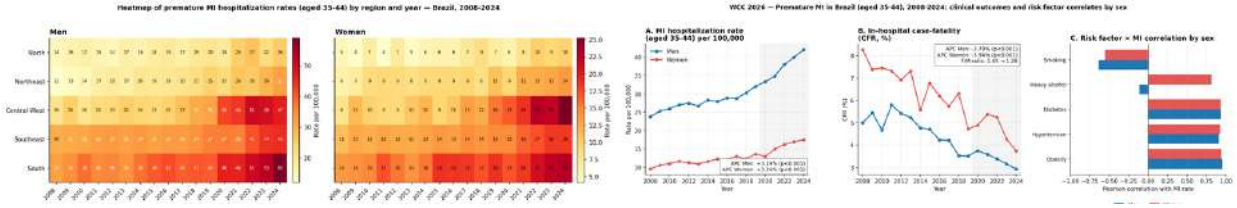
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OBESITY AND ALCOHOL AS CARDIOMETABOLIC AXES OF ACUTE MYOCARDIAL INFARCTION IN YOUNG BRAZILIAN ADULTS: A SEX-STRATIFIED ANALYSIS (2008-2024)

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Background/Introduction: Acute myocardial infarction (AMI) in Brazil is no longer a disease exclusively associated with aging: between 2008 and 2024, hospitalizations among adults aged 35 to 44 nearly doubled, while in-hospital case-fatality declined. Objectives: This divergent scenario, whose sex-specific dimensions and cardiometabolic correlates remained scarcely explored, motivated this study. Methods: This is an ecological time-series study, linking hospitalizations (ICD-10 I21-I22) and deaths from the Brazilian Hospital Information System (SIH-SUS), by sex and federative unit, with IBGE population estimates and annual sex-stratified prevalences of five risk factors (obesity, hypertension, diabetes, smoking, and heavy alcohol use) from Vigitel (except 2022). The annual percent change (APC) was calculated using log-linear regression, along with stratified Pearson/Spearman correlations and standardized β coefficients, comparing the pre-pandemic and pandemic subperiods. Results and Conclusions: The AMI hospitalization rate per 100,000 inhabitants rose from 23.74 to 42.01 in men (APC +3.19%) and from 9.58 to 17.48 in women (APC +3.24%), both p<0.001, with an approximately threefold acceleration after 2020. Conversely, in-hospital case-fatality fell from 5.00% to 2.94% in men and from 8.27% to 3.75% in women (APC ≈ −3.9%, p<0.001), narrowing — but not eliminating — the female disadvantage: the female-to-male case-fatality ratio declined from 1.65 in 2008 to 1.28 in 2024, with young women dying proportionally more often than men in every one of the 17 years analysed. Obesity was the strongest correlate in both sexes (r ≈ 0.95). Notably, however, the female prevalence of heavy alcohol use nearly doubled over the period (9.6% to 15.7%) and correlated strongly with the rise in female infarction rates (r=+0.81), while remaining silent in men (r=−0.11), consistent with recent evidence of greater female cardiovascular vulnerability to heavy episodic drinking. In standardized multivariate regression, obesity dominated in men (β=1.18); in women, obesity (β=0.66) and hypertension (β=0.42) contributed independently. Premature AMI in Brazil is not merely a growing problem, but a transforming one: while Brazil has achieved genuine gains in mortality, the accelerating incidence and persistent female disadvantage expose the limits of an approach still insufficiently differentiated by sex. Obesity consolidates as a universal therapeutic axis, while heavy alcohol use emerges as a distinctly female preventive target.



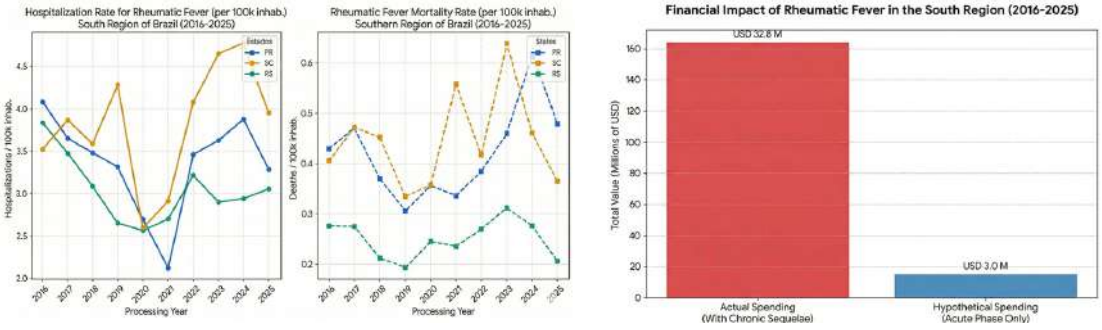
19720

PERSISTENT CLINICAL AND ECONOMIC BURDEN OF RHEUMATIC HEART DISEASE IN SOUTHERN BRAZIL DESPITE UNIVERSAL HEALTHCARE ACCESS

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Background/Introduction: Rheumatic fever remains a leading preventable cause of morbidity and recurrent episodes are the primary driver of progression to advanced Rheumatic Heart Disease (RHD). Despite its preventable nature, the prevalence of severe valvular lesions persists as a significant burden in middle-income settings. Southern Brazil provides a relevant scenario to assess the impact of disease recurrence and the frequency of late-stage presentations in a region with broad healthcare access. Objectives: To evaluate hospitalization patterns, mortality trends, and the economic impact of rheumatic fever and RHD in Southern Brazil between 2016 and 2025, thereby assessing whether healthcare availability has reduced the severe disease burden. Methods: A population-based study using the Brazilian Unified Health System database analyzed hospitalizations for acute rheumatic fever and chronic RHD in Southern Brazil from 2016 to 2025. Analyzed variables included admissions, in-hospital deaths, case-fatality rate, admission type, age distribution, and direct hospitalization costs. Additionally, all rates were standardized per 100,000 inhabitants. Results and Conclusions: A total of 11,995 hospitalizations were recorded, 63% as emergency admissions. More than 60% of this were urgent. By 2024, hospitalization rates reached 4.77 per 100,000 inhabitants in Santa Catarina. Indeed, Paraná presented nearly 8/100000 severe admissions annually, with the highest mortality rate as 0.62 per 100,000. There were 1,099 in-hospital deaths, increasing from 107 in 2016 to 140 in 2024. Overall case-fatality was 9,16%, reaching 11% in Paraná. Furthermore, hospitalizations increased with age, peaking at 60-69 years, consistent with cumulative valvular damage. Overall, rheumatic conditions represent ~1 in 250 cardiovascular hospitalizations, concentrated in advanced stages. Total costs exceeded USD 32 million, with >98% attributable to chronic RHD sequelae. Hospitalizations for chronic disease were ~11 times more expensive than acute episodes, accounting for most valvular expenditures. Conclusion: Despite universal healthcare availability, rheumatic fever and RHD remain persistent onerous in Southern Brazil. The predominance of emergency admissions, persistent mortality and concentration of costs in advanced disease suggest gaps in sustained secondary prevention and long-term care. Strengthening primary care follow-up and ensuring benzathine penicillin may reduce preventable late-stage burden and improve system efficiency.



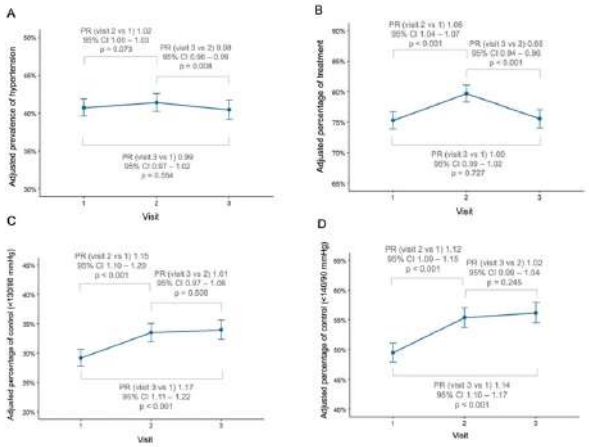
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PREVALENCE, PHARMACOLOGICAL TREATMENT, AND CONTROL OF HYPERTENSION: TRENDS OVER UP TO 11 YEARS OF FOLLOW-UP IN THE BRAZILIAN LONGITUDINAL STUDY OF ADULT HEALTH (ELSA-BRASIL)

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Background/Introduction: Hypertension is one of the main determinants of cardiovascular morbidity and mortality and has a high prevalence in the adult population. Although its relevance is widely recognized, studies assessing longitudinal trends in hypertension in Brazil are limited. Objectives: To describe changes in the prevalence, pharmacological treatment of hypertension, and blood pressure (BP) control (BP <130/80 mmHg or <140/90 mmHg) over up to 11 years of follow-up in the Brazilian Longitudinal Study of Adult Health (ELSA-Brasil). Methods: This prospective longitudinal cohort study included public servants from six Brazilian state capitals, using data collected during the first (2008–2010), second (2012–2014), and third (2017–2019) visits of the ELSA-Brasil study. Hypertension was defined as BP ≥140/90 mmHg or use of antihypertensive medication. Prevalence ratios and ratios for pharmacological treatment and BP control across visits, adjusted for sex, age, race/skin color, and educational level, were estimated using generalized estimating equations. Results and Conclusions: A total of 15,088, 13,949, and 12,289 participants were included in visits 1, 2, and 3, respectively. Crude hypertension prevalence rates were 36.0% (95% CI: 35.2%–36.7%), 41.0% (95% CI: 40.2%–41.8%), and 45.8% (95% CI: 44.9%–46.7%) at visits 1, 2, and 3, respectively. Adjusted analyses showed stability in prevalence between visits 1 and 3 (Figure 1-A). Between visits 1 and 2, there was an increase in the proportion of pharmacological treatment (Figure 1-B), concomitant with a significant increase in BP control (Figure 1-C and 1-D). Between visits 2 and 3, there was a reduction in the proportion of pharmacological treatment (Figure 1-B), with stability in BP control (Figure 1-C and 1-D). Between visits 1 and 3, there was no significant difference in drug treatment rates (Figure 1-B), but BP control improved significantly (Figure 1-C and 1-D). At the final visit, the crude rate of medication use was 80.4%; however, 38.1% and 61.2% of individuals did not achieve adequate BP control, considering the 140/90 mmHg and 130/80 mmHg thresholds, respectively. Conclusion: Over up to 11 years of follow-up in ELSA-Brasil, hypertension prevalence and pharmacological treatment rates remained stable, while BP control indicators improved. However, target attainment remains insufficient, underscoring the need for more effective implementation strategies.



16831

PROFILE OF COMORBIDITIES ASSOCIATED WITH PREVIOUS CARDIOVASCULAR EVENTS IN A RENAL SCREENING CAMPAIGN IN SERGIPE

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Background/Introduction: INTRODUCTION: The occurrence of cardiovascular events, such as acute myocardial infarction and stroke, is related to multiple comorbidities. These individuals often present several risk factors that are underdiagnosed and silently accelerate the cardio-renal decline, which justifies population screening strategies for proper management. Objectives: OBJECTIVE: To assess the metabolic, hemodynamic, and renal profiles of patients with previous cardiovascular events during the World Kidney Day campaign. Methods: METHODS: The activities took place in public squares in the cities of Aracaju, Nossa Senhora do Socorro, and Estância on March 13, 2025, where healthcare professionals conducted a cross-sectional screening study among the general population using the SCORED renal risk score. Demographic data and comorbidities reported in the questionnaire were collected. Individuals who scored ≥ 4 points were referred for creatinine measurement using a reagent strip–based point-of-care automatic analyzer. Systolic Blood Pressure (BP) ≥ 140 mmHg and/or diastolic BP ≥ 90 mmHg and capillary blood glucose > 99 mg/dL were considered altered. The Estimated Glomerular Filtration Rate (eGFR) was calculated using the CKD-EPI 2021 equation (without the race coefficient) and classified as follows: stage 1–2 (≥ 60 mL/min), stage 3a (45–59 mL/min), stage 3b (30–44 mL/min), stage 4 (15–29 mL/min), and stage 5 (< 15 mL/min). Results and Conclusions:). RESULTS: Among the 549 participants evaluated, 51 (9.3%) reported a history of cardiovascular events. The mean age of this group was 62.2 (± 12.7) years, and 60.8% were female. Among these patients, 92.2% reported arterial hypertension, 70.6% diabetes mellitus or prediabetes, and 27.5% heart failure. Additionally, 68.6% of patients presented altered capillary blood glucose, with an overall mean of 168.4 mg/dL and an average of 202.7 mg/dL among those with abnormal values. Regarding blood pressure, approximately 31.4% had uncontrolled levels, with a mean of 136.4/76.7 mmHg. Only 1.9% of patients had a previous diagnosis of CKD; however, the mean creatinine level was 2.83 mg/dL, and the mean eGFR was 62.6 mL/min. According to eGFR classification, 53.3% were in stages 1–2, 31.1% in stage 3a, 13.3% in stage 3b, and 2.2% in stage 4. CONCLUSION: The campaign identified a high prevalence of metabolic, hemodynamic, and renal alterations among patients with previous cardiovascular events, revealing frequent subclinical dysfunctions.

19783

SEASONAL VARIATION IN CARDIOVASCULAR MORTALITY AND HOSPITALIZATIONS IN BRAZIL: A NATIONWIDE TIME-SERIES ANALYSIS

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Background/Introduction: Seasonal cardiovascular variation is well established in temperate high-income settings, but national evidence from tropical and subtropical low- and middle-income countries remains limited. Objectives: To assess long-term trends and seasonal variation in cardiovascular mortality and in MI and stroke hospitalizations across Brazil's 27 federative units from January 2008 through December 2022. Methods: We conducted a nationwide ecological time-series study using monthly mortality data from the Mortality Information System and hospitalizations for myocardial infarction (MI) and stroke reimbursed by the Brazilian Unified Health System. Age-standardized mortality rates were calculated using the WHO world standard population. Long-term trends were estimated with Joinpoint regression and expressed as annual percent change (APC) and average annual percent change (AAPC). Seasonal patterns were modeled with generalized additive models. Results and Conclusions: National age-standardized mortality declined for overall cardiovascular disease (CVD; AAPC, −1.56%), MI (−1.25%), and stroke (−5.00%). After 2020, CVD mortality increased (APC, +3.57%; P<0.05), most markedly in the Southeast (+6.57%) and South (+6.16%). CVD and MI mortality peaked during May–August, with stronger seasonality in the South and Southeast and weaker or absent seasonality in the North and Northeast. Stroke mortality did not show a consistent seasonal peak. MI and stroke hospitalizations peaked from July to October and were lowest from February to April. The North had stagnant or worsening mortality trends and the lowest hospitalization rates. Cardiovascular outcomes in Brazil show clinically relevant seasonality and marked regional heterogeneity. Cool-season peaks were more evident in colder regions, whereas less favorable mortality trends and lower hospitalization rates in the North are consistent with persistent inequities in timely cardiovascular care. The post-2020 increase in mortality coincided with the COVID-19 period and supports climate-sensitive, equity-oriented cardiovascular planning.

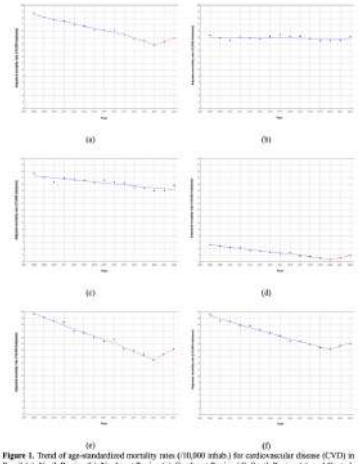


Figure 1. Trend of age-standardized mortality rates (/10,000 inhab.) for cardiovascular disease (CVD) in Brazil (a), North Region (b), Northeast Region (c), Southeast Region (d), South Region (e), and Central-West Region (f), from 2008 to 2022. APC represents the annual percent change.

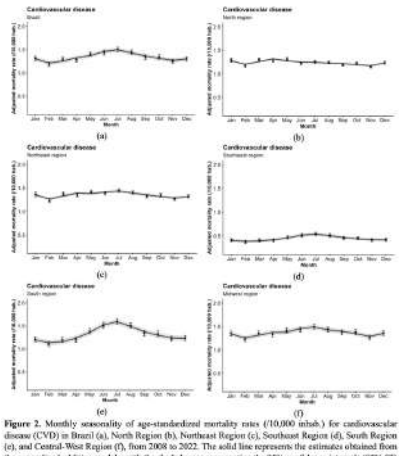


Figure 2. Monthly seasonality of age-standardized mortality rates (/10,000 inhab.) for cardiovascular disease (CVD) in Brazil (a), North Region (b), Northeast Region (c), Southeast Region (d), South Region (e), and Central-West Region (f), from 2008 to 2022. The solid line represents the estimates obtained from the generalized additive models, with the shaded areas representing the 95% confidence intervals (95% CI) of the estimates. The dots represent the actual estimates of mortality rates, with the segments representing the respective 95% CI.

17880

SOCIOECONOMIC AND REGIONAL INEQUALITIES AS INDEPENDENT DETERMINANTS OF DISABILITY RETIREMENT AFTER CORONARY ARTERY DISEASE IN BRAZIL: ANALYSIS OF 117,175 BENEFITS

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Background/Introduction: Functional outcomes and return to work after acute coronary events are closely related to time to myocardial reperfusion and access to structured cardiovascular rehabilitation. In Brazil, inequities in technological resources and socioeconomic disparities may influence long-term outcomes, contributing to progression from temporary disability to permanent retirement. Objectives: To evaluate geographic and socioeconomic factors as independent predictors of disability retirement due to ischemic heart disease in beneficiaries of the National Social Security Institute (INSS). Methods: Retrospective cross-sectional study based on administrative data from the INSS. Benefits related to ischemic heart disease (ICD I20–I25) granted between 2023 and 2026 were included, totaling 117,175 cases, covering sickness benefit and disability retirement. The outcome was disability retirement. Descriptive and bivariate analyses (chi-square, Student's t-test) were performed, followed by multivariate logistic regression including age, sex, initial monthly income (RMI), region, and insured category (urban vs. rural). Results are presented as odds ratios (OR) with 95% confidence intervals (95%CI). Lack of detailed clinical variables limits causal inference, as adjustment for disease severity, type of treatment, and rehabilitation access was not possible. Results and Conclusions: Disability retirement rate was 7.6%. Retired individuals were older (58.5 vs. 54.0 years) and had lower income (1.19 vs. 1.38 minimum wages; p<0.001). In multivariate analysis, age (OR 1.095; 95%CI 1.091–1.099) and lower income (OR 0.51; 95%CI 0.48–0.54) were the main predictors. Female sex was protective (OR 0.80; 95%CI 0.76–0.85). Higher risk was observed in the North (OR 1.58; 95%CI 1.42–1.76), Northeast (OR 1.34; 95%CI 1.26–1.42), and Central-West (OR 1.22; 95%CI 1.12–1.33) compared to the Southeast, with no difference in the South. Rural affiliation was not associated after adjustment. Permanent disability after ischemic heart disease in Brazil is strongly associated with socioeconomic and regional factors. Higher risk in the North, Northeast and Central-West regions and among lower-income individuals suggests a possible influence of structural inequalities in access to care and functional recovery, with relevant impact on the social security system. These findings highlight the need to expand cardiovascular emergency care networks and rehabilitation access, particularly in vulnerable regions, as strategy to reduce work disability.

Table 1 – Sociodemographic and economic characteristics of beneficiaries of sickness benefits and disability retirement due to ischemic heart disease (2023 – 2026).

Variable	Sickness benefit (n=108.267)	Disability retirement (n=8.908)	p-value
Age (years)			<0,001
Mean ± SD	54,0 ± 7,6	58,5 ± 6,2	
Median (IQR)	55 (11)	59 (7)	
Sex			0,001
Male	82.754 (76,4%)	6.944 (78,0%)	
Female	25.513 (23,6%)	1.964 (22,0%)	
Insured category			<0,001
Urban	101.144 (93,4%)	8.174 (91,8%)	
Rural	7.123 (6,6%)	734 (8,2%)	
Income (minimum wages)			<0,001
Mean ± SD	1,39 ± 0,64	1,20 ± 0,48	
Median (IQR)	1,08 (0,53)	1,00 (0,11)	
Region			<0,001
North	3.817 (3,5%)	440 (4,9%)	
Northeast	19.387 (17,9%)	2.015 (22,6%)	
Central-West	7.490 (6,9%)	700 (7,9%)	
Southeast	53.599 (49,5%)	3.972 (44,6%)	
South	23.974 (22,1%)	1.781 (20,0%)	

Values are presented as mean ± standard deviation or n (%). IQR = interquartile range. P-values were obtained using Studen t-test or Pearson's chi-square test.

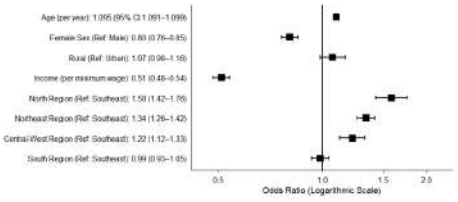


Figure 1. Multivariate analysis (Forest Plot) of factors associated with disability retirement after ischemic heart disease - 2023 to 2026

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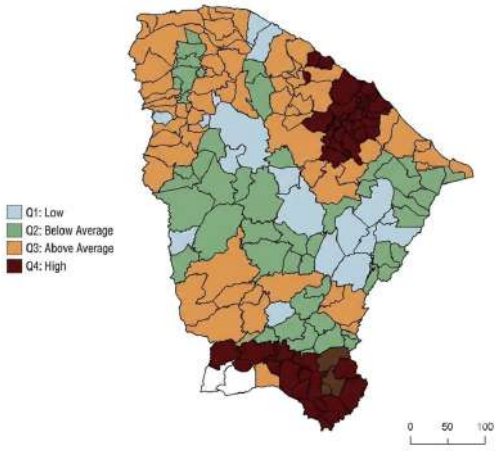
SPATIO-TEMPORAL ANALYSIS OF PREMATURE CARDIOVASCULAR MORTALITY IN CEARÁ (2014-2024)

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Background/Introduction: Cardiovascular diseases (CVD) are the leading cause of death globally and in Brazil, imposing a heavy socioeconomic burden on healthcare systems. When occurring prematurely in individuals of working age, the impacts are even more devastating. In the state of Ceará, mortality dynamics are non-uniform, influenced by a complex network of demographic, epidemiological, and socio-spatial factors. Understanding how these deaths are distributed across time and territory is essential for identifying vulnerable areas and guiding effective preventive and clinical actions. Objectives: This study aims to analyze the spatio-temporal patterns of premature cardiovascular mortality in Ceará from 2014 to 2024, identifying trends in rate evolution and mapping high-risk geographic clusters to support public health policies. Methods: An ecological and retrospective study was conducted on premature cardiovascular mortality (ages 30–69) in Ceará. Data were extracted from SIM/DATASUS (ICD-10, Chap. IX) and IBGE. Joinpoint regression was used to analyze temporal trends and calculate the Annual Percent Change (APC). Spatial analysis was performed by distributing standardized rates into quartiles, allowing for a visual comparison of the mortality burden across the state's Health Regions. Results and Conclusions: The analysis reveals an epidemiological transition marked by initial progress followed by recent setbacks. Between 2014 and 2019, a moderate downward trend in standardized mortality rates was observed, with an Annual Percent Change (APC) of -1.2%. This initial decline can be attributed to the expansion of Primary Health Care and access to hypertension and diabetes therapies. However, from 2020 onwards, the data indicate a slight reversal of this trend (APC = +0.5%), a phenomenon intensified by the impacts of the COVID-19 pandemic, including post-infection cardiovascular sequelae and the postponement of elective procedures and chronic disease monitoring. Spatially, the quartile distribution highlighted significant inequalities. The highest mortality rates were concentrated in the Fortaleza Metropolitan Area and Cariri region, which comprised the upper quartile. Despite greater technological support, these regions face a higher density of urban risk factors. The lower quartile, with lower rates, was predominantly located in the Sertão dos Inhamuns, possibly indicating underreporting. These findings reinforce the need to decentralize cardiovascular stabilization units to optimize emergency care outside major urban centers.

Figure 1: Spatial distribution of cardiovascular mortality in the state of Ceará by quartiles, 2015–2025.



Source: Prepared by the author (2026); data retrieved from DATASUS/TABNET.

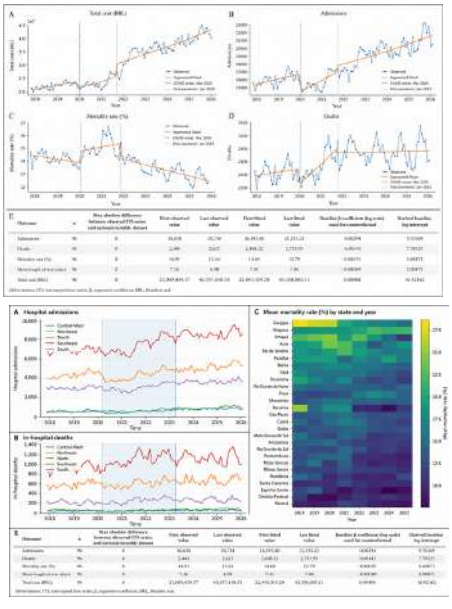
21054

TEMPORAL CHANGES IN STROKE BURDEN AND HEALTHCARE EXPENDITURES IN BRAZIL DURING AN INTERNATIONAL PUBLIC HEALTH EMERGENCY: A NATIONWIDE INTERRUPTED TIME-SERIES (ITS) ANALYSIS

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Background/Introduction: Cerebrovascular diseases have always impacted the Brazilian healthcare system, disproportionately affecting socially vulnerable subgroups. Objectives: We evaluated temporal trends, regional variability, and demographic disparities in stroke-related hospitalizations and in-hospital mortality rates in Brazil between 2018-2025. Methods: This is a large nationwide, ecological time-series study using monthly stroke-related evidence registered from all regions of Brazil during a 8-years period in the Brazilian Unified Health System/DATASUS. Primary outcomes included hospital admissions (AIH), deaths, mortality rate, mean length of hospital stay, total hospitalization costs, and mean hospitalization cost per-admission (AIH value). For estimating the annual percent change (APC) and classifying temporal trends, we used Prais-Winsten regression models, while the Interrupted time-series (ITS) analyses considered changes across two pre-defined timepoints (March, 2020/"pandemic onset" and January, 2022/"post-pandemic recovery stage"). Results and Conclusions: Over an 8-year period, 1,773,829 stroke-driven hospital admissions and 251,235 in-hospital deaths were registered, corresponding to a hospital mortality rate of 14.2%. Mean length of hospital stay was 7.2 days, with total hospitalization expenditure of around BRL3 billions and mean AIH value of BRL1,633. Older adults aged 60-79 were prevailing (917,189 admissions), whereas the highest mortality burden was observed at the oldest-old (≥ 80 years, 75,466 deaths). Geographically, the Southeast demonstrated the highest burden, with 753,402 admissions and 108,942 deaths, followed by the Northeast, with 465,992 admissions and 72,322 deaths. We observed that stroke admissions (APC4.11%; 95%CI 2.62–5.63), deaths (APC2.19%; 95%CI 1.14–3.26), total hospitalization costs (APC10.10%; 95%CI 7.91–12.34), and mean AIH value (APC5.38%; 95%CI 4.57–6.19) significantly increased with time, whereas mortality rates declined (APC−1.98%; 95%CI −3.47/−0.47). During the pandemic, ITS analysis showed immediate reductions in admissions (−14.09%; 95%CI −18.83/−9.08) and deaths (−9.00%; 95%CI −13.00/−4.82), followed by concomitant enhance in mortality rates (+5.92%; 95%CI 1.90–10.10). As for the post-pandemic stage, mortality rates declined immediately (−7.55%; 95%CI −14.20/−0.38) and over time (−0.47%; 95%CI −0.83/−0.10), while total hospitalization costs (+18.95%; 95%CI 5.62–33.96) and mean hospitalization costs per admission (+12.92%; 95%CI 8.52–17.50) increased substantially.



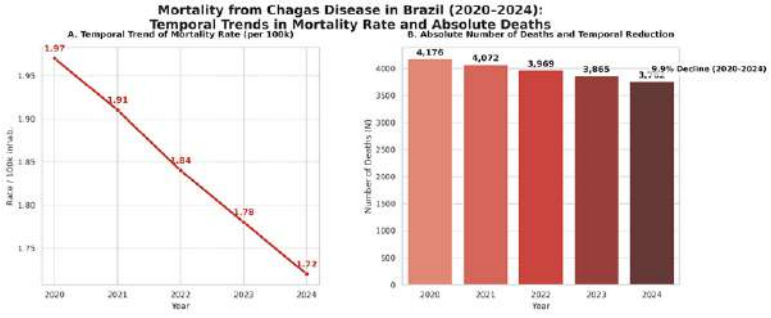
18383

TEMPORAL TRENDS AND INEQUALITIES IN MORTALITY FROM CHAGAS DISEASE IN BRAZIL (2020–2024)

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Background/Introduction: Despite advances in vector control, Chagas disease remains a significant public health concern in Brazil, with increasing impact among older populations and a heterogeneous distribution across the national territory. Objectives: To analyse temporal trends and the epidemiological profile of mortality from Chagas disease in Brazil, exploring demographic and regional inequalities. Methods: Ecological, descriptive, and analytical study using data from the Mortality Information System (DATASUS), including deaths due to Chagas disease (ICD-10: B57) between 2020 and 2024. Demographic and geographic variables were analyzed. Absolute mortality counts and population-adjusted mortality rates (per 100,000 inhabitants) were calculated. Temporal trend analysis was performed to assess changes over time, along with descriptive comparisons across age groups, sex, and regions. Results and Conclusions: A total of 19,887 deaths from Chagas disease were recorded in Brazil between 2020 and 2024, with a 9.9% reduction in the absolute number of deaths over the period. When adjusted for population, the mortality rate showed a progressive decline, decreasing from 1.97 to 1.72 deaths per 100,000 inhabitants, reinforcing a consistent downward trend. There was a marked predominance among individuals aged 60 years or older (82.6%), consistent with the chronic and late manifestations of the disease. Sex distribution showed a slight male predominance (51.7%). Regionally, deaths were more concentrated in the Southeast (46%), followed by the Northeast and Central-West, reflecting both the historical distribution of the endemic disease and inequalities in the organization of the healthcare system. Despite the overall reduction, the persistence of high mortality among older adults and regional heterogeneity suggests the maintenance of higher-risk populations, as well as possible underdiagnosis in areas with limited access to healthcare services. The concentration of deaths among older individuals and regional disparities highlight the need for targeted strategies focused on early diagnosis, management of Chagas cardiomyopathy, and reduction of inequities in healthcare access. Limitations include the ecological design, the possibility of underreporting, and inconsistencies in DATASUS data entry, as well as the lack of adjustment for comorbidities and socioeconomic factors.



15755

TEMPORAL TRENDS IN MORTALITY FROM NON-RHEUMATIC AORTIC STENOSIS IN BRAZIL: IS POPULATION AGING SUFFICIENT TO EXPLAIN THE INCREASE?

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Background/Introduction: Non-rheumatic aortic stenosis (AS) has been described as a 21st-century epidemic driven by population aging. However, whether the increase in AS-related mortality in Brazil can be explained solely by aging remains uncertain. Objectives: To assess temporal trends in mortality from non-rheumatic AS in Brazil and determine whether population aging alone accounts for the observed increase. Methods: Population-based study of basic-cause mortality due to non-rheumatic aortic stenosis among individuals aged ≥50 years in Brazil from 2000 to 2023 (pre-incorporation period of transcatheter aortic valve implantation (TAVI) in the Brazilian Unified Health System (SUS). Results and Conclusions: RESULTS: Among individuals aged ≥50 years, 28,180 deaths were recorded between 2000 and 2023, increasing by 375%, while the corresponding population grew by 105%. The increase was particularly pronounced among those aged ≥80 years, with deaths rising by 435% despite a 44% increase in the corresponding population.Crude mortality rate increased from 1.68 in 2000 to 3.8 in 2023 per 100,000, and age- and sex-standardized mortality increased from 1.7 to 3.6 per 100,000. A temporal shift in sex pattern was observed, with higher rates initially in women and subsequently in men. Most federations states showed increasing standardized mortality. Regions with historically high rates (South/Southeast regions) continued to rise, while previously low-reporting states (North/Northeast regions) began registering deaths. Regression analysis confirmed a significant upward trend (APC 3.12% year; 95% CI 2.94–3.31; p<0.001), higher in men (3.74%) than women (2.61%), with predominance in ≥80 years (3.8%). CONCLUSION: The increase in age-standardized mortality—particularly in advanced ages—cannot be attributed to population aging alone. These findings support a multifactorial process, consistent with disease unmasking, driven by increased detection, improved data quality, and evolving diagnostic and therapeutic paradigms in AS.

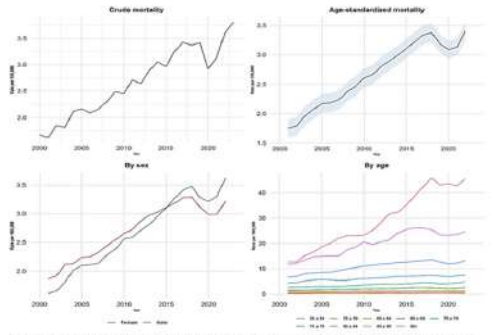


Figure1: Trends in mortality due to non-rheumatic aortic stenosis in Brazil, overall and by sex and age, 2000–2023.

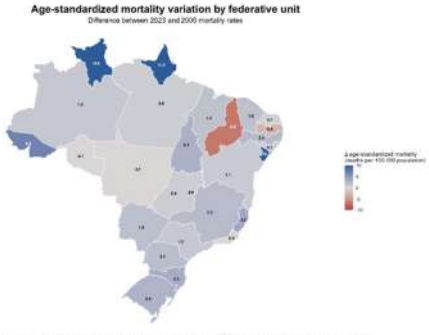


Figura2: Delta change in mortality rates between 2000 and 2023 by federation units

21409

THE GLOBAL BURDEN OF ALCOHOLIC CARDIOMYOPATHY: EPIDEMIOLOGICAL TRENDS, SOCIOECONOMIC DISPARITIES AND POLICY IMPLICATIONS

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Background/Introduction: Alcoholic cardiomyopathy (ACM) accounts for approximately 36% of dilated cardiomyopathy cases, driven by the toxic effects of chronic ethanol consumption on cardiac structure. Beyond individual health, ACM imposes a substantial global economic burden. Despite being a preventable condition, its epidemiology is profoundly shaped by regional, cultural, and socioeconomic disparities. Objectives: To evaluate the global, regional, and demographic burden of ACM, emphasizing the impact of the Socio-demographic Index (SDI) and socioeconomic inequalities on disease distribution, with specific observations regarding the Americas. Methods: A global burden of disease (GBD) analysis was conducted using data from the GBD Study 1990–2021. DALYs, mortality, and prevalence were analyzed and stratified by sex, age, and SDI. Temporal trends were assessed using estimated annual percentage change (EAPC). Cross-country inequalities were evaluated through macroeconomic indicators to characterize socioeconomic gradients in disease distribution. Results and Conclusions: ACM disproportionately affects males, with incidence peaking between 60 and 64 years of age. High and high-middle SDI nations bear the greatest disease burden. Regional disparities are substantial: in Eastern Europe, the elevated burden reflects high per capita distilled alcoholic beverages consumption and historically limited implementation of alcohol control policies, whereas in East Asia, the risk is amplified by the prevalence of ALDH2 Glu504Lys allele. In the Americas, notable contrasts are observed; while Southern Latin America exhibited the fastest decline in mortality globally (EAPC: -6.69%) and the Andean region recorded the lowest disease burden worldwide, the Caribbean faces increasing mortality rates. Globally, although age-standardized rates have decreased, the absolute number of cases has risen. These findings reveal a heterogeneous global burden shaped by socioeconomic, genetic, and behavioral determinants, with rising absolute case numbers offsetting gains in age-standardized rates. ACM remains a significant public health burden shaped by socioeconomic determinants. The SDI gradient and regional heterogeneity in genetic susceptibility underscore the need for risk-stratified epidemiological surveillance. Systematic integration of alcohol consumption history into cardiovascular risk evaluation may improve early identification of high-risk populations, particularly older males in high and high-middle SDI regions.

17923

TRENDS IN HOSPITAL MORBIDITY AND MORTALITY FROM HEART FAILURE IN THE BRAZILIAN ADULT POPULATION, 1994–2025: A MORE-THAN-THREE-DECADE ANALYSIS

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Background/Introduction: Heart failure (HF) is one of the leading causes of cardiovascular hospitalization in Brazil. Over the past three decades, substantial efforts have been made to reduce HF-related morbidity and mortality, encompassing pharmacological therapies and device-based interventions. Despite meaningful improvements in clinical outcomes, HF hospitalization rates remain elevated. Additionally, demographic changes, population aging, and structural transformations in the healthcare system may influence hospitalization patterns over time. Objectives: To analyze trends in HF hospitalization rates and in-hospital mortality among the adult Brazilian population from 1994 to 2025. Methods: We obtained data from the Brazilian Ministry of Health (DATASUS) on hospital admissions for HF among adults (≥20 years of age) in Brazil from 1994 through 2025. Hospitalization rates (admissions per 100,000 inhabitants) and in-hospital mortality rates (deaths per 1,000 admissions) were calculated and adjusted for age and sex by the direct method, using the 2022 Brazilian Census count (IBGE) as the reference population. Temporal trends were assessed with log-linear Poisson regression. Results and Conclusions: A total of 10,183,329 HF admissions were recorded during the study period. The hospitalization rate decreased significantly, from 357.6 to 94.1 admissions per 100,000 inhabitants (R^2=0.907; P<0.001), a pattern that was consistent in both men and women and across all age groups studied. In-hospital mortality, however, increased significantly, from 55 to 98 deaths per 1,000 admissions, in both sexes and more markedly among adults older than 60 years. Over the same period, the number of public hospital beds (SUS) decreased by 35%, from 506,000 to 360,000, while the ratio of HF admissions per bed per year remained stable (P=0.56). Mean length of hospital stay increased from 6.0 to 8.2 days. Although the absolute number of hospitalizations and the admission rates for HF in the adult population decreased between 1994 and 2025, in-hospital mortality rose significantly. Taken together, these findings suggest that, with the reduction in SUS bed availability, patients with more severe disease are preferentially being admitted. Data from the private sector are lacking, which limits a broader assessment of the quality of HF care in Brazil.

Experimental Cardiology (Basic Science)



81º CONGRESSO BRASILEIRO DE CARDIOLOGIA together with WORLD CONGRESS OF CARDIOLOGY





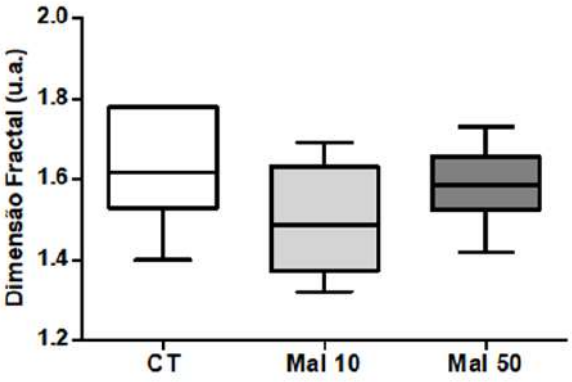
15843

ANALYSIS OF CARDIAC FRACTAL DIMENSION AFTER EXPOSURE TO A PESTICIDE USED FOR DENGUE CONTROL: A PRECLINICAL STUDY

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Background/Introduction: Dengue is a disease associated with high rates of mortality and disability. One of the control strategies used to combat its vector is malathion spraying, which may have potential cardiotoxic effects. However, the impact of this pesticide on the organization of the extracellular matrix in the developing heart remains unclear. Objectives: This study aimed to evaluate the effects of malathion exposure on cardiac extracellular matrix organization during development. Methods: The study was approved by the Animal Ethics Committee (Protocol 7880). Eighteen female Wistar rats, aged 21 days, were randomly assigned to three experimental groups (n = 6 per group): malathion at 10 mg/kg (M10), malathion at 50 mg/kg (M50), and a control group (CT) receiving soybean oil at an equivalent volume, administered via gavage. At postnatal day 60, animals were euthanized and hearts were dissected. The left ventricle was stained with Picrosirius Red and analyzed using images obtained from a LEICA microscope equipped with a video camera and a 40× objective (400× magnification). Three images per animal were captured and processed using Image-Pro Plus software. Images were binarized, and collagen organization was quantified using ImageJ software. Data normality was assessed using the Shapiro–Wilk test, followed by Kruskal–Wallis and Dunn's post hoc tests ($p < 0.05$). Results and Conclusions: No significant differences were observed in collagen fractal dimension among groups (CT: 1.62 ± 0.14 au; M10: 1.49 ± 0.13 au; M50: 1.58 ± 0.10 au; $p = 0.25$). Malathion exposure during cardiac development did not induce structural alterations in cardiac collagen organization.



15824

CARDIAC IMPACT OF DAPAGLIFLOZIN IN CHRONIC ARTERIAL HYPERTENSION

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Background/Introduction: Systemic arterial hypertension (SAH) is a major cause of cardiac remodeling and heart failure with both preserved and reduced ejection fraction. Sodium-glucose cotransporter-2 (SGLT2) inhibitors are recommended for heart failure treatment. The effects of SGLT2 inhibitors on cardiac remodeling under sustained arterial hypertension have not been established. Objectives: To evaluate the effects of the SGLT2 inhibitor dapagliflozin (DAPA) on hypertension and cardiac remodeling in middle aged-spontaneously hypertensive rats (SHR). Methods: Male SHR and normotensive Wistar rats aged 14 months were assigned into four groups: Control (n=14); Control-DAPA (n=14); SHR (n=15); and SHR-DAPA (n=14). The treated groups received DAPA added to the rat chow at a dosage of 10 mg/kg/day for 12 weeks. Before treatment, echocardiograms were performed to assure homogeneity between groups (data not shown). At the end of the study, structural heart and functional left ventricular parameters were assessed by echocardiogram. Caudal blood pressure was evaluated by pletismography before and after treatment. Statistical analysis: two-way ANOVA and Bonferroni or Kruskal–Wallis and Dunn's test, and repeated measures ANOVA. Results and Conclusions: Results: Blood pressure was higher in SHR and SHR-DAPA than their controls. Blood pressure was higher at the end of the experiment than the initial evaluation in SHR and SHR-DAPA groups and did not differ between SHR-DAPA and SHR (Table 1). Body weight was lower in Control-DAPA than Control and lower in SHR and SHR-DAPA than their controls; no difference was observed between SHR-DAPA and SHR. Both SHR-DAPA and SHR had left atrium dilation, concentric left ventricle (LV) hypertrophy, and diastolic dysfunction. Ejection fraction did not differ between groups. Except for a significantly higher tissue Doppler imaging (TDI) of the mean systolic velocity of the mitral annulus (mean S') in SHR-DAPA than SHR, no more differences were observed between SHR-DAPA and SHR groups (Table 2). Conclusion: Long-term use of dapagliflozin does not modulate body weight and caudal blood pressure in middle-aged-spontaneously hypertensive rats under sustained hypertension. Cardiac remodeling is not changed by dapagliflozin, except for a slightly improvement in TDI mean S' in the treated SHR group.

Table 1: Blood pressure data

Control (n=14)		Control-DAPA (n=14)		SHR (n=15)		SHR-DAPA (n=14)	
Initial	Final	Initial	Final	Initial	Final	Initial	Final
117 ± 9	114 ± 4.9	116 ± 5.3	115 ± 4.7	205 ± 26.7 *	218 ± 27.9 ¹*	203 ± 30.9 #	217 ± 24.7 ¹#

Control-DAPA: control treated with dapagliflozin; SHR: spontaneously hypertensive rats; SHR-DAPA: SHR treated with dapagliflozin. Data are expressed as the mean ± standard deviation. Repeated measures ANOVA; * p<0.05 vs Control; # p<0.05 vs Control-DAPA; ¹ p<0.05 final vs initial blood pressure.

Table 2: Echocardiographic data

	Control (n=14)	Control-DAPA (n=14)	SHR (n=15)	SHR-DAPA (n=14)
BW (g)	570 ± 44	528 ± 32 *	369 ± 26 *	363 ± 28 #
LVDD/BW (mm/kg)	13.6 ± 1.62	13.9 ± 1.68	20.4 ± 1.73 *	21.6 ± 1.46 #
DPWT (mm)	1.41 (1.38-.1.47)	1.45 (1.40-1.52)	1.77 (1.73-1.85)*	1.77 (1.68-1.90) #
LVMI (g/kg)	1.32 ± 0.23	1.34 ± 0.17	2.65 ± 0.34 *	2.81 ± 0.27 #
RWT	0.37 ± 0.04	0.40 ± 0.04	0.49 ± 0.04 *	0.46 ± 0.06 #
LA/BW (mm/kg)	9.16 ± 1.14	9.83 ± 0.98	15.28 ± 0.84 *	15.69 ± 1.15 #
LVEF	0.84 (0.82-0.87)	0.86 (0.84-0.88)	0.87 (0.84-0.91)	0.86 (0.83-0.90)
TDI S' (average, cm/s)	3.10 ± 0.27	2.95 ± 0.22	2.62 ± 0.55 *	2.98 ± 0.24 §
E/A	1.45 (1.29-1.59)	1.78 (1.54-1.95)*	2.07 (1.85-2.28)*	2.11 (1.96-2.17) #
IVRT (ms)	36.6 ± 4.42	38.7 ± 6.66	47.7 ± 6.30 *	44.7 ± 7.16 #
E/TDI E' (average)	20.4 (17.6-22.2)	21.0 (19.0-23.0)	27.5 (24.9-30.0)*	29.7 (26.9-30.8) #

Control-DAPA: control treated with dapagliflozin; SHR: spontaneously hypertensive rats; SHR-DAPA: SHR treated with dapagliflozin. BW: body weight; LVDD: left ventricular (LV) diastolic diameter; DPWT: LV diastolic posterior wall thickness; LVMI: LV mass index; RWT: relative wall thickness; LA: left atrium diameter; LVEF: LV ejection fraction; TDI S': tissue Doppler imaging (TDI) of the systolic velocity of the mitral annulus; E/A: ratio between early (E)-to-late(A) diastolic mitral inflow; IVRT: isovolumetric relaxation time; TDI E': TDI of the early diastolic velocity of the mitral annulus. Data are expressed as the mean ± standard deviation or medians and percentiles; two-way ANOVA and Bonferroni or Kruskal Wallis and Dunn; * p<0.05 vs Control; # p<0.05 vs Control-DAPA; § p<0.05 vs SHR.

17362

CARDIOPROTECTIVE EFFECTS OF CILOSTAZOL IN EXPERIMENTAL METABOLIC SYNDROME

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Background/Introduction: Metabolic syndrome (MS) is a public health challenge, characterized by a cluster of metabolic alterations, including obesity, hypertension, dyslipidemia, hyperglycemia and hypertension (Engin, A. Adv Exp Med Biol. 2017). This condition increases the risk of cardiovascular disease. Cilostazol (CZ), a phosphodiesterase-3 (PDE3) inhibitor used in the treatment of intermittent claudication, exhibits vasodilatory, antiplatelet effects, as well as pleiotropic properties, such as anti-inflammatory and antioxidant properties (Brazão SC. Life Sci. 2023). We hypothesized that CZ may exert beneficial effects in the treatment of MS. Objectives: This study aims to evaluate the cardioprotective properties of cilostazol using a model of metabolic syndrome induced in spontaneously hypertensive rats (SHR). Methods: Male SHR rats (8 weeks old) were housed under controlled temperature, humidity, and a 12 h light/dark cycle. Animals were randomly assigned to four groups (n=8): WKY (Wistar Kyoto normotensive rats) and SHR, both fed a standard diet for 12 weeks; MS (SHR fed a hypercholesterolemic) and MS+ CZ (SHR fed a hypercholesterolemic treated with CZ). The experimental protocol lasted 12 weeks, and during the last 15 days, WKY, SHR, and MS groups received vehicle (tween: ethanol/ water), while the MS + CZ group received CZ (30 mg/kg/day), administered by gavage. Blood pressure was measured at the end of the study, and rats were anesthetized and euthanized for functional, biochemical, and molecular analyses (CEUA 1479140219). Data was analyzed using one-way ANOVA followed by post-hoc Bonferroni Multiple Comparison Test, $p<0.05$. Results and Conclusions: The MS model exhibits alterations in lipid profile and elevated systolic blood pressure (SBP). CZ reduced SBP and LDL cholesterol levels, ($p<0.05$). The MS group showed prolongation of QT and QTc intervals, increased SαT and RαT intervals, reduced R-wave and T-wave amplitudes, decreased heart rate variability parameters (SDNN and RMSSD), and decrease ejection and shortening fractions compared to the WKY group. On the other hand, the MS+CZ reduced SαT and RαT intervals, increased R and T-wave amplitudes, and improved RMSSD compared to the MS group, ($p<0.05$). Western blot analysis demonstrated increased expression of NOX2, NOX4, p-AKT, NF-κB, and BAX in the MS group, whereas CZ treatment significantly reduced the expression of these proteins ($p < 0.05$). These findings suggest that cilostazol exerts cardioprotective effects in metabolic syndrome.

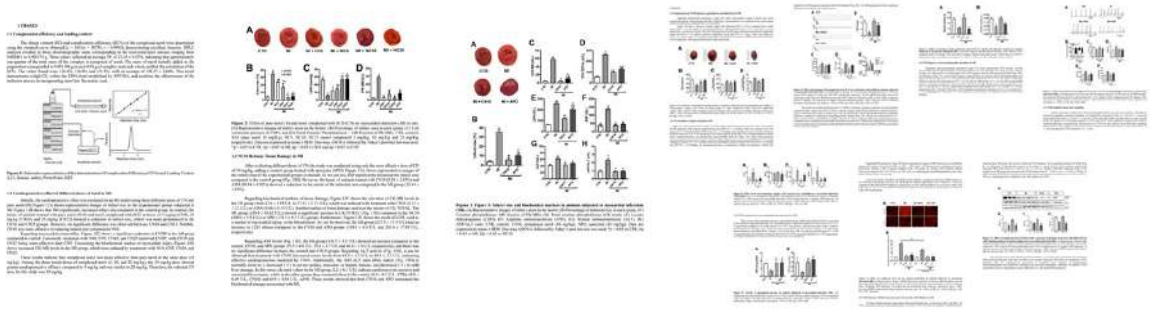
20494

CARDIOPROTECTIVE EFFECTS OF NEROL COMPLEXED WITH B-CYCLODEXTRIN IN MYOCARDIAL INFARCTION: MODULATION OF THE ANTIOXIDANT SOD/CAT AND AKT/P-AKT PATHWAY

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Background/Introduction: Cardiovascular diseases, especially acute myocardial infarction (MI) is major causes of death and involve hypoxia and ROS-induced damage. O nerol, a monoterpene with antioxidant and L-type calcium channel blocking action, may exert cardioprotective effects. Objectives: Evaluate the cardioprotective effect of nerol (N) and the nerol–β-cyclodextrin complex (CN) in MI in rats. Methods: Approved by the Animal Ethics Committee (CEUA no. 4214070723), adult Wistar rats were divided into 6 groups (n = 6): 1) CTR, 2) MI+βCD, 3) MI+N (10 mg/kg), and 4, 5 e 6) MI+CN (5, 10, or 25 mg/kg). O MI was induced by isoproterenol (ISO, 100 mg/kg for 2 days, i.p.), and 30 min later, animals were treated with N or CN. The parameters were evaluated: LVDP, ECG, heart rate variability, infarct size, biochemical markers of tissue damage, ROS levels, and the activity and expression of SOD, CAT, and AKT/pAKT. Data are expressed as mean ± SEM, with $p < 0.05$ considered statistically significant. Results and Conclusions: CN10 showed superior cardioprotection compared to N10 and CN5/25, as evidenced by reduced infarct size and CK-MB levels, along with increased LVDP. The results showed that the increase in heart weight/body weight (3.9 ± 0.1 mg/g) and heart weight/tibia length (247.9 ± 13.1 mg/cm) in the MI group was reduced by CN10 (2.9 ± 0.1 mg/g and 207.7 ± 9.3 mg/cm, respectively). Elevated infarct size and CK-MB levels in the MI group (34.2 ± 3.2% and 57.8 ± 3.1 U/L) were reduced by CN10 (3.2 ± 0.9% and 4.3 ± 1.2 U/L). CN10 also improved LVDP (from 10.3 ± 1.8 to 53.1 ± 3.1 mmHg), reduced heart rate from 333.3 ± 23.3 to 222.1 ± 10.6 bpm, normalized ECG alterations (QTc from 129 ± 1.5 to 101.9 ± 10.5 ms), and decreased the incidence of ST-segment elevation from 67% to 30%. In addition, CN10 improved sympathetic autonomic modulation compared to the MI group (decreasing the LF/HF from 0.1 ± 0.01 to 0.02 ± 0.003 nu) and increased SOD and CAT activities (from 0.6 ± 0.1 to 1.7 ± 0.4 U/µg and from 0.7 ± 0.06 to 3.0 ± 0.4 U/µg, respectively), associated with reduced ROS production (from 3.83 ± 0.18 to 1.06 ± 0.01 a.u.). Furthermore, CN10 increased the expression of SOD2 (from 0.72 ± 0.02 to 1.4 ± 0.03 a.u.) and AKT/p-AKT (from 0.7 ± 0.05 to 1.1 ± 0.01 a.u. and from 0.6 ± 0.02 to 0.9 ± 0.02 a.u., respectively). Thus, CN10 promoted cardioprotection by restoring cardiac contractile and electrical function, reducing myocardial injury, increasing antioxidant enzyme activity, and decreasing ROS production.



15545

CARDIOVASCULAR EFFECTS OF PERFLUOROOCTANOIC ACID EXPOSURE IN ADULT MALE MICE

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Background/Introduction: Environmental factors play an important role in the development of cardiovascular diseases (CVD), including exposure to endocrine-disrupting chemicals (EDC). Among EDC, per- and polyfluoroalkyl substances (PFAS) comprise a class of chemicals that have gained attention due to their high resistance to degradation and widespread use in industrial and consumer products. Perfluorooctanoic acid (PFOA) is the most widely studied and the main representative compound of this class. It is widely detected in the environment and in human populations, and commonly found in nonstick cookware and water- and grease-resistant packaging materials. Previous studies have shown that PFOA exposure is associated with metabolic, reproductive, and carcinogenic effects. Despite these effects, the cardiovascular impact of PFOA exposure remains poorly explored. Objectives: Given the widespread human exposure to PFOA, understanding its potential impact on cardiovascular health is of significant public health relevance. Thus, this study aimed to evaluate the effects of exposure to different doses of PFOA on the cardiovascular system in adult male mice Methods: Adult male mice were divided into control (CT), PF-L (0.1 µg/kg/day PFOA), and PF-H (0.1 mg/kg/day PFOA). PFOA was administered via drinking water for 90 days. Body mass (BM), adiposity index, systolic blood pressure (SBP), cardiac electrophysiology by electrocardiogram (ECG), cardiac mass, and left ventricle (LV) wall thickness were evaluated. Ethical approval n. 6891070125. Statistical analyses were performed using one-way ANOVA with Holm-Sidak post hoc test. Results and Conclusions: Both PF-L and PF-H groups increased BM gain and adiposity index compared to CT, reinforcing the obesogenic potential of PFOA exposure. SBP was elevated in both exposed groups in relation to CT. In addition, cardiac function was impaired, as evidenced by alterations in ECG parameters. The QRS complex duration was increased in both groups, and a reduction in T-wave integral was observed in the PF-H group, suggesting impaired ventricular depolarization and repolarization. Furthermore, both PFOA-exposed groups exhibited greater cardiac mass and thicker LV walls than CT, indicating cardiac hypertrophy and structural remodeling. PFOA exposure appears to promote an obesogenic and hypertensive phenotype, accompanied by cardiac remodeling and impairments in cardiac function, suggesting detrimental effects on cardiovascular health.

21563

CITRUS BERGAMIA LEAF EXTRACT REVERSES CARDIAC DAMAGE INDUCED BY CHRONIC CONSUMPTION OF A HIGH SUGAR-FAT DIET

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Background/Introduction: Contemporary dietary patterns characterized by unhealthy eating habits, particularly the chronic consumption of hypercaloric diets rich in fat and sugar, have become a major global health concern strongly associated with cardiovascular diseases and progressive cardiac dysfunction. In this context, Citrus bergamia leaf extract (BLE) emerges as a potential treatment for HSFD-associated cardiac comorbidities due to its cardioprotective and hypolipidemic effects. Objectives: This study aimed to evaluate the cardioprotective effect of Citrus bergamia leaf extract on the progression of HSFD-induced cardiac dysfunction. Methods: Male Wistar rats were divided into Control (C; n=12), receiving a standard chow diet and High sugar-fat diet (HSFD; n=22), receiving a high sugar-fat diet with 25% sucrose in drinking water for 20 weeks. Body weight (BW) and echocardiographic evaluation were assessed to confirm HSFD-associated cardiac dysfunction. Subsequently, the HSFD group was allocated into two groups: HSFD (n=12) and HSFD+BLE (n=10). Treatment was administered daily for 10 weeks by gavage (50mg/Kg). At the end of the experimental period, echocardiographic analyses were repeated in the same animals, CEUA:1393/2021. Normality and variance were tested by Shapiro–Wilk test and Levene's test. For parametric data, comparisons were performed using linear mixed-effects models for repeated measures followed by Sidak's post hoc test. For nonparametric data, analyses were performed using the Friedman test for repeated measures followed by Dunn's post hoc test. ($p<0.05$). Results and Conclusions: The analyses demonstrated that the HSFD group at 20 and 30 weeks showed increased Posterior Wall Thickness in diastole (PWTd), Isovolumetric Relaxation Time (IVRT), Deceleration Time (DT), E/E' ratio, and systolic blood pressure (SBP), along with reduced Lateral S', Lateral E', Septal S', Mean S', Mean E', and E'/A' ratio compared with C group at 20 and 30 weeks. At 30 weeks, the HSFD group showed increased BW compared with 20 weeks and reduced ejection fraction (EF) compared with the C groups at 20 and 30 weeks. The BLE-treated group showed increased BW, PWT in systole (PWTs), EF, Lateral S', Lateral E', Septal S', Mean S', Mean E', and E'/A' ratio, along with reduced PWTd, IVRT, DT, and E/E' ratio compared with 20 weeks. In conclusion, treatment with BLE reversed the structural and functional cardiac damage induced by the HSFD, confirming its potential cardioprotective effect even without dietary pattern modification.

Table 1. Echocardiographic and hemodynamic parameters.

	Control 20	Control 30	HSFD 20	HSFD 30	HSFD 20 + BLE	HSFD 30 + BLE
BW (g)	500±40.2	506±56.1	512±518	589±74.8a○	509±71.7	582±88.2#
Heart rate (bpm)	271(248-326)	258(242-301)	285(254-301)	262(244-280)	267(233-313)	251(232-280)
PWTd (mm)	1.53(1.50-1.54)	1.52(1.45-1.53)	1.95(1.90-2.04)=◊	1.95(1.58-2.04)=◊	1.93(1.86-2.02)=◊	1.53(1.53-1.53)○*#
PWTs(mm)	3.66±0.37	3.69±0.32	3.73±0.29	3.51±0.51	3.48±0.30	3.94±0.34#
IVRT (ms)	22.2±0.87	22.5±0.90	32.9±4.29=◊	29.2±5.82=◊	32.5±3.89=◊	24.9±5.59○#
DT (ms)	46.1±2.69	44.17±2.12	58.2±7.30=◊	55.8±9.54=◊	58.8±4.47=◊	50.3±7.90#
EF (%)	0.95(0.95-0.96)	0.96(0.95-0.96)	0.91(0.90-0.93)=◊○	0.91(0.89-0.93)=◊	0.90(0.85-0.93)=◊	0.93(0.92-0.93)#
Lateral S' (cm/s)	5.65±0.35	5.66±0.25	4.78±0.48=◊	5.27±0.45○	4.67±0.33=◊*	5.61±0.20○#
Lateral (cm/s)	5.38±0.65	5.37±0.60	2.86±0.50=◊	3.73±0.95=◊○	3.00±0.32=◊	4.55±0.74○#
Septal S' (cm/s)	5.47±0.29	5.48±0.22	4.84±0.41=◊	4.91±0.38=◊	4.78±0.34=◊	5.27±0.24○#
Mean S' (cm/s)	5.56±0.20	5.57±0.19	4.81±0.43=◊	5.09±0.39=◊	4.73±0.23=◊	5.44±0.19○#
Mean E' (cm/s)	5.44±0.38	5.58±0.57	3.00±0.58=◊	3.87±0.85=◊○	3.14±0.32=◊	4.65±0.72=○○#
E/E' Ratio	14.7(13.3-16.2)	13.6(12.9-14.7)	26.5(23.3-27.4)=◊	21.8(15.5-24.5)=◊	27.6(23.6-29.0)=◊*	16.2(15.2-17.1)○#
E'/A' Ratio	1.63(1.55-1.67)	1.55(1.51-1.63)	0.61(0.57-0.65)=◊	0.83(0.69-1.43)=○○	0.54(0.56-0.71)=◊*	1.47(1.17-1.58)○#
SBP (mmHg)	116±3.47	116±7.09	136±9.37=◊	142±7.80=◊	135±8.93=◊	144±13.2=◊#

HSFD: high sugar fat diet, BLE: *Citrus bergamia* Leaf Extract, PWTd: Posterior Wall Thickness in diastole, PWTs: Posterior Wall Thickness in systole, IVRT: Isovolumetric Relaxation Time, DT: Deceleration Time and EF: Ejection Fraction. Data expressed in mean ± standard deviation; median (interquartile range). Normality and homogeneity of variance were assessed by Shapiro–Wilk and Levene's tests, respectively. Parametric and nonparametric repeated measures were analyzed by linear mixed-effects and Friedman tests, followed by Sidak's and Dunn's post hoc tests, respectively. Differences were considered significant for $p< 0.05$ =vs. Control 20, ◊vs. Control 30, ○vs. HSFD 20, *vs. HSFD 30 and #vs. HSFD 20 + BLE. (n=10-12).

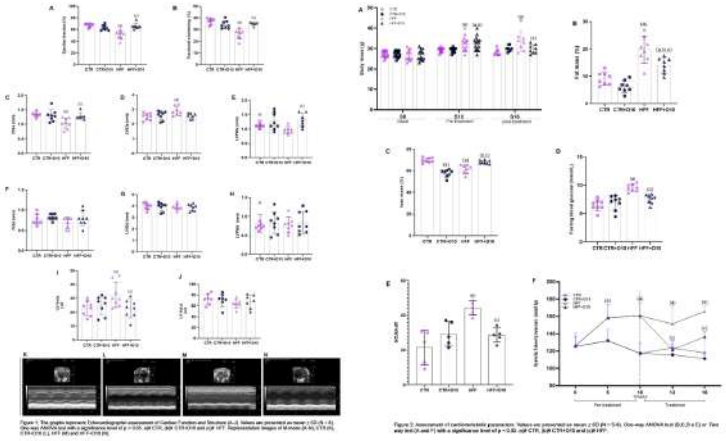
16068

DAPAGLIFLOZIN IMPROVES CARDIAC FUNCTION AND REDUCES MYOCARDIAL DAMAGE IN METABOLIC SYNDROME IN A MURINE MODEL

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Background/Introduction: A high-fat diet combined with fructose in drinking water (HFF) promotes the accumulation of toxic lipids in cardiomyocytes, contributing to the development of cardiac dysfunction. Objectives: The objective was to evaluate the cardiometabolic effect of dapagliflozin in C57BL/6 mice fed an HFF diet. Methods: The experiment was approved by the Ethics Committee (CEUA No. 10/2024). The diet was provided for 16 weeks, and treatment with dapagliflozin 10 mg/kg/day (D10) or vehicle was administered from the 10th to the 16th week via orogastric gavage. Biometric parameters were assessed by magnetic resonance imaging, fasting blood glucose, and insulin resistance using the HOMA-IR index. The biochemical profile included total cholesterol, LDL, CK-MB, and CK-NAC. Cardiac function was assessed by echocardiography, while systolic blood pressure (SBP) was measured by tail plethysmography. Cardiomyocyte area was determined by histological analysis using hematoxylin and eosin (H&E) staining. Data were presented as mean ± standard deviation and analyzed using one-way ANOVA or two-way ANOVA, followed by Tukey's post-hoc test ($p < 0.05$) using GraphPad Prism software (v.10.6.1). Results and Conclusions: Animals in the HFF group showed increased body weight, fat mass, glycemic homeostasis, lipid profile, and systolic blood pressure compared to the control group (CTR). In contrast, the HFF+D10 group showed a reduction in these parameters. Regarding cardiac damage, the HFF group showed increased levels of these markers, along with reduced ejection fraction, shortening fraction, and interventricular septal thickness during systole, in the absence of hypertrophy. The HFF+D10 group showed reduced cardiac damage markers and improved echocardiographic parameters. The CTR+D10 group showed results similar to the CTR group in all analyses performed. HFF consumption promoted phenotypic characteristics of metabolic syndrome in addition to inducing myocardial injury and systolic dysfunction. The HFF+D10 group attenuated metabolic and hemodynamic changes, reduced markers of cardiac damage, and improved systolic function, highlighting its potential cardioprotective effect. These results reinforce the role of dapagliflozin as a promising therapeutic strategy for cardiovascular protection under conditions of metabolic overload.



20857

DIETARY MACRONUTRIENT COMPOSITION DICTATES FUNCTION OVER MORPHOLOGY: CORRELATIONAL INSIGHTS INTO MORPHOFUNCTIONAL CARDIAC REMODELING IN OBESITY

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Background/Introduction: The chronic consumption of simple sugars and saturated fat-enriched foods leads to obesity and cardiac remodeling (CR). However, the isolated impacts of macronutrient intake on morphological and functional disturbances remain poorly understood. Objectives: This study aimed to correlate specific dietary macronutrients with morphofunctional cardiac remodeling in obesity. Methods: Male Wistar rats were randomly assigned to two groups (n=12/group) and fed a Control (CTRL) or a hypercaloric diet, enriched with sucrose, fructose, and saturated fatty acids (stearic, palmitic, and myristic) and 25% sucrose water (CR) for 20 weeks (CEUA: 1150/2015). In vivo dietary intake, nutritional status, metabolic and hormonal parameters, and echocardiogram were assessed. Data were analyzed using the Shapiro-Wilk test, followed by a student t-test or Rank Sum Test and Pearson correlation (α=5%). Results and Conclusions: CR group exhibited higher caloric, carbohydrate, and fat intake ($p<0.005$), combined with increased body weight and systolic blood pressure ($p<0.001$), despite lower total food and protein intake ($p<0.001$). In addition, morphofunctional cardiac remodeling was effectively induced in this group. Correlation analysis revealed divergent remodeling aspects. In CTRL, increased caloric, lipidic, and proteic intake correlated with prolonged E-wave deceleration time (EDT), suggesting a physiological volumetric adaptation. In contrast, CR presented a morphofunctional decoupling. Caloric intake correlated negatively with left ventricular end-diastolic diameter (LVDd; $r = -0.599$, $p = 0.039$) and positively with fractional shortening (FS%; $r = 0.601$, $p = 0.039$). Markedly, fat and protein intake intensified this concentric/hyperdynamic phenotype (LVDd; $r = -0.685$, $p = 0.014$; FS%; $r = 0.726$, $p = 0.007$; ejection fraction; $r = 0.499$, $p = 0.099$). Conversely, final body weight positively correlated with LVDd ($r = 0.579$, $p = 0.048$) and negatively with systolic function (FS%; $r = -0.662$, $p = 0.019$; ejection fraction; $r = -0.722$, $p = 0.008$). In conclusion, specific poor quality dietary macronutrients correlate with functional over morphological cardiac remodeling in obesity.

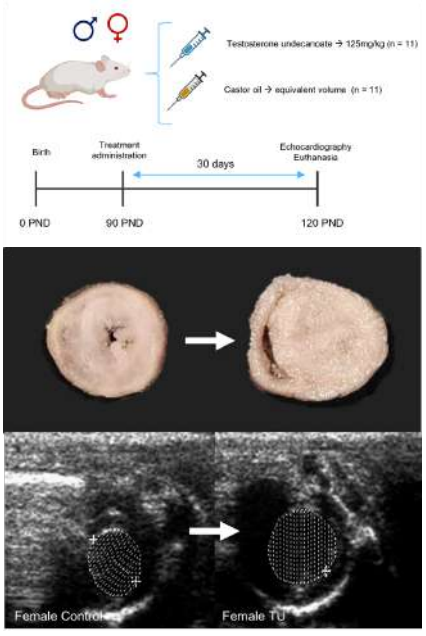
17068

EFFECTS OF TESTOSTERONE UNDECANOATE ON CARDIAC REMODELING AND ITS ASSOCIATION WITH OXIDATIVE STRESS AND INFLAMMATION MARKERS IN INTACT MALE AND FEMALE WISTAR RATS.

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Background/Introduction: The use of anabolic androgenic steroids (AAS) at supraphysiological doses in non-clinical settings is associated with atherosclerotic disease, pathological cardiac remodeling, and oxidative stress. Testosterone undecanoate (TU) is a long-acting AAS with greater clinical availability, but has limited preclinical research, particularly in female models. Objectives: To evaluate the effects of TU on cardiac remodeling and associated mechanisms of oxidative stress and inflammation in male and female Wistar rats. Methods: Intact male and female Wistar rats at 90 postnatal days (PND) received a single subcutaneous administration of TU at 125 mg/kg or castor oil. At 120 PND, animals were submitted to echocardiography, followed by euthanasia. Organs were weighed and normalized to tibial length. For morphological evaluation, the heart was sectioned after formalin fixation, and cardiac structures were measured. Biochemical analysis for oxidative stress and qPCR for inflammation were performed. Data were analyzed by two-way ANOVA, Tukey's test and t-test (CEUA: 44789). Results and Conclusions: Echocardiography showed that TU-treated females exhibited reduced heart rate alongside increased anterior wall thickness in systole, greater end-diastolic volume, and higher cardiac output (p<0.05). In TU-treated males, ejection fraction and fractional area change were reduced (p<0.05). Morphological analysis revealed a higher heart/tibia index in TU-treated females (p<0.05), with increased septal and left ventricular wall thickness (p<0.05). In males, no change in heart/tibia index was observed; however, increased septal thickness and bilateral ventricular wall thickening were detected (p<0.05). Biochemical analysis showed that TU reduced sulfhydryl levels and the SOD/CAT ratio while increasing nitrite concentration in treated males (p<0.05). In females, TU increased SOD activity (p<0.05) without altering the other parameters tested (p>0.05). Lipid oxidative stress, assessed by TBARS, was elevated in both sexes (p<0.05). Treated females exhibited reduced IL-6 levels (p<0.05), with no changes in IL-1β or IL-10 expression. TU induced sex-dependent cardiac remodeling accompanied by distinct oxidative stress profiles in males and females, with lipid peroxidation representing a shared mechanism of injury across both sexes. These findings underscore the sexual dimorphism in the cardiovascular response to AAS and support the use of TU as a viable model for preclinical research. Supported by CNPq.



18348

EXPOSURE TO BISPHENOL S AND HIGH-FAT DIET INTAKE INDUCES VASCULAR REMODELING AND PRO-ATHEROGENIC PROFILE IN MALE MICE

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Background/Introduction: Cardiovascular diseases (CVD) are the main cause of death worldwide, and one characteristic of many CVD is vascular remodeling. The development of CVD is influenced by several risk factors, including obesity and environmental factors, such as exposure to endocrine disruptors (ED). It is well known that bisphenol A (BPA), used in the manufacture of plastic and epoxy resins, is an ED that induces pathological cardiovascular outcomes. Due to its adverse health effects, BPA has been extensively regulated, leading to the use of bisphenol S (BPS) as its main substitute. BPS has been described as an ED with adverse cardiovascular effects, but its impact on vascular remodeling and atherogenic parameters remains unclear. Objectives: This study aims to investigate the impact of BPS exposure and high-fat (HF) diet intake on vascular remodeling and atherogenic parameters. Methods: Adult male mice were divided into SC (control diet), SCB (control diet + BPS), HF (high-fat diet), and HFB (high-fat diet + BPS). BPS was administered at a dose of 25µg/Kg/day through drinking water for 12 weeks. Body weight (BW) (g), total cholesterol and HDL levels (mg/dL), atherogenic index, systolic blood pressure (SBP) variation (mmHg), and aortic morphology were assessed. Statistical analyses were performed using one-way ANOVA with Holm-Sidak post hoc tests. Ethical approval 1929240521. Results and Conclusions: All interventions increased BW and total cholesterol levels in comparison to SC. These parameters were also elevated in HF and HFB in relation to SCB. HDL levels did not vary among groups; however, SCB, HF, and HFB increased the atherogenic index in relation to SC. All groups had higher SBP variation than SC, with increases in HF and HFB compared with SCB. SCB, HF, and HFB presented a thicker aortic wall, but only HF increased lumen size in comparison to SC. All interventions increased circumferential wall tension and tensile stress in relation to SC. Only HF and HFB reduced elastic fiber density in relation to the SC group. These findings indicate that both BPS exposure and high-fat diet intake promoted a pro-atherogenic profile and adverse vascular remodeling but the combined exposure did not act synergistically in worsening cardiovascular parameters.

20149

GAMMA-ORYZANOL IMPROVES CARDIAC FUNCTION BY MODULATING HEPATIC PROTEOMIC SIGNATURES IN DIET-INDUCED METABOLIC DYSFUNCTION

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Background/Introduction: The chronic consumption of diets rich in sugar and fat can lead cardiovascular disease, condition strongly associated with metabolic dysfunction. In this context, the liver plays a central role in lipid metabolism. Gamma-oryzanol (ORY), a bioactive compound with antioxidant and hypolipidemic properties, has been investigated for metabolic disorders; however, its impact on hepatic pathways linked to cardiovascular risk remains unclear. Objectives: The aim was to investigate the effect of ORY on hepatic metabolic pathways associated with cardiovascular function using a proteomic approach in a model of metabolic dysfunction. Methods: Male Wistar rats were assigned to three groups (n=6/group): control (CTRL), high sugar-fat diet (HSF), and HSF supplemented with ORY (0.5% w/w) for 30 weeks (CEUA 1451/2024). Plasma triglycerides and very low-density lipoprotein (VLDL) were evaluated. Cardiac function was assessed by echocardiography. Liver proteomics was performed by LC-MS/MS, processed using MaxQuant (FDR = 1%), and analyzed with Ingenuity Pathway Analysis. Data were analyzed using one-way ANOVA or Kruskal–Wallis test with post hoc comparisons (α = 5%). Results and Conclusions: The HSF diet increased triglycerides and VLDL, while ORY attenuated these alterations (p<0.05). Proteomic analysis identified 2,194 hepatic proteins and revealed that HSF induced molecular signatures associated with increased heart rate (z=1.13) and cardiac contractility (z=1.13), driven by the upregulation of proteins involved in calcium handling (ATP2A2), sarcomeric structure (ACTC1, MYH6/7, MYL3, TPM1), and cytoskeletal organization (DES, JUP). Echocardiographic analysis demonstrated that HSF impaired cardiac function, with reduced S' (p < 0.001) and increased E/E' (p < 0.001), as well as a higher Tei index (p < 0.05), indicating that this molecular profile reflects a compensatory response rather than improved function. ORY supplementation downregulated these proteins, attenuated the predicted activation of heart rate (z=-0.78) and contractility (z=-0.08), and restored systolic (S') and diastolic (E/E') function. These findings demonstrate that HSF induces a maladaptive, compensatory activation of contractility-related pathways that is insufficient to preserve cardiac function, while ORY restores both molecular and functional homeostasis, highlighting its therapeutical potential in modulating liver–heart axis dysfunction. Financial support: FAPESP (2022/16108-4)

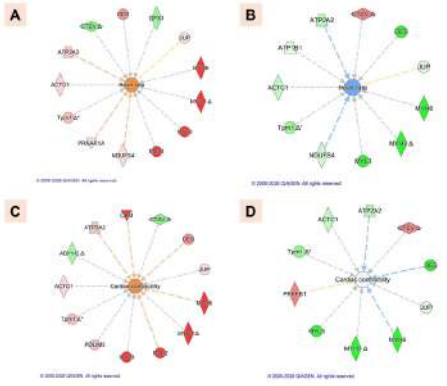


Table 1. Effects of gamma-oryzanol on lipidic and echocardiographic parameters.

	Control	HSF	HSF+ORY
Triglycerides (mg/dL)	56.60±8.8[a]	120.30±2.5[b]	79.80±12.92[c]
VLDL (mg/dL)	12.33±3.72[a]	24.00±0.82[b]	16.00±2.83[a]
S mean	5.68±0.30[a]	4.94±0.47[b]	5.66±0.22[a]
E/E'	13.48±0.99[a]	18.36±3.78[b]	14.16±1.35[a]
TEI index	0.27(0.17-0.39)[a]	0.42(0.41-0.51)[b]	0.26(0.19-0.47)[a,b]

Data are presented as mean values. S': systolic myocardial velocity; E/E': ratio between early diastolic transmitral flow velocity and early diastolic mitral annular velocity; TEI index: myocardial performance index. TEI index is presented as median (interquartile range); other variables are presented as mean values. Different letters indicate statistically significant differences between groups (p < 0.05).

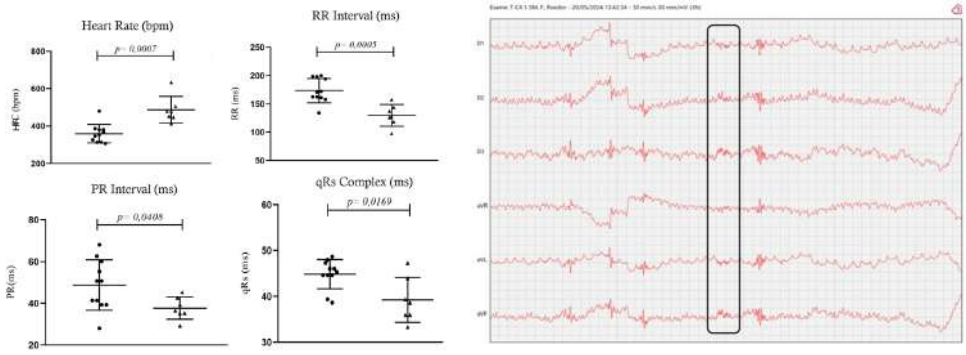
20896

GENERATION OF A CRISPR/CAS9-ENGINEERED C57BL/6J MOUSE MODEL OF PRKAG2 CARDIAC SYNDROME HARBORING THE PRKAG2 P.HIS398GLN VARIANT AND RECAPITULATING THE DISEASE PHENOTYPE

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Background/Introduction: PRKAG2 cardiac syndrome (PCS) is an autosomal dominant disorder caused by variants in the PRKAG2 gene, which encodes the γ2 subunit of AMP-activated protein kinase (AMPK). It manifests with glycogen accumulation in cardiomyocytes, ventricular hypertrophy (VH), ventricular pre-excitation (VPE), and risk of sudden cardiac death (SCD). Objectives: Evaluate electrical, structural, autonomic, and gene expression alterations in Prkag2-p.His398Gln knock-in (KI) mice. Methods: Prkag2-p.His398Gln KI C57BL/6J mice were generated via CRISPR/Cas9 homology-directed repair. Male and female KI and wild-type (WT) mice underwent electrocardiography, echocardiography, and autonomic modulation assessment. Gene expression of Slc2a4 (GLUT4 transporter) and Gys1 (glycogen synthase) was quantified by SYBR Green qPCR in atrial and ventricular tissues. Results and Conclusions: Electrocardiography showed atrial fibrillation, supraventricular tachycardia, ventricular preexcitation, and left ventricular (LV) overload in female KI mice. Male KI exhibited first-degree atrioventricular block with LV overload. Echocardiography revealed hypertrophy-like changes in the mid/proximal LV thirds with elevated fractional shortening and ejection fraction in females, and apical hypertrophy in males. Sympathovagal analysis indicated higher sympathetic and lower parasympathetic activity in female KI mice, with small-to-moderate sympathetic increases and variable parasympathetic changes in males. Gene expression analysis demonstrated upregulated Slc2a4 in KI female atria (vs. WT females) and upregulated Gys1 in KI male hearts (vs. WT males), without similar changes in females. These findings confirm that Prkag2-p.His398Gln KI mice recapitulate the PCS phenotype in a sex-specific manner, mirrored by Slc2a4 and Gys1 expression patterns. Further studies are needed to fully characterize this first Brazilian PCS animal model.



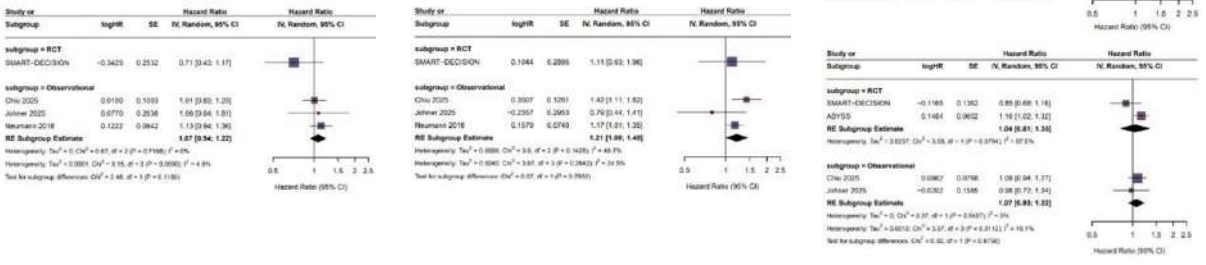
18619

IMPACT OF BETA-BLOCKER DISCONTINUATION AFTER MYOCARDIAL INFARCTION: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background/Introduction: Beta-blockers have historically been a cornerstone of secondary prevention after myocardial infarction (MI), although their long-term benefit in the contemporary era remains uncertain. In stable patients without heart failure or left ventricular dysfunction, the benefit of prolonged therapy beyond the first year remains unclear, particularly in the context of modern reperfusion and medical therapy. Recent evidence has suggested that discontinuation may be safe, raising questions about the need for continued treatment in this population. Objectives: This study aims to evaluate the safety and clinical impact of beta-blocker discontinuation in stable patients after myocardial infarction. Methods: A systematic review and meta-analysis was conducted in accordance with PRISMA guidelines. A total of 128 records were screened. Studies enrolling stable patients after MI, without heart failure or significant left ventricular dysfunction (LVEF >40%), receiving beta-blockers for at least one year, and comparing continuation versus discontinuation were included. Both randomized and non-randomized studies were considered. Data were synthesized using random-effects models. Results and Conclusions: A total of 6 studies were included, comprising 34,303 patients. The mean age ranged from approximately 60 to 64 years, and the majority of patients were male. Hypertension (approximately 40–60%) and diabetes (approximately 10–30%) were common across studies, and most patients underwent percutaneous coronary intervention, with preserved left ventricular ejection fraction in most populations. Multivessel disease was frequently reported. The duration of beta-blocker therapy prior to discontinuation varied across studies, ranging from less than 6 months to more than 1 year after myocardial infarction. There was no statistically significant difference between groups in major adverse cardiovascular events (HR 1.09, 95% CI 0.94–1.27) or all-cause mortality (HR 1.07, 95% CI 0.94–1.22). However, beta-blocker discontinuation was associated with a higher risk of recurrent myocardial infarction (HR 1.17, 95% CI 1.01–1.35). These findings suggest that in stable patients after myocardial infarction, discontinuation of beta-blockers after long-term use is not associated with increased mortality but may be associated with a higher risk of recurrent myocardial infarction, highlighting a potential trade-off between long-term safety and protection against ischemic events.



18035

IMPACT OF INCREASED DISTURBED BLOOD FLOW ON ENDOTHELIAL FUNCTION IN POSTMENOPAUSAL WOMEN

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Background/Introduction: Menopause is characterized by a decline in female sex hormones, which directly affects vascular integrity and increases cardiovascular risk. This may lead to alterations in blood flow (BF) patterns and contribute to endothelial dysfunction mainly due to decreased nitric oxide bioavailability. Objectives: To determine endothelial function in response to increased disturbed blood flow in postmenopausal women. Methods: Young women (YW; 25±4 years; n=13) and postmenopausal women (PMW; 56±4 years; n=19) underwent a 30-min partial forearm blood flow occlusion (75 mmHg) to disturb brachial artery blood flow (DBF) and induce transient endothelial dysfunction. Hemodynamic parameters and endothelial function [flow-mediated dilation, FMD] were assessed using vascular ultrasound. Blood samples were collected before and during the DBF for plasma nitrate measurement. The data were presented as mean and standard deviation. Two-way ANOVA was performed, followed by Fisher's post test. The study was approved by the research ethics committee (CAAE 71649823.6.0000.524). Results and Conclusions: The cuff occlusion increased antegrade BF (YM, baseline: 177.50 ± 80.30 vs DBF: 272.24 ± 101.69; PMW, baseline: 266.76 ± 111.29 vs DBF: 316.05 ± 101.36 mL/min; p<0.01), retrograde BF (YM, baseline: 39.80 ± 17.46 vs DBF: 132.74 ± 62.61; PMW, baseline: 73.15 ± 37.57 vs DBF: 129.57 ± 79.86 mL/min; p<0.01) and the oscillatory shear index (YM, baseline: 0.19 ± 0.07 vs DBF: 0.32 ± 0.04; PMW, baseline: 0.22 ± 0.07 vs DBF: 0.27 ± 0.10 mL/min; p=0.03), whereas it decreased mean BF (YM, baseline: 135.34 ± 58.96 vs DBF: 73.32 ± 29.11; PMW, baseline: 233.96 ± 93.69 vs DBF: 124.36 ± 85.74 mL/min; p<0.01) in both groups, returning to baseline levels after five minutes of recovery. Additionally, the DBF decreased FMD only in the postmenopausal women (Baseline: 10.09 ± 4.58 vs Post-DBF: 6.89 ± 3.40%; p=0.01), while nitrate levels remained unchanged. In summary, preliminary data indicate that disturbed blood flow was associated with decreased flow-mediated dilation only in postmenopausal women, suggesting a transient endothelial dysfunction in this population.

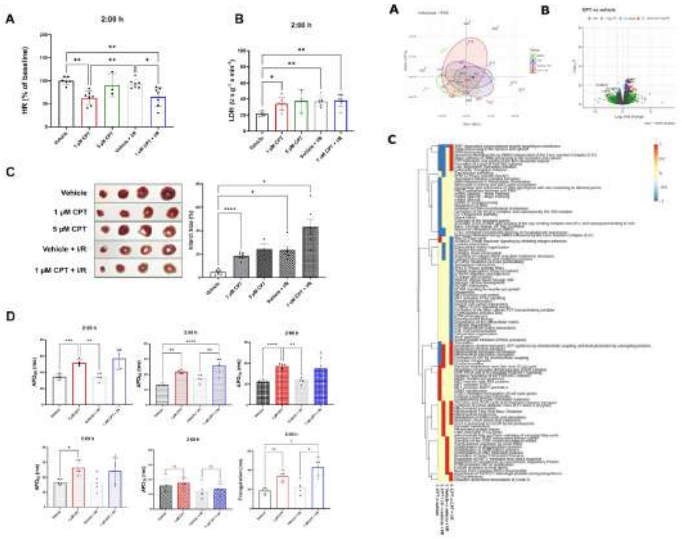
21004

NUCLEOLAR STRESS ALTERS MYOCARDIAL ELECTROPHYSIOLOGY AND MITOCHONDRIAL STRESS RESPONSES

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Background/Introduction: The nucleolus plays a critical role in ribosome biogenesis and the regulation of cellular stress responses. Markers of nucleolar instability have been observed in myocardial biopsies from multimorbid cardiac surgery patients; however, the functional consequences of nucleolar dysfunction on the myocardium remain poorly understood, particularly under conditions of ischaemic stress. Objectives: This study aimed to investigate whether pharmacological induction of nucleolar stress using camptothecin (CPT) modifies myocardial vulnerability to ischaemia–reperfusion (I/R) injury and alters myocardial stress-response pathways. Methods: Hearts from male C57BL/6J mice (30.56 ± 0.72 g) perfused by Langendorff apparatus were randomly divided into four groups: normoxic continuous perfusion (120 minutes) of CPT (1 µM) or vehicle; and 30 minutes perfusion of CPT (1 µM) or vehicle followed by 30 minutes of global ischaemia and 60 minutes of reperfusion. Functional measures included heart rate and monophasic action potential duration (APD). LDH release and TTC staining were used to measure infarct size. Transcriptomic profiling was performed using RNA sequencing with gene set enrichment analysis. Results and Conclusions: CPT-induced nucleolar stress resulted in electrophysiological remodelling, characterised by a progressive reduction in heart rate (63% of baseline at 2 hours; P = 0.0023), prolongation of mid-to-late repolarisation (APD50-90), and increased action potential triangulation (2 hours; P = 0.0066). Myocardial injury was demonstrated by increased LDH release (2 hours; P = 0.0398) and a four-fold increase in infarct size (2 hours; P < 0.0001). Under I/R conditions, nucleolar stress altered functional responses, including reduced heart rate (2 hours; P = 0.0207) and attenuation of I/R-induced repolarisation shortening. Transcriptomic analysis demonstrated enrichment of nucleolar-associated pathways, including rRNA processing and ribosome biogenesis and DNA damage repair pathways in CPT-perfused hearts. Pathways related to mitochondrial metabolism and energy production were enriched following CPT perfusion, but attenuated or downregulated in the presence of I/R. Our study shows that nucleolar stress alters myocardial electrophysiology and injury whilst modulating the cardiac response to ischaemic stress. These findings identify nucleolar dysfunction as a regulator of myocardial vulnerability and a potential therapeutic target in multimorbid patients undergoing cardiac surgery.



21937

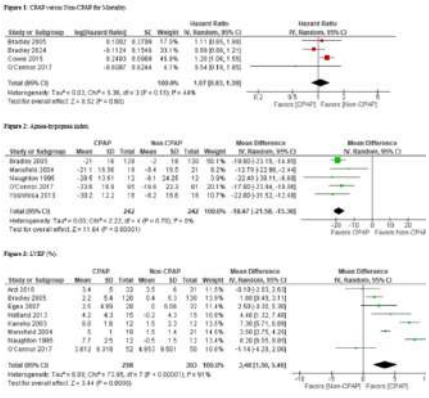
POSITIVE AIRWAY PRESSURE THERAPY IN PATIENTS WITH HEART FAILURE AND SLEEP-DISORDERED BREATHING: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background/Introduction: Sleep-disordered breathing, including obstructive and central sleep apnea, is highly prevalent among patients with heart failure and is associated with intermittent hypoxemia, sleep fragmentation, sympathetic activation, reduced functional capacity, impaired quality of life, and worse cardiovascular outcomes. Positive airway pressure therapies, including CPAP, APAP, and adaptive servo-ventilation, have been proposed to reduce respiratory events and improve cardiac performance. However, previous trials have shown conflicting results regarding their effects on mortality, oxygenation, left ventricular function, and symptoms. Objectives: This study aims to evaluate the efficacy and impact of positive airway pressure therapy compared with non-positive airway pressure strategies in patients with heart failure and sleep-disordered breathing. Methods: A systematic review and meta-analysis was conducted in accordance with PRISMA guidelines. A total of 3996 records were identified from PubMed, Embase, and Cochrane. After removal of 1169 duplicates, 2827 articles were screened, and 156 full-text articles were assessed for eligibility. Reports were excluded due to wrong publication type, overlapping populations, wrong population/control group/outcome, or unavailable full text. A total of 19 studies were included. Outcomes were synthesized using random-effects models. Results and Conclusions: A total of 19 studies were included, comprising 2,566 patients. Of these, 398 patients received CPAP/APAP/PAP therapy, 889 received adaptive servo-ventilation, and 1,279 were allocated to control, sham, usual care, or non-positive airway pressure strategies. Positive airway pressure therapy was not associated with a significant reduction in mortality compared with control (HR 1.07, 95% CI 0.83–1.39; p = 0.60). NT-proBNP/BNP was assessed in three studies, and all showed reductions after positive airway pressure therapy. Therapy significantly reduced apnea-hypopnea index (MD -18.47 events/h, 95% CI -21.58 to -15.36; p < 0.00001), improved left ventricular ejection fraction (MD 3.48%, 95% CI 1.50 to 5.46; p = 0.0006), and reduced daytime sleepiness (MD -1.98, 95% CI -3.52 to -0.45; p = 0.01). We concluded that positive airway pressure therapy improves respiratory control, left ventricular systolic function, neurohormonal markers, and daytime symptoms in patients with heart failure and sleep-disordered breathing, but no significant mortality benefit was observed.





17779

PROGNOSTIC VALUE OF THE HEART SCORE FOR PREDICTING ACUTE ISCHEMIC EVENTS IN EMERGENCY DEPARTMENT PATIENTS PRESENTING WITH CHEST PAIN

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Background/Introduction: Chest pain is a common cause of emergency department visits, requiring rapid identification of patients at risk for acute coronary syndrome. The HEART Score is a validated risk stratification tool, but real-world data from Brazilian populations remain limited. Objectives: To evaluate the association between HEART Score stratification and acute ischemic events, as well as its relationship with in-hospital outcomes in patients presenting with chest pain. Methods: Retrospective observational study including adult patients evaluated under an institutional chest pain protocol in a tertiary hospital between January and December 2025. Patients were stratified according to HEART Score into low (0–3), intermediate (4–6), and high risk (7–10). The primary outcome was acute ischemic event. Diagnostic performance metrics of the HEART Score were calculated. Results and Conclusions: A total of 131 patients were included, of whom 38 (29.0%) had acute ischemic events. High-risk HEART Score classification was significantly associated with ischemic events (54.1% vs. 2.2%, p<0.001). HEART Score ≥4 showed 97.3% sensitivity and 98.1% negative predictive value for acute ischemic event, while high-risk classification demonstrated 97.8% specificity and 90.9% positive predictive value. High HEART Score was also associated with increased rates of hospitalization, coronary angiography, and revascularization. These findings support the HEART Score as a robust and clinically useful tool for risk stratification of chest pain patients in the emergency setting.

FIGURES

Figure 1. Distribution of acute ischemic events according to HEART Score category.

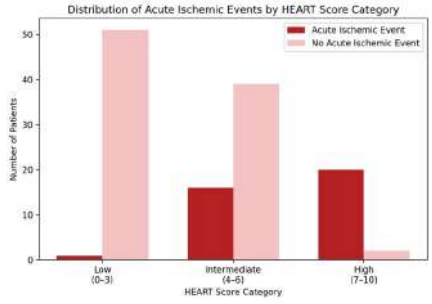
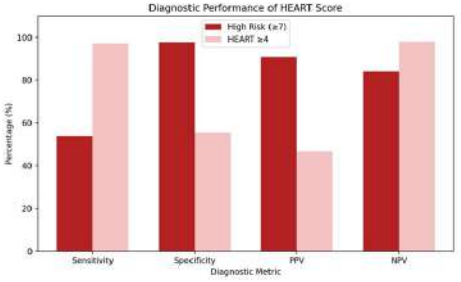


Figure 2. Diagnostic performance metrics of the HEART Score for prediction of acute ischemic events.



20462

ROLE OF DAPAGLIFLOZIN IN ATTENUATING CARDIAC REMODELING AND MODULATING SIRTUIN GENE EXPRESSION IN TYPE 1 DIABETES

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Background/Introduction: Inhibition of sodium-glucose co-transporter 2 (SGLT2) induces well established cardiovascular benefits in high-risk patients with Type 2 diabetes mellitus (DM). However, only a few studies have evaluated the cardiovascular effects of SGLT2 inhibition in individuals with Type 1 DM. The mechanisms involved in beneficial effects have not yet been fully clarified. Studies suggest that SGLT2 inhibitors interact with sirtuins, proteins that modulate cellular survival and apoptosis, autophagy, mitochondrial function, and stress response. Objectives: To analyze the effects of the SGLT2 inhibitor dapagliflozin (Dapa) on cardiac structure, left ventricular function, and myocardial gene expression of sirtuins 1, 3, 5, 6 e 7 in rats with streptozotocin-induced DM. Methods: Male Wistar rats were assigned into control (C), C treated with Dapa (C-Dapa), DM, and DM treated with Dapa (DM-Dapa) groups. DM was induced by a single streptozotocin injection, 50 mg/kg. Dapa was added to rat chow at a dosage of 10 mg/kg/day for 16 weeks. Cardiac remodeling was evaluated by echocardiogram at the end of the study and gene expression by RT-qPCR. Statistical analysis: ANOVA complemented by Tukey or Kruskal–Wallis and Dunn tests (p<0.05). Results and Conclusions: Results: Final body weight was lower in DM and DM-Dapa than their controls and higher in DM-Dapa than DM. Glycemia and echocardiogram data are shown in the Table. Gene expressions of sirtuins 1 and 5 were lower in DM than C and gene expressions of sirtuins 3, 6 and 7 did not differ between groups. Conclusion: Long-term dapagliflozin attenuates body weight loss, hyperglycemia, left cardiac chambers dilation, left ventricular hypertrophy, and systolic and diastolic dysfunction in rats with Type 1 diabetes mellitus. Gene expression of sirtuins 1 and 5 is also modulated by dapagliflozin.

Body weight, glycemia and echocardiographic data

	C	C-Dapa	DM	DM-Dapa
Final BW (g)	497 ± 41	483 ± 43	351 ± 35 *	400 ± 46 #†
Initial glycemia	95 (91 – 104)	99 (92 – 107)	98 (93 – 105)	99 (94 – 107)
Glycemia before Dapa	-	99 (92 – 107)	397 (366 – 445) *	382 (364 – 425) #†
Final glycemia	101 (99 – 106)	98 (90 – 103)	439 (401 – 476) *	132 (108 – 155) #†
LVDD/BW (mm/kg)	14.6 (13.3 – 15.2)	14.9 (14.1 – 16.3)	22.8 (21.5 – 24.4) *	18.9 (18.0 – 21.6) #†
LA/BW (mm/kg)	10.6 (9.6 – 10.8)	10.4 (9.7 – 11.1)	15.2 (14.3 – 17.5) *	13.4 (12.5 – 14.5) #†
LVMI (g/kg)	1.28 (1.27 – 1.42)	1.32 (1.24 – 1.46)	2.04 (1.91 – 2.22) *	1.72 (1.60 – 1.94) #†
PWSV (mm/s)	40.1 ± 4.78	39.5 ± 6.26	29.5 ± 3.60 *	38.0 ± 4.04 †
S' mean	3.38 ± 0.28	3.26 ± 0.31	3.01 ± 0.42 *	3.24 ± 0.50 †
IVRT (ms)	29.0 ± 4.81	33.9 ± 4.05 *	45.8 ± 5.55 *	38.0 ± 4.39 #†
EDT (ms)	43.7 ± 5.24	43.0 ± 3.58	52.7 ± 7.82 *	45.6 ± 7.28 †

C: control; C-Dapa: C treated with dapagliflozin (Dapa); DM: diabetes mellitus; DM-Dapa: DM treated with Dapa; sample size: 18 rats per group; BW: body weight; LVDD and LVSD: left ventricular (LV) diastolic and systolic diameters, respectively; LA: left atrium diameter; LVMI: LV mass index; PWSV: posterior wall shortening velocity; S' mean: mean of the maximum systolic displacement velocity of the lateral and septal walls of the mitral annulus; IVRT: isovolumetric relaxation time; EDT: E wave deceleration time. Data are mean ± standard deviation or median and percentiles; ANOVA and Tukey or Kruskal Wallis and Dunn; * p<0.05 vs C; # p<0.05 vs C-Dapa; † p<0.05 vs DM.

17769

SEX-DEPENDENT CARDIOMETABOLIC EFFECTS OF CHRONIC MILD HYPERHOMOCYSTEINEMIA IN AGED WISTAR RATS

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Background/Introduction: Introduction: Homocysteine (Hcy) is a non-proteinogenic sulfur-containing amino acid generated during methionine metabolism. Physiological plasma levels range from 5 to 15 µmol/L, and elevations are characterized as hyperhomocysteinemia (HHcy). Mild HHcy, defined by plasma homocysteine levels of 16–30 µmol/L, is associated with oxidative stress, metabolic imbalance, and increased cardiovascular risk. Although these effects are described, the sex-specific impact of chronic HHcy on cardiometabolic parameters remains poorly understood. Objectives: Objectives: To investigate the effects of chronic mild HHcy on cardiac structure, lipid profile, adipose tissue distribution, estrous cycle, and biochemical/biomolecular markers in aged male and female Wistar rats. Methods: Methods: Twelve-month-old Wistar rats received DL-homocysteine (0.03 µmol/g, s.c., twice daily) or saline for 30 days. The estrous cycle was monitored in females. Serum and cardiac tissues were collected for biochemical, morphometric, histological, and ultrastructural analyses, and data were analyzed by two-way ANOVA (procedures approved by the institutional animal ethics committee). Results and Conclusions: Results: HHcy increased reactive oxygen species in both sexes ($p<0.05$). In males, HHcy elevated triglycerides and VLDL, increased AST activity, reduced butyrylcholinesterase (BuChE), and increased cardiac mass relative to tibial length and total collagen area ($p<0.05$), indicating hypertrophic remodeling. The atherogenic index of plasma and matrix metalloproteinase-9 expression were also increased ($p<0.05$), with ultrastructural changes including sarcoplasmic reticulum dilation, glycogen accumulation, and altered intercellular junctions. In females, HHcy increased visceral adiposity, elevated ALT and BuChE activity, worsened the Castelli I index ($p<0.05$), and reduced proestrus frequency compared to controls, without cardiac hypertrophy. Histology showed increased cardiomyocyte necrosis and reduced total collagen area ($p<0.05$), along with greater mesenteric and gonadal fat deposition ($p<0.05$). Conclusion: Chronic mild HHcy promotes sex-dependent cardiometabolic dysfunction. Both sexes show increased ROS, but males develop a lipid-driven hypertrophic cardiac phenotype, whereas females exhibit a pro-atherogenic profile associated with increased adiposity. These findings highlight the roles of redox imbalance, lipid metabolism, and cholinergic signaling in sex-specific cardiovascular risk under HHcy conditions. Supported by CNPq.

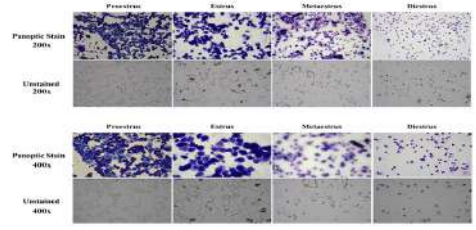


Figure 2. Representative vaginal cytology of female Wistar rats across the estrous cycle stages: proestrus, estrus, metestrus, and diestrus. Images are shown at 200× and 400× magnifications, with Panoptic-stained and unstained preparations. Proestrus is characterized by predominance of nucleated epithelial cells; estrus by abundant cornified epithelial cells; metestrus by a mixed cell population including leukocytes; and diestrus by predominance of leukocytes.

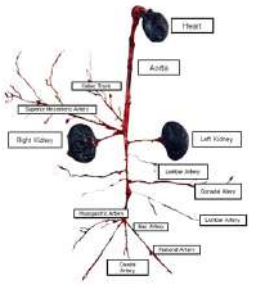


Figure 1. Vascular anatomy of a control male Wistar rat at 395 postnatal days. The image shows the heart and major arterial branches, including the aorta, celiac trunk, superior mesenteric artery, renal arteries supplying the right and left kidneys, lumbar arteries, gonadal artery, common iliac artery, hypogastric artery, femoral artery, and caudal artery.

17495

THE ROLE OF THE ATP-SENSITIVE PURINERGIC P2X7 RECEPTOR IN HEART STRUCTURAL AND FUNCTIONAL ALTERATIONS INDUCED BY SARS-COV-2 IN A HUMANIZED MOUSE MODEL

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Background/Introduction: Since its onset in 2019, COVID-19 spread worldwide, culminating in a pandemic that had profound impacts on healthcare systems. In the heart, patients may develop, during and after infection (long COVID), disorders such as myocarditis and arrhythmias. Objectives: In this study, we investigated the structural alterations of cardiac tissue in K18-hACE2 humanized transgenic mice infected with active SARS-CoV-2. Methods: To assess the involvement of P2X receptors, both K18-hACE2 and K18-hACE2/P2X7 knockout animals were used, divided into six groups: SARS-K18, SARS-K18/BBG (that received additionally Brilliant Blue G, a P2X antagonist receptor) and SARS-K18/P2X7-/- groups that received 2.5 x 10^4 PFU/mL of SARS-CoV-2 intranasally; MOCK-K18, MOCK-K18/BBG and MOCK-K18/P2X7-/- that received virus-free media. Results and Conclusions: After 5 days of infection, electrocardiogram analysis revealed bradycardia in SARS-K18 animals. After 7 days of infection, animals were euthanized, and hearts were processed for structural and cellular analysis. Results showed a significant reduction in heart weight in SARS-K18 mice compared to the animals from MOCK-K18, SARS-K18/BBG and SARS-K18/P2X7-/- groups. Furthermore, histological analysis revealed inflammatory infiltrate and a decrease of cardiomyocyte cross-sectional area in SARS-K18 and SARS-K18/BBG animals, indicating cardiac atrophy. LC3-II (an autophagy marker) expression was increased, while P62 protein concentrations (delivers ubiquitinated proteins to autophagossome) were reduced in SARS-K18, confirming enhanced autophagic flux induced by infection. The MAFBx and MuRF-1 E3 ligases, from the ubiquitin-proteassome system of protein degradation also showed increased expression in animals from SARS-K18 groups compared to MOCKs groups. Expression of the main cardiac gap junction proteins, Connexin-40 and -43, was significantly reduced in animals from SARS-K18 groups, which may be related to the bradycardia. We suggest that SARS-CoV-2 infection induced cardiac atrophy through increased autophagy in K18-hACE2 mice, and that this atrophy was prevented by P2X7 receptor deletion. Further investigations will address potential morphofunctional alterations caused by the SARS-CoV-2 infection.

20747

TITLE EVALUATION OF ALGINATE SCAFFOLD AND HUMAN AMNIOTIC MEMBRANE ON VENTRICULAR REMODELING AFTER MYOCARDIAL INFARCTION IN AN EXPERIMENTAL MODEL

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Background/Introduction: Acute Myocardial Infarction (AMI) is associated with high morbidity and mortality worldwide. Cardiac regeneration after AMI remains a challenge, since conventional therapies do not promote effective tissue repair. Objectives: To evaluate the potential of alginate scaffolds and human amniotic membrane in promoting cardiac tissue regeneration after myocardial infarction through functional and histological analysis in a preclinical rat model. Methods: After approval by the Animal Ethics Committee of UFPR (Protocol: 23075.046582/2024-88), AMI was induced in 60 male Wistar rats by coronary artery ligation. Seven days later, baseline echocardiography was performed to assess left ventricular ejection fraction (LVEF), end-diastolic volume (LVEDV), and end-systolic volume (LVESV) using the Simpson method. After post-AMI mortality, surviving animals were randomized into three groups: Control – untreated AMI (n=12); Alginate – implantation of a 3D-printed alginate scaffold (n=10); and Amniotic Membrane – implantation of decellularized human amniotic membrane (n=14). Final echocardiographic evaluation was performed 30 days after AMI induction. Results and Conclusions: At 7 days after AMI (D7), the control, alginate, and amniotic membrane groups showed distinct LVEF values (44% vs 53.3% vs 36.9%; p=0.009). At 30 days (D30), significant differences in LVEF persisted among the groups (38.9% vs 60.2% vs 41.6%; p=0.005). No significant intergroup differences in LVESV were observed at D7 or D30. However, intragroup analysis showed a significant LVESV increase only in the control group between D7 and D30 (p=0.008). Similarly, no significant differences in LVEDV were found among groups, although only the control group showed a significant increase over time (p=0.013). These findings suggest that the evaluated biomaterials may attenuate post-AMI ventricular remodeling, particularly in the alginate scaffold group, which demonstrated better preservation of ventricular function and less ventricular dilation progression compared with the control group.

16875

HOME-BASED HIGH-RESISTANCE INSPIRATORY MUSCLE STRENGTH TRAINING ATTENUATES SYMPATHETIC-CARDIOVASCULAR REACTIVITY TO ACUTE MENTAL STRESS IN LONG COVID PATIENTS: A RANDOMIZED, DOUBLE-BLIND, SHAM-CONTROLLED TRIAL

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Introdução/Fundamentos: We have recently demonstrated that Long COVID patients exhibit exaggerated sympathetic-cardiovascular reactivity during acute mental challenges, indicating an increased cardiovascular risk. Conversely, home-based high-resistance inspiratory muscle strength training (IMST) reduces muscular sympathetic nerve activity (MSNA), lowers mean arterial pressure (MAP) and improves vascular function in other populations. Objetivos: Therefore, IMST may be a promising strategy to attenuate sympathetic-cardiovascular reactivity to mental stress (MS) in Long COVID patients Métodos: To test this hypothesis, a randomized, double-blind, sham-controlled clinical trial (Identifier: NCT06091384) with 6 weeks of home-based high-resistance IMST (30 breaths/day, 6 days/week at 75% PImax) vs. SHAM (30 breaths/day, 6 days/week at 15% PImax) was conducted. MSNA (Microneurography), brachial artery blood flow (BABF, Ultrasound-Doppler), MAP (Finomenter), and heart rate (HR, ECG) were measured during 3 min of MS (Stroop color test) before and after 6 weeks of intervention. Resultados e Conclusões: Thirty-one Long COVID patients completed the study, 15 in IMST (men 9, age: 49.9±8.2 years and BMI: 32.0±6.25kg/m²) and 16 in SHAM (men 7, age: 51.9±10.9 years, BMI: 34.0±5.66 kg/m²). IMST was safe, well tolerated, had excellent adherence (≈96), and increased the PImax (P<0.05). IMST decreased the burst frequency and incidence MSNA, and MAP responses to MS (P<0.001 for all), but did not change HR and BABF (P>0.05 for both). No changes were observed in the studied variables in SHAM (P>0.05). Importantly, the perceived stress levels to MS conducted before and after 6 weeks of IMST or SHAM were similar (P>0.05). Our findings clearly indicate that home-based high-resistance IMST attenuates sympathetic-cardiovascular reactivity to MS in Long COVID patients, suggesting it may be a promising strategy for lowering cardiovascular risk. These results will need to be confirmed in larger trials.

21978

HYPERGLYCEMIA IS ASSOCIATED WITH FIBROBLAST-ENRICHED THROMBOSPONDIN-2 UPREGULATION IN DIABETIC MOUSE HEARTS

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Introdução/Fundamentos: Diabetic cardiomyopathy is characterized by early myocardial fibrosis and ventricular stiffening, yet the fibroblast-specific molecular signals linking hyperglycemia to extracellular matrix remodeling remain incompletely defined. Thrombospondin-2 (TSP2) is a matricellular protein involved in collagen organization and tissue mechanics, but its regulation in the diabetic heart is not well established. Objetivos: We assessed the hypothesis that diabetes and high-glucose exposure are associated with increased TSP2 expression in cardiac fibroblast-lineage cells. Métodos: Single-cell RNA sequencing data from 17-week-old male diabetic db/db and control db/h mouse hearts were analyzed by pseudobulk aggregation across mice and by cardiac cell lineage (n=8/group). Thbs2 transcript abundance was compared between diabetic and control hearts and across non-myocyte populations. A second single-cell dataset from older diabetic mice was used to assess lineage specificity. Primary wild-type mouse cardiac fibroblasts were cultured under low- and high-glucose conditions, and TSP2 protein expression was evaluated by Western blot with GAPDH normalization. Resultados e Conclusões: Diabetic db/db hearts demonstrated an approximately two-fold increase in Thbs2 transcript abundance compared with db/h controls (p=0.0002). Lineage-level analysis identified fibroblasts and pericytes as the dominant contributors to cardiac Thbs2 expression, with fibroblasts showing the highest absolute expression and diabetic induction (p<0.001). The independent older-mouse dataset further supported fibroblast-enriched TSP2 expression. Western blot analysis showed an approximately three-fold increase in GAPDH-normalized TSP2 protein in high-glucose versus low-glucose cardiac fibroblasts (p=0.0414; n=2 per condition), consistent with the transcriptomic findings but requiring replication. These results suggest that hyperglycemia-associated TSP2 upregulation in cardiac fibroblasts may represent a fibroblast-centered mechanism linking diabetes to myocardial matrix remodeling, extending prior evidence that high glucose drives TSP2 elevation in dermal fibroblasts and contributes to impaired healing in diabetes.

Geriatric Cardiology



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21129

HIGH PREVALENCE OF SARCOPENIA IN ELDERLY PATIENTS WITH CHRONIC CHAGAS CARDIOMYOPATHY: A CROSS-SECTIONAL STUDY

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Background/Introduction: Chronic Chagas cardiomyopathy (CCC) induces a state of chronic inflammation and heart failure, which act as potential triggers for sarcopenia. Although this underdiagnosed geriatric syndrome drastically worsens prognosis, its comparative prevalence between the clinical forms of chronic Chagas disease (CCD) remains uncertain. Objectives: To compare the prevalence of sarcopenia in elderly patients with the cardiac form (CF) and the indeterminate form (IF) of CCD, and to identify independent risk factors associated with this syndrome. Methods: This cross-sectional analytical study evaluated 130 patients aged ≥ 60 years with a serological diagnosis of CCD from a tropical disease referral outpatient clinic. Patients were divided into CF (with electrocardiographic/echocardiographic alterations) and IF (without cardiac involvement) groups. Sarcopenia was diagnosed using the strict EWGSOP2 criteria: low muscle strength (handgrip dynamometry) plus low appendicular skeletal muscle mass (bioelectrical impedance analysis). Comorbidities (Charlson Comorbidity Index), nutritional status (Mini Nutritional Assessment), and inflammatory markers (hs-CRP) were assessed. Statistical analysis included Chi-square test and multivariate logistic regression, with significance set at $p < 0.05$. Results and Conclusions: Out of 130 patients (mean age 68.4 ± 6.1 years), 62 (47.7%) had IF and 68 (52.3%) had CF. Global sarcopenia prevalence was 36.9%, indicating a high burden. However, stratified analysis revealed a drastic difference: 58.8% (40/68) in the CF group met the criteria for sarcopenia, compared to only 11.3% (7/62) in the IF group ($p < 0.001$). Multivariate logistic regression identified the following independent predictors for sarcopenia: presence of the cardiac form (OR 7.9; 95% CI 3.1–20.3), worse nutritional status (OR 3.1; 95% CI 1.4–6.9), and elevated hs-CRP levels (OR 2.4; 95% CI 1.1–5.2). Sarcopenia is highly prevalent in elderly patients with CCD, but the risk is intrinsically linked to cardiomyopathy rather than the infection alone. The cardiac form independently increased the odds of sarcopenia nearly eightfold. These findings highlight the critical need to incorporate routine muscle mass and strength assessments into the cardiological follow-up of Chagas patients, targeting the highest-risk subgroup for early multimodal rehabilitation to improve functional capacity and prognosis.

15900

LISTENING TO ELDERLY HEART FAILURE PATIENTS: PATIENT-REPORTED QUALITY OF LIFE PREDICTS MORTALITY BETTER THAN PHYSICIAN-ASSESSED FUNCTIONAL CLASS

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Background/Introduction: The prevalence of heart failure (HF) is rising significantly due to improved treatment and longer life expectancy. Health status assessments by healthcare providers may differ from patients' perspectives, particularly in the elderly population. Literature on quality of life (QoL) in this demographic, especially among hospitalized patients, remains limited. Objectives: This study evaluates the association between QoL assessed by the Kansas City Cardiomyopathy Questionnaire (KCCQ), New York Heart Association (NYHA) functional class, and mortality. Methods: Cross-sectional study of elderly in-patients with HF at a tertiary cardiology center in Brazil. The KCCQ assessed QoL 15 days prior to admission, and NYHA classification was recorded at admission. KCCQ scores of 0–49 represented poor health status, and 50–100 represented good health status. Results and Conclusions: A total of 196 patients were enrolled, with a mean age of 73±6 years; 53.6% were male. Mean KCCQ score was 54.8±19.7; poor QoL was observed in 39.4% of patients, whereas 60.6% had good QoL. Regarding NYHA functional class, 54.4% were in class III or IV, and 45,6% were in class I or II at admission. Overall, 81.1% of patients were discharged, 9.2% had prolonged hospitalization, and 9.7% died. Among patients with poor QoL, 18.3% died versus 81.7% who survived. Conversely, among those with good QoL, 93.6% had good outcomes versus 6.4% mortality (q=0.016). Regarding NYHA functional class, 11% of patients in class III or IV died, whereas 89% survived; those in class I or II had 92% with good outcomes and 8% mortality (p=0.615). In conclusion, within this sample, poor QoL as assessed by KCCQ was a statistically significant predictor of mortality in elderly patients with HF, whereas NYHA functional class assessed by healthcare providers was not.

17532

PERIOPERATIVE MYOCARDIAL INFARCTION AS THE LEADING CAUSE OF DEATH IN ELDERLY LIVER TRANSPLANT RECIPIENTS: A CALL FOR CARDIOVASCULAR RISK STRATIFICATION

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Background/Introduction: Liver transplantation is the definitive treatment for end-stage liver disease, with increasing use worldwide. As surgical techniques advance, it has expanded to elderly patients with significant cardiovascular comorbidities. Perioperative myocardial infarction (MI) and cardiovascular complications are the main causes of morbidity and mortality, accounting for up to 50% of early hospitalizations and 40% of deaths within the first month. Cardiovascular risk stratification, however, remains heterogeneous and challenging. Objectives: To assess the incidence of death due to perioperative MI in liver transplant patients and compare outcomes between elderly (≥70 years) and younger (<70 years) individuals. Methods: Observational, retrospective, cross-sectional study conducted at a tertiary private hospital in Brazil. Adult patients who underwent liver transplantation between January 2020 and May 2025 were included and categorized by age (≥70 vs. <70 years). Data were obtained from electronic medical records. The primary outcome included death due to perioperative MI, defined as events occurring during hospitalization or within 30 days after transplantation, according to the Fourth Universal Definition. Secondary outcomes included overall mortality and other causes of death, such as infection and graft dysfunction. Results and Conclusions: 241 patients were evaluated, 42 (17.4%) aged ≥70 years and 199 (82.6%) aged <70 years. In the group ≥70 years old, there were 4 deaths (9.5%), of which 3 (7.1%) were due to perioperative infarction and 1 (2.4%) due to infection. In the <70 years old group, there were 9 deaths (4.5%), 2 (1.0%) due to heart attack, 5 (2.5%) due to infection and 2 (1.0%) due to graft dysfunction. Perioperative infarction deaths were significantly higher in patients aged ≥ 70 years (7.1% vs. 1.0%). Considering the proportional mortality in deaths, perioperative infarction corresponded to 75% of deaths in the group ≥70 years and 22.2% in the group <70 years, highlighting the greater cardiovascular vulnerability of the first group. Although liver transplantation is increasingly performed in the elderly, the presence of comorbidities and low physiological reserve may contribute to the prognosis. The high proportion of heart attacks as a cause of death reinforces the importance of rigorous preoperative cardiovascular risk stratification, in addition to the need for preventive strategies and individualized management to reduce mortality in this subgroup.

16317

TIME OUT OF HOME AND MORTALITY IN OLDER ADULTS WITH HEART FAILURE AFTER ACUTE CARE

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Background/Introduction: Time out of home reflects days lost to healthcare utilization and death, capturing the overall burden of disease. Although proposed as a patient-centered outcome in older adults with heart failure (HF), its prognostic value remains unclear. Objectives: To identify determinants of time out of home during the first year after an acute outpatient event in older adults with HF and to evaluate its association with subsequent 3-year mortality. Methods: This prospective cohort study included patients aged ≥60 years with HF who were consecutively admitted (2014–2020) to an acute care day hospital at a large academic medical center in São Paulo, Brazil. Time out of home was calculated during the first year following the acute event as the number of calendar days spent in emergency departments, hospitals, post-acute care settings, or nursing homes, plus days lost to death. Sociodemographic and clinical characteristics, frailty, and the Cardiac and Comorbid Conditions Heart Failure (3C-HF) score, a validated measure of HF severity, were assessed. First-year survivors were followed for 3 additional years for all-cause mortality. Negative binomial regression identified factors associated with time out of home, and multivariable Cox proportional hazards models evaluated the association between time out of home and time to death over 3 years. Results and Conclusions: Among 326 patients (mean age 80.9 ± 7.7 years; 38.0% female; 59.8% identified as White), 195 (59.8%) had ≤7 days out of home, 40 (12.2%) had 8–14 days, and 91 (28.0%) had ≥15 days. Greater time out of home was associated with non-White race/ethnicity, ≥8 years of education, frailty, and greater heart failure severity (3C-HF) (Figure 1). Among 254 first-year survivors, greater time out of home during the first year was associated with higher subsequent 3-year mortality (≤7 days: 42%; 8–14 days: 58%; ≥15 days: 66%; p<0.001) (Figure 2). After adjustment for sociodemographic and clinical factors, frailty, and HF severity, ≥15 days out of home was associated with a twofold higher hazard of 3-year mortality compared with ≤7 days during the first year (HR 2.0, 95% CI 1.3–3.1).

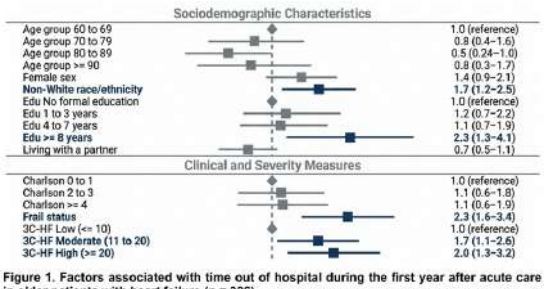


Figure 1. Factors associated with time out of hospital during the first year after acute care in older patients with heart failure (n = 326)
Edu: education level; Charlson: Charlson comorbidity index; 3C-HF: Cardiac and Comorbid Conditions Heart Failure. Estimates are presented as incidence rate ratios (IRRs) with 95% confidence intervals.

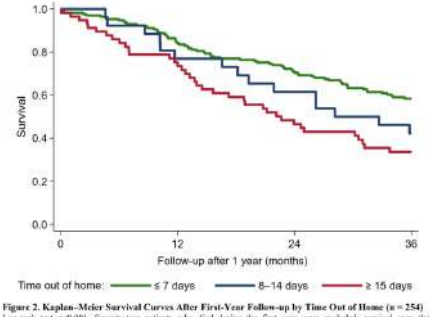


Figure 2. Kaplan–Meier Survival Curves After First-Year Follow-up by Time Out of Home (n = 254)
Log-rank test p<0.001. Seventy-two patients who died during the first year were excluded; survival over the subsequent 3 years was analyzed among the 254 patients who survived the first year after acute care day hospital admission.

Heart Failure / Transplantation / Ventricular Assist Devices / Cardiomyopathies



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19103

A DECADE OF SURVIVAL: LONG-TERM FOLLOW-UP OF HEART TRANSPLANT RECIPIENTS AT A TERTIARY CENTER

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Background/Introduction: Heart transplantation (HTx) is an established therapy for advanced heart failure. The average survival rate for patients is approximately 7 years in Brazil and 12 years worldwide. However, many patients exceed this average, developing various comorbidities and requiring specific longitudinal follow-up. Objectives: Profile of HTx survivors >10 years. Methods: A total of 521 HTx have been performed at our hospital since 1991; patients with a survival rate of more than 10 years were selected for this study. Following the implementation of electronic medical records in 2020, patients without electronic data were excluded. We analyzed demographic data, HTx etiology, pre- and post-transplant comorbidities, late complications, immunosuppression protocols, echocardiographic findings, and screenings for cardiac allograft vasculopathy (CAV). Results and Conclusions: Eighty-four (84) patients with survival exceeding 10 years were identified. Mean age at HTx was 46.6 years, with a male predominance (65.5%). The primary etiology was Chagas cardiomyopathy (31.8%), followed by dilated (27.1%) and ischemic cardiomyopathy (22.4%). Most frequent pre-HTx comorbidities were arterial hypertension (47.6%) and dyslipidemia (29.8%); post-HTx, dyslipidemia prevalence rose to 59.5%. Main late complications included Chagas disease reactivation (17.9%), occurring at a mean of 1.1 years post-HTx, cellular rejection (15.5%), and cytomegalovirus infection (13.1%). The immunosuppressive regimen predominantly used mycophenolate (87.6%) and cyclosporine (46.4%). mTOR inhibitors (everolimus/sirolimus) were used in 13.5% of patients. Echocardiography showed a mean ejection fraction (EF) of 63.0%, with only 4.8% having an EF < 50%. Moderate-to-severe tricuspid regurgitation was present in 31.0%, and left atrial enlargement in 28.0%. Screening for cardiac allograft vasculopathy (CAV) was performed in 67 patients (79.8%), with a 9.0% positivity rate. Overall mortality was 25.0% (21 patients), with a mean interval of 19.3 years between HTx and death. This study delineated the clinical and echocardiographic profile of long-term HTx survivors. The predominance of Chagas etiology, often associated with lower CAV incidence and fewer comorbidities, reflects both a favorable prognosis for this group and the Brazilian epidemiological profile. The low prevalence of CAV in this cohort (9.0%) reinforces its role as a critical survival-limiting factor, as its relative absence was a hallmark of patients who successfully exceeded a decade of survival.

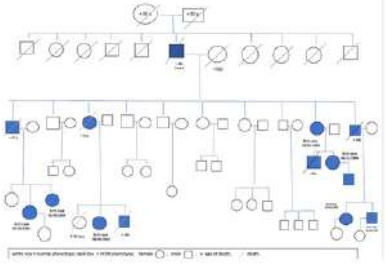
20717

A MALIGNANT FORM OF NONOBSTRUCTIVE HYPERTROPHIC CARDIOMYOPATHY ASSOCIATED WITH A NOVEL MYH7 VARIANT: LONG-TERM NATURAL HISTORY

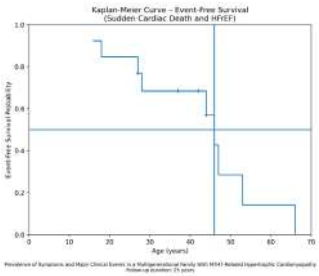
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Background/Introduction: Interpretation of variants of uncertain significance (VUS) in sarcomeric genes remains a major challenge in inherited cardiomyopathies. Comprehensive phenotyping and robust segregation data are essential for accurate variant classification. Objectives: To evaluate genotype–phenotype correlation and segregation patterns of the MYH7 c.1498G>A variant in a multigenerational family with hypertrophic cardiomyopathy (HCM), and to assess evidence supporting reclassification. Methods: Thirteen phenotypically affected individuals across three generations were identified within a 34-member family and followed in an observational cohort for up to 25 years. Non-obstructive HCM was diagnosed by echocardiography. Seven surviving affected relatives underwent genetic testing (two by whole-genome next-generation sequencing and five by Sanger sequencing). Co-segregation between genotype and phenotype was evaluated according to American College of Medical Genetics and Genomics (ACMG) criteria. Genetic testing of phenotypically negative relatives is currently underway to further strengthen segregation analysis. Results and Conclusions: The MYH7 c.1498G>A variant, previously classified as a VUS, was detected in the proband and in all tested affected relatives. No alternative pathogenic sarcomeric variants were identified. Consistent co-segregation between the variant and the HCM phenotype was observed across generations. Clinical expression was early (median diagnosis 16.5 years) and severe: syncope occurred in 75%, atrial fibrillation in 50%, complete atrioventricular block in 25%, and sudden cardiac death in 38% of affected individuals. Although baseline systolic function was preserved, 33% progressed to heart failure with reduced ejection fraction during long-term follow-up. In this multigenerational family, the MYH7 c.1498G>A variant demonstrates strong genotype–phenotype co-segregation and aggressive clinical expression. These findings provide substantial clinical evidence supporting reclassification from VUS to likely pathogenic and highlight the importance of detailed familial phenotyping in variant interpretation.



Clinical Variable	n / 12	Prevalence (%)
Fatigue	11 / 12	91.7%
Dyspnea	10 / 12	83.3%
Palpitations	10 / 12	83.3%
Chest pain	10 / 12	83.3%
Syncope / Presyncope	8 / 12	66.7%
Arterial thrombosis	1 / 12	8.3%
Atrial fibrillation	6 / 12	50.0%
Complete AV block	3 / 12	25.0%
Non-sustained VT	1 / 12	8.3%
LVEF decline	6 / 12	50.0%
ICD implantation	8 / 12	66.7%
Upgrade to CRT-D	3 / 12	25.0%
HFrEF (LVEF <40%)	4 / 12	33.3%
Sudden cardiac death	5 / 12	41.7%
Overall mortality	5 / 12	41.7%



17777

AFICAMTEN VERSUS METOPROLOL IN PATIENTS WITH OBSTRUCTIVE HYPERTROPHIC CARDIOMYOPATHY: A FREQUENTIST NETWORK META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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Background/Introduction: INTRODUCTION: While beta-blockers are the standard initial therapy for symptomatic obstructive hypertrophic cardiomyopathy (oHCM), their effectiveness is poorly documented. Aficamten, a cardiac myosin inhibitor, effectively reduces outflow gradients and improves symptoms when added to existing regimens. The question remains, however, whether aficamten alone is more clinically effective than traditional beta-blocker such as metoprolol. Objectives: OBJECTIVE: This meta-analysis aimed to compare Aficamten and Metoprolol in oHCM. Methods: METHODS: The study was reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement with NMA extension. Study selection included only randomized controlled trials (RCTs). Main outcomes were: (1) improvement of ≥1 NYHA functional class, (2) peak oxygen uptake as assessed during cardiopulmonary exercise testing, (3) change of left ventricular outflow tract (LVOT) gradient at rest and (4) after the Valsalva maneuver from baseline, (5) change in Kansas City Cardiomyopathy Questionnaire clinical summary score (KCCQ-CSS) from baseline. A frequentist framework was used for the NMA to integrate direct and indirect evidence across interventions. All analyses employed a random-effects model. Treatment effects were expressed as risk ratio (RR) with 95% confidence intervals (CIs) for binary outcomes and standardized mean difference (SMD) for continuous outcomes. Results and Conclusions: RESULTS: Four RCTs comprising 527 patients were included. Aficamten showed higher rates of improvement ≥1 in NYHA scores (RR 1.86 [1.29; 2.68]) and significantly higher peak oxygen uptake (SMD 0.88 (0.60; 1.16)) and KCCQ-CCS (SMD 0.43 (0.16; 0.69)) compared to metoprolol. Also, aficamten showed lower LVOT at rest (SMD -1.18 (-1.47; -0.89)) and lower LVOT after valsalva maneuver (SMD -1.10 (-1.38; -0.82)) compared to the beta-blocker. CONCLUSION: This meta-analysis demonstrates that aficamten achieved better outcomes compared to metoprolol regarding improving NYHA functional class, exercise capacity, and quality of life in oHCM patients. Furthermore, aficamten achieved significantly greater reductions in LVOT gradients. These findings need to be further investigated through head-to-head comparisons in larger RCTs and different populations.

19862

ASSOCIATION BETWEEN NT-PROBNP LEVELS AND EVOLUTIONARY STAGES OF CHAGASIC CARDIOMYOPATHY

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Background/Introduction: Chagas disease remains an important cause of cardiovascular morbidity and mortality in Latin America, with chronic Chagasic cardiomyopathy representing its most severe form. Stratification of disease severity is essential in clinical practice, and biomarkers such as NT-proBNP have been associated with ventricular dysfunction and worse prognosis. However, their relationship with the different evolutionary stages of the disease has not yet been fully established. Objectives: To evaluate the association between NT-proBNP levels and the severity of Chagasic cardiomyopathy. Methods: This was an observational, cross-sectional, and analytical study conducted using a database from a referral center in northern Minas Gerais, Brazil. Patients with Chagas disease who had both cardiomyopathy classification and NT-proBNP measurements available were included. Disease severity was categorized into stages A, B1, B2, C, and D, according to the Brazilian Society of Cardiology. NT-proBNP was analyzed as a continuous variable. The Kruskal–Wallis test was used, followed by Dunn's post hoc test. A p-value < 0.05 was considered statistically significant. Results and Conclusions: A total of 115 patients were included. A progressive increase in NT-proBNP levels was observed according to cardiomyopathy severity, with median values of 115.0 pg/mL (A), 108.0 pg/mL (B1), 355.0 pg/mL (B2), 775.0 pg/mL (C), and 5468 pg/mL (D). There was a statistically significant difference between stages ($H = 51.47$; $p < 0.001$; $\varepsilon^2 = 0.45$). A more pronounced increase was noted from stage B2 onward, suggesting an inflection point in biomarker elevation. In the post hoc analysis, stages C and D showed significantly higher levels compared to early stages ($p < 0.001$). NT-proBNP levels are significantly associated with the severity of Chagasic cardiomyopathy, showing a progressive increase with a more marked rise beginning at stage B2. These findings reinforce its role as a severity marker and suggest its potential use as a complementary tool in disease stratification.

21906

ATRIAL FIBRILLATION IN HYPERTROPHIC CARDIOMYOPATHY: A RISK MARKER FOR STROKE AND SYMPTOMS

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Background/Introduction: Background: Hypertrophic cardiomyopathy (HCM) is a disease with a heterogeneous course, in which the identification of markers associated with worse clinical outcomes remains challenging. Atrial fibrillation (AF) is a frequent arrhythmia in this population and may influence relevant outcomes, such as symptoms and thromboembolic events. However, data from Brazilian cohorts are still limited. Objectives: Objective: To evaluate the correlation between AF and morbidity and mortality in patients with HCM Methods: Methods: Retrospective Brazilian cohort of patients with HCM, divided into two groups according to the presence or absence of AF, evaluating their characteristics and clinical outcomes. Continuous variables were presented as arithmetic means and standard deviation (SD), and categorical variables as absolute and relative frequencies. A p value < 0.05 was considered statistically significant. Results and Conclusions: Results: A total of 732 patients were included, 53.7% male, with a mean age of 54±16.5 years. Atrial fibrillation (AF) was present in 144 patients (19.7%). The AF group was older (60±13.4 vs. 52.5±16.9 years; p<0.001), had lower left ventricular ejection fraction (60.8±9.5% vs. 63.8±9.1%; p<0.001), and larger left atrial diameter (48±7.7 vs. 42.4±6.9 mm; p<0.001). Dyspnea symptoms were more frequent in the AF group (59.7% vs. 41.7%; p<0.001). Furosemide use was more common among patients with AF (31.3% vs. 9.5%), associated with a higher likelihood of use (OR 4.31; 95%CI: 2.78–6.68; p<0.001). The overall prevalence of stroke was 9.4%, being higher in the AF group (20.1% vs. 6.8%; p<0.001), with an approximately threefold increased risk (RR 2.96; 95%CI: 1.90–4.60; p<0.001). In the multivariate analysis, age, left atrial diameter, diuretic use, and presence of symptoms were independently associated with AF. Mortality for all causes was no statistic relevant (p=0,098), dispite more prevalente (20,9% vs 15,1%). Conclusions: AF was a frequent complication in HCM, associated with a worse clinical profile, greater symptom burden, and higher need for diuretics. Patients with AF had an approximately threefold higher risk of stroke, reinforcing its prognostic relevance in this population.

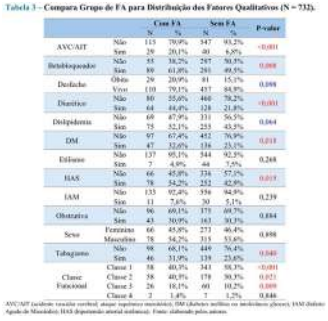
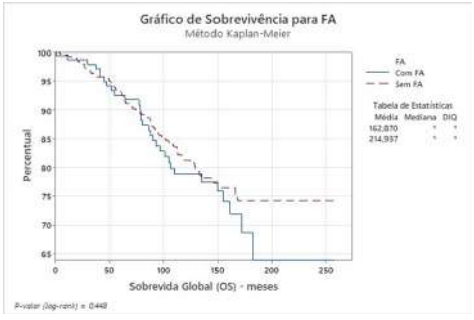


Tabela 3 – Compara Grupo de FA para Distribuição dos Fatores Qualitativos (N = 732).

		Com FA		Sem FA		P-valor
		N	%	N	%	
AVC/AIT	Não	115	79,9%	347	93,2%	<0,001
	Sim	29	20,1%	40	6,8%	
Bebidoso	Não	55	38,2%	247	50,5%	0,008
	Sim	89	61,8%	291	49,5%	
Dorfache	Ob-tio	29	20,9%	81	15,1%	0,098
	Vivo	110	79,1%	457	84,9%	
Diurético	Não	80	55,6%	460	78,2%	<0,001
	Sim	64	44,4%	128	21,8%	
Dislipidemia	Não	69	47,9%	331	56,5%	0,064
	Sim	75	52,1%	255	43,5%	
DM	Não	97	67,4%	452	76,9%	0,018
	Sim	47	32,6%	136	23,1%	
Etilismo	Não	137	95,1%	544	92,5%	0,268
	Sim	7	4,9%	44	7,5%	
HAS	Não	66	45,8%	336	57,1%	0,015
	Sim	78	54,2%	252	42,9%	
IAM	Não	133	92,4%	556	94,8%	0,239
	Sim	11	7,6%	30	5,1%	
Obstrutiva	Não	96	69,1%	373	69,7%	0,884
	Sim	43	30,9%	163	30,3%	
Sexo	Feminino	66	45,8%	273	46,4%	0,898
	Masculino	78	54,2%	315	53,6%	
Tabagismo	Não	98	68,1%	449	76,4%	0,040
	Sim	46	31,9%	139	23,6%	
Classe Funcional	Classe 1	58	40,3%	341	58,3%	<0,001
	Classe 2	58	40,3%	178	30,3%	0,021
	Classe 3	26	18,1%	60	10,2%	0,009
	Classe 4	2	1,4%	7	1,2%	0,846

AVC/AIT (acidente vascular cerebral, ataque isquêmico transitório), DM (diabetes mellitus ou medicamentos glicemia), HAS (hipertensão arterial sistêmica). Fonte: elaborado pelos autores.



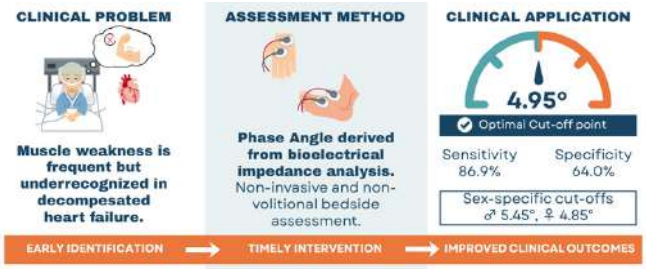
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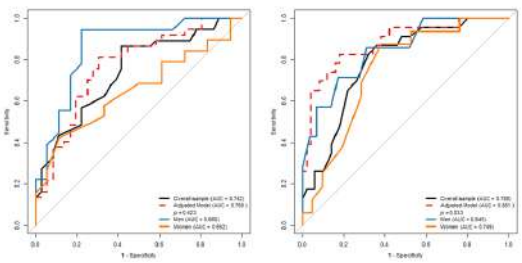
BIOELECTRICAL IMPEDANCE-DERIVED PHASE ANGLE FOR DETECTING MUSCLE WEAKNESS IN DECOMPENSATED HEART FAILURE: DIAGNOSTIC PERFORMANCE AND OPTIMAL CUTOFF

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Background/Introduction: Muscle weakness is a frequent complication in hospitalized patients with decompensated heart failure (DHF). Bioelectrical impedance–derived phase angle (PhA) reflects cellular integrity and muscle quality, but its role in identifying weakness during DHF remains unclear. Objectives: To evaluate the association between PhA and muscle weakness and its ability to discriminate against this condition in inpatients with DHF. Methods: A cross-sectional study with patients aged ≥60 years hospitalized for DHF. PhA was measured by bioelectrical impedance analysis. Muscle strength was evaluated using handgrip strength (HGS) and the Medical Research Council (MRC) scale. Diagnostic performance was evaluated using ROC curves and Youden's index. A significance level of p < 0.05 was adopted. This study was approved by the local Research Ethics Committee of the and all participants signed informed consent. Results and Conclusions: Seventy-three patients were analysed. Muscle weakness was identified in 37 (50.7%) patients using HGS and in 23 (31.5%) using the MRC scale. PhA did not differ between sexes (4.80 [1.30]° in men vs. 5.15 [1.70]° in women, p=0.407) and correlated positively with HGS in men only (rs=0.757, p<0.001). Higher PhA was independently associated with lower likelihood of muscle weakness even after adjustment for age and sex (OR 0.40, 95%CI 0.21–0.76, p=0.006 for HGS; OR 0.25, 95%CI 0.09–0.65, p=0.005 for MRC). PhA showed moderate discriminatory ability for detecting muscle weakness defined by HGS (AUC=0.742, 95% CI 0.628–0.855) and the MRC scale (AUC=0.788, 95% CI 0.681–0.895). An optimal cutoff of 4.95° yielded 86.9% sensitivity and 64.0% specificity. After adjustment for age and sex, discriminatory performance improved, particularly for the MRC scale (AUC=0.881, 95% CI 0.788–0.955), with a significant increase compared with the unadjusted model (p=0.033). These findings suggest that PhA is independently associated with muscle weakness in DHF and may serve as a practical bedside screening tool to enable earlier targeted interventions and mitigate functional decline during hospitalization.





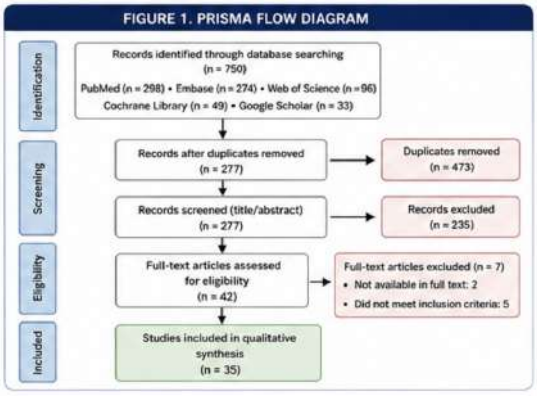
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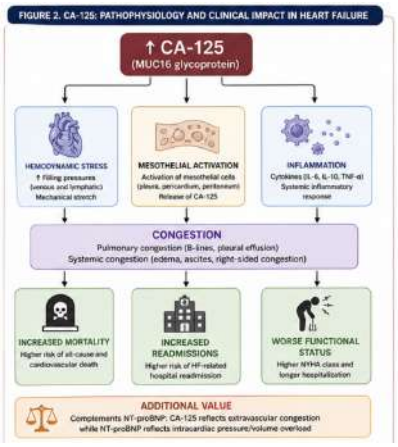
CA-125 AS A BIOMARKER OF CONGESTION AND PROGNOSIS IN HEART FAILURE: A SYSTEMATIC REVIEW

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Background/Introduction: Heart failure (HF) is associated with high morbidity and mortality. CA-125 has emerged as a biomarker reflecting congestion and adverse outcomes, but its clinical role remains uncertain. Objectives: To evaluate the diagnostic and prognostic value of CA-125 in detecting congestion in acute or decompensated HF. Methods: Systematic review conducted according to PRISMA-DTA. Databases (PubMed, Embase, Web of Science, Cochrane, Google Scholar) were searched until December 2024 without language restriction. From 750 records identified, 35 studies were included after independent screening. Risk of bias was assessed using QUADAS-2 and evidence quality by GRADE. Results and Conclusions: Elevated CA-125 levels were consistently associated with congestion, particularly right-sided, and correlated with clinical, echocardiographic, and natriuretic peptide parameters. Higher CA-125 levels were associated with increased mortality (HR ≈1.68) and HF-related readmissions (HR ≈1.77). Patients with congestion showed significantly higher CA-125 levels (≈54.8 U/mL difference). Cut-off values varied across studies, though levels >35 U/mL were frequently associated with worse outcomes. Combined use with NT-proBNP improved risk stratification and may support therapeutic monitoring. CA-125 is a promising and widely available biomarker for congestion assessment and prognostic stratification in HF. However, variability in cut-off values and lack of standardization limit its routine clinical use. Further studies are needed to validate its integration into clinical practice.





21011

CARDIAC INVOLVEMENT IN HYPEREOSINOPHILIC SYNDROME: A MULTIMODALITY IMAGING AND BIOMARKER ANALYSIS

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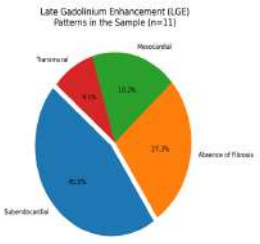
Background/Introduction: Hypereosinophilic Syndrome (HES) is a rare multisystem disorder characterized by persistent hypereosinophilia and eosinophil-mediated organ damage. Cardiac involvement is the main cause of morbidity and mortality, progressing through necrotic, thrombotic, and fibrotic stages, potentially culminating in endomyocardial fibrosis (EMF). Multimodality imaging allows comprehensive evaluation of structural, functional, and tissue abnormalities. Objectives: To characterize cardiac involvement in patients with primary and idiopathic HES using cardiac biomarkers and multimodality imaging. Methods: This retrospective descriptive study included 14 patients with HES who underwent electrocardiography (ECG), 24-hour Holter monitoring, transthoracic echocardiography (TTE), and cardiac magnetic resonance (CMR). Clinical, laboratory, and imaging findings were analyzed descriptively. Results and Conclusions: Fourteen patients were included, predominantly male (71.4%), with a mean age of 47.9 years. Primary HES accounted for 35.7% of cases, whereas idiopathic disease represented 64.3%. Mean eosinophil count was 11,109.9/μL (median 5,684/μL). Cardiovascular involvement occurred in 71.4% of patients, with EMF as the most frequent manifestation (21.4%), followed by eosinophilic myocarditis, restrictive cardiomyopathy, and heart failure. Troponin elevation was observed in 61.5% of patients, while natriuretic peptides were elevated in 35%. ECG demonstrated sinus rhythm in all patients, with a mean heart rate of 73.4 ± 17.3 bpm. Main abnormalities included left atrial enlargement (50%), ventricular repolarization abnormalities (40%), and inactive areas suggestive of fibrosis (30%). Holter monitoring showed low arrhythmic burden, although non-sustained atrial tachycardia occurred in 35% and non-sustained ventricular tachycardia in two cases. TTE showed preserved LVEF (57.3 ± 12.4%), mitral regurgitation in 75%, diastolic dysfunction in 41%, and one intracardiac thrombus. CMR confirmed preserved LVEF (57.7 ± 9.6%), identified intracavitary thrombi in two patients and apical obliteration in three. LGE was absent in only 27.2% of cases, predominantly showing a subendocardial pattern (n=5), followed by mesocardial (n=2) and transmural enhancement (n=2). Patients with primary and idiopathic HES demonstrated high prevalence of cardiac abnormalities, predominantly EMF. LGE on CMR was frequent and associated with elevated biomarkers, electrocardiographic abnormalities, and arrhythmic events.

Table 1. Characteristics of the Study Population (n=14)

Variable	Value
Age (years), Mean ± SD (Median)	47.9 ± SD (47.5)
Sex, n (%)	
Male	10 (71.4%)
Female	4 (28.6%)
HES Etiology, n (%)	
Idiopathic	9 (64.3%)
Primary	5 (35.7%)
Geographic Distribution, n (%)	
Southeastern Region (São Paulo)	8 (57.1%)
Northeastern Region (BA, PE, CE)	6 (42.9%)
Laboratory Data	
Total eosinophils (/μL), Mean ± SD	11,109.9 ± 19,392.8
Total eosinophils (/μL), Median	5,684
Troponin > ULN, n (%) ± SD (% × ULN)	8/13 (61.5%) ± 21.9%
BNP (pg/mL), Mean ± SD	95.6 ± 26.2
BNP (pg/mL), Median	26.0
NT-proBNP (pg/mL), Mean ± SD	120.2 ± 107.9
NT-proBNP (pg/mL), Median	102.9
Cardiovascular Manifestations, n (%)*	
Endomyocardial fibrosis	3 (21.4%)
Restrictive cardiomyopathy	1 (7.1%)
Eosinophilic myocarditis	1 (7.1%)
Asymptomatic	4 (28.6%)
Other cardiac manifestations†	
History of myocardial infarction	3 (21.4%)
Heart failure (HF)	2 (14.2%)

Table 2. Subanalysis of Patients with Late Gadolinium Enhancement on CMR

Finding	LGE Subgroup (N=8)	Total Sample (N=14)
Elevated Troponin	62% (5/8)	61.5% (8/13)
Elevated BNP	75% (6/8)	35.7% (5/14)
Arrhythmias (Holter)	75% (6/8)	42.8% (6/14)
LAE on ECG	62% (5/8)	35.7% (5/14)
Repolarization/Inactive Areas	75% (6/8)	50.0% (7/14)



20290

CIRRHOTIC CARDIOMYOPATHY AND MORTALITY IN CIRRHOTIC PATIENTS: A SYSTEMATIC REVIEW

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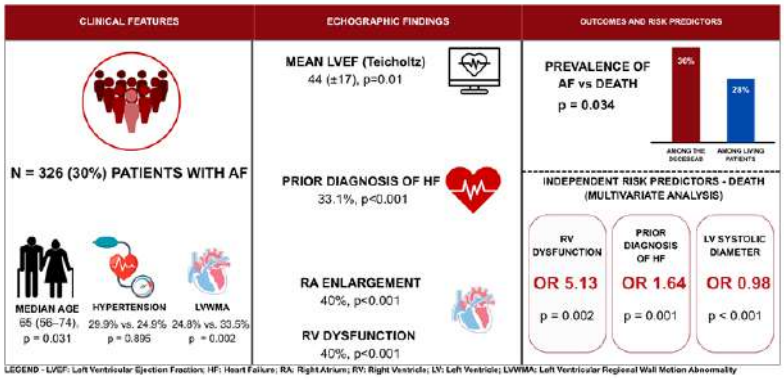
Background/Introduction: Cirrhotic cardiomyopathy (CCM) is a chronic cardiac dysfunction in cirrhotic patients without prior structural heart disease, characterized by diastolic dysfunction, attenuated systolic response under stress, and electrophysiological abnormalities. Redefined by the 2019 Berlin Criteria, CCM has emerged as an independent predictor of major adverse cardiovascular events following high-demand procedures such as TIPS placement and liver transplantation. Objectives: To evaluate whether cirrhotic cardiomyopathy is associated with higher overall mortality in cirrhotic patients compared to those without this diagnosis. Methods: Systematic review following PRISMA 2020 guidelines. Databases: PubMed, LILACS, and Embase. Descriptors: “cirrhotic cardiomyopathy,” “liver cirrhosis,” and “mortality.” Inclusion criteria: studies from 2006–2026 in English or Portuguese addressing CCM outcomes. Exclusion criteria: pediatric populations, unavailable full texts, studies without a control group or defined outcomes. Risk of bias assessed using RoB 2. Protocol registered in PROSPERO prior to data collection. Results and Conclusions: A total of 476 studies were identified; 25 met inclusion criteria, comprising ~8,500 patients. Among these, 18 were cohort studies and 7 were case-control studies. CCM prevalence ranged from 20% to 50% depending on diagnostic criteria. In most studies, CCM was associated with increased all-cause mortality compared to cirrhotic patients without this condition, particularly during TIPS insertion and liver transplantation. CCM was also consistently linked to higher incidence of major adverse cardiovascular events. Risk of bias: 12 studies showed low risk, 9 presented some concerns, and 4 had high risk. Evidence supports an association between CCM and increased mortality, though heterogeneity in study design and diagnostic definitions limits definitive conclusions. Prospective studies applying standardized criteria are warranted.

16999

CLINICAL AND ECHOCARDIOGRAPHIC PREDICTORS OF ATRIAL FIBRILLATION AND ITS ASSOCIATION WITH MORTALITY IN PATIENTS HOSPITALIZED FOR HEART FAILURE: A RETROSPECTIVE COHORT STUDY

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Background/Introduction: Atrial fibrillation (AF) is the most common sustained arrhythmia, affecting approximately 1.5 million Brazilians. This condition is associated with increased morbidity and mortality, making it a major public health problem. Therefore, identifying predictors of AF in the general population is essential for risk stratification and prevention of complications in susceptible individuals. Objectives: To evaluate clinical and echocardiographic variables associated with AF and to investigate their association with in-hospital mortality in the study population. Methods: This retrospective cohort study was approved by the local ethics committee (CAAE 75341723.1.0000.5192) and analyzed patients hospitalized at a tertiary care center for decompensated heart failure (HF), with and without AF. The Mann-Whitney U test was used for quantitative variables, and the chi-square test or Fisher’s exact test was applied for qualitative variables. To identify independent predictors of AF, logistic regression analysis was performed with multicollinearity assessment and stepwise backward selection, with results expressed as odds ratios (OR). A significance level of 5% was adopted. Results and Conclusions: A total of 1,100 patients were evaluated, of whom 326 (30%) had AF, with a mean age of 63±15 years. The most common etiologies were ischemic (26%) and valvular (21%). Compared with patients without AF, those with AF were older (65±14 years; p=0.031), more frequently had a prior diagnosis of HF (33.1% vs. 22.1%; p<0.001), and was not associated with diabetes mellitus or hypertension. In logistic regression, the final model showed a good predictive performance, with a Nagelkerke pseudo-R^2 of 0.702, 85.1% accuracy, 92.1% specificity, and 72.8% sensitivity, and the following remained independently associated with AF: Previous diagnosis of heart failure (OR = 4.71 ; 95% CI 1.83-12.2; p=0.001), right ventricular dysfunction (OR = 5.13; 95%CI 1.80-14.59; p=0.002), and absence of left ventricular diastolic dysfunction (OR = 0.34; 95%CI 0,13-0,87; p=0.025). Regarding prognosis, patients with AF was associated with higher crude mortality (24%; p=0.010). However, in the multivariable analysis for death, AF did not remain an independent predictor, whereas prior diagnosis of heart failure [OR = 1.64 (1.07-2.52); p=0.022], moderate/severe mitral disease [OR 1.93 (1.3-2.8); p<0.001], and left ventricular systolic diameter (OR = 0.98; 95% IC 0.97-0.99; p=0.027) remained associated with the outcome.

22012

COMORBIDITY BURDEN AND FUNCTIONAL CLASS DETERMINE REDUCED SURVIVAL IN PATIENTS WITH HYPERTROPHIC CARDIOMYOPATHY

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Background/Introduction: Hypertrophic cardiomyopathy (HCM) presents a heterogeneous clinical course and may progress with heart failure, atrial fibrillation (AF), thromboembolic events, and cardiovascular death. The presence of cardiovascular comorbidities and worsening functional class may act as important prognostic markers. However, national data correlating comorbidity burden, functional class, and survival remain limited. Objectives: To evaluate the association between functional class, clinical comorbidities, and mortality in patients with HCM followed at a Brazilian tertiary care center. Methods: Retrospective study involving patients diagnosed with HCM followed for up to 15 years. Clinical characteristics, comorbidities, New York Heart Association (NYHA) functional class, presence of AF, and clinical outcomes were analyzed. Survival analysis was performed using the Kaplan-Meier method. Results and Conclusions: A total of 732 patients were included, with a mean age of 54±16.5 years, predominantly male (53.7%). Most patients were classified as NYHA I (54.7%) or II (32.2%). A high prevalence of comorbidities was observed, including systemic arterial hypertension (45.1%), dyslipidemia (45.1%), diabetes mellitus (25%), and AF (19.7%). More than 70% of patients were overweight or obese. During follow-up, 110 deaths occurred. Patients with AF had a worse functional profile, with lower prevalence of NYHA I (40.3% vs. 58.3%; p<0.001) and higher frequency of NYHA III (18.1% vs. 10.2%; p=0.009), in addition to higher prevalence of systemic arterial hypertension, diabetes mellitus, and smoking. Kaplan-Meier analysis demonstrated progressive reduction in survival according to worsening functional class, with poorer prognosis among NYHA III-IV patients (log-rank p<0.001). Additionally, AF was associated with a higher risk of stroke/transient ischemic attack (RR 2.96; 95%CI 1.90–4.60; p<0.001). Patients with HCM present a high burden of comorbidities even in less symptomatic stages of the disease, and worsening functional class constitutes an important prognostic marker associated with reduced survival.



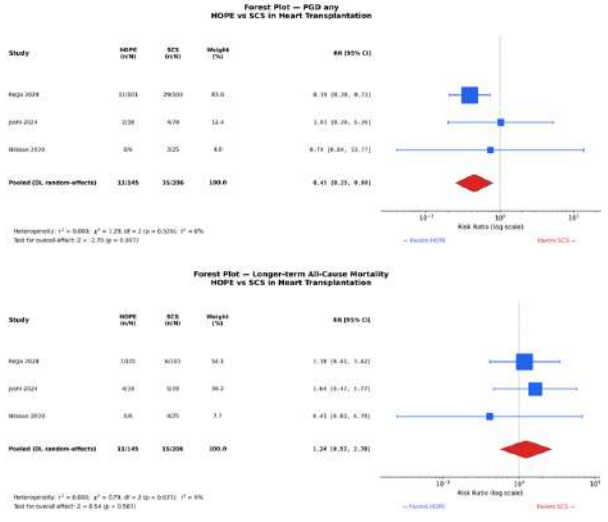
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COMPARATIVE OUTCOMES OF HYPOTHERMIC OXYGENATED PERFUSION VERSUS STATIC COLD STORAGE IN HEART TRANSPLANTATION: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background/Introduction: Primary graft dysfunction (PGD) is a leading cause of early morbidity after orthotopic heart transplantation, driven by ischaemia-reperfusion injury during ex vivo preservation. Static cold storage (SCS) — the global default for over four decades — provides no continuous metabolic support and limits safe cold ischaemia to approximately four hours, beyond which PGD risk increases sharply. Hypothermic oxygenated perfusion (HOPE) replenishes mitochondrial substrate and washes accumulated reactive oxygen species precursors, potentially attenuating reperfusion injury. A recent network meta-analysis (Kim et al., 2025) identified only two studies directly comparing HOPE with SCS; awareness of a third eligible comparative report not captured in that synthesis motivated a dedicated systematic review, which ultimately identified four eligible studies. Objectives: To provide an updated, prospectively registered synthesis of comparative evidence for HOPE versus SCS in orthotopic heart transplantation, with primary focus on PGD incidence and post-transplant mortality. Methods: PRISMA 2020 systematic review (PROSPERO CRD420251071495). PubMed, Embase, and CENTRAL were searched without restrictions; backward citation searching was performed to minimise risk of missing older reports. Two reviewers independently screened records, extracted data, and assessed risk of bias (RoB-2 for randomised; ROBINS-I for non-randomised studies). Risk ratios (RR) were pooled using a DerSimonian-Laird random-effects model on the log-RR scale. Results and Conclusions: Four studies (one RCT; three non-randomised; N = 423 transplants) met eligibility criteria. HOPE was associated with a significant reduction in any PGD compared with SCS (pooled RR 0.45, 95% CI 0.25–0.80; p = 0.007; I^2 = 0%), representing an approximately 55% relative risk reduction. Pooled estimates for severe LV-PGD (RR 0.63, 95% CI 0.10–3.84), 30-day mortality (RR 1.20, 95% CI 0.25–5.84), and longer-term mortality (RR 1.24, 95% CI 0.57–2.70) were non-significant. ECMO requirement, troponin release, and post-transplant LV function could not be meta-analysed due to data sparsity. HOPE is associated with a consistent, statistically significant reduction in PGD without detected heterogeneity; however, mortality benefit remains inconclusive. Adequately powered trials with standardised reporting of ECMO, biomarker, and DCD outcomes are required before HOPE can be recommended as standard of care.



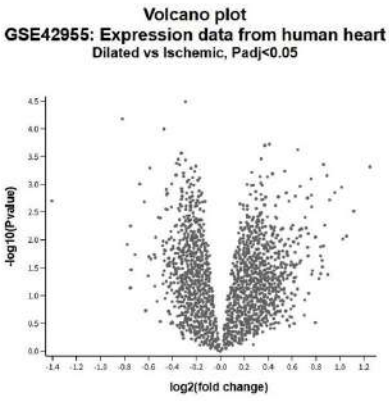
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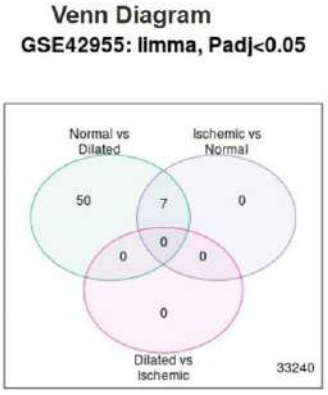
COMPARATIVE TRANSCRIPTOMIC ANALYSIS OF HUMAN MYOCARDIUM HIGHLIGHTS DISEASE-SPECIFIC MOLECULAR NETWORKS IN ISCHAEMIC AND DILATED CARDIOMYOPATHY

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Background/Introduction: Ischaemic and dilated cardiomyopathies are leading causes of advanced heart failure. Current management relies on polypharmacy without directly addressing underlying molecular mechanisms. Bioinformatic analysis of large-scale genomic datasets (e.g., GSE42955 from GEO) can identify dysregulated molecular pathways and potential pharmacogenetic targets for personalised risk stratification and therapeutic strategies. Objectives: To evaluate the different gene expression patterns in human hearts from patients with ischemic cardiomyopathy, dilated cardiomyopathy and normal controls. Methods: We obtained gene expression data under the identification number GSE42955 from Gene Expression Omnibus (GEO) datasets were analysed using the GEO2R platform in which patients were divided into three groups: (i) ischaemic, (ii) dilated, and (iii) normal. The data were then analysed using Venn diagrams to evaluate the overlap of significantly expressed genes among the groups, and volcano plots to assess statistical significance in relation to the magnitude of change, which are useful for visualising different patterns of gene expression. Results and Conclusions: The Venn Diagram shows that 7 genes overlap (SCN2B, RHOJ, TP53INP2, SNRPB, ETS2, SELM, ELOVL7) when we compare the Normal vs Dilated and Ischemic vs Normal, but no genes overlap when analysing these groups in comparison with the dilated vs ischemic or even when comparing all groups. In the Volcano Plot, when comparing the ischemic with the normal group, 5 genes are underexpressed and 2 genes are overexpressed and when comparing the dilated with normal group, 41 genes are underexpressed and 11 genes are overexpressed. Our findings indicate that dilated cardiac cells exhibited greater changes in gene expression compared with normal cardiac cells. Ischaemic cells also exhibited differences in gene expression, although involving fewer genes. An unexpected finding was that no significantly overlapping genes were identified between dilated and ischaemic cardiac cells. Publicly available datasets enable researchers to use new analytical tools to existing data, thereby generating new conclusions or complementing those already reported in the literature. Overall, this study highlights the potential of bioinformatics-driven genetic analysis as a tool for risk stratification and prevention of disease progression. The identification of key regulatory genes also supports their relevance as pharmacogenetic targets, enabling the development of personalised therapeutic strategies.





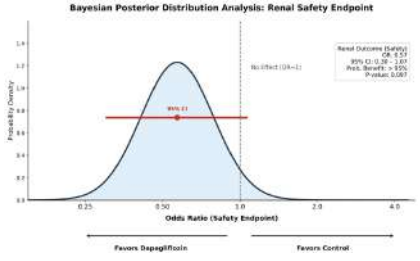
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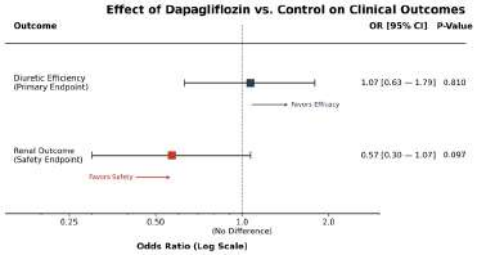
DAPA-DECONGEST: DIURETIC EFFICIENCY AND RENAL SAFETY OF DAPAGLIFLOZIN DURING HOSPITALIZATION FOR ACUTELY DECOMPENSATED HEART FAILURE — A REAL-WORLD BEFORE–AFTER OBSERVATIONAL STUDY

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Background/Introduction: In patients hospitalized for acutely decompensated heart failure (ADHF), early and effective decongestion is directly associated with symptomatic improvement and short-term prognosis. Although sodium-glucose cotransporter 2 inhibitors (SGLT2i) reduce long-term clinical outcomes in heart failure, the impact of dapagliflozin on early diuretic efficiency during hospitalization remains to be fully elucidated in real-world clinical practice settings. Objectives: To evaluate the impact of in-hospital dapagliflozin on early diuretic efficiency and renal safety in patients hospitalized for ADHF, comparing consecutive cohorts before and after institutional implementation of inpatient dapagliflozin use. Methods: Retrospective, observational cohort study with a before-after design including consecutive patients hospitalized for ADHF. Primary endpoint: early diuretic efficiency (cumulative urine output within 24 hours per 40 mg furosemide equivalent). Secondary endpoint: worsening renal function (WRF), defined as serum creatinine increase ≥0.3 mg/dL or ≥1.5 times baseline. Continuous variables were compared using non-parametric methods. Results and Conclusions: A total of 234 patients were included: 112 without dapagliflozin and 122 with dapagliflozin. The median 24-hour diuretic efficiency was numerically higher in the dapagliflozin group (564 vs. 452 mL/40 mg furosemide), corresponding to an absolute increase of 112 mL (~25% relative difference); however, this did not reach statistical significance (p=0.08). The proportion of patients achieving diuretic efficiency above the median was similar between groups (42.6% vs. 41.1%; OR 1.07; 95% CI 0.63-1.79; p=0.81). Worsening renal function occurred in 18 patients (14.8%) in the dapagliflozin group and 26 patients (23.2%) in the control group. Despite a lower numerical incidence in the dapagliflozin group, no statistically significant difference was observed (OR 0.57; 95% CI 0.30-1.07; p=0.097). In patients hospitalized for ADHF, the use of in-hospital dapagliflozin was not associated with statistically significant differences in early diuretic efficiency or the occurrence of worsening renal function compared to standard of care. These findings reinforce that the clinical benefits of SGLT2 inhibitors in heart failure are not limited to their diuretic effect but reflect broader cardioprotective mechanisms.





16488

DIGITAL TOOL FOR HEMODYNAMIC DATA RECORDING IN PULMONARY VASOREACTIVITY TESTING: VALIDATION AND WORKFLOW OPTIMIZATION

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Background/Introduction: Pulmonary vasoreactivity testing (PVRT) is essential for evaluating cardiac transplant candidates and critically ill patients with pulmonary hypertension. However, hemodynamic data from the Hemosphere® monitor are still recorded manually on paper flowcharts, a process prone to transcription errors, data loss, and delays. Objectives: We developed a mobile app for real-time recording and automatic calculation of hemodynamic variables during PVRT and evaluated its agreement with the standard monitor, reliability, and impact on recording time. Methods: The Pulmonary Vasoreactivity Test App was built on the AppSheets® platform with direct integration to Google Sheets. In the validation phase, we analyzed 42 PVRT forms from patients evaluated for heart transplantation at Recife (2023–2025). Agreement was assessed using absolute percentage error (APE), intraclass correlation coefficient (ICC), and Bland-Altman plots for key variables (TPG, SVR, and PVR). In the prospective phase, 10 experienced ICU physicians completed paired manual and digital flowcharts based on a standardized case, with completion time measured and compared using a paired t-test. The app was registered with INPI (BR512025005898-5). Results and Conclusions: Absolute percentage error was ≤5% in 100% of observations, with a median error of 0%. ICC showed excellent to near-perfect agreement for most variables (0.969–1.000), except initial PVR, which was explained by a single manual transcription error upon reanalysis. Bland-Altman plots confirmed minimal bias and clinically acceptable limits of agreement. Digital flowchart completion was significantly faster than manual recording (mean 116 ± 20 s vs 248 ± 43 s; p < 0.001), representing an average 53% time reduction (approximately 20 minutes saved per completed exam). The app demonstrated high numerical agreement with the Hemosphere® monitor and substantially reduced documentation time. It replaces the vulnerable manual recording step with an automated, standardized, and auditable workflow while also calculating additional hemodynamic parameters not directly provided by the monitor. This tool has strong potential to improve safety and efficiency in pulmonary vasoreactivity testing.

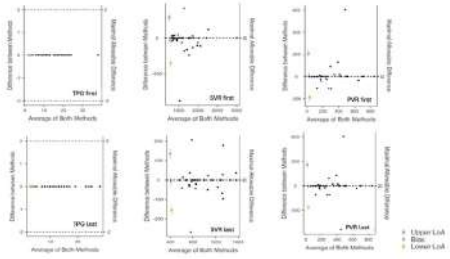


Figure 1. Agreement analysis between derived values obtained from the Hemosphere® monitor and those automatically calculated by the application for TPG, SVR, and PVR at the first and last measurements of the pulmonary vasoreactivity test.

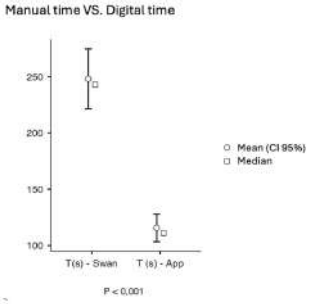


Figure 2. Paired comparison of flowchart completion time between the manual method and the application (n = 10).

14422

DO DIFFERENCES IN GUIDELINE-DIRECTED MEDICAL THERAPY EXPLAIN EDUCATIONAL INEQUALITIES IN OUTCOMES AFTER ACUTE HEART FAILURE?

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Background/Introduction: Lower educational attainment is consistently associated with worse outcomes after hospitalization for acute heart failure (AHF). Whether disparities in guideline-directed medical therapy (GDMT) prescription and optimization explain these differences remains unclear. Objectives: We aimed to investigate whether disparities in treatment prescription or therapy optimization explain the association between education level and post-discharge mortality following AHF hospitalization. Methods: We conducted a prospective cohort study including patients hospitalized with AHF at 19 public hospitals within the Brazilian Unified Health System (SUS) between 2016 and 2022. GDMT prescription (ACEi/ARB/ARNI, beta-blockers, and mineralocorticoid receptor antagonists) was assessed at discharge and during follow-up at 30 days and 6 months. “Three-drug therapy” was defined as the concurrent use of all three classes. Therapy optimization was defined as dose up-titration, addition of a GDMT class, or switch to ARNI during follow up. The association between education level and 180-day all-cause mortality was assessed using multivariable Cox models. Mediation was evaluated using the four-way decomposition method to quantify the proportion of the association explained by GDMT prescription and early optimization. A sensitivity analysis was performed in patients with LVEF ≤40%. Results and Conclusions: Among 2,425 patients (mean age 60.7±15.0 years; 41% women; LVEF 41±17%), 274 deaths (11.3%) occurred over a median follow-up of 180 days. Lower educational attainment was independently associated with higher mortality (adjusted HR 1.39 per level decrease; 95% CI 1.13–1.73; p=0.002). Patients with lower education were less likely to receive three-drug therapy at discharge (42.9% vs 45.3% vs 61.5% vs 54.7%; p-for-trend=0.001) and less likely to undergo early therapy optimization at 30 days (15.9% vs 20.5% vs 22.4% vs 23.5%; p-for-trend=0.04). However, mediation analysis showed that differences in GDMT prescription and early optimization accounted for only a small and non-significant proportion of the association between education and mortality (2.4%, 95% CI −2.7 to 7.4; p=0.359 and 0.3%, 95% CI −1.3 to 1.8; p=0.757, respectively). Findings were consistent in patients with LVEF ≤40%. Disparities in GDMT prescription and early optimization do not explain the excess mortality observed in patients with lower education in the vulnerable period after acute HF, suggesting that other socioeconomic or care-related factors drive these differences

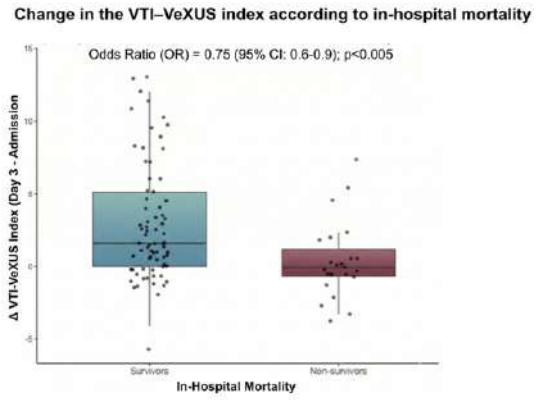
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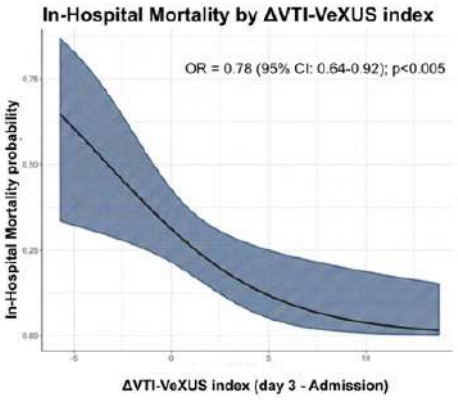
EARLY IMPROVEMENT IN THE VTI–VEXUS INDEX IDENTIFIES SURVIVAL IN ACUTE DECOMPENSATED HEART FAILURE

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Background/Introduction: The VTI–VeXUS index integrates arterial flow (LVOT-VTI) and venous congestion (VeXUS score) into a single haemodynamic metric. While proof-of-concept data in septic shock suggest potential prognostic value, its ability to reflect treatment response in acute decompensated heart failure (ADHF) is unknown. Objectives: To evaluate whether early dynamic changes in the VTI–VeXUS index are associated with in-hospital mortality in patients admitted with ADHF. Methods: We analysed a prospective cohort of patients hospitalized for ADHF who underwent echocardiographic assessment of LVOT-VTI and VeXUS at admission and after 72 hours. The VTI–VeXUS index was calculated as VTI/(VeXUS+1). Dynamic change (ΔVTI–VeXUS) was analysed as a continuous variable and in multivariable logistic regression adjusting for clinical severity markers. The primary outcome was in-hospital mortality. Results and Conclusions: Among 114 patients, survivors demonstrated greater improvement in VTI–VeXUS over 72 hours compared with non-survivors. Each unit increase in ΔVTI–VeXUS was associated with a 25% reduction in the odds of in-hospital mortality (OR 0.75, 95% CI 0.60–0.90, p<0.05) and remained independently predictive after adjustment (OR 0.79, 95% CI 0.63–0.94, p=0.01). ROC analysis showed moderate discrimination (AUC≈0.71) for in-hospital mortality, and predicted mortality declined progressively with increasing ΔVTI–VeXUS. Conclusion In ADHF, early trajectory of the VTI–VExUS index identifies effective hemodynamic response and independently predicts survival. Serial assessment may provide an objective bedside target to guide decongestion therapy.





17279

EARLY USE OF SACUBITRIL/VALSARTAN AFTER ACUTE HEART FAILURE STABILIZATION: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED TRIALS

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(1) HOSPITAL DE CLINICAS DE PORTO ALEGRE - PORTO ALEGRE - RS - BRASIL; (2) UNIVERSIDADE FEDERAL DE SANTA MARIA - SANTA MARIA - RS - BRASIL; (3) UNIVERSIDADE FRANCISCANA - SANTA MARIA - RS - BRASIL;

Background/Introduction: The role of initiating sacubitril/valsartan shortly after stabilization from acute heart failure (AHF) remains to be clearly established. Objectives: This study aimed to evaluate the effects of sacubitril/valsartan on biomarkers and clinical outcomes compared with angiotensin-converting enzyme inhibitors (ACEIs) or angiotensin receptor blockers (ARBs). Methods: A systematic search of PubMed, Embase, and the Cochrane Central Register was performed to identify randomized controlled trials enrolling hemodynamically stabilized patients after AHF. Sacubitril/valsartan was compared with ACEIs or ARBs. The primary outcome was the change in N-terminal pro–B-type natriuretic peptide (NT-proBNP) at 8 weeks. Secondary outcomes included all-cause mortality and adverse events (worsening renal function, hyperkalemia, and symptomatic hypotension). Ratio of change in NT-proBNP and odds ratios (OR) with 95% confidence intervals (CI) were pooled using a random-effects model. The study protocol was registered on PROSPERO (CRD42024599541). Results and Conclusions: Results: Three randomized trials including 1,723 patients were analyzed; 856 (49.7%) received sacubitril/valsartan. Compared with ACEIs/ARBs, sacubitril/valsartan resulted in a significantly greater reduction in NT-proBNP at 8 weeks (ratio of change 0.78; 95% CI 0.69–0.87; p < 0.05). There were no significant differences between groups in worsening renal function (OR 0.85; 95% CI 0.57–1.25; p = 0.40), hyperkalemia (OR 1.12; 95% CI 0.84–1.51; p = 0.44), symptomatic hypotension (OR 1.22; 95% CI 0.73–2.02; p = 0.45), all-cause mortality (OR 0.95; 95% CI 0.53–1.69; p = 0.85), or serious adverse events (OR 1.11; 95% CI 0.90–1.37; p = 0.35). Conclusion: Initiation of sacubitril/valsartan following stabilization from AHF is associated with a greater reduction in NT-proBNP at 8 weeks compared with ACEIs/ARBs, without significant differences in mortality or adverse events.

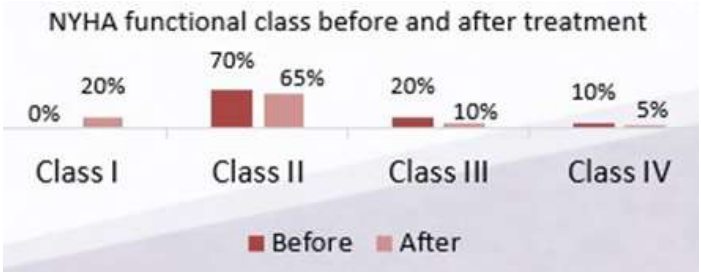
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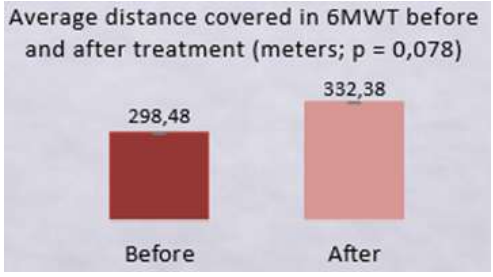
EFFECT OF INTRAVENOUS REPLETION OF FERRIC HYDROXIDE SUCROSE ON THE FUNCTIONAL CAPACITY OF PACIENTS WITH HEART FAILURE

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Background/Introduction: Iron deficiency (ID), in patients with heart failure (HF) is associated with reduced functional capacity and impaired quality of life. Oral iron therapy has limited absorption, whereas intravenous iron is more effective. However, most clinical trials have used ferric carboxymaltose, a high-cost formulation, which limits its use in Brazilian public healthcare settings. In this context, iron hydroxide sucrose emerges as a more affordable alternative, although real-world data on its use are still limited. Objectives: To evaluate the effect of intravenous iron hydroxide sucrose repletion on functional capacity and iron parameters in patients with HF and ID. Methods: This prospective study included stable outpatients with HF who were receiving optimised therapy but remained symptomatic, and who had ID - defined as ferritin <100 ng/mL or ferritin between 100–300 ng/mL with transferrin saturation <20%. Patients received intravenous iron hydroxide sucrose replacement and were evaluated at baseline and 30 days after . Functional capacity was assessed using the six-minute walk test (6MWT) and NYHA functional class. Serum ferritin levels and transferrin saturation were also measured. Results and Conclusions: Twenty patients were included (mean age 65.8 years; 60% female), predominantly with reduced left ventricular ejection fraction. After treatment, ferritin levels increased significantly (Δ +132.2 ng/mL; 95% CI 70.4–193.9; p < 0.001). NYHA functional class improved significantly (p = 0.011), with a shift towards lower functional classes. The six-minute walk distance increased after the intervention, with no statistically significant difference between etiologies. Among patients with ischemic heart failure (n = 12), the mean variation in the 6MWT was 34.9 meters, while among those with non-ischemic etiology (n = 8), the mean variation was 32.5 meters, demonstrating a similar functional response between groups. A clinically relevant gain (≥30 m) in 6MWT distance was observed in 45% of patients. Baseline ferritin levels were not correlated with functional improvement. Conclusions: Intravenous iron hydroxide sucrose repletion was associated with significant improvement in iron stores and functional class, with a clinically meaningful gain in functional capacity in nearly half of patients. These findings support intravenous iron as an effective and safe therapeutic strategy in patients with HF and iron deficiency.





18022

EFFECT OF SACUBITRIL/VALSARTAN ON THE MANAGEMENT OF CLINICAL OUTCOMES IN PATIENTS WITH HEART FAILURE AND RESISTANT ARTERIAL HYPERTENSION

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Background/Introduction: Heart failure with preserved ejection fraction (HFpEF) is a systemic clinical syndrome, caused by structural and functional changes in the heart, caused mainly by resistant arterial hypertension (RAH). However, this syndrome has limited therapeutic options, with few drugs demonstrating a relevant impact. Sacubitril-valsartan is a new therapeutic class that acts by inhibiting angiotensin-neprilisin receptors (ARNI). It has great benefits in the treatment of other groups of heart failure (HF). However, its effectiveness in HFpEF is still questioned. Objectives: To analyze the effectiveness of treatment with Sacubitril-valsartan in reducing mortality, reducing blood pressure and improving quality of life in patients with HFpEF and HAR. Methods: This is a systematic review developed according to the PRISMA protocol. The search considered articles published on the PubMed, Cochrane and EMBASE platforms. The review was guided by the PICO strategy and the DeCS/MeSH descriptors were used. Randomized clinical trials and observational studies published between 2021 and 2026, in Portuguese, English and Spanish, were included. Articles not available in full, studies with a high risk of bias, evaluated by the RoB 2.0 tool, were excluded. Results and Conclusions: 7 studies with 7,006 participants were included, 52% female. Sacubitril/valsartan has reduced vascular mortality, hospitalization for heart failure and new cardiovascular events, in addition to ensuring greater reducing control of blood pressure when compared to ACE inhibitors/ABR. In addition, sacubitril/valsartan obtained more favorable outcomes when compared to ACE inhibitors/ABRs in quality of life scores. These are the NYHA and KCCQ. Therefore, it is concluded that the set of evidence points to sacubitril-valsartan as a promising, safe and effective alternative, especially in individuals with a higher burden of cardiovascular risk.

21871

EFFICACY AND SAFETY OF GLP-1 RECEPTOR AGONISTS AND DUAL GIP/GLP-1 AGONISTS IN PATIENTS WITH OBESITY AND HEART FAILURE WITH PRESERVED EJECTION FRACTION: A SYSTEMATIC REVIEW

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Background/Introduction: Heart failure with preserved ejection fraction (HFpEF) associated with obesity is an increasingly prevalent phenotype characterized by high morbidity and limited response to conventional therapies. Glucagon-like peptide-1 receptor agonists (GLP-1 RAs) and dual GIP/GLP-1 receptor agonists have emerged as promising therapeutic options in this setting. Objectives: To systematically evaluate the efficacy and safety of GLP-1 RAs and dual GIP/GLP-1 receptor agonists in adults with HFpEF and obesity, focusing on clinical, functional, quality-of-life, and safety outcomes. Methods: This systematic review followed PRISMA 2020 and Cochrane Handbook recommendations. Searches were conducted in PubMed/MEDLINE, Embase, Web of Science, Cochrane Library, and Scopus. Randomized placebo-controlled trials including adults (≥18 years) with HFpEF (LVEF ≥45%) and obesity (BMI ≥30 kg/m²) treated with semaglutide, liraglutide, tirzepatide, dulaglutide, or GLP-1/GIP analogs were eligible. Risk of bias was assessed using the Cochrane RoB 2 tool. Due to heterogeneity, data synthesis was primarily narrative. Results and Conclusions: Of 537 records screened, 22 studies were included, comprising 3 primary RCTs and 19 prespecified or post-hoc secondary analyses. The main RCTs were STEP-HFpEF (semaglutide 2.4 mg; N=529; 52 weeks), STEP-HFpEF DM (semaglutide 2.4 mg in type 2 diabetes; N=616; 52 weeks), and SUMMIT (tirzepatide ≤15 mg; N=731; median follow-up 104 weeks). Semaglutide significantly improved KCCQ-CSS scores (+7.8 and +7.3 points; p<0.001), reduced body weight (−10.7% and −6.4%; p<0.001), and increased 6-minute walk distance (+20.3 m and +14.3 m). A pooled analysis of semaglutide trials demonstrated reduced risk of cardiovascular death or worsening HF (HR 0.69; 95% CI 0.53–0.89; p=0.0045). Tirzepatide also reduced the composite of cardiovascular death or worsening HF (HR 0.62; 95% CI 0.41–0.95; p=0.026), while improving KCCQ-CSS and functional capacity. Gastrointestinal adverse events were more frequent with active treatment but were generally mild, and serious adverse events were numerically lower in treatment groups. Incretin-based therapies, particularly semaglutide and tirzepatide, demonstrate significant benefits in patients with HFpEF and obesity, improving symptoms, quality of life, functional capacity, and HF outcomes with acceptable safety. These agents represent promising therapeutic strategies for this high-risk population.

Table 1 — Characteristics of Included Primary Studies

Study	Reference	Country/ Region	N	Intervention	Comparator	Follow-up	Study Type
STEP-H FpEF	Kosiborod et al., NEJM 2023	International (18 countries, n=129 centers)	529	Semaglutide 2.4 mg SC weekly	Placebo	52 weeks	RCT, double-blind
STEP-H FpEF DM	Kosiborod/Petrie et al., NEJM 2024	International (18 countries, n=129 centers)	616	Semaglutide 2.4 mg SC weekly	Placebo	52 weeks	RCT, double-blind
SUMMIT	Packer et al., NEJM 2025	International	731	Tirzepatide ≤15 mg SC weekly	Placebo	Median 104 weeks	RCT, double-blind

Table 2. Secondary Analyses Included

Study/Analysis	Reference	Type	Source	N	Design/Baseline
STEP-HFpEF	Kosiborod et al., JACC HF 2023	Design study (STEP HFpEF Program)	STEP-HFpEF Program	1,144	STEP-HFpEF + STEP-HFpEF DM
Pooled	Butler, Shah et al., Lancet 2024	Pre-specified pooled analysis	STEP-HFpEF + STEP-HFpEF DM	1,345	–
SELECT + FLOW + STEP-HFpEF Pooled	Kosiborod, Deanfield et al., Lancet 2024	Post-hoc pooled analysis	Four RCTs	3,743	–
Atrial Fibrillation and Semaglutide	Verma et al., JACC 2024	Pre-specified analysis	STEP-HFpEF Program	1,345	–
Cardiac Remodeling (Echocardiography)	Solomon et al., JACC 2024	Pre-specified substudy	STEP-HFpEF Program	~1,000	–
Health Status (KCCQ)	Kosiborod et al., Circulation 2024	Pre-specified analysis	STEP-HFpEF Program	529	–
Semaglutide by Sex	Verma et al., JACC 2024	Pre-specified analysis	STEP-HFpEF Program	1,345	–
Frailty	JACC HF 2025	Pre-specified analysis	STEP-HFpEF Program	1,345	–
NT-proBNP	Petrie et al., JACC 2024	Pre-specified analysis	STEP-HFpEF Program	1,345	–
NYHA Class	Schou et al., JACC 2024	Pre-specified analysis	STEP-HFpEF Program	1,345	–
Diuretic Use	Shah et al., Eur Heart J 2024	Pre-specified analysis	STEP-HFpEF + STEP-HFpEF DM	1,345	–
6MWT and Functional Capacity	Borlaug et al., JACC HF 2025	Pre-specified analysis	STEP-HFpEF Program	1,345	–
Obesity Class	Borlaug et al., JACC 2024	Pre-specified analysis	STEP-HFpEF Program	529	–
Inflammation (CRP)	Verma, Petrie et al., JACC 2024	Pre-specified analysis	STEP-HFpEF Program	1,345	–
Age Spectrum	JACC HF 2025	Post-hoc analysis	STEP-HFpEF Program	1,345	–
SUMMIT — Hemodynamics	Nature Medicine 2025	Pre-specified substudy	SUMMIT	731	–
SUMMIT — Clinical Trajectory	Zile et al., Circulation 2025	Pre-specified analysis	SUMMIT	731	–
SUMMIT — Diabetes Subgroup	JACC 2025	Pre-specified analysis	SUMMIT	731	–
SUMMIT — CKD Subgroup	JACC 2025	Pre-specified analysis	SUMMIT	731	–

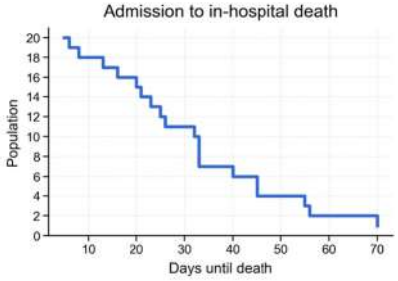
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EPIDEMIOLOGICAL PROFILE OF IN-HOSPITAL DEATHS AMONG PATIENTS WITH HEART FAILURE IN A TERTIARY CARE CENTER

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Background/Introduction: Heart failure (HF) is a progressive, and highly prevalent condition associated with substantial morbidity and mortality. It significantly impairs functional capacity and quality of life. Furthermore, it is frequently accompanied by psychological and spiritual distress. Objectives: Describe the epidemiological and clinical profile of patients who died during hospitalization with a diagnosis of heart failure in a tertiary care hospital, and to characterize their phenotypes. Methods: Retrospective study with 373 patients hospitalized with heart failure in tertiary care, between September 2022 and July 2025. Demographic, clinical, and phenotypic data were obtained from medical records and analyzed descriptively. Two cases with missing data on dyslipidemia were considered non-dyslipidemic. Analysis and plotting were performed using Python 3.9.6, Pandas 2.3.3, Seaborn 0.13.2, Matplotlib 3.9.4, and Scipy 1.13.1. Results and Conclusions: Twenty in-hospital deaths among patients with heart failure were analyzed (9 women and 11 men), with a mean age of 85.5 years. Hypertension (90%) and diabetes mellitus (75%) were highly prevalent, particularly among men. Atrial fibrillation was present in 55% of cases. Heart failure phenotypes were heterogeneous, with preserved ejection fraction (45%) predominating, followed by reduced ejection fraction (40%). Patients had a high burden of prior healthcare utilization, with a mean of 2.5 hospital admissions in the preceding 12 months. The mean length of stay from admission to death was 29.9 days (standard deviation(SD) 17.5), with longer stays observed in men than in women (32.9 vs. 26.2 days). In conclusion, in-hospital deaths among patients with heart failure occurred predominantly in very elderly individuals with a high prevalence of comorbidities and frequent prior hospitalizations. The distribution of heart failure phenotypes highlights the coexistence of preserved and reduced ejection fraction in fatal cases. These findings reinforce the complexity and advanced stage of disease in this population and the need for further research in the area.It also reinforces the concept that hospital readmissions within a short period increase mortality.



Label		Value		
Group		Overall	Female	Male
Count		20	9	11
Age, mean (SD)		85.5 (9.6)	88.4 (8.2)	83.1 (10.3)
Hypertension, n (%)	No	2 (10.0)	1 (11.1)	1 (9.1)
	Yes	18 (90.0)	8 (88.9)	10 (90.9)
Diabetes Mellitus, n (%)	No	5 (25.0)	4 (44.4)	1 (9.1)
	Yes	15 (75.0)	5 (55.6)	10 (90.9)
Atrial Fibrillation, n (%)	No	9 (45.0)	3 (33.3)	6 (54.5)
	Yes	11 (55.0)	6 (66.7)	5 (45.5)
Delirium, n (%)	No	13 (65.0)	7 (77.8)	6 (54.5)
	Yes	7 (35.0)	2 (22.2)	5 (45.5)
Dyslipidemia, n (%)	No	6 (30.0)	2 (22.2)	4 (36.4)
	Yes	14 (70.0)	7 (77.8)	7 (63.6)
Ejection Fraction, n (%)	LVEF 40-49%	3 (15.0)	2 (22.2)	1 (9.1)
	LVEF < 40%	8 (40.0)	2 (22.2)	6 (54.5)
	LVEF >= 50%	9 (45.0)	5 (55.6)	4 (36.4)
Admissions in 12 months, mean (SD)		2.5 (1.6)	2.3 (1.7)	2.7 (1.7)
Admission to Death (days), mean (SD)		29.9 (17.5)	26.2 (16.3)	32.9 (18.3)

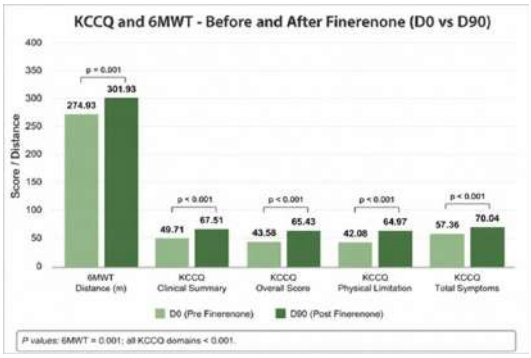
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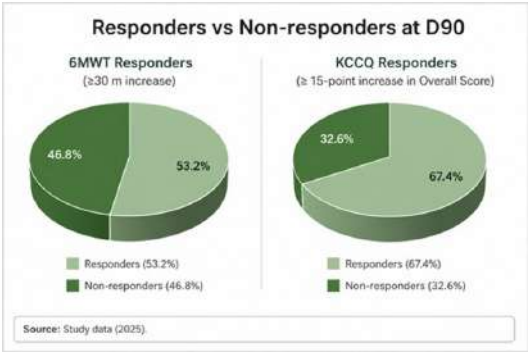
FINE-FUNCTION HF: FINERENONE AND FUNCTIONAL CAPACITY IN HEART FAILURE AFTER SWITCHING FROM SPIRONOLACTONE TO FINERENONE.

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Background/Introduction: While finerenone has demonstrated cardiovascular benefits in heart failure with preserved and mild-reduced ejection fraction (HFpEF and HFmrEF), its early effects on functional capacity and patient-reported outcomes in real-world settings remain poorly characterized. Objectives: To evaluate the early and short-term effects of switching from spironolactone to finerenone on functional capacity and patient-reported health status in patients with HFpEF/HFmrEF. Methods: This prospective, single-centre study evaluated consecutive patients with HFpEF/HFmrEF undergoing transition from spironolactone to finerenone in routine clinical practice. Functional capacity was assessed using the 6-minute walk test (6MWT), and health status using the Kansas City Cardiomyopathy Questionnaire (KCCQ). Assessments were performed at baseline, 30 days, and 90 days. Safety endpoints included renal function and serum potassium. Results and Conclusions: A total of 53 patients were included. Functional capacity improved significantly, with 6MWT distance increasing from 274.9 ± 12.9 m to 301.9 ± 13.2 m at 90 days (Δ +27.0 m; p=0.001). KCCQ total score improved from 48.5 ± 3.5 to 67.4 ± 3.2 (Δ +18.9; p<0.001), with consistent improvements across domains. Clinically meaningful improvement (≥30 m in 6MWT) was observed in 53.2% of patients, while 67.4% achieved significant improvement in KCCQ. Benefits were evident at 30 days and sustained at 90 days. Serum potassium remained stable over time (p=0.811), and although a small statistical change in creatinine was observed (p=0.013), median values remained stable, indicating no clinically relevant renal deterioration. CONCLUSIONS In patients with HFpEF/HFmrEF, transition from spironolactone to finerenone was associated with early and sustained improvements in functional capacity and health status, without clinically relevant safety concerns. These findings highlight a meaningful early functional benefit of mineralocorticoid receptor modulation in real-world practice.





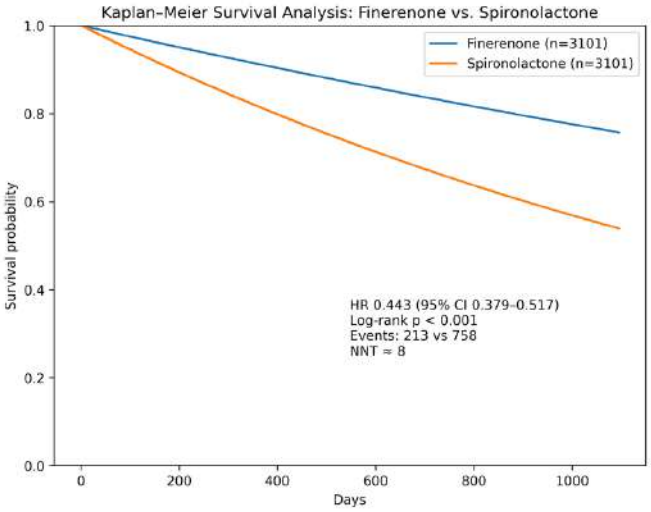
19408

FINERENONE VERSUS SPIRONOLACTONE IN PATIENTS WITH CHRONIC KIDNEY DISEASE AND HEART FAILURE

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Background/Introduction: Mineralocorticoid receptor antagonists (MRA) are well established in heart failure with reduced ejection fraction (HFrEF). However, spironolactone use in patients with concomitant chronic kidney disease is limited by hyperkalaemia and variable benefit. Finerenone, a non-steroidal and more selective MRA, has shown favourable outcomes in cardiorenal populations. Objectives: To compare five-year all-cause mortality between finerenone and spironolactone users in patients with chronic kidney disease and heart failure Methods: We conducted a retrospective cohort analysis using real-world data derived from the global TriNetX research network. The search was conducted on February 6, 2026, including patients diagnosed with heart failure and chronic kidney disease, divided into a finerenone cohort and a spironolactone cohort. Cohort data were subjected to propensity score matching (PSM) for age, sex, ethnicity, medical and medication history. The evaluated endpoint is all-cause mortality mover a five-year follow-up period. Results and Conclusions: A total of 3,103 patients with chronic kidney disease (CKD) and heart failure (HF) receiving finerenone and 427,157 receiving spironolactone were identified. After propensity score matching, 3,100 patients remained in each group, with a mean age of 70 years; approximately 61.2% were male. Coronary artery disease was present in over 60% of patients, while hypertension and diabetes were observed in more than 80% of the cohort. The primary outcome occurred less frequently in the finerenone group compared with the spironolactone group (8.6% vs. 21.5%; RR 0.399; HR 0.519, 95% CI 0.44–0.60; log-rank p<0.001). The absolute risk reduction was 12.9%, corresponding to a number needed to treat (NNT) of approximately 8. In patients with concomitant heart failure and chronic kidney disease, finerenone was associated with a significant reduction in mortality compared with spironolactone, suggesting a potential therapeutic advantage of non-steroidal MRAs in this high-risk population.



21603

GLP-1 RECEPTOR AGONISTS IN HEART FAILURE WITH PRESERVED EJECTION FRACTION: A SYSTEMATIC REVIEW AND META-ANALYSIS OF CLINICAL OUTCOMES

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Background/Introduction: Heart failure with preserved ejection fraction (HFpEF) accounts for over 50% of heart failure cases and is strongly associated with obesity and cardiometabolic comorbidities, with limited effective pharmacological options. Objectives: To evaluate the effects of glucagon-like peptide-1 receptor agonists (GLP-1 RAs) on HF hospitalization, functional capacity, quality of life, and safety in patients with HFpEF. Methods: Systematic review and meta-analysis following PRISMA guidelines. Three studies were included: two randomized controlled trials (RCTs) and one propensity score-matched retrospective cohort. Primary outcome: HF hospitalization or acute HF exacerbation. Main analysis included only RCTs using hazard ratios and DerSimonian-Laird random-effects model; a sensitivity analysis incorporated all three studies via Generic Inverse Variance. Heterogeneity was assessed by the I^2 statistic. Results and Conclusions: Across 2,594 patients, GLP-1 RAs significantly reduced HF hospitalization or acute HF exacerbation in the primary RCT meta-analysis (pooled HR 0.43; 95% CI 0.20–0.91; p=0.028; I^2=68.1%). Sensitivity analysis confirmed this effect (pooled HR/OR 0.49; 95% CI 0.35–0.68; p<0.001; I^2=36.1%). Descriptively, GLP-1 RAs improved quality of life (KCCQ-CSS mean difference +7.5 points; p<0.001), six-minute walk distance (+17.1m; p<0.001), and body weight (−8.4%; p<0.001). All-cause mortality was reduced in the retrospective cohort (OR 0.34; 95% CI 0.16–0.72; p=0.004). Serious adverse events were consistently lower with GLP-1 RAs. GLP-1 RAs significantly reduce HF-related hospitalizations in HFpEF, with benefits consistent across diabetes status and a favorable safety profile. Substantial heterogeneity in the primary analysis reflects differences in study design, drug formulation, and follow-up duration, underscoring the need for dedicated large-scale outcome trials.

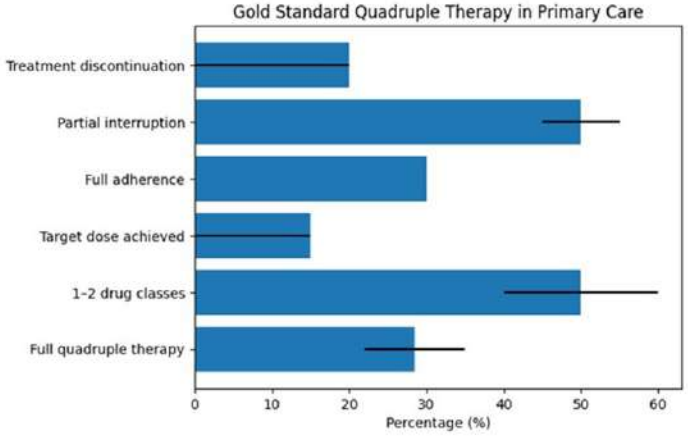
17953

GOLD STANDARD QUADRUPLE THERAPY IN HEART FAILURE AND THE CHALLENGES OF ITS APPLICABILITY IN PRIMARY HEALTH CARE: SYSTEMATIC REVIEW

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Background/Introduction: Heart failure (HF) is a clinical syndrome with high prevalence and significant impact on health systems, representing one of the leading causes of hospitalization among adults and the elderly. The combination of renin–angiotensin system inhibitors (ACE inhibitors), beta-blockers, mineralocorticoid receptor antagonists, angiotensin receptor–neprilysin inhibitors (ARNI), and SGLT2 inhibitors, known as Gold Standard Quadruple Therapy, provides additive and early benefits. However, despite its proven efficacy, the implementation of this strategy in clinical practice remains limited, particularly in primary health care (PHC). Objectives: To evaluate, through a systematic review, the impact of Gold Standard Quadruple Therapy on heart failure outcomes and its applicability in primary care. Methods: This is a systematic review with qualitative synthesis, conducted according to PRISMA guidelines. Searches were performed in PubMed, Embase, Cochrane Library, and Scopus to identify randomized controlled trials and meta-analyses on Gold Standard Quadruple Therapy. Studies with relevant clinical outcomes and applicability in PHC were included, while other study designs were excluded. Results and Conclusions: Among the studies analyzed, 18 met the eligibility criteria. Quadruple therapy demonstrated a reduction in mortality with ACE inhibitors (16–27%), beta-blockers (30–35%), mineralocorticoid receptor antagonists (~30%), ARNI (~20%), and SGLT2 inhibitors (25–30%), resulting in an overall mortality reduction of up to 45%. In PHC, the therapy remains underutilized, being fully prescribed in 22% to 35% of patients, while 40% to 60% use one or two classes, and less than 15% achieve target doses. When implemented, it reduces mortality (25–35%), hospitalizations (30–45%), and 30-day readmissions (20–28%). Adherence remains limited, with full adherence around 30%, partial interruption in 45% to 55%, and treatment discontinuation up to 20%. The main barriers include limited access to medications (50%–70%), lack of structured protocols (~60%), therapeutic inertia (~50%), low titration rates (up to 65%), cost (30%–50%), and polypharmacy (>70%). Gold Standard Quadruple Therapy significantly reduces mortality and hospitalizations in HF; however, its effectiveness in real-world settings depends on adequate implementation in primary care, including overcoming structural barriers and improving access to evidence-based therapies.



17776

HEART TRANSPLANTATION AT THE EXTREMES OF LIFE – IN CHILDHOOD AND AGING

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Background/Introduction: Heart transplantation is a last-line therapy for end-stage heart failure, indicated in both pediatric and elderly populations. The epidemiological analysis of these procedures at the extremes of life may reveal disparities in healthcare delivery and help guide public health policies. Objectives: To analyze the epidemiological profile of hospitalizations for heart transplantation in Brazil (2019–2023), evaluating regional differences in mean cost, length of hospital stay, and mortality rate, with a focus on the extremes of age (children and the elderly). Methods: A retrospective, descriptive, and quantitative epidemiological study was conducted using data from the Brazilian Unified Health System Informatics Department (DATASUS), covering the period from 2019 to 2023. Hospitalizations for heart transplantation (procedure code 0505020041) were analyzed by region, considering the following variables: mean cost per hospitalization, average length of stay, and mortality rate. Results and Conclusions: The national mean cost per hospitalization during the study period was R$ 557,623.14. The Southeast region had the highest mean cost (R$ 578,022.23), while the North region had the lowest (R$ 484,934.03). The average hospital stay was 12.6 days, with longer durations observed in the North (13.6 days) and South (13.2 days) regions. The overall mortality rate was 11.3%, with the highest rate in the Southeast (13.9%) and the lowest in the Midwest (6.87%). Although the data were not stratified by age group, it is well established that pediatric and elderly patients have higher postoperative risks, which may contribute to increased rates in certain regions. Heart transplantation at the extremes of life requires specialized infrastructure and complex clinical management. The observed regional differences may reflect disparities in access to care and variability in healthcare quality. Public policies aimed at improving equity and optimizing outcomes in vulnerable populations are essential.

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IDENTIFYING DEPRESSION IN HEART FAILURE: THE PROTECTIVE ROLE OF SPIRITUALITY AND DEMOGRAPHICS

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Background/Introduction: Heart failure is a major cause of hospitalization worldwide. Depression affects over 30% of patients and is associated with adverse clinical outcomes. Decompensated heart failure represents a period of increased physiological and psychological vulnerability; however, the factors associated with depression in this acute setting remain poorly defined. Identifying predictors of depression in patients with decompensated heart failure may support early recognition and targeted management in this high-risk population. Objectives: To identify independent predictors of depression in hospitalized patients and to evaluate the predictive contribution of spirituality to heart failure phenotypes. Methods: This cross-sectional study included adults hospitalized with decompensated heart failure at a tertiary cardiology center. Depression was assessed using the Patient Health Questionnaire-9 (PHQ-9), and spirituality was measured with the Functional Assessment of Chronic Illness Therapy–Spiritual Well-Being Scale (FACIT-Sp-12). Patients were classified into depressive and non-depressive groups based on PHQ-9 diagnostic criteria. Multivariable logistic regression was used to identify independent predictors of depression The study protocol was conducted in accordance with ethical standards and approved by the Research Ethics Committee. Results and Conclusions: Among the 250 patients included (mean age 71.9 ± 12.7 years; 54% male), 23.6% met criteria for depression.The predominant heart failure phenotype in the group was reduced ejection fraction, 61.2% (n = 153). Multivariable analysis demonstrated that higher spirituality scores were independently associated with a lower likelihood of depression (OR = 0.928; 95% CI = 0.892–0.965), representing the strongest inverse predictor. Spiritually, emerged as a significant protective factor (B = –0.075, SE = 0.020, p < 0.001), such that each 1-point increase in the FACIT–Sp-12 score was associated with a 7.2% decrease in the odds of depression. Older age was also associated with reduced odds of depression (B = –0.038, SE = 0.013, p = 0.002). Depression was highly prevalent among patients hospitalized with decompensated heart failure. Female sex and younger age were independent risk factors, whereas higher spirituality emerged as a protective factor. These findings support the use of psychosocial and spiritual assessments as complementary tools for depression risk stratification in patients with decompensated heart failure regardless of IC phenotype.

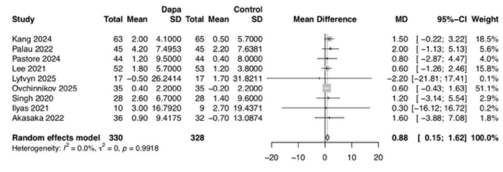
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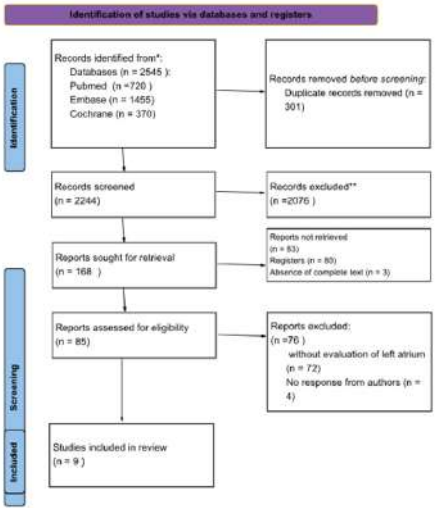
IMPACT OF SGLT2 INHIBITORS ON LEFT VENTRICULAR EJECTION FRACTION IN HEART FAILURE: A SYSTEMATIC REVIEW OF RANDOMIZED CLINICAL TRIALS

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Background/Introduction: Left ventricular ejection fraction (LVEF) is a key parameter for functional assessment and prognostic stratification in heart failure (HF), and is widely used for phenotypic classification and therapeutic decision-making. Although sodium–glucose cotransporter 2 inhibitors (SGLT2i) have demonstrated consistent benefits in reducing mortality and hospitalizations in patients with HF, their direct effects on ventricular systolic function remain incompletely elucidated, particularly across different phenotypes and follow-up durations. Objectives: To evaluate the impact of SGLT2i on LVEF in adult patients with HF. Methods: This systematic review was conducted according to PRISMA guidelines (registered in PROSPERO). A search was performed in PubMed, Embase, and Cochrane, using the terms "heart failure," "SGLT2 inhibitors," and "randomized controlled trials," yielding 2,545 records. After applying eligibility criteria, 85 articles underwent full-text review. Randomized controlled trials comparing SGLT2 inhibitors versus placebo or standard therapy in patients ≥18 years with HF were included. The primary outcome of the main analysis was left atrial diameter and volume assessed by echocardiography or magnetic resonance imaging. For the LVEF subanalysis, a quantitative synthesis was performed using a random-effects model, with results expressed as mean difference (MD) and 95% confidence intervals (CI). Statistical heterogeneity was assessed using the I^2 statistic. Results and Conclusions: Nine randomized controlled trials comprising 658 patients were included in this subanalysis. Follow-up ranged from 1.5 to 12 months. Pooled analysis demonstrated a significant improvement in LVEF favoring SGLT2 inhibitors, with a mean difference (MD) of 0.88% (95% CI 0.15 to 1.62). No heterogeneity was observed among studies (I^2 = 0%), indicating high consistency across trials. The present analysis was restricted to randomized controlled trials in patients with heart failure, providing a more homogeneous and methodologically rigorous estimate. The absence of heterogeneity (I^2 = 0%) further strengthens the reliability of these findings and suggests that the observed effect may reflect the true effect of SGLT2 inhibitors on systolic function. Overall, SGLT2 inhibitors are associated with a consistent and statistically significant improvement in LVEF. These findings reinforce the concept that reverse remodeling may occur, but likely represents only one component of the broader clinical benefit of SGLT2 inhibitors in heart failure.





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IMPACT OF THE COVID-19 PANDEMIC ON HEART FAILURE HOSPITALIZATIONS IN MARANHÃO: AN ECOLOGICAL TIME-SERIES STUDY (2018–2024)

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Background/Introduction: Heart failure (HF) is a leading cause of cardiovascular hospitalization in Brazil, especially in regions with limited specialized care. The COVID-19 pandemic disrupted healthcare delivery, potentially affecting HF management continuity and inpatient outcomes. Data on this impact in the Brazilian Northeast remain scarce. Objectives: To compare HF hospitalizations, in-hospital mortality, and length of stay across pre-pandemic, pandemic, and post-pandemic periods in Maranhão. Methods: Ecological time-series study using data from SIH/SUS (ICD-10 I50) via DATASUS. Monthly records were divided into pre-pandemic (Jan/2018–Dec/2019), pandemic (Jan/2020–Dec/2021), and post-pandemic (Jan/2022–Sep/2024). Variables: monthly hospitalizations, mortality rate (%), and mean length of stay (days). Given the non-normal distribution of monthly data, Kruskal-Wallis was used as the primary test with DSCF pairwise comparisons; one-way ANOVA with Games-Howell post-hoc served as confirmatory analysis. The post-pandemic period (33 vs. 24 months) and DATASUS reporting cutoff at September 2024 are acknowledged limitations; monthly means were used to mitigate temporal asymmetry. Results and Conclusions: Mean monthly hospitalizations fell from 302.5 ± 26.2 (pre) to 233.7 ± 53.6 (pandemic), rising to 372.5 ± 28.2 (post); all pairwise comparisons p < 0.001. In-hospital mortality rose from 10.6% to 14.0% (pandemic) and remained at 14.2% (post); pre vs. pandemic/post p < 0.001, pandemic vs. post p = 0.961 (ANOVA) / 0.867 (Kruskal-Wallis). Length of stay increased progressively: 6.6, 7.5, and 8.3 days (pandemic vs. pre p < 0.001; post vs. pandemic p = 0.004). The pandemic was associated with reduced HF hospitalizations acutely, followed by a rebound exceeding pre-pandemic levels, suggesting unmet demand. Persistently elevated mortality and progressive increase in length of stay indicate lasting disruption of chronic HF care, suggesting increased clinical complexity at admission.

		F	gl1	gl2	p
Internacoes	**Welch**	88.1	2	45.6	<.001
	Fisher	98.1	2	78	<.001
Mortalidade	**Welch**	30.2	2	44.4	<.001
	Fisher	19.7	2	78	<.001
Permanencia	**Welch**	66.4	2	46.7	<.001
	Fisher	39.1	2	78	<.001

Comparações múltiplas - Internacoes

		W	p
Pandemico	**Pos**	8.87	<.001
Pandemico	**Pre**	6.02	<.001
Pos	**Pre**	-8.52	<.001

Comparações múltiplas - Mortalidade

		W	p
Pandemico	**Pos**	0.720	0.867
Pandemico	**Pre**	-4.987	0.001
Pos	**Pre**	-7.761	<.001

Comparações múltiplas - Permanencia

		W	p
Pandemico	**Pos**	4.70	0.003
Pandemico	**Pre**	-5.36	<.001
Pos	**Pre**	-8.88	<.001

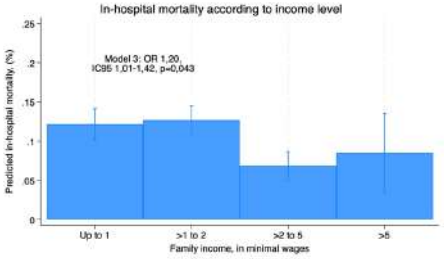
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INCOME LEVEL LINKED TO INCREASED IN-HOSPITAL MORTALITY AMONG PATIENTS WITH ACUTE HEART FAILURE IN BRAZIL

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Background/Introduction: Acute heart failure (AHF) continues to be associated with high mortality and morbidity rates; therefore, appropriate risk stratification is essential for the prioritization of patients and the allocation of resources. While socioeconomic factors are linked to worse prognoses in chronic HF, this relationship remains poorly understood in acute HF patients, especially in developing countries with universal healthcare systems, like Brazil. Objectives: Our objetive is to analyze the impact of income and educational attainment in the mortality of patients with AHF in Brazil. Methods: This is a prospective cohort study including patients admitted with a primary diagnosis of AHF at 19 hospitals within the Brazilian Unified Health System (SUS) from February 2016 to November 2022. Patients were classified by monthly household income into the following groups: ≤1 minimum wage (MW), >1 to <2 MW, ≥2 to <5 MW, and ≥5 MW. Educational level was categorized as less than basic, basic, intermediate, and advanced, according to the 2011 International Standard Classification of Education (ISCED) equivalency for Brazil. The impact of income and education on in-hospital mortality was analyzed using logistic regression models additionally adjusted for sociodemographic characteristics (age, sex, race and region of Brazil) (Model 1); HF etiology and ejection fraction (Model 2); and the ADHERE prognostic score, along with non-adherence and infection as causes of decompensation (Model 3). Results and Conclusions: A total of 3,216 patients were included in the analysis (mean age 60.9±14.9 years, 42% women; Figure 1). The mean ejection fraction was 40.7±17.1%; 20,2% had ischemic and 8,4% chagasic etiology. Patients with lower income were more frequently classified as moderate or high risk according to ADHERE (55.8% vs 58.2% vs 49.9% vs 49.1%, p-for-trend=0,015). In-hospital mortality was 11% (n=354), and was more frequent among those with lower income (12,1% vs 12,7% vs 6,8% vs 8,5%, p-for-tend=0,001). Lower income levels remained associated with a higher risk of death after adjustment for Model 1 (OR 1.19, CI95 1.02 - 1.39, p=0.030), Model 2 (OR 1.19, CI95 1.01 - 1.40, p=0.035) and Model 3 (OR 1.20, CI95 1.01 - 1.42, p=0.043; Figure 2). Education levels were not associated with mortality after adjustment for Model 1 to 3. In this large Brazilian cohort of patients with AHF, income level was independently associated with increased risk of in-hospital mortality.





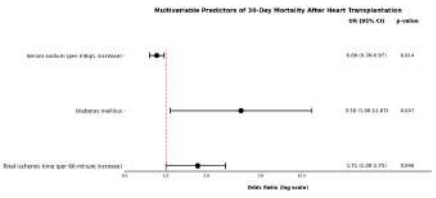
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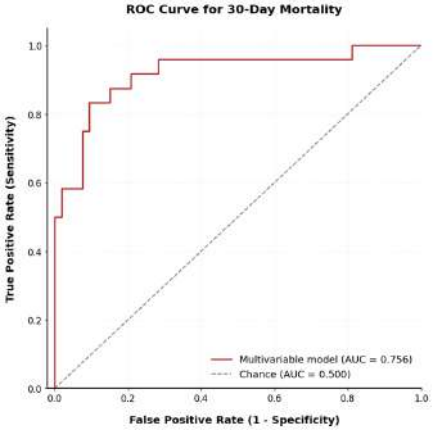
METABOLIC AND PERIOPERATIVE FACTORS ASSOCIATED WITH 30-DAY MORTALITY AFTER HEART TRANSPLANTATION: A MULTIVARIABLE ANALYSIS

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Background/Introduction: Early mortality after heart transplantation remains a complex outcome driven by the interaction between recipient characteristics and perioperative factors. Identifying metabolic and perioperative variables associated with early outcomes may improve risk stratification in the early post-transplant period. Objectives: To evaluate metabolic and perioperative variables associated with 30-day mortality after heart transplantation. Methods: This retrospective cohort included 77 consecutive adult patients undergoing heart transplantation between 2019 and 2026. The primary endpoint was 30-day all-cause mortality. A multivariable logistic regression model was constructed including pre-transplant serum sodium, recipient diabetes mellitus, and total ischemic time. Variable selection was based on clinical relevance and univariate screening (p<0.10). Model performance was assessed using the area under the receiver operating characteristic curve (AUC) and Nagelkerke R². Total ischemic time was rescaled to 60-minute increments for clinical interpretability. A sensitivity analysis was performed replacing ischemic time as a continuous variable with a binary cutoff (>300 minutes). Results and Conclusions: Thirty-day mortality was 31.2% (24/77). The multivariable model showed moderate discrimination, with an AUC of 0.756 and Nagelkerke R² of 0.252. On multivariable analysis, lower pre-transplant serum sodium was associated with mortality (odds ratio [OR] 0.86; 95% confidence interval [CI] 0.76–0.97; p=0.014), as well as diabetes mellitus (OR 3.58; 95% CI 1.08–11.87; p=0.037). Total ischemic time was also associated with mortality (OR 1.71 per 60-minute increment; 95% CI 1.00–2.75; p=0.046). In sensitivity analysis (>300 minutes), findings remained consistent, with similar direction of effect for serum sodium (OR 0.85; p=0.005), diabetes mellitus (OR 4.84; p=0.019), and ischemic time (OR 3.49; p=0.055). Model performance remained similar (AUC 0.756 in the main analysis vs 0.752 in the sensitivity analysis). These results should be interpreted in the context of the retrospective single-center design, limited sample size, and potential residual confounding. In this cohort, pre-transplant serum sodium, diabetes mellitus, and total ischemic time were associated with 30-day mortality. These findings support a multifactorial model in which early post-transplant outcomes reflect the interplay between recipient metabolic vulnerability and perioperative ischemic exposure.





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METABOLOMIC ALTERATIONS ASSOCIATED WITH EJECTION FRACTION PATTERNS IN HEART FAILURE

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Background/Introduction: Introduction: Heart failure (HF) is characterized by structural and functional abnormalities, such as reduced left ventricular ejection fraction (EF). Systemic metabolic alterations play a central role in HF pathophysiology, often preceding and accompanying cardiac dysfunction. Thus, metabolomics emerges as a powerful approach to uncover biochemical signatures associated with HF. Objectives: Objectives: To evaluate the metabolomic profile of patients across different HF phenotypes. Methods: Methods: A cross-sectional study included 60 participants of both sexes, allocated into groups characterized by Doppler echocardiography: HF with preserved EF (HFpEF; n=17), mildly reduced EF (HFmrEF; n=13), reduced EF (HFrEF; n=15), and a control group (C; n=15). Plasma metabolomic profiling was performed using nuclear magnetic resonance spectroscopy. Student's t-test was used for metabolomic comparisons, and one-way ANOVA with Tukey's post hoc test for echocardiographic variables, ($p<0.05$). Results and Conclusions: Results: Metabolomic analysis revealed distinct signatures across HF phenotypes compared to C. In HFpEF, formate was downregulated, while glutamate and choline were upregulated. In HFmrEF, formate, creatine, acetate, and lysine were downregulated, alongside upregulated choline, lactate, and pyruvate. In HFrEF, formate, acetate, and asparagine were downregulated, with no metabolites significantly upregulated. Regarding echocardiography, there was an increase in the values of LVEDD, LVM/BSA, LAV/BSA and septal E/E' in all HF groups vs. C; LVM/BSA showed an increase in the HFrEF vs. HFmrEF; and LVM in the HFpEF and HFrEF groups vs. C. LVESD progressively increased from C to HFpEF, HFmrEF, and HFrEF. LVEF, septal S' and lateral S' progressively decreased from C to HFpEF, HFmrEF, and HFrEF. There was a reduction in the values of E/A, septal E', lateral E', and tricuspid E' in all HF groups vs. C; septal E' and lateral E' also showed a reduction in the HFrEF vs. HFpEF and HFmrEF groups; and TAPSE in the HFrEF group vs. HFpEF, HFmrEF, and C, and in HFpEF vs. C. Conclusion: HF phenotypes exhibit progressive metabolic reprogramming associated with EF patterns. In addition, downregulated formate emerges as a potential biomarker for disease severity, highlighting the utility of metabolomics in the clinical stratification of HF. FAPESP: 2023/08537-5.

21367

PHENOTYPE-SPECIFIC CIRCULATING METABOLOMIC SIGNATURES ASSOCIATED WITH SYSTOLIC AND DIASTOLIC DYSFUNCTION IN HEART FAILURE: AN ECHOCARDIOGRAPHY-INTEGRATED ANALYSIS

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Background/Introduction: Introduction: Heart failure (HF) is characterized by the inability of the heart to meet the metabolic demands of tissues and is associated with high morbidity and mortality. Classifying HF based on ejection fraction (EF) as preserved, mildly reduced, or reduced reflects distinct pathophysiological mechanisms, clinical profiles, and therapeutic responses. HF progression involves systemic alterations, including metabolic dysfunction. In this context, metabolomics has emerged as a promising approach to identify metabolic alterations associated with cardiac function and HF heterogeneity. Objectives: Objectives: To evaluate the association between circulating metabolites and echocardiographic parameters in patients with different heart failure phenotypes. Methods: Methods: This cross-sectional study included patients with HF classified as preserved (HFpEF; n=17), mildly reduced (HFmrEF; n=13), and reduced (HFrEF; n=15), as well as a control group (C; n=15) without cardiovascular risk factors. Echocardiography assessed cardiac structure and function, and metabolomic analysis was performed by 1H-NMR. Identified metabolites were correlated with echocardiographic variables by Pearson correlation ($p<0.05$). Additionally, selected significant metabolites were further analyzed using linear regression models to evaluate associations with systolic (EF) and diastolic (E/E' ratio) function, including interaction terms between metabolites and HF groups, adjusted for sex. Results and Conclusions: Results: Metabolomic analysis identified 38 metabolites that showed significant correlations with echocardiographic parameters. Acetate and formate, metabolites related to energy metabolism and one-carbon pathways, were selected for further analysis. In interaction models, acetate was associated with EF in a group-dependent manner (p-interaction = 0.019), with stronger effects in HFrEF patients. Formate was associated with the E/E' ratio in a phenotype-dependent manner (p-interaction = 0.002), showing a positive association with diastolic dysfunction in HFrEF patients. Formate also showed a group-dependent association with EF (p-interaction = 0.004). Conclusion: These findings indicate that specific circulating metabolites are differentially associated with systolic and diastolic dysfunction according to HF phenotype, supporting metabolomics as a tool to characterize HF heterogeneity. FAPESP: 2023/08537-5

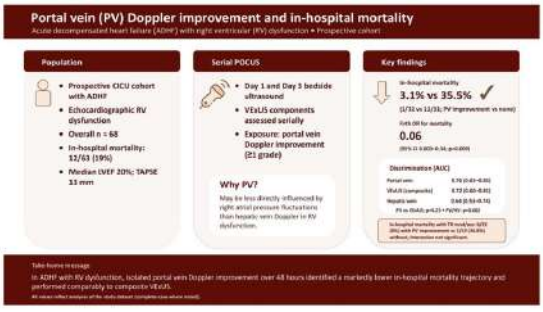
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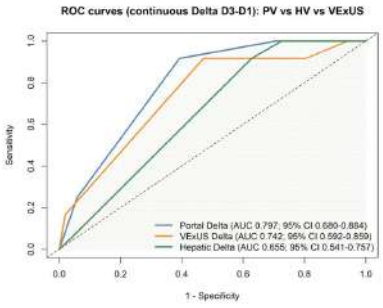
Portal vein doppler improvement predicts lower in-hospital mortality in acute decompensated heart failure with right ventricular dysfunction: a prospective cohort study

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Background/Introduction: Venous Excess Ultrasound (VExUS) is increasingly used for risk stratification and monitoring decongestion in acute decompensated heart failure (ADHF). However, its validity in patients with right ventricular (RV) dysfunction remains uncertain, as elevated right-sided pressures and compliance may alter Doppler signals. Among VExUS components, portal vein Doppler may be less influenced by right atrial pressure fluctuations than hepatic vein Doppler, potentially offering a pragmatic target for serial congestion assessment. Objectives: To evaluate whether improvement in portal vein Doppler is associated with in-hospital mortality in ADHF patients with RV dysfunction. Methods: We conducted a prospective cohort study including adults (>18 years) admitted to a cardiac intensive care unit with ADHF and RV dysfunction. Venous congestion was assessed on days 1 and 3 using portal vein Doppler grading and other VExUS components. The exposure was an improvement of ≥1 portal Doppler grade. The primary outcome was in-hospital mortality. Associations were assessed using logistic regression. Discrimination was evaluated using ROC curves (AUC) with 95% confidence intervals, and AUCs were compared using DeLong's test. Results and Conclusions: Among 68 patients (median age 61 years; 74% male; median LVEF 20%; median TAPSE 13 mm), complete-case analysis included 63 patients, with 12 deaths (19%). Portal Doppler improvement occurred in 32/63 (51%) and was associated with lower mortality (1/32, 3.1%) versus no improvement (11/31, 35.5%). Portal improvement was independently associated with lower in-hospital mortality (OR 0.06, 95% CI 0.003–0.34; p=0.009). Discrimination was higher for portal improvement (AUC 0.76, 95% CI 0.65–0.85) than hepatic improvement (AUC 0.64, 95% CI 0.53–0.74; DeLong p=0.002), and similar to composite VExUS improvement (AUC 0.72, 95% CI 0.60–0.81; p=0.25). In patients with moderate-to-severe tricuspid regurgitation, no deaths occurred with portal improvement (0/22 vs. 7/19), suggesting identification of a low-risk subgroup, although interaction was not significant. In ADHF patients with RV dysfunction, early improvement in portal vein Doppler was strongly associated with lower in-hospital mortality and showed discrimination comparable to VExUS. Given its simplicity and rapid bedside applicability compared with the full VExUS assessment, serial portal vein Doppler may represent a practical and efficient marker of decongestion response in this high-risk population.





20977

PREDICTORS OF SUDDEN OR ARRHYTHMIC DEATH DURING THE VULNERABLE PERIOD AFTER ACUTE HEART FAILURE

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Background/Introduction: The post-discharge phase following hospitalization for acute heart failure (AHF) —known as the "vulnerable period"—is associated with increased mortality, including sudden or arrhythmic death; however, predictors of sudden death during this period remain poorly characterized. Objectives: To identify predictors of sudden or arrhythmic death within 180 days after discharge following hospitalization for AHF. Methods: In this prospective cohort, we included patients discharged after hospitalization for AHF from 20 public hospitals participating in the Brazilian Unified Health System (SUS) "Best Practices in Cardiology" program between 2016 and 2022. Patients with an implantable cardioverter-defibrillator were excluded. Fine-Gray competing-risk hazards models were used to identify predictors of sudden or arrhythmic death within 180 days after discharge, with non-arrhythmic death treated as a competing event. Results and Conclusions: Among 1,689 patients (age 61±14 years, ejection fraction 42±17%, 41% women), 98 sudden or arrhythmic deaths and 78 non-arrhythmic deaths occurred within 180 days after discharge. Chagas cardiomyopathy was independently associated with increased risk of sudden or arrhythmic death (SHR 2.60, 95% CI 1.40–4.84, p=0.002), whereas ischemic etiology was not independently associated with mortality. Additional independent predictors included reduced mobility during hospitalization (SHR 2.30, 95% CI 1.37–3.87, p=0.002) and older age (SHR 1.03 per year, 95% CI 1.01–1.05, p=0.002). In contrast, higher systolic blood pressure at discharge (SHR 0.98, 95% CI 0.97–0.99, p=0.008) and higher educational level (SHR 0.68, 95% CI 0.52–0.88, p=0.004) were independently associated with lower risk of sudden or arrhythmic death. In this large cohort of patients with AHF, predictors of sudden or arrhythmic death during the vulnerable post-discharge period included Chagas cardiomyopathy, older age, markers of greater clinical severity and lower educational attainment.

16559

PROGNOSTIC VALUE OF CLINICAL SCORES AND BIOMARKERS IN ADVANCED HEART FAILURE: IMPLICATIONS FOR PALLIATIVE CARE ELIGIBILITY

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Background/Introduction: Advanced heart failure (HF) poses a significant prognostic challenge, especially in low- and middle-income countries (LMICs). Determining the optimal threshold for palliative care (PC) referral relies heavily on accurate risk stratification. While multiparametric clinical scores, such as the MAGGIC (Meta-Analysis Global Group in Chronic Heart Failure) score, and biomarkers like N-terminal pro-B-type natriuretic peptide (NT-proBNP) are well-established for predicting mortality, their specific utility in triggering early PC interventions remains underutilized in clinical practice. Recent epidemiological studies emphasize the need for objective triggers to overcome the current underutilization of PC. Objectives: To systematically evaluate the combined prognostic value of the MAGGIC risk score and natriuretic peptide levels in patients with advanced HF and to define evidence-based thresholds that identify eligibility for early PC integration. Methods: An integrative review of literature (2024-2026) was conducted using PubMed and Cochrane databases. The analysis focused on large-scale validation studies of prognostic models (MAGGIC, SHFM) and biomarkers (NT-proBNP) in advanced HF populations. Outcomes of interest included the area under the curve (AUC) for 1-year mortality prediction and the correlation of high-risk scores with the initiation of PC or advance care planning. Results and Conclusions: Recent real-world validation studies demonstrate that the MAGGIC score remains the most extensively validated prognostic tool for advanced HF, consistently showing an AUC >0.70 for mortality prediction. The integration of MAGGIC scores with elevated NT-proBNP levels significantly enhances prognostic accuracy for near-term mortality. Despite the availability of these robust predictive tools, contemporary observational data reveal a stark clinical gap: fewer than 18% of high-risk HF patients receive a formal PC consultation. The integration of the MAGGIC score with biomarker data provides a robust, objective framework for identifying advanced HF patients at high risk of near-term mortality. Utilizing these validated thresholds as automated triggers for PC referral could bridge the current gap in care, ensuring timely therapeutic adjustments.

15914

RARE COEXISTENCE OF DUAL PATHOGENIC VARIANTS IN THE TTR GENE: A CASE SERIES

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Background/Introduction: We report a case series of p with dual pathogenic variants in the TTR gene, followed for three years after diagnosis. These cases were identified through the analysis of all p with cardiac amyloidosis and those carrying pathogenic variants in the TTR gene, followed between 2019 and 2025. Objectives: Clinical, echocardiographic, and laboratory characteristics of p with dual pathogenic variants in TTR Methods: We report a case series of p with dual pathogenic variants in the TTR gene, followed for three years after diagnosis. These cases were identified through the analysis of all p with cardiac amyloidosis and those carrying pathogenic variants in the TTR gene, followed between 2019-2025. Results and Conclusions: Among 450 p, four individuals with dual pathogenic variants in TTR were identified; 50% were male, with a mean age of 60±12 years. All carried the Val142Ile variant, three in combination with Val50Met and one with Ser70Arg. All p exhibited a mixed phenotype (cardiac and neurological). Extracardiac manifestations were frequent: dysautonomia in 100%, peripheral polyneuropathy in 75%, carpal tunnel syndrome in 75%, and diarrhea in 50%. Regarding cardiac manifestations, two p required pacemaker implantation due to complete atrioventricular block, and all four developed heart failure—three in NYHA class II and one in class III—with a mean NT-proBNP of 2218±1432 pg/mL. On echocardiography, mean left ventricular ejection fraction (LVEF) was 53±8% (two p with LVEF<50%), global longitudinal strain was 8.5±2.5%, and left atrial volume index was 47±13 mL/m². Mean interventricular septal and posterior wall thicknesses were 18.2±0.9 mm and 15±2.9 mm, respectively. All patients were receiving disease-specific therapy for ATTR with tafamidis 20 mg/day; in one case, treatment also included eplontersen. This case series highlights the rare coexistence of dual pathogenic variants in the TTR gene, a phenomenon scarcely reported in the literature and, to our knowledge, representing the largest series described to date. The presence of both variants was associated with a more severe phenotype, characterized by combined cardiac and neurological involvement in all patients, underscoring the impact of dual genotypic expression and greater clinical burden. Despite this more severe presentation, clinical outcomes were favorable, with survival exceeding three years, surpassing the expected prognosis in the absence of treatment. These findings reinforce the benefit of disease-modifying therapy in ATTR.

Table 1. Clinical, echocardiographic, and laboratory characteristics of the study sample

P	Age	Sex	Genetic Variant	Comorbidities	CKD*	Orthop edic	Neurological	ECG	LVEF (%)	LA (mL/m²)	DD	Septo/PW (mm)	PASP (mmHg)	Dyspnea (NYHA)	NT-proBNP	Polyneuro pathy	NAC
I	70	F	Val142Ile Val50Met	Hypertension; Hypothyroidism ; obesity	Yes	No	Dysautonomia	AV block (PPM)	57	35	I	17/11	33	II	621	I	I
II	44	M	Val142Ile Ser70Arg	None	No	CTS	Polyneuropathy, dysautonomia, dyanthea	Low voltage	65	43	III	18/15	28	III	1.470	II	I
III	56	F	Val142Ile Val50Met	None	No	CTS	Polyneuropathy, dysautonomia, dyanthea	Absent	48	66	II	15/10	47	II	3.775	II	II
IV	70	M	Val142Ile Val50Met	Dyslipidemia	No	CTS	Polyneuropathy, dysautonomia	AV block (PPM); pseudoinfarction	63	44	II	10/16	23	II	3.010	II	II

*CKD defined as eGFR <60 mL/min/1.73 m². CKD: chronic kidney disease; CTS: carpal tunnel syndrome; DD: diastolic dysfunction; ECG: electrocardiogram; LA: left atrial volume index; LVEF: left ventricular ejection fraction; NAC: National Amyloidosis Centre; NYHA: New York Heart Association; PASP: pulmonary artery systolic pressure; PND: polyneuropathy disability; PPM: permanent pacemaker; PW: posterior wall.



Figure 1. Cardiac and neurological involvement in Patient IV, secondary to the phenotype associated with dual pathogenic variants in TTR (Val142Ile and Val50Met). **Left:** Cardiac magnetic resonance imaging (four-chamber view) demonstrating increased ventricular wall thickness, associated with diffuse subendocardial late gadolinium enhancement. **Right:** Evidence of peripheral polyneuropathy in the hands, with intrinsic muscle atrophy on the dorsal aspect, exhibiting a claw-like deformity.

20739

REGISTRY OF CARDIOMYOPATHIES AND INFLAMMATORY MYOPERICARDIAL SYNDROME: PRELIMINARY DATA.

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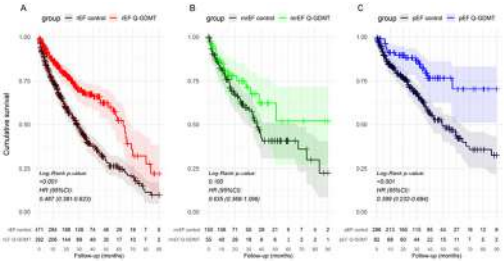
Background/Introduction: Myocarditis and cardiomyopathies are conditions affecting the myocardium that share pathophysiological mechanisms and can progress to heart failure, which carries a substantial impact on cardiovascular morbidity and mortality. Despite overlapping characteristics, they differ in etiology and clinical presentation, requiring personalized diagnostic and therapeutic approaches. In this regard, establishing a registry to enhance the understanding of these conditions is crucial for developing diagnostic and therapeutic strategies that can improve prognosis and quality of life. Objectives: To analyze epidemiological data and outcomes related to cardiomyopathy and Inflammatory Myopericardial Syndrome among hospitalized patients in the main centers of the Metropolitan Region II of Rio de Janeiro. Methods: This is a cross-sectional, observational and multicenter study. Data collection from November 2025 to May 2026, covering demographic, clinical, laboratory, imaging, and outcome variables obtained from medical records in accordance with national ethical regulations. Results and Conclusions: A total of 52 patients were included (53.8% male). Dilated cardiomyopathy was the predominant phenotype (n=17), followed by myocarditis (n=13), hypertrophic cardiomyopathy (n=8), pericarditis (n=8), left ventricular arrhythmogenic cardiomyopathy (n=3), and infiltrative cardiomyopathy (n=3). Systemic arterial hypertension (55.8%), obesity (28.8%), and diabetes mellitus (23.1%) were the most prevalent comorbidities. One death (1.9%) was recorded due to non-cardiological causes. Initial diagnostic methods included echocardiography (100%), troponin (80.8%), NT-proBNP (67.3%), and ECG (59.6%). For advanced investigation, cardiac MRI (61.5%), genetic testing (7.7%), and endomyocardial biopsy (1.9%) were performed. The partial results of this registry in Metropolitan Region II of Rio de Janeiro demonstrate a predominance of dilated cardiomyopathy and myocarditis, highlighting the relevance of inflammatory and dilated phenotypes in the local hospital setting. The etiological diversity found, including cases of amyloidosis and arrhythmogenic cardiomyopathy, reinforces the need for rigorous differential diagnosis and the use of advanced imaging and genetic technologies. In summary, strengthening clinical registries is fundamental to optimizing risk stratification, enabling personalized therapies, and consequently reducing hospitalization rates and improving the prognosis of patients with myocardial and pericardial diseases.

16062

RESULTS OF QUADRUPLE GUIDELINE-DIRECTED THERAPY ACROSS EJECTION FRACTION CATEGORIES IN HEART FAILURE: REAL-WORLD DATA FROM THE BEAT-HF REGISTRY

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Background/Introduction: Heart failure (HF) remains a major contributor to cardiovascular morbidity and mortality worldwide. Quadruple guideline-directed medical therapy (Q-GDMT) is a standard strategy in HF with reduced ejection fraction, but current evidence is heterogeneous across other ejection fraction categories. Objectives: To evaluate the results of Q-GDMT across HF ejection fraction categories. Methods: We analyzed data from BEAT-HF (Brasília Evaluation and Tracking of Heart Failure), an observational cohort of 2,314 HF patients who received care between Aug/2010 and Jan/2024 at 6 public hospitals in Brasília, Brazil. Kaplan-Meier curves and Cox proportional hazard regression models were used to asses outcomes stratified by Q-GDMT. The primary outcome was combined hospitalization or death. Results and Conclusions: Our cohort was 56.8% male, with a mean age of 64.5±14.0 years. The population was ethnically-diverse: 53.4% mixed, 20.5% white, 19.5% black, and 6.5% asian. In total, 903 had rEF (56.2%), 241 mrEF (15.0%), and 463 pEF (28.8%). Adherence to GDMT was as follows: ACEI, ARB or ARNI (84.6%), beta-blockers (89.9%), MRA (68.8%), and SGLT2I (41.4%). Only 28,9% received Q-GDMT. Over the median follow-up of 20.8 months [IQR 8.1–36.7], 32.9% were hospitalized at least once, and 22.2% died (mean survival 63.6 months). Q-GDMD was associated with reduced risk for the primary outcome in patients with both rEF (HR 0.487, 95%CI 0.381–0.623, p<0.001) and pEF (HR 0.399, 95%CI 0.232–0.684, p<0.001). In this regionally-representative and ethnically-diverse cohort, Q-GDMT was associated with reduced combined hospitalization or death in HFrEF and HFpEF.

Table 1. Population characteristics, total and stratified by ejection fraction.

Variable	rEF (n=903)	mrEF (n=241)	pEF (n=463)	p-value
Male sex, n(%)	565 (62.6)	135 (56.0)	221 (47.7)	**<0.001***
Age (years), M±SD	63.4 ± 13.2	64.9 ± 13.7	65.0 ± 15.7	0.087‡
BMI (kg/m²), M±SD	27.0 ± 5.8	27.5 ± 5.70	28.6 ± 5.8	**<0.001‡**
Obesity, n(%)	210 (24.4)	64 (27.2)	165 (36.8)	**<0.001***
Hypertension, n(%)	575 (67.9)	179 (77.2)	346 (79.7)	**<0.001***
Type 2 diabetes, n(%)	372 (41.2)	97 (40.2)	195 (42.1)	0.887*
Dyslipidemia, n(%)	481 (54.8)	135 (57.4)	268 (59.6)	0.241*
Smoking history, n(%)	351 (39.0)	77 (32.0)	147 (31.9)	**0.014***
Atrial fibrillation, n(%)	156 (18.8)	39 (17.6)	94 (21.7)	0.337*
COPD, n(%)	70 (7.8)	20 (8.4)	41 (8.9)	0.789*
CKD, n(%)	265 (30.1)	72 (30.6)	148 (32.7)	0.622*
Prior MI, n(%)	257 (30.5)	68 (29.8)	102 (23.2)	**0.021***
Prior stroke, n(%)	136 (15.1)	27 (11.3)	51 (11.0)	0.065*
ACEI, ARB, or ARNI, n(%)	723 (86.5)	182 (81.6)	361 (83.6)	0.128*
Beta-blockers, n(%)	828 (94.3)	206 (89.2)	382 (84.7)	**<0.001***
MRA, n(%)	703 (80.2)	138 (59.7)	247 (54.6)	**<0.001***
SGLT2I, n(%)	378 (47.6)	82 (39.4)	134 (34.4)	**<0.001***
Q-GDMT, n(%)	297 (36.6)	55 (25.2)	82 (19.6)	**<0.001***
Furosemide, n(%)	466 (58.7)	93 (44.5)	185 (47.3)	**<0.001***
Thiazides, n(%)	53 (6.7)	11 (5.3)	56 (14.4)	**<0.001***
CCB, n(%)	47 (5.4)	33 (14.2)	99 (22.0)	**<0.001***
Amiodarone, n(%)	174 (19.8)	33 (14.2)	66 (14.6)	**0.021***
Acetylsalicylic acid, n(%)	324 (37.0)	98 (42.4)	160 (35.4)	0.189*
Statins, n(%)	567 (64.6)	160 (69.3)	304 (67.3)	0.332*
All-cause hosp. or death, n(%)	358 (45.0)	88 (41.1)	138 (35.0)	**0.004***
At least 1 hosp., n(%)	270 (34.2)	68 (31.8)	108 (27.4)	0.061*
All-cause mortality, n(%)	213 (24.4)	43 (18.2)	66 (14.5)	**<0.001***
Survival until death (months), M(95%CI)	60.6 (57.4 - 63.8)	69.1 (63.7 - 74.5)	71.5 (67.6 - 75.5)	**<0.001//**

*Yates's continuity-corrected Pearson's chi-squared test. †Fisher's exact test. ‡One-way ANOVA. §Kruskal-Wallis test. //Log-rank test. BMI: body mass index. COPD: chronic obstructive pulmonary disease. LVEF: left ventricular ejection fraction. CKD: chronic kidney disease. MI: myocardial infarction. ACEI: angiotensin-converting-enzyme inhibitors. ARB: angiotensin receptor blockers. ARNI: angiotensin receptor-neprilysin inhibitor. MRA: mineralocorticoid receptor antagonists. SGLT2I: sodium-glucose linked transporter inhibitors.

16064

RESULTS OF QUADRUPLE GUIDELINE-DIRECTED THERAPY ACROSS THE MOST PREVALENT HEART FAILURE ETIOLOGIES IN BRAZIL: REAL-WORLD DATA FROM THE BEAT-HF REGISTRY

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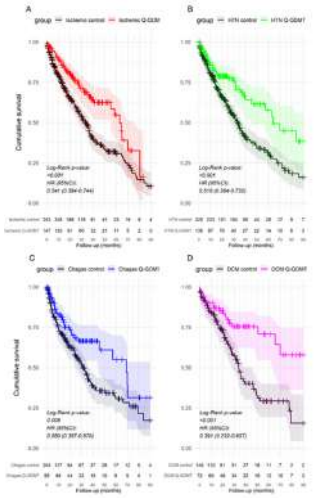
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Background/Introduction: Heart failure (HF) remains a major contributor to cardiovascular morbidity and mortality in Latin America and worldwide. Objectives: To evaluate the results of quadruple guideline-directed medical therapy (Q-GDMT) across the Most Prevalent Heart Failure Etiologies in Brazil. Methods: We analyzed data from BEAT-HF (Brasília Evaluation and Tracking of Heart Failure), an observational cohort of 2,314 HF patients who received care between Aug/2010 and Jan/2024 at 6 public hospitals in Brasília, Brazil. Kaplan-Meier curves and Cox proportional hazard regression models were used to asses outcomes stratified by Q-GDMT. The primary outcome was combined hospitalization or death. Results and Conclusions: Our cohort was 56.8% male, with a mean age of 64.5±14.0 years. The population was ethnically-diverse: 53.4% mixed, 20.5% white, 19.5% black, and 6.5% asian. The most frequent HF etiologies were: ischemic (34.7%), hypertensive (24.7%), chagasic (20.8%), and dilated cardiomyopathy (14.0%). Adherence to guideline-directed medical therapies (GDMT) was as follows: ACEI, ARB or ARNI (84.6%), beta-blockers (89.9%), MRA (68.8%), and SGLT2I (41.4%). Only 28,9% received Q-GDMT. Over the median follow-up of 20.8 months [IQR 8.1–36.7], 32.9% were hospitalized at least once, and 22.2% died (mean survival 63.6 months). Q-GDMD was associated with reduced risk for the primary outcome across all investigated etiologies – ischemic (HR 0.541, 95%CI 0.394–0.744, p<0.001), hypertensive (HR 0.516, 95%CI 0.364–0.732, p>0.001), chagasic (HR 0.580, 95%CI 0.387–0.870, p=0.008), and DCM (HR 0.391, 95%CI 0.232–0.657, p<0.001). Data from this regionally-representative cohort shows that Q-GDMT was associated with reduced combined hospitalization or death across the most prevalent HF etiologies in Brazil.

Table 1. Population characteristics, total and stratified by frequent HF etiologies.

Variable	Ischemic (n=773)	HTN (n=504)	Chagasic (n=428)	DCM (n=285)	p-value
Male sex, n(%)	501 (64.8)	175 (53.2)	162 (49.1)	98 (54.4)	**<0.001***
Age (years), M±SD	66.8 ± 12.0	66.9 ± 14.2	63.9 ± 13.8	63.3 ± 14.3	**<0.001‡**
BMI (kg/m²), M±SD	27.7 ± 5.3	28.8 ± 6.7	24.6 ± 4.6	27.8 ± 4.9	**<0.001‡**
LVEF(%), Mdn[IQR]	38.0 [29.0 - 48.7]	41.0 [31.0 - 51.0]	32.5 [25.7 - 44.2]	35.0 [24.0 - 51.5]	**<0.001§**
Obesity, n(%)	161 (29.1)	101 (34.2)	32 (15.1)	33 (26.2)	**<0.001***
Hypertension, n(%)	446 (78.7)	329 (100.0)	99 (43.8)	77 (58.8)	**<0.001***
Type 2 diabetes, n(%)	411 (53.2)	150 (45.6)	84 (25.5)	66 (36.7)	**<0.001***
Dyslipidemia, n(%)	485 (63.5)	198 (61.9)	128 (40.5)	67 (38.7)	**<0.001***
Smoking history, n(%)	365 (47.3)	111 (33.8)	100 (30.4)	47 (26.1)	**<0.001***
Atrial fibrillation, n(%)	77 (14.9)	68 (23.1)	47 (23.3)	24 (19.8)	**0.010***
COPD, n(%)	57 (9.9)	26 (8.4)	21 (9.3)	11 (8.4)	0.869*
CKD, n(%)	166 (30.0)	125 (41.3)	81 (37.2)	42 (33.3)	**0.008***
Prior MI, n(%)	447 (81.7)	0 (0.0)	0 (0.0)	0 (0.0)	**<0.001***
Prior stroke, n(%)	89 (15.5)	38 (12.2)	43 (19.1)	9 (6.9)	**0.008***
ACEI, ARB, or ARNI, n(%)	446 (84.5)	247 (82.3)	174 (83.3)	97 (78.2)	0.404*
Beta-blockers, n(%)	504 (92.3)	268 (88.7)	193 (89.8)	116 (92.1)	0.314*
MRA, n(%)	359 (65.9)	201 (66.6)	162 (75.3)	91 (72.2)	0.052*
SGLT2I, n(%)	218 (41.8)	137 (45.2)	90 (42.1)	44 (35.2)	0.299*
Q-GDMT, n(%)	149 (28.1)	101 (33.3)	66 (30.7)	35 (28.0)	0.425*
Furosemide, n(%)	248 (47.4)	183 (60.4)	122 (57.0)	69 (54.8)	**0.002***
Thiazides, n(%)	44 (8.4)	34 (11.3)	7 (3.3)	10 (7.9)	**0.013***
CCB, n(%)	75 (13.7)	60 (19.9)	4 (1.9)	14 (11.1)	**<0.001***
Amiodarone, n(%)	76 (13.9)	55 (18.2)	80 (37.4)	24 (19.0)	**<0.001***
Acetylsalicylic acid, n(%)	344 (63.1)	97 (32.1)	55 (25.7)	32 (25.4)	**<0.001***
Statins, n(%)	461 (84.4)	202 (66.7)	116 (54.0)	68 (54.0)	**<0.001***
All-cause hosp. or death, n(%)	252 (48.0)	120 (39.1)	104 (46.4)	47 (36.7)	**0.021***
At least 1 hosp., n(%)	195 (37.1)	91 (29.6)	78 (35.3)	34 (26.8)	**0.046***
All-cause mortality, n(%)	143 (26.1)	64 (20.8)	61 (27.1)	27 (21.1)	0.199*
Survival until death (months), M(95%CI)	62.1 (58.4-65.7)	64.9 (59.9-69.9)	61.7 (55.8-67.5)	66.3 (58.8-73.9)	0.262//

*Yates's continuity-corrected Pearson's chi-squared test. †Fisher's exact test. ‡One-way ANOVA. §Kruskal-Wallis test. //Log-rank test. BMI: body mass index. COPD: chronic obstructive pulmonary disease. LVEF: left ventricular ejection fraction. CKD: chronic kidney disease. MI: myocardial infarction. ACEI: angiotensin-converting-enzyme inhibitors. ARB: angiotensin receptor blockers. ARNI: angiotensin receptor-neprilysin inhibitor. MRA: mineralocorticoid receptor antagonists. SGLT2I: sodium-glucose linked transporter inhibitors.



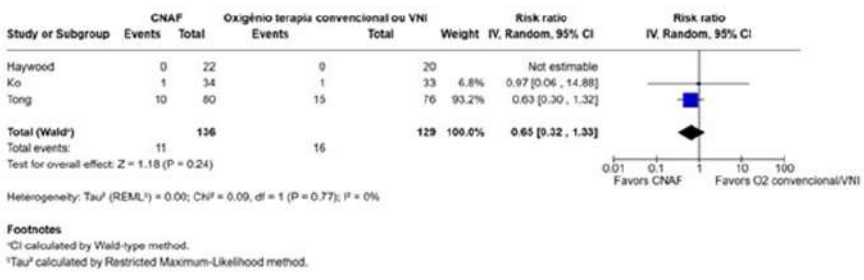
19861

RISK OF INTUBATION IN PATIENTS WITH HEART FAILURE SUBMITS TO HIGH-FLOW NASAL THERAPY VS NONINVASIVE VENTILATION AND CONVENTIONAL OXYGEN THERAPY

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Background/Introduction: Patients with Heart Failure (HF), especially during acute decompensation, are at high risk of requiring invasive ventilatory support, which is associated with poorer prognosis and adverse clinical outcomes. Therefore, the use of noninvasive respiratory support strategies has become essential. However, current evidence remains insufficient to establish the clinical benefit of high-flow nasal therapy (HFNT) compared with other therapies. Objectives: Quantify the impact of using HFNT in comparison with conventional oxygen therapy and noninvasive ventilation (NIV) in patients with HF. Methods: PubMed, EMBASE, Web of Science, Scopus and Cochrane were searched for this systematic review and meta-analysis of studies comparing HNFT, NIV and conventional oxygen therapy in patients with HF. A total of 568 were triaged, for 15 full text-screenings. The primary outcome was needed for orotracheal intubation. Statistical analysis was performed using relative risk (RR) with corresponding 95% confidence intervals (CIs). All analyses were conducted using Review Manager (RevMan 5.4). Statistical heterogeneity was assessed using the I² statistic. Results and Conclusions: Three studies were included, comprising a total of 265 patients. The primary outcome was the need for orotracheal intubation. Pooled analysis using a random-effects model showed no statistically significant difference between strategies (RR 0.65; 95% CI 0.32–1.30; p=0.24), although the RR favored high-flow nasal therapy (HFNT), with no observed heterogeneity among studies (I²=0%). Secondary outcomes included all-cause mortality, intensive care unit admission, and length of hospital stay; however, reporting of these outcomes was highly heterogeneous, precluding quantitative synthesis. Additional parameters, such as arterial blood gas measurements, suggest improved physiological responses with HFNT. CONCLUSION: In patients with Heart Failure (HF), high-flow nasal therapy (HFNT) did not demonstrate a statistically significant reduction in the need for endotracheal intubation compared with noninvasive ventilation (NIV) or conventional oxygen therapy. The absence of heterogeneity across studies suggests consistency in these findings. However, variability in outcome reporting and the limited number of studies involving this population preclude definitive conclusions. Further well-designed studies are warranted to better define the role and clinical impact of these noninvasive respiratory support strategies in patients with HF.



16160

SAFETY AND EARLY EXPERIENCE WITH VUTRISIRAN IN PATIENTS WITH TRANSTHYRETIN AMYLOID CARDIOMYOPATHY AT A REFERENCE CENTER

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Background/Introduction: Cardiac amyloidosis is an increasingly recognized cause of heart failure, particularly in older individuals, and remains frequently underdiagnosed. It is characterized as a restrictive cardiomyopathy with progressive course and poor prognosis. Therapeutic options for transthyretin amyloid cardiomyopathy (ATTR-CM) include transthyretin stabilizers and newer therapies such as vutrisiran, an RNA interference–based treatment that reduces hepatic production of transthyretin (TTR). Recent clinical trials have demonstrated a favorable impact of this therapy on cardiovascular outcomes. Objectives: To evaluate the tolerability of vutrisiran in patients with transthyretin cardiac amyloidosis (ATTR-CM) associated with peripheral neuropathy, based on the initial experience of a reference center in southern Brazil, including different patient profiles—wild-type and hereditary forms—and across both early and advanced stages of the disease. Methods: This is a descriptive case series including three patients diagnosed with ATTR-CM receiving vutrisiran. Baseline clinical data were collected, and patients were monitored after treatment initiation, with emphasis on the identification of adverse events and clinical evolution. Results and Conclusions: Three patients were evaluated. The first patient, carrying the p.Ala101Val genetic variant, was in New York Heart Association (NYHA) functional class II with stage 2 neuropathy and remained clinically stable after 5 months of treatment, with no adverse events. The second patient, with wild-type disease, was in NYHA class I with stage 1 neuropathy and showed significant improvement in neuropathic symptoms after 3 months of treatment, without adverse effects. The third patient, also with wild-type disease, initially presented in NYHA class III with stage 3 neuropathy and improved after 3 months to NYHA class II and stage 2 neuropathy, with no reported adverse events. In this initial series, vutrisiran demonstrated good tolerability and a favorable safety profile, with no adverse reactions observed. Clinical improvement was noted in two of the three patients. Larger studies with longer follow-up are warranted to confirm these findings.

Table 1. Clinical characteristics and evolution of patients treated with vutrisiran

Patient	Disease type	Genetic variant	Baseline NYHA	Baseline neuropathy	Follow-up	Clinical evolution	Adverse events
1	Hereditary	p.Ala101Val	II	Stage 2	5 months	Clinical stability	No
2	Wild-type	—	I	Stage 1	3 months	Improvement in neuropathic symptoms	No
3	Wild-type	—	III	Stage 3	3 months	Clinical improvement (NYHA II; neuropathy stage 2)	No

Abbreviations: NYHA = New York Heart Association.

Note: Clinical improvement was observed in 2 of 3 patients, with no reported adverse events.

18605

Serum 25-hydroxyvitamin D and depressive symptoms across heart failure phenotypes in hospitalized older adults: a cross-sectional study

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Background/Introduction: Heart failure is associated with a high prevalence of depressive symptoms, which negatively impact clinical outcomes. Vitamin D deficiency is common in this population and may contribute to mood disorders. Objectives: To investigate the relationship between serum 25-hydroxyvitamin D [25(OH)D] concentrations and depressive symptoms across HF phenotypes in hospitalized older adults. Methods: This cross-sectional study included patients aged ≥60 years hospitalized with heart failure. Serum 25(OH)D levels were measured, and deficiency was defined as <30 ng/mL. Depressive symptoms were assessed using the Patient Health Questionnaire-9 (PHQ-9), defined as a score ≥5 with at least one core symptom (depressed mood or anhedonia). Heart failure phenotypes were classified according to ejection fraction. Logistic regression was used to evaluate the association between 25(OH)D and depressive symptoms. A two-tailed p-value <0.05 was considered statistically significant. Results and Conclusions: A total of 64 patients were included. HF phenotypes differed in NT-proBNP levels (p=0.017), and prevalence of 25(OH)D deficiency (p=0.019), which was observed in 63.6%, 75.0%, and 33.3% of patients with preserved, mildly reduced, and reduced ejection fraction, respectively. Serum 25(OH)D concentrations were not associated with depressive symptoms, and no significant correlations were observed with PHQ-9 scores, either in the overall sample or stratified by ejection fraction. The prevalence of depressive symptoms did not differ between phenotypes (p=0.572). In multivariable logistic regression, only spiritual well-being was independently associated with depressive symptoms (OR=0.771; 95% CI: 0.646–0.920; p=0.004), whereas 25(OH)D, age, sex, and race were not significant predictors. The model was statistically significant (χ^2=15.743; p=0.008) with moderate explanatory power (Nagelkerke R^2=0.367). Although no correlation was found between serum 25(OH)D and depressive symptoms, greater spiritual well-being was associated with a lower occurrence of these symptoms.

15025

THE HIDDEN BURDEN: SOMATIC DEPRESSION IN DECOMPENSATED HEART FAILURE PATIENTS

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Background/Introduction: Heart failure is among the leading causes of morbidity and mortality worldwide. Depression, in turn, is a highly prevalent and often underrecognized condition that significantly impacts quality of life and is associated with increased mortality and healthcare costs. In patients with HF, depressive symptoms are common and may worsen clinical outcomes, treatment adherence, and functional status. Depression often presents with a predominance of somatic symptoms, such as fatigue, sleep disturbances, reduced energy, appetite changes, and psychomotor retardation, which may overlap with manifestations of heart failure itself. Objectives: To investigate the association between somatic depression and the different phenotypes of heart failure. Methods: This observational cross-sectional study was conducted in a private hospital. Patients with a previous or new diagnosis of heart failure, according to Brazilian Cardiology Guideline criteria, were included, and those with cognitive disorders were excluded. Depressive symptoms were assessed using the PHQ-9, defined as five or more symptom symptoms including at least one of depressed mood or anhedonia. Somatic symptoms were assessed based on sleep disturbances, fatigue, appetite changes, and psychomotor changes. Statistical analyses included t-test, chi-square test, linear regression, Pearson correlation, and Levene's test. Results and Conclusions: A total of 191 patients were evaluated, of whom 37.9% were women. The mean age was 72 ± 6.2 years. The sample comprised 31.8% with heart failure with reduced ejection fraction and 68.2% with preserved ejection fraction. Depressive symptoms were identified in 74 (59.1%) patients and were more frequent in women, who had approximately twice the prevalence. Somatic symptoms were common but were not significantly associated with heart failure phenotypes (p=0.916, chi-square test). Depressive symptoms were highly prevalent among patients with decompensated heart failure, reinforcing their role as a frequent and clinically relevant comorbidity. Somatic manifestations were particularly prominent; however, they were not associated with different heart failure phenotypes.

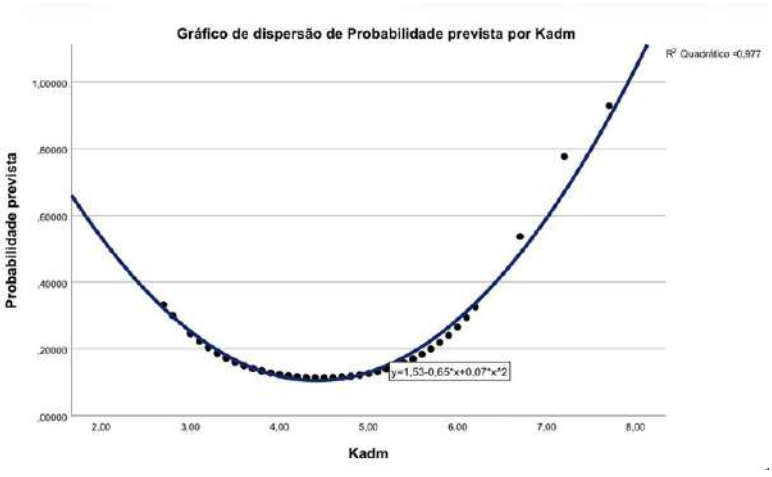
17698

U-SHAPED RELATIONSHIP BETWEEN POTASSIUM DYSREGULATION AND IN-HOSPITAL MORTALITY IN DECOMPENSATED HEART FAILURE

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Background/Introduction: Potassium homeostasis disorders are frequently observed in patients hospitalized for decompensated heart failure (DHF) and are associated with worse in-hospital (IH) prognosis. Objectives: To evaluate whether potassium disturbances measured at admission or during hospitalization are associated with IH mortality. Methods: A retrospective, longitudinal, observational cohort study was conducted at a quaternary university hospital. Patients admitted with DHF between September 2019 and February 2024 were included. Potassium values at admission, as well as the highest and lowest values recorded during hospitalization, were collected. Hyperkalemia was defined as potassium >5.1 mEq/L and hypokalemia as <3.5 mEq/L, according to the institutional laboratory reference values. Vital status was determined by medical record review. Creatinine clearance was estimated using the 2021 CKD-EPI equation. Statistical analyses were performed using SPSS, with a significance level of 5%. The proportion of missing potassium data was below 10%. Results and Conclusions: A total of 402 patients admitted for DHF were analyzed: 56% male, mean age 64.9 ± 14.2 years. Systolic dysfunction was present in 65.7%; ischemic and valvular etiologies accounted for 30.6% and 11.4%, respectively. Hypertension was present in 67.7%, diabetes in 35.8%, atrial fibrillation or flutter in 32.8%, and CKD (creatinine clearance <60 mL/min) in 58.6%. Mean admission potassium was 4.31 ± 0.74 mEq/L. Hyperkalemia occurred in 9.2% at admission and 44.5% during hospitalization; hypokalemia in 7.1% and 39.6%, respectively. IH mortality was 14.4%. ROC curve analysis identified the lowest in-hospital potassium as the variable most strongly associated with IH mortality (AUC 0.75), with an optimal cut-off of 3.45 mEq/L (sensitivity 69.8%; specificity 74.8%). Given its proximity to the institutional lower reference limit, 3.5 mEq/L was adopted as the operational cut-off. Hypokalemia during hospitalization was associated with higher IH mortality (OR 6.86; 95% CI 3.63–12.95; p<0.001). A U-shaped relationship between admission potassium and IH mortality was observed, with nadir risk at approximately 4.3 mEq/L. Potassium disturbances were frequent in DHF. Hypokalemia during hospitalization was associated with higher IH mortality, and admission potassium exhibited a U-shaped relationship with this outcome.



19902

USE OF ARTIFICIAL INTELLIGENCE FOR INDIVIDUALIZATION OF CARDIAC REHABILITATION IN PATIENTS WITH HEART FAILURE

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Background/Introduction: Heart failure remains a major challenge in cardiology due to its high morbidity and mortality. Although cardiac rehabilitation is a gold-standard intervention for improving functional capacity and reducing hospitalizations, its implementation is limited by geographic barriers, shortage of specialized centers, and low patient adherence. In this context, Artificial Intelligence (AI) may help by processing clinical guidelines to generate personalized exercise protocols, expanding access and optimizing outcomes. Objectives: To evaluate the clinical and functional effectiveness of an AI-individualized cardiac rehabilitation protocol compared with conventional rehabilitation and no structured exercise in patients with heart failure. Methods: Prospective experimental study including 15 clinically stable patients with heart failure with reduced ejection fraction. Participants were randomized into three groups: Group A, AI-individualized rehabilitation protocol (via a bot trained with major national and international heart failure guidelines); Group B, conventional rehabilitation; and Group C, no formal exercise guidance. Follow-up was 8 weeks. Assessments included the Kansas questionnaire, Sit-to-Stand Test, Handgrip Strength, and 6-Minute Walk Test. Results and Conclusions: The sample (mean age 60 years; 80% male) showed relevant benefits with rehabilitation. The AI group demonstrated superior performance in objective outcomes: mean increase of 102 meters in the 6-minute walk test (vs 63 meters in the conventional group and 6 meters in controls) and gain of 5.5 kgf in handgrip strength. The conventional group was superior in the sit-to-stand test, while the control group showed better results in a subjective quality-of-life measure, contrary to the remaining findings. No serious adverse events occurred. Limitations included the small sample size and adherence challenges: follow-up rates were 72% in the AI group, 83% in the conventional group, and 44% in controls. Conclusion AI-guided rehabilitation prescription was safe and effective in heart failure, producing functional gains comparable or superior to conventional methods. This technology may support clinical decision-making and expand access to therapy without replacing human care. Larger studies are needed to confirm these findings.



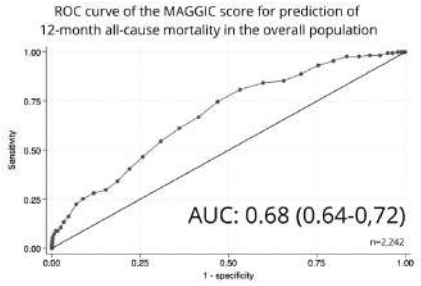
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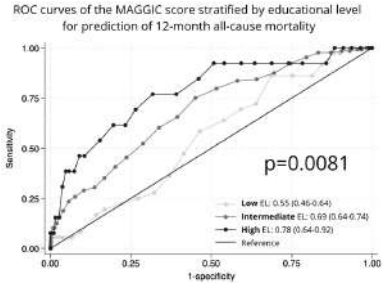
VALIDATION OF THE MAGGIC SCORE IN BRAZIL AND THE IMPACT OF EDUCATIONAL LEVEL ON ITS PROGNOSIS ACCURACY.

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Background/Introduction: The Meta-analysis Global Group in Chronic Heart Failure (MAGGIC) score is a widely used prognostic model for mortality risk estimation in chronic heart failure (CHF). It was derived from ~40,000 patients, with limited representation of Latin American populations, and validated mainly in developed countries. Socioeconomic differences in Brazil may limit its external validity. Objectives: To assess the performance of the MAGGIC score in predicting 12-month mortality in Brazilian patients with CHF, and to evaluate the influence of educational level (EL) on its discrimination and calibration. Methods: This prospective, multicenter Brazilian cohort included outpatients with CHF from 30 specialized centers. Patients aged ≥18 years with LVEF ≤50% were enrolled between June 2021 and June 2025 and followed through September 2025. Baseline data for MAGGIC calculation were obtained via standardized questionnaire and medical record review. EL was self-reported and classified as low (illiterate/basic literacy), intermediate (incomplete elementary to high school), and high (college or higher). Follow-up was conducted by telephone to ascertain mortality. Results and Conclusions: A total of 2,389 patients were included (low/intermediate/high EL: n=406/1,757/216; 10 missing). Mean LVEF was 33.6±9.1%, age 61.0±13.5 years, and MAGGIC score 18.6±6.8. Lower EL was associated with higher MAGGIC, older age, higher SBP, more Chagas etiology and COPD, higher NYHA class, and lower use of GDMT at target doses (all p<0.01 for trend). The MAGGIC score showed modest discrimination (AUC 0.68 [0.64–0.72]) and poor calibration (Hosmer-Lemeshow p=0.02). AUCs were 0.55, 0.69, and 0.78 from low to high EL (p=0.008). Calibration was acceptable within strata (p=0.37, 0.20, 0.87). EL modified the association with mortality: compared with low EL, each 10-point increase in MAGGIC was associated with higher odds of death in intermediate (OR 2.16 [1.12–3.92]; p=0.011) and high EL (OR 3.22 [1.21–8.57]; p=0.019). In conclusion, the MAGGIC score showed modest discrimination and inadequate calibration overall. Discrimination was higher in the higher EL groups.





19039

VASOACTIVE SUPPORT IN THE WARD FOR ADVANCED HEART FAILURE: WHEN EXTREME SEVERITY DOES NOT TRANSLATE INTO HIGH MORTALITY

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(1) PRONTO SOCORRO CARDIOLOGICO DE PERNAMBUCO - PROCAPE - RECIFE - PE - BRASIL; (2) FAMENE - JOÃO PESSOA - PB - BRASIL; (3) UPE - RECIFE - PE - BRASIL;

Background/Introduction: Advanced heart failure presents high mortality and complex management, with frequent use of vasoactive drugs, even in ward settings, due to structural limitations. Despite its clinical relevance, data on outcomes outside the intensive care unit (ICU) remain scarce. Investigating this practice is essential to guide management, optimize resources, and improve prognosis. Objectives: To evaluate the association between vasoactive support use, length of stay, in-hospital mortality, and 30-day readmission in patients hospitalized for decompensated heart failure. Methods: An observational, retrospective study with analysis of medical records of 252 patients hospitalized in a tertiary hospital between January and December 2024. Results and Conclusions: The use of vasoactive drugs (VAD) was frequent and not exclusive among patients, reflecting the need for therapeutic escalation. Dobutamine had the longest median duration of use (29 days), suggesting greater severity. Nitroglycerin was the most commonly used (n=77), but for a shorter duration (8 days), consistent with acute phases. Milrinone and levosimendan had limited use. Vasoactive support was associated with longer hospital stay, especially with dobutamine (34 vs. 18 days; p=0.002) and nitroglycerin (31 vs. 20 days; p=0.002). In-hospital mortality was 8.3%, higher among vasoactive users, particularly with milrinone (75%; p<0.001). The 30-day readmission rate was 7.2%, occurring exclusively in patients with heart failure with reduced ejection fraction (HFrEF) (p=0.014). The study reveals a profile of advanced heart failure, with frequent and prolonged use of vasoactive drugs, especially dobutamine, reflecting greater severity and hemodynamic instability. The need for these therapies was associated with longer hospital stays and worse outcomes, representing an important risk marker rather than a direct causal effect. Despite this scenario of high complexity, the in-hospital mortality rate was relatively low (8.3%), falling within or below the range described in contemporary registries (7–12%) and lower than more severe cohorts with inotrope use (>20%). This finding reinforces the adequacy of clinical management, even with widespread use of vasoactive support. The 30-day readmission rate was also low (7.2%), concentrated exclusively in patients with HFrEF, highlighting this phenotype as having greater vulnerability in the post-discharge period.

Table 3. Length of stay (in days) on inotropic and vasodilator support.

Medication	n	Median (Minimum – Maximum)	Mean (SD)
Dobutamine	75	29.0 (8–75)	32.0 (±6.6)
Nitroglycerin	77	8.0 (2–22)	10.0 (84.6)
Milrinone	8	7.0 (1–46)	14.6 (18.6)
Levosimedan	4	1.0 (1–1)	1.0 (0.0)

n, number of participants; sd: standard deviation; [1] The drug categories are not mutually exclusive, as the same patient may have used more than one vasoactive therapy during the inpatient period; ^A ^2 The values refer to the length of **hospital stay** (in days) for users of each drug. Source: Research data, 2026.

Table 4. Length of hospital stay (in days) according to the pharmacological support used.

Drug	Median (IQR)	Minimum – Maximum	P
Dobutamine[3]			
Yes (n=75)	34.0 (22 – 63)	3 – 276	0.00[2]
No (n=175)	18 (12 – 18)	4 – 80	
Nitroglycerin[3]			
Yes (n=77)	31.0 (15 – 45)	3 – 276	0.00[2]
No (n=173)	20 (12 – 29)	4 – 225	
Milrinone[3]			
Yes (n=8)	60.5 (20 – 172)	3 – 266	0.57
No (n=242)	22 (13 – 34)	4 – 276	
Levosimedan[3]			
Yes (n=4)	67.0 (26 – 139)	7 – 189	0.148
No (n=246)	22 (13 – 34)	3 – 276	

n, number of participants; iqr, interquartile range; [A1] The values refer to the length of hospital stay (in days) for users of each drug; [A2] Based on the analysis by the Mann–n-Whitney Test, adopting a 95% confidence interval, there was a statistical difference between the groups (p < 0.05); [3] The drug categories are not mutually exclusive, as the same patient may have used more than one vasoactive therapy during the inpatient period. Source: Research data, 2026.

Table 5. Comparison of in-hospital mortality between users and non-users of pharmacological support.

VAD	Death in Users n (%)	Death in Non-Users n (%)	P
Dobutamine	16 (26-23)	5 (2.8)	< 0.001[1]
Nitroglycerin	11 (14.3)	10 (5.7)	0.023[3]
Milrinone	6 (75.0)	15 (6.1)	< 0.001[2]
Levosimedan	1 (25.0)	20 (8.1)	0.295[2]

VAD: Vasoactive Drug; n: number of participants; n number of participants; (%) Percentage within the group; [A1] Pearson's Chisquare Test; [A2] Fisher's Exact Test. Source: Research data, 2026. data, 2026.

Table 6. Distribution of 30-day readmissions according to HF profile.

HF profile	Discharge (n)	Readmission (n)	Rate (%)	P
HFrEF	166	16	9.6%	0.014[1]
HFmrEF	15	0	0.0%	
HFpEF	40	0	0.0%	
Total	**221**	**16**	**7.2%**	

Heart Failure (HF); Heart Failure with reduced Ejection Fraction (HFrEF); Heart Failure with mildly reduced Ejection Fraction (HFmrEF); Heart Failure with **thh** preserved Ejection Fraction (HFpEF); n, number of participants; %, percentage corresponding to the total; [A1] Due to the absence of readmission events **in in** the HFmrEF and HFpEF groups, a dichotomous comparative analysis between the HFrEF profile and the early readmission variable was performed. Based on the analysis by Fisher's Test, adopting a 95% confidence interval between the groups (p < 0.05). Source: Research data, 2026.

Hypertension / Renal Denervation



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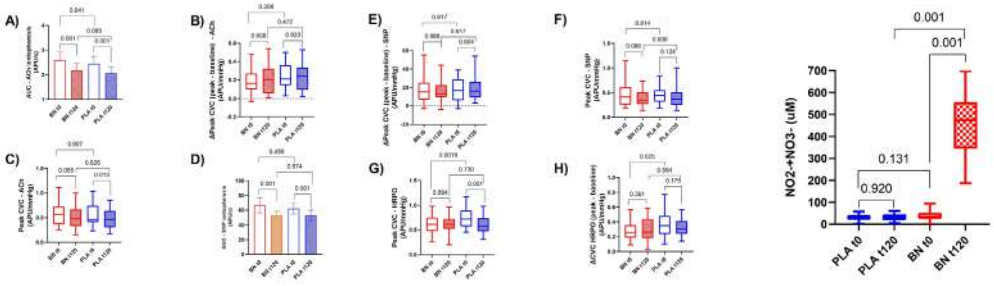
16602

ACUTE EFFECTS OF BEETROOT NITRATE SUPPLEMENTATION ON MICROVASCULAR FUNCTION AND NITRIC OXIDE METABOLITES IN RESISTANT HYPERTENSION

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Background/Introduction: Hypertension is a major cardiovascular risk factor. Resistant hypertension (RH) is a severe form associated with endothelial dysfunction and reduced nitric oxide (NO) bioavailability. Dietary nitrate (NO_3^-), particularly from beetroot, may enhance NO production, but evidence in RH remains limited. Objectives: Evaluate the acute effects of beetroot extract on microvascular function and plasma nitrite and nitrate levels in patients with RH. Methods: This was a single-blind, randomized, placebo-controlled clinical trial conducted in patients with RH. Participants (≥18 years) attended a single visit after an overnight fast and were randomly to receive either beetroot extract (10g, ~400 mg NO_3^-) or placebo (maltodextrin 10g). Microvascular endothelial function was assessed at baseline and 120 minutes post-intervention using laser speckle contrast imaging (LSCI) (Pericam PSI System, Perimed, Sweden), combined with iontophoresis of acetylcholine (ACh) and sodium nitroprusside (SNP) to evaluate dependent and independent responses, as well as post-occlusive reactive hyperemia (PORH). Plasma NO_3^- and NO_2^- were measured at t0 and t120. Microvascular perfusion was normalised to mean arterial pressure to derive cutaneous vascular conductance (CVC, APU/mmHg). Statistical analysis used Student's t-test ($p<0.05$). Results and Conclusions: A total of 59 participants were included. The BN group showed higher plasma NO_2^- and NO_3^- concentrations at 120 min ($p=0.001$). Area under the curve (AUC) decreased following both ACh and SNP stimuli in both groups ($p=0.001$). Peak CVC decreased within the PLA group at t120 in response to ACh ($p=0.013$); however, no between-group difference was found at this time point ($p=0.826$). No differences between groups were observed for Δpeak CVC (ACh or SNP), and peak CVC in response to SNP was similar between groups. PORH responses showed higher peak CVC in PLA at baseline ($p=0.002$). Peak CVC decreased within the PLA group at t120 ($p=0.001$), with no between-group difference ($p=0.730$). No between-group differences were observed for Δpeak CVC adjusted for HRPO. Despite increased NO_2^- and NO_3^- bioavailability, beetroot extract did not improve microvascular reactivity. This lack of effect may reflect the severe endothelial dysfunction typical of RH, compounded by comorbidities such as obesity, dyslipidemia, and diabetes, and possibly an insufficient dose to elicit endothelial benefits. Further studies are needed to better elucidate the nitrate–nitrite–NO pathway in this population.



18916

BAROREFLEX ACTIVATION IN THE TREATMENT OF RESISTANT HYPERTENSION: A SYSTEMATIC REVIEW.

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Background/Introduction: Resistant hypertension represents a significant clinical challenge, being associated with high cardiovascular morbidity and mortality and limitations of conventional pharmacological therapies. In this context, baroreflex activation therapy (BAT) emerges as an innovative alternative. Objectives: Analyze the effects of baroreflex activation in resistant hypertension. Methods: This is a systematic literature review following the parameters established by PRISMA-2020. For the search, the terms "Baroreflex activation and resistant hypertension" were used; searches were conducted in PubMed with the filters "last 5 years and clinical studies" and in LILACS with the filters "last 5 years," selecting the complete collection from BVS. Clinical studies in English were included. Results and Conclusions: 31 articles were found, which 2 were deleted for being duplicates, 13 for being tangential to the topic, 2 for being meta-analyses, 5 reviews, 2 animal studies, and 1 case report; 8 articles were included. The applicability of BAT in resistant hypertension (RH) proved to be highly selective. Clinical evaluation revealed that surgical recommendation was feasible for only 17.1% of patients, with implantation effectiveness restricted to 7.8%. Patients undergoing active stimulation exhibited a decrease in 24-hour ambulatory systolic blood pressure at 8 months. Continuous neurological dependence was demonstrated in a crossover trial. Retrospective data confirm that first-generation devices promoted statistically robust reductions in 24-hour and nighttime systolic blood pressure. In contrast, second-generation minimally invasive devices exerted their primary effect through a significant reduction in 24-hour and daytime heart rate, with a less pronounced impact on ambulatory blood pressure in this subgroup. The advantage of the second generation was limited to gains in structural longevity.In 24 patients with a refractory non-dipper phenotypic profile, algorithmic optimization exclusively enhancing nocturnal pulse width converted the physiological pattern, promoting an increase in nocturnal systolic dipping.Baroreflex activation therapy constitutes an effective therapeutic strategy, mainly in patients with a well-defined clinical phenotype and high cardiovascular risk. Its effect in reducing blood pressure in the long term. However, its applicability remains limited, as it requires rigorous clinical evaluation to rule out secondary factors.

17998

DOSE–RESPONSE EFFECT OF SACUBITRIL/VALSARTAN ON OFFICE BLOOD PRESSURE CONTROL IN PREDOMINANTLY AFRO-DESCENDANT PATIENTS WITH RESISTANT HYPERTENSION: A POST HOC ANALYSIS OF A RANDOMIZED CLINICAL TRIAL

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(1) UNIVERSIDADE FEDERAL DA BAHIA - PROGRAMA DE POS GRADUACAO EM MEDICINA E SAUDE - SALVADOR - BA - BRASIL; (2) UNIVERSIDADE FEDERAL DA BAHIA - SALVADOR - BA - BRASIL;

Background/Introduction: Resistant hypertension (RH) remains a major therapeutic challenge and is associated with increased cardiovascular risk. Sacubitril/valsartan (Sac/Val) has demonstrated efficacy in blood pressure reduction; however, data regarding its dose-dependent effects in Afro-descendant populations, remain limited. Objectives: To evaluate the dose–response effect of Sac/Val on seated office blood pressure (systolic, diastolic, and pulse pressure), compared with standard therapy, in patients with RH, with emphasis on a predominantly Afro-descendant population, through a post hoc analysis of a randomized clinical trial (RCT). Methods: This post hoc analysis of a prospective, multicenter, open-label, 8-week RCT included 80 predominantly Afro-descendant patients with RH receiving ≥3 antihypertensive agents at maximally tolerated doses. Participants were randomized to standard therapy (enalapril 40 mg/day or losartan 100 mg/day, combined with a calcium channel blocker and a thiazide diuretic) or Sac/Val, up-titrated from 100 to 400 mg/day according to tolerance. The primary endpoint was the proportion of patients achieving seated office systolic blood pressure (SBP) targets ≤140 and ≤130 mmHg and diastolic blood pressure (DBP) targets ≤90 and ≤80 mmHg. Secondary endpoints included mean reductions in office SBP, DBP, and pulse pressure (PP). Proportions were compared using the chi-square test, and continuous variables using analysis of variance (ANOVA) with post hoc analyses. Statistical analyses were performed using SPSS version 25.0, with statistical significance defined as $p < 0.05$. Results and Conclusions: Eighty patients were randomized to Sac/Val (n=40) or standard therapy (n=40), and 75 completed follow-up. After 8 weeks, Sac/Val 100 and 200 mg/day showed the highest blood pressure (BP) target achievement. SBP ≤140 mmHg was achieved in 92.3% and 88.5% of patients, respectively ($p = 0.004$), while SBP ≤130 mmHg was achieved in 76.9% and 84.6% ($p < 0.001$). The 200 mg dose showed the highest DBP control rates for ≤90 mmHg (100%) and ≤80 mmHg (65.4%) ($p = 0.008$ and $p = 0.005$, respectively). Post hoc analyses demonstrated greater SBP reduction with Sac/Val 400 mg versus ACE inhibitor therapy (−20.1 mmHg; 95% CI: −39.4 to −0.9; $p = 0.043$), while the 200 mg dose showed the greatest DBP reduction (−9.1 mmHg; 95% CI: −18.0 to −0.2; $p = 0.044$). No serious adverse events occurred. Sac/Val improved BP control in predominantly Afro-descendant patients with RH, particularly at intermediate doses.

Figure A)

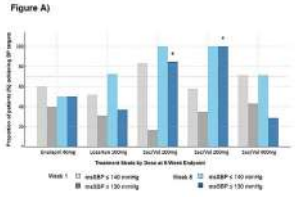
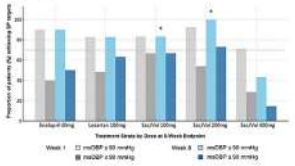
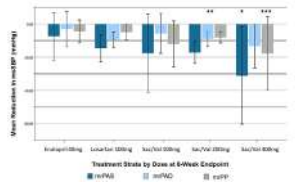


Figure B)





16334

EFFICACY AND SAFETY OF BAXDROSTAT FOR RESISTANT OR UNCONTROLLED HYPERTENSION: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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Background/Introduction: Aldosterone dysregulation plays a key role in the pathogenesis of hypertension (HTN). Baxdrostat, a selective aldosterone synthase inhibitor (ASI), is under investigation as a potential treatment option. However, evidence on its efficacy and safety is limited. Objectives: To evaluate the efficacy and safety of baxdrostat in patients with uncontrolled or resistant hypertension through a systematic review and meta-analysis of randomized controlled trials. Methods: This systematic review and meta-analysis was conducted in accordance with PRISMA guidelines. PubMed, Embase, and Cochrane databases were searched for Randomized Controlled Trials (RCTs) comparing Baxdrostat with placebo in patients with uncontrolled or resistant HTN. We pooled risk ratios (RR) and mean differences (MD) with 95% confidence intervals (CI) for binary and continuous endpoints, respectively. The number needed to harm (NNH) was computed as 1/[CER×(RR−1)] using the pooled RR and the pooled control event rate with 95% CI. Results and Conclusions: We included 3 RCTs comprising 1,264 patients, of whom 865 (68%) were randomized to Baxdrostat. Overall, Baxdrostat was associated with reductions in systolic (MD -8.6 mmHg; 95% CI -10.6 to -6.6; p<0.01; Figure 1A) and diastolic blood pressure (BP) (MD -3.5 mmHg; 95% CI -4.8 to -2.2; p<0.01; Figure 1B). Patients treated with Baxdrostat had a higher risk of hyperkalemia (RR 10.2; 95% CI 4.0 to 25.7; p<0.001; Figure 1C), corresponding to an NNH of 10.7 (95% CI 4.0 to 32.2), and overall adverse events (RR 1.2; 95% CI 1.0 to 1.4; p=0.028; Figure 1D). There was no difference in the risk of hypotension (RR 1.8; 95% CI 0.5 to 6.0; p=0.29) or hyponatremia (RR 3.35; 95% CI 0.61 to 18.30; p=0.162). While baxdrostat provides clinically meaningful blood pressure reductions with an increased risk of hyperkalemia, highlighting the need for careful patient selection and monitoring. Larger and longer-term trials are required to define its role in clinical practice.

Figure 1A) There was a significant reduction in systolic blood pressure with the use of Baxdrostat (p<0.01)

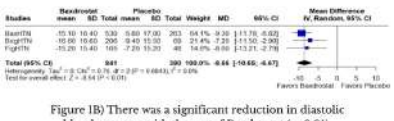


Figure 1C) The use of Baxdrostat was associated with a higher risk of hyperkalemia (p<0.001)

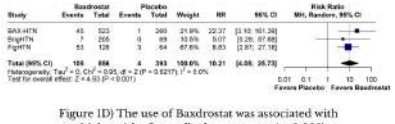


Figure 1B) There was a significant reduction in diastolic blood pressure with the use of Baxdrostat (p<0.01)

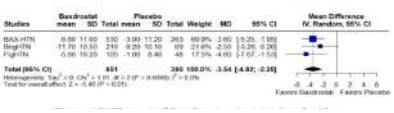
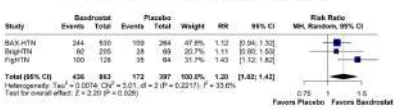


Figure 1D) The use of Baxdrostat was associated with a higher risk of overall adverse events (p=0.028)



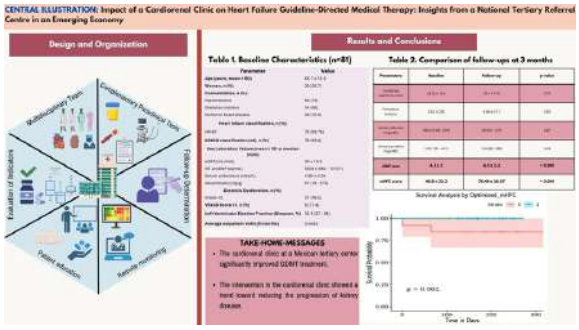
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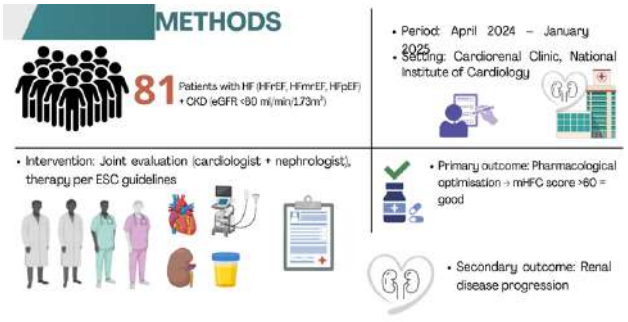
IMPACT OF A CARDIORENAL CLINIC ON HEART FAILURE GUIDELINE-DIRECTED MEDICAL THERAPY: INSIGHTS FROM A NATIONAL TERTIARY REFERRAL CENTRE IN AN EMERGING ECONOMY

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Background/Introduction: The global burden of cardiorenal disease is rising, prompting integrated care models. Cardiorenal clinics unite cardiologists and nephrologists. This study evaluated GDMT uptitration in severely ill cardiorenal patients. Objectives: To evaluate the impact of a dedicated cardiorenal clinic on the optimization and implementation of guideline-directed medical therapy in patients with heart failure at a national tertiary referral center in an emerging economy. Methods: Between April 2024 and January 2025, 81 patients with heart failure (HFrEF, HFmrEF, or HFpEF) and chronic kidney disease (eGFR <60 ml/min/1.73m²) were prospectively analysed at the National Institute of Cardiology's cardiorenal clinic. All patients were jointly assessed by a cardiologist and a nephrologist to determine optimal treatment based on current evidence and ESC guidelines. The primary outcome was pharmacological optimisation, measured by the modified Heart Failure Collaborative (mHFC) score. A score >60 indicates good optimisation. Renal disease progression was also analysed. Results and Conclusions: Results: In this high-risk cohort, 93.7% had HFrEF, predominantly of ischaemic origin (70.9%). Median LVEF was 32.5%, NT-proBNP 5503 pg/mL, and CA125 12.9. After six months, the mHFC score improved significantly (48.8→78.4; p<0.001), with favourable renal outcomes. Conclusion Our cardiorenal clinic model significantly improved pharmacological optimisation and reduced prognostic markers such as albuminuria. No significant difference in CV mortality was observed, likely due to limited follow-up and sample size. Further analysis is on going guideline-directed medical therapy





17772

THE ASSOCIATION BETWEEN SERUM BIOMARKERS AND CARDIAC REMODELLING IN EARLY STAGES OF CHRONIC KIDNEY DISEASE: A SYSTEMATIC REVIEW

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Background/Introduction: The main cause of mortality in patients with chronic kidney disease (CKD) is cardiovascular damage. Cardiac remodeling begins silently in the early stages of CKD, and if not treated correctly, may cause severe cardiac compromise. The usual imaging resources can detect left ventricular hypertrophy in severe chronic kidney disease, and it might be too late for any kind of therapy. Therefore, cardiac biomarkers may be a useful screening tool for identifying subclinical cardiac remodeling. Objectives: To evaluate the role of cardiac biomarkers in early detection and risk stratification of subclinical cardiac remodeling. Methods: A systematic review was conducted in accordance with PRISMA guidelines. MEDLINE (via PubMed) and Cochrane Library were searched. Studies including adult patients with CKD stages 1–3a and reporting associations between serum cardiac biomarkers and imaging-defined cardiac remodeling published until August 2025 were included. Study selection was reviewed by an independent reviewer. Risk of bias was assessed using the Joanna Briggs Institute tool. Results and Conclusions: Six studies comprising 9,074 patients were included. NT-proBNP consistently demonstrated a strong association with early cardiac remodeling parameters, particularly left ventricular mass index (LVMI), as it is more closely associated with ventricular wall stress and filling pressure; its synthesis and release occur in response to myocyte distension, volume, and pressure overload. Cardiac troponins were associated with edema and direct damage, including LVMI, left ventricular end-systolic volume (LVESV), and left ventricular end-diastolic volume (LVEDV), but showed no consistent association with left ventricular ejection fraction (LVEF) or left atrial diameter (LAD). Overall, findings across studies were consistent despite methodological heterogeneity. CONCLUSION: NT-proBNP appears to be a promising biomarker for early detection of subclinical cardiac remodeling in patients with CKD. These findings support the potential role of biomarker-based strategies in improving early cardiovascular risk stratification and enabling timely intervention in this high-risk population.

Interventional Cardiology



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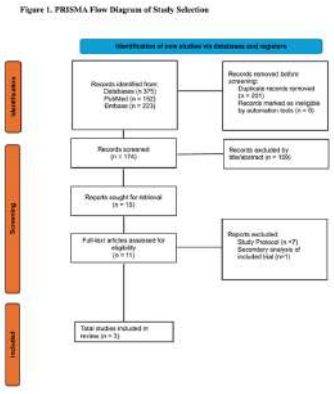
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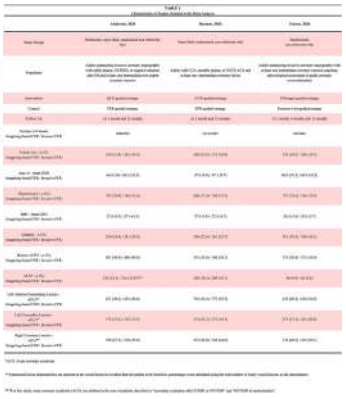
ANGIOGRAPHY-DERIVED FRACTIONAL FLOW RESERVE VERSUS INVASIVE WIRE-BASED FFR IN INTERMEDIATE CORONARY STENOSES: A SYSTEMATIC REVIEW AND META-ANALYSIS OF NON-INFERIORITY

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Background/Introduction: Invasive fractional flow reserve (FFR) with a pressure wire during angiography is the gold standard for functional assessment of intermediate coronary stenoses. However, it remains underutilized in clinical practice mostly due to its high cost and invasive nature. In this context, angiography-derived FFR technologies emerged as a less invasive and more clinically accessible alternative. However, whether these technologies are non-inferior to invasive FFR regarding clinical outcomes remains unclear. Thus, this meta-analysis evaluates the comparability of angiography-derived FFR to invasive FFR. Objectives: To compare imaging-based FFR and invasive FFR regarding clinical outcomes, including MACE and hard endpoints, through a systematic review and meta-analysis of available randomized controlled trials. Methods: Following PRISMA standards, we systematically searched MEDLINE and Embase for RCTs comparing imaging-based FFR to invasive FFR. The primary outcome was 1-year MACE, while secondary outcomes included unplanned indicated revascularization, MI, cardiovascular death, and stent thrombosis. Pooled risk ratios (RR) with 95% confidence intervals were calculated using a random-effects model. Results and Conclusions: Three RCTs comprising a total of 6,141 patients (3,089 imaging-based FFR vs. 3,052 invasive FFR) were included. The comparative analysis did not demonstrate statistically significant differences in MACE (RR 1.14; 95% CI 0.85–1.55; I² 57.4%), Unplanned Indicated Revascularization (RR 0.96; 95% CI 0.71–1.29; I² 0%), Any Myocardial Infarction (RR 1.14; 95% CI 0.65–2.00; I² 65.3%), or any other outcome. Although imaging-based FFR showed no significant difference compared to invasive FFR, it is important to highlight that vFFR and FFRangio formally demonstrated non-inferiority and differences may be influenced by distinct algorithms and how each method classified vessel disease severity. Three studies still represent a limited number to establish non-inferiority or a bicaudal difference. Thus, the absence of significant differences suggests the clinical gap between both strategies is probably not large, and imaging-based FFR is likely better than angiography-alone guidance. Furthermore, angio-FFR platforms should not be considered a single therapeutic class, since vFFR and FFRangio demonstrated non-inferiority to invasive FFR outcomes, unlike QFR, which holds a current Class IB guideline recommendation. Further studies are warranted to define the role of imaging-based FFR in clinical practice.





16995

BALLOON PULMONARY ANGIOPLASTY IN CHRONIC THROMBOEMBOLIC PULMONARY HYPERTENSION: INITIAL REGISTRY FROM A TERTIARY HOSPITAL IN SOUTHERN BRAZIL

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Background/Introduction: Chronic thromboembolic pulmonary hypertension (CTEPH) occurs in up to 5% of cases of pulmonary thromboembolism. Although pulmonary thromboendarterectomy is the treatment of choice, a multimodal management approach including balloon pulmonary angioplasty (BPA) and medications has been gaining ground in non-surgical patients, high-risk surgical candidates, and those with persistent pulmonary hypertension after surgery. BPA may potentially improve functional capacity, reduce pulmonary pressures and pulmonary vascular resistance, and enhance right ventricular performance. Objectives: The present study aims to describe the initial experience from a tertiary hospital in southern Brazil with the use of BPA in patients with CTEPH. Methods: Ambispective cohort including all patients who underwent BPA for CTEPH at the hospital between January 2023 and March 2026. Continuous variables were compared using Student's t-test or the Mann–Whitney test according to the distribution of normality. Results and Conclusions: Twenty-six patients were included and 87 sessions were executed: male sex (27%), mean age 57 years. The mean number of sessions and treated lesions were 3.8 (±1.6) and 13.5 (±5.9), respectively. There was a significant reduction in serum BNP levels: 416 pg/mL pre-procedure vs. 130 pg/mL post-procedure ($p < 0.001$); reduction in mean pulmonary artery pressure: 51.3 mmHg pre vs. 39.5 mmHg post ($p < 0.001$); increase in distance walked in the 6-minute walk test from 303 meters pre to 396 meters post ($p = 0.012$); increase in cardiac output from 3.9 L/min pre to 5.5 L/min post ($p = 0.01$); reduction in total pulmonary vascular resistance from 13.7 Wood units pre to 7.5 Wood units post ($p < 0.001$); increase in mixed venous oxygen saturation from 59.5% pre to 68.5% post ($p < 0.001$); and an increase in pulmonary arterial compliance from 1.29 mL/mmHg pre to 2.5 mL/mmHg post ($p = 0.003$). There were minor complications in 12 cases (7 hemoptysis and 5 reperfusion injury) and no serious complications or deaths. BPA emerges as a promising effective and safe therapeutic alternative for the treatment of patients with CTEPH, with encouraging results in the studied sample. Long-term follow-up and expansion of the sample size will allow more robust conclusions in this context.

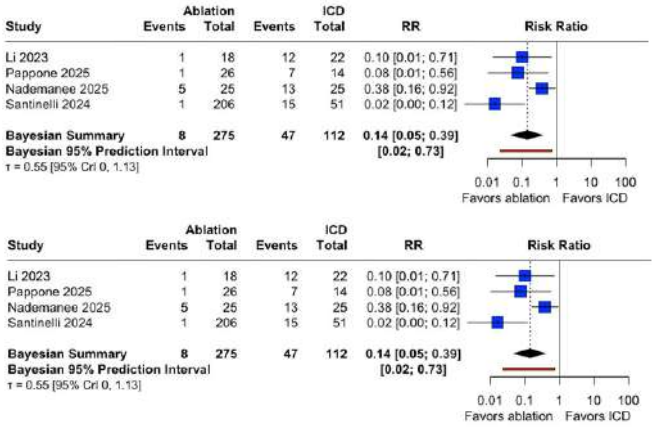
19467

CATHETER ABLATION VERSUS STANDARD TREATMENT IN PATIENTS WITH SYMPTOMATIC BRUGADA PATTERN: A SYSTEMATIC REVIEW AND BAYESIAN META-ANALYSIS

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Background/Introduction: Brugada syndrome (BrS) is an inherited arrhythmogenic disorder that can cause sudden cardiac arrest and death due to ventricular fibrillation (VF). Conventionally, it is treated with an implantable cardioverter-defibrillator (ICD) and quinidine, but this approach is associated with significant adverse effects and limitations. Catheter ablation (CA) has emerged as a promising therapeutic choice for BrS. Thus, we performed a systematic review and bayesian meta-analysis comparing CA with conventional treatment for BrS. Objectives: Thus, we performed a systematic review and bayesian meta-analysis comparing CA effectiveness with conventional treatment for BrS. Methods: PubMed, Embase, and the Cochrane Library were systematically searched for studies evaluating the effect of CA in patients with symptomatic BrS. Patients undergoing CA were compared with those receiving ICD only, for the primary endpoint of first occurrence of VF or death. We performed a Bayesian random-effects meta-analysis using the bayesmeta R package. Results are expressed as risk ratios with 95% credible intervals (CrI), alongside posterior probabilities of benefit (RR < 1) and harm (RR > 1). The posterior predictive distribution was used to estimate the probable treatment effect in future study populations, accounting for uncertainty in both the pooled effect and between-study heterogeneity. Results and Conclusions: A total of 4 studies, of which 2 are randomized, were included. The study population, comprising 387 patients, was predominantly male (76.5%), with a mean age of approximately 41 years. CA was associated with a significantly lower risk of the primary endpoint compared with standard therapy (RR 0.14, 95% CrI 0.05 to 0.39), with moderate between-study heterogeneity (τ = 0.55, 95% CrI 0.00 to 1.13). The posterior probability of benefit (RR < 1) was 99.98% for the average treatment effect and 98.79% for the predictive distribution, indicating a very high likelihood of consistent treatment benefit across different clinical settings. In patients with symptomatic BrS, CA was associated with a substantially lower risk of VF or death compared with standard therapy. The high posterior probability of benefit, including the predictive framework, supports the consistency of this effect across different clinical settings and indicates the strong effectiveness of therapy.



Ablation
ICD
Study
Events
Total
Events
Total
RR
Risk Ratio
Li 2023 1 18 12 22 0.10 [0.01; 0.71]
Pappone 2025 1 26 7 14 0.08 [0.01; 0.56]
Nademanee 2025 5 25 13 25 0.38 [0.16; 0.92]
Santinelli 2024 1 206 15 51 0.02 [0.00; 0.12]
Bayesian Summary 8 275 47 112 0.14 [0.05; 0.39]
Bayesian 95% Prediction Interval [0.02; 0.73]
τ = 0.55 [95% CrI 0, 1.13]
0.01 0.1 1 10 100
Favors ablation
Favors ICD

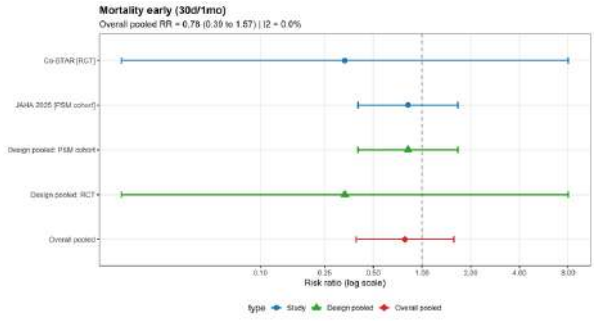
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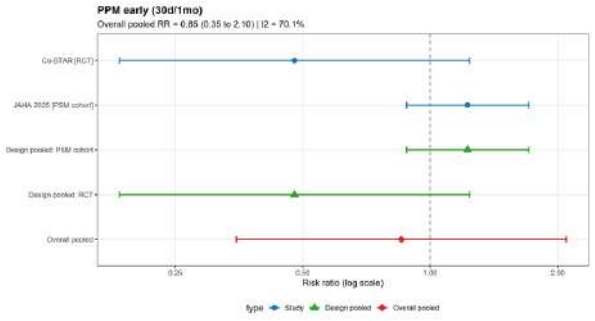
COLCHICINE AND POST-TAVI CONDUCTION DISTURBANCES: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background/Introduction: Post-procedural inflammatory activation has been implicated in conduction disturbances, leaflet thrombosis, and early adverse clinical events after transcatheter aortic valve implantation (TAVI). Colchicine, a well-established anti-inflammatory agent, has been proposed as an adjunctive strategy to mitigate these complications. Objectives: To assess the efficacy and safety of colchicine after TAVI through a PRISMA-guided systematic review and meta-analysis. Methods: We systematically searched PubMed, Embase, Scopus, and Web of Science for randomized controlled trials and comparative observational studies evaluating colchicine versus control after TAVI. Two independent reviewers performed title/abstract screening, full-text selection, and data extraction. Dichotomous outcomes were pooled as risk ratios (RR) using random-effects models with DerSimonian–Laird estimation. Prespecified harmonized analyses were performed for early permanent pacemaker implantation (PPM) and early mortality combining data across comparable follow-up windows (30 days and 1 month). Statistical heterogeneity was assessed with the I² statistic, and certainty of evidence was evaluated using GRADE methodology. Results and Conclusions: Three study datasets were included — one randomized trial (Co-STAR; n=120), one randomized imaging substudy (n=96), and one propensity score-matched cohort (n=1,404). Colchicine reduced the composite of new-onset atrial fibrillation or PPM-requiring conduction disturbance in the Co-STAR trial (6/60 vs 15/60) and subclinical leaflet thrombosis in the imaging substudy (13/48 vs 26/48). Harmonized pooled analyses showed no significant reduction in early PPM implantation (RR 0.86, 95% CI 0.35–2.10; I²=70.1%) or early mortality (RR 0.78, 95% CI 0.39–1.57; I²=0%), with certainty of evidence rated as low for both outcomes. Although colchicine showed favorable signals for selected mechanistic endpoints, current evidence is insufficient to support its routine use after TAVI, and larger randomized trials are warranted.





15645

DISTAL RADIAL ACCESS VERSUS CONVENTIONAL RADIAL ACCESS FOR CORONARY ANGIOGRAPHY AND INTERVENTION: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background/Introduction: Introduction: Coronary angiography and percutaneous coronary intervention (PCI) are important tools for the diagnosis and treatment of coronary artery disease (CAD). Conventional transradial arterial access (cTRA) is widely used; however, radial artery occlusion remains a complication in this procedure and may prevent future endovascular interventions in the artery. In this context, distal transradial arterial access (dTRA) in the anatomical snuffbox may reduce the incidence of radial artery occlusion and other complication rates. Objectives: Objectives: To evaluate the short- and long-term safety and feasibility of dTRA in patients with CAD undergoing coronary angiography and/or PCI. Methods: Methods: This is a systematic review with meta-analysis, based on the methods described in the Cochrane Handbook for Systematic Reviews of Interventions. Randomized, quasi-randomized, and non-randomized clinical trials were included. The study population consisted of adults with CAD undergoing coronary angiography and/or PCI. The experimental group consisted of those who underwent procedures using dTRA, and the control group used cTRA and/or femoral access. The outcomes evaluated were vascular complications, bleeding, mortality, and clinical outcomes. For study selection, the PubMed, Embase, ClinicalTrials, and Cochrane databases were used, without date or language restrictions. Study selection, data extraction, and risk of bias assessment were performed by two independent, blinded reviewers. The meta-analysis was conducted to obtain a combined effect estimate, using a random-effects model to compare outcomes between the different procedures performed. Results and Conclusions: Results: Safety outcomes (major and minor bleeding, hematomas, aneurysms/pseudoaneurysms, and mortality) did not differ significantly between dTRA and cTRA (OR 1.22; 95% CI 0.88–1.68; I^2=0%). However, the crossover rate was significantly higher in the dTRA (OR 2.39; 95% CI 1.54–3.71; p=0.0001). Conclusion: This meta-analysis demonstrates that the dTRA offers a safety profile comparable to cTRA, though it is associated with a higher probability of crossover, reflecting greater technical challenges at the distal site. Although feasible and safe, the routine adoption of the dTRA should consider operator experience, distal anatomy, and the clinical context of the procedure. Support: FAPESP:2025/15518-2.

18445

GAP BETWEEN GUIDELINES AND CLINICAL PRACTICE IN LDL-C CONTROL IN PATIENTS UNDERGOING MYOCARDIAL REVASCULARIZATION: REAL-WORLD DATA FROM A BRAZILIAN UNIVERSITY HOSPITAL

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Background/Introduction: Coronary atherosclerosis is the leading cause of cardiovascular mortality worldwide. National and international guidelines recommend LDL-cholesterol (LDL-c) < 50 mg/dL for very high cardiovascular risk patients. However, data from global registries demonstrate a wide gap between recommendations and real clinical practice. Objectives: To assess adherence to LDL-c targets in patients undergoing percutaneous coronary intervention (PCI) or coronary artery bypass grafting (CABG) at a Brazilian public university hospital. Methods: Retrospective cohort study including patients who underwent PCI or CABG between January 2019 and December 2022 at Brazilian public university hospital. Demographic variables, comorbidities, type of revascularization, pre- and post-procedure lipid levels, and prescribed therapy were analyzed. Patients without cholesterol records were excluded. SPSS 26 was used for statistical analysis (Mann-Whitney and Wilcoxon; p<0.05). Results and Conclusions: A total of 547 patients were included (265 PCI, 282 CABG); mean age 64.6 years; 61.3% male. Prevalence of hypertension (86%), smoking (63.1%), and diabetes (46.3%). Only 16.1% of PCI patients and 7.2% of CABG patients achieved the LDL-c target < 50 mg/dL post-procedure. Although 97.8% were on statins, 71.3% were using simvastatin (low potency) and only 2.3% received ezetimibe. No patient used PCSK9 inhibitors. In very high cardiovascular risk patients after revascularization, the majority did not achieve recommended lipid targets, highlighting the underutilization of high-efficacy lipid-lowering therapies within the Brazilian public health system.

Chart 1 – Adherence to LDL-c Target < 50 mg/dL Post-Procedure

Group	On Target (LDL-c < 50 mg/dL)	Off Target
PCI (Percutaneous Intervention)	16.1%	83.9%
CABG (Surgical Revascularization)	7.2%	92.8%

Chart 2 – Statins Prescribed Post-Myocardial Revascularization

Statin	% of Patients
Simvastatin (low potency)	71.3%
Rosuvastatin (high potency)	23.8%
Atorvastatin (high potency)	3.3%
Other	~1.6%

⚠ 71.3% of patients received low-potency statin therapy

18608

GENDER DISPARITY IN LIPID CONTROL AFTER MYOCARDIAL REVASCULARIZATION: WOMEN SHOW WORSE ACHIEVEMENT OF LDL-C AND NON-HDL CHOLESTEROL TARGETS

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Background/Introduction: Cardiovascular disease presents pathophysiological differences between sexes. Post-menopausal women exhibit lipid profile changes resulting from estrogen decline, with elevation of LDL-c and non-HDL cholesterol. Despite this, therapeutic intensification in women after myocardial revascularization remains understudied in developing country contexts. Objectives: To analyze sex-based differences in LDL-c and non-HDL cholesterol levels before and after percutaneous or surgical myocardial revascularization, and to investigate possible disparities in lipid-lowering prescription patterns Methods: Sex-based subanalysis of a retrospective cohort (2019–2022) of patients undergoing PCI or CABG. LDL-c, HDL-c, non-HDL-c, and triglyceride levels were compared between men and women at pre- and post-procedure timepoints using the Mann-Whitney U test (p<0.05). Results and Conclusions: The sample included 211 women (38.7%) and 334 men (61.3%). In the post-procedure period, women had significantly higher LDL-c than men (112.7 vs. 86.0 mg/dL; p=0.022), as well as higher non-HDL-c (141.9 vs. 108.8 mg/dL; p=0.006). HDL-c also differed between sexes (p=0.022). No significant difference was observed in pre-procedure values. Women undergoing myocardial revascularization present significantly worse post-procedure lipid control than men, suggesting insufficient therapeutic intensification in this very high cardiovascular risk subgroup.

Chart 3 – LDL-Cholesterol by Sex: Pre- and Post-Revascularization

Timepoint	Female (mg/dL)	Male (mg/dL)
Pre-procedure	79.9	77.0
Post-procedure	112.7 *	86.0 *

** Post-procedure difference: p = 0.022 | Target: 50 mg/dL*

Chart 4 – Non-HDL Cholesterol by Sex: Pre- and Post-Revascularization

Timepoint	Female (mg/dL)	Male (mg/dL)
Pre-procedure	178.8	109.6
Post-procedure	141.9 *	108.8 *

** Post-procedure difference: p = 0.006 | Target Non-HDL-c: 80 mg/dL*

16377

IMPACT OF PERCUTANEOUS CORONARY INTERVENTION FOR CHRONIC TOTAL OCCLUSION ON REFRACTORY ANGINA IMPROVEMENT: COMPARATIVE ANALYSIS BETWEEN TECHNICAL SUCCESS AND FAILURE

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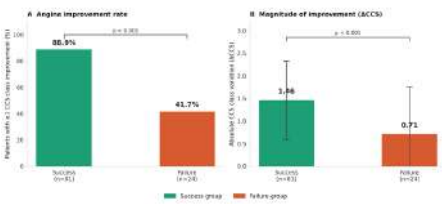
Background/Introduction: Percutaneous coronary intervention for chronic total occlusion (CTO-PCI) is recommended for refractory angina to improve quality of life. However, real-world data directly comparing CCS functional class outcomes between technically successful and unsuccessful CTO-PCI remain scarce, representing a relevant gap in the evidence base for clinical decision-making in this population. Objectives: To evaluate angina improvement in patients undergoing CTO-PCI, comparing outcomes between those with successful recanalization and those with technical failure, and to identify independent predictors of symptomatic improvement. Methods: Single-center retrospective cohort study at a tertiary teaching hospital, including patients >18 years with refractory angina (CCS ≥II) undergoing single-vessel CTO-PCI between 2008 and 2025. Patients were divided by technical outcome: success group (TIMI 3 flow after stent implantation) and failure group. Outcomes were assessed at the first follow-up visit within 6 months post-procedure. The primary endpoint was angina improvement, defined as ≥1 CCS class reduction and absolute ΔCCS. Between-group comparisons used Student's t-test or Mann-Whitney and Fisher's exact tests according to data distribution; within-group comparisons used the Wilcoxon signed-rank test. Independent predictors were identified by multivariate logistic regression (p<0.05). Results and Conclusions: 105 patients were analyzed (success group n=81; failure group n=24). Baseline CCS distribution was similar between groups (p=0.26). The proportion achieving ≥1 CCS class improvement was markedly higher in the success group (88.9% vs. 41.7%, p<0.001), with more than twice the absolute class variation (ΔCCS: 1.46 ± 0.87 vs. 0.71 ± 1.04, p<0.001). No patient in the success group experienced worsening angina, whereas some failure-group patients showed CCS deterioration post-procedure. Regarding antianginal therapy at baseline, the mean number of drug classes in use was similar between groups (2.1 ± 1.0 vs. 2.2 ± 0.9, p=0.80). On multivariate analysis, technical success (OR 9.8; 95% CI 3.2–30.0; p<0.001) and higher baseline CCS class (OR 5.2; 95% CI 1.8–15.0; p=0.007) were the only independent predictors of symptomatic improvement (AUC 0.848; Hosmer-Lemeshow p=0.89). Successful CTO recanalization was associated with greater angina improvement compared to technical failure. The magnitude of benefit was directly related to baseline symptom severity, identifying higher CCS class as a key criterion for patient selection.

Table 1. Baseline clinical and demographic characteristics

Variable	Success group (n=81)	Failure group (n=24)	p-value
DEMOGRAPHIC DATA			
Age (years)	60.3 ± 9.7	57.9 ± 10.1	NS
Female sex, n (%)	29 (35.8%)	4 (25.0%)	NS
RISK FACTORS			
Hypertension	74/80 (92.5%)	—	—
Diabetes mellitus	41/80 (51.2%)	—	—
Dyslipidemia	77/81 (95.1%)	—	—
Current/former smoker	13/77 (16.9%)	—	—
Obesity	24/75 (32.0%)	—	—
CLINICAL HISTORY			
Prior MI	43/81 (53.1%)	—	—
Prior PCI	16/68 (23.5%)	—	—
Prior CABG	11/68 (16.2%)	—	—
Heart failure	8/87 (11.3%)	—	—
Chronic kidney disease	6/86 (11.0%)	—	—
CORONARY ANATOMY			
Single-vessel disease	34 (43.6%)	1 (13.0%)	< 0.001
Two-vessel disease	31 (39.7%)	5 (21.7%)	< 0.001
Three-vessel disease	13 (15.4%)	15 (61.2%)	< 0.001
No. of diseased vessels — median (IQR)	2 (1–2)	3 (2–3)	< 0.001
LVEF (%) — median (IQR)	60 (51–65)	51 (45–61)	NS
BASELINE ANGINA			
CCS class — mean ± SD	2.69 ± 0.56	2.71 ± 0.75	0.26
CCS II, n (%)	42 (51.9%)	11 (45.8%)	
CCS III, n (%)	38 (46.9%)	9 (37.5%)	
CCS IV, n (%)	1 (1.2%)	4 (16.7%)	
No. of antianginal drug classes — mean ± SD	2.1 ± 1.0	2.2 ± 0.9	0.80

Data expressed as mean ± SD, median (IQR), or n (%). PCI = percutaneous coronary intervention; CABG = coronary artery bypass grafting; LVEF = left ventricular ejection fraction; CCS = Canadian Cardiovascular Society; IQR = interquartile range; NS = not significant (p ≥ 0.05); — = data not available.

Figure 1. CCS functional class improvement by technical outcome



18668

INSUFFICIENT LONGITUDINAL FOLLOW-UP AND UNDERUSE OF HIGH-POTENCY STATINS AS STRUCTURAL BARRIERS TO LIPID CONTROL IN THE SUS: COHORT ANALYSIS POST-MYOCARDIAL REVASCULARIZATION

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Background/Introduction: Adequate clinical follow-up and the use of high-potency statins are cornerstones of secondary cardiovascular prevention. Within the Brazilian Unified Health System (SUS), structural barriers such as restricted access to medications, bureaucracy in dispensing processes, and deficits in continuity of care may compromise the implementation of best clinical practices. Objectives: To identify structural barriers to LDL-c control in very high cardiovascular risk patients after myocardial revascularization at a public university hospital, and to propose evidence-based strategies to overcome them. Methods: Retrospective cohort (2019–2022) of patients undergoing PCI or CABG. The following were analyzed: type of statin prescribed, use of combination therapies, duration of post-procedure follow-up, and completeness of cholesterol records in medical charts. Data were organized in Excel and analyzed using SPSS 26. Results and Conclusions: Among 547 patients, only 28.1% received a high-potency statin. Ezetimibe was prescribed in 2.3% of cases and no patient used PCSK9 inhibitors. Simvastatin, the lowest-potency statin, was the most frequently prescribed (71.3%). Only 12% of patients had documented LDL-c, and 61.9% had follow-up of less than 6 months. Structural barriers — including restricted access to atorvastatin through the SUS Specialized Component (LME), underreporting in medical records, and insufficient longitudinal follow-up — compromise post-revascularization lipid control. Strategies such as telemedicine, institutional protocols, and streamlined access to high-efficacy lipid-lowering agents are needed.

Chart 5 – Duration of Post-Revascularization Follow-Up

Follow-up Period	Patients (%)
< 6 months	61.9% ⚠
6 months – 1 year	14.2%
1–2 years	12.5%
2–3 years	7.3%
3–4 years	4.1%

Chart 6 – Post-Revascularization Therapeutic Quality Indicators

Indicator	Value
High-potency statin prescribed	28.1%
Ezetimibe prescribed	2.3%
LDL-c documented in medical chart	12.0%

16552

INTRACARDIAC VERSUS TRANSESOPHAGEAL ECHOCARDIOGRAPHY FOR PERCUTANEOUS ATRIAL SEPTAL DEFECT AND PATENT FORAMEN OVALE CLOSURE: A SYSTEMATIC REVIEW, META-ANALYSIS, AND META-REGRESSION

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Background/Introduction: Background: The optimal imaging modality for guiding percutaneous closure of atrial septal defect (ASD) and patent foramen ovale (PFO) remains debated. Intracardiac echocardiography (ICE) may offer procedural and safety advantages over transesophageal echocardiography (TEE), but comparative evidence is inconsistent. Objectives: Objectives: To compare the efficacy, safety, and procedural outcomes of ICE versus TEE in patients undergoing percutaneous ASD/PFO closure, and to explore sources of heterogeneity through meta-regression. Methods: Methods: We conducted a systematic review and meta-analysis in accordance with PRISMA 2020 guidelines. PubMed, Embase, Cochrane Library, and Web of Science were searched through January 2026. Randomized controlled trials and observational studies comparing ICE versus TEE were included. Outcomes included complete closure, procedural success, adverse events, vascular complications, arrhythmias, procedure time, fluoroscopy time, and length of hospitalization. Random-effects models were used to pool effect estimates. Subgroup analyses and meta-regression were performed to investigate heterogeneity. Results and Conclusions: Results: Fifteen studies comprising 45,037 patients were included. ICE demonstrated comparable efficacy to TEE, with no significant differences in complete closure at follow-up (RR 0.99, 95% CI 0.98–1.01), complete closure at discharge (RR 1.02, 95% CI 0.96–1.08), or procedural success (RR 1.00, 95% CI 0.99–1.01). ICE was associated with a significant reduction in vascular complications (RR 0.56, 95% CI 0.32–0.99) and overall adverse events (RR 0.77, 95% CI 0.65–0.91), while no significant difference was observed in arrhythmias. ICE significantly reduced length of hospitalization (MD −0.71 days, 95% CI −1.30 to −0.13), whereas procedure time and fluoroscopy time showed no overall significant differences and substantial heterogeneity. Meta-regression identified publication year as a significant moderator for procedure time and length of hospitalization. Conclusions: ICE provides comparable efficacy to TEE for percutaneous ASD/PFO closure while offering improved safety, with lower rates of vascular complications and adverse events, and shorter hospital stays. These findings support ICE as a safe and effective alternative, particularly in settings prioritizing procedural efficiency and avoidance of general anesthesia. Further randomized studies are warranted to confirm these findings and define optimal patient selection.

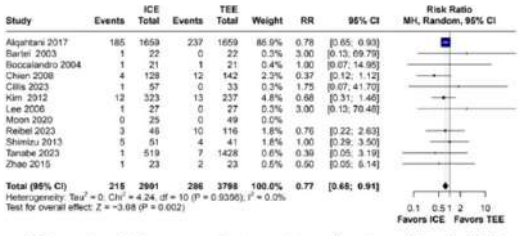


Figure 1. Comparison of adverse events between intracardiac echocardiography (ICE) and transesophageal echocardiography (TEE) in patients with ASD/PFO.

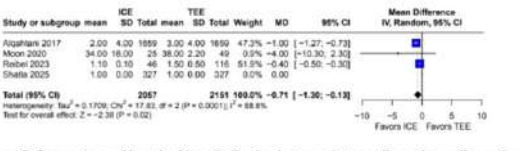


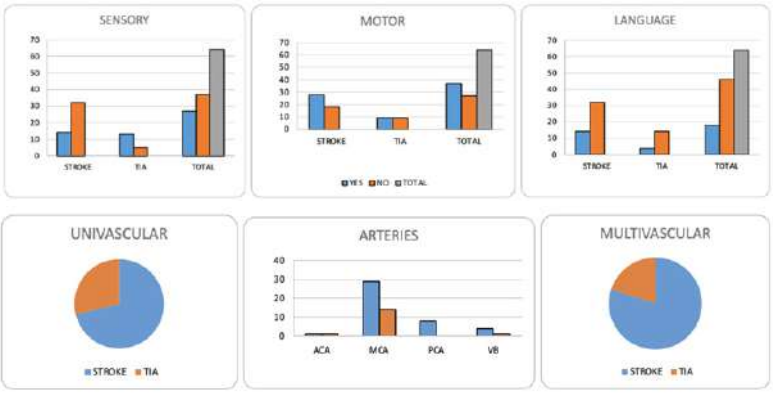
Figure 2. Comparison of length of hospitalization between intracardiac echocardiography (ICE) and transesophageal echocardiography (TEE) in patients with ASD/PFO.

21534

NEUROLOGICAL PHENOTYPES AND VASCULAR PATTERNS IN PATIENTS WITH PATENT FORAMEN OVALE: INSIGHTS FROM A PERCUTANEOUS CLOSURE COHORT IN A TERTIARY HOSPITAL

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(1) HOSPITAL QUINTA D'OR - RJ - RJ - BRASIL;



Background/Introduction: Patent foramen ovale (PFO) is an atrial septal defect present in 25-30% of the population, recognized as a cause of ischemic stroke and transient ischemic attack (TIA) due to paradoxical embolism. The RESPECT and REDUCE trials demonstrated the benefit of percutaneous PFO closure in preventing recurrent neurological events compared to medical therapy alone. However, Brazilian data are scarce regarding the relationship between neurological phenotype, vascular territory and causal probability of FOP. Characterizing these patterns can improve etiological assessment and patient selection for occlusion. Objectives: To characterize the clinical profile and neurological deficits in patients with closed PFO after an acute neurological event. Methods: Observational, retrospective study from a tertiary hospital in the Brazilian supplementary health network, including 64 patients who underwent percutaneous PFO occlusion after stroke/TIA. The presence of PFO was documented by Transesophageal Echocardiography with microbubble test, performed by an echocardiographer. Patients with atrial fibrillation or other important cardioembolic sources were excluded. Sex, type of event, neurological deficit profile (sensory, motor and language), arterial territory responsible for irrigating the affected region and RoPE score were analyzed. Results and Conclusions: Male predominance was observed (56%vs44%), along with ischemic stroke (72%vs28% TIA), with a mean age of 52.73 ± 12.74 years. Neurological phenotypes varied by event type: ischemic stroke predominantly featured motor deficits (61%) and language deficits (30%), suggesting greater cortical involvement. TIA showed a predominance of sensory symptoms (72%vs30% in ischemic stroke). Univascular involvement predominated (92%), with the middle cerebral artery (MCA) being the most affected territory; multivascular events were rare (~8%). The mean RoPE score was higher in males (6.42vs5.57) and TIA patients (6.22vs5.98). Patients with PFO exhibited distinct clinical patterns: ischemic stroke was associated with structured cortical deficits, whereas TIA predominantly manifested as sensory symptoms, possibly due to transient microembolization. The predominance of univascular involvement and anterior circulation in young patients reinforces paradoxical embolism as the central pathophysiological mechanism. Thus, integrating neurological phenotype, vascular anatomy, and RoPE score may improve attribution of causality to PFO and optimize selection of candidates for percutaneous closure.

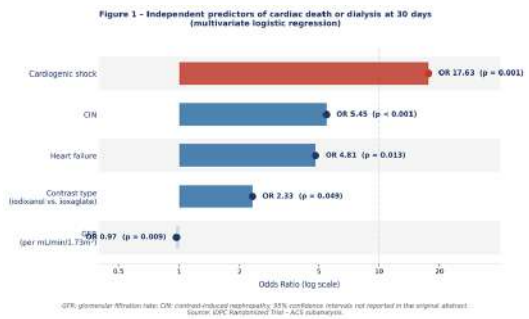
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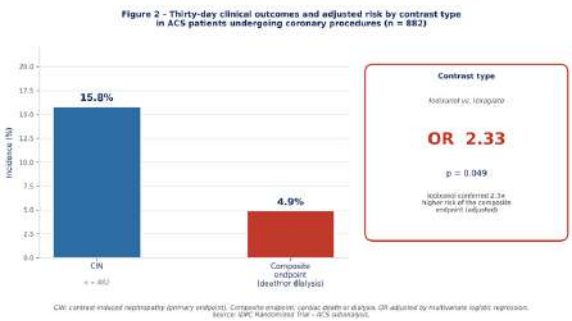
RENAL OUTCOMES IN ACUTE CORONARY SYNDROME PATIENTS UNDERGOING CORONARY PROCEDURES: SUBANALYSIS OF THE IDPC RANDOMIZED TRIAL

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Background/Introduction: Contrast-induced nephropathy (CIN) is a clinically relevant complication in patients with acute coronary syndrome (ACS), with direct impact on morbidity and mortality among those undergoing diagnostic or therapeutic percutaneous coronary interventions. Objectives: To determine the incidence of CIN and identify independent predictors of cardiac death and dialysis within 30 days in ACS patients undergoing coronary angiography within the IDPC randomized trial. Methods: Subanalysis of a single-center randomized clinical trial conducted at a tertiary public hospital over two consecutive years, including 882 ACS patients undergoing coronary angiography. Only ioxaglate (low-osmolar) or iodixanol (iso-osmolar) contrast agents were used. Patients on dialysis or exposed to other contrast types were excluded. All received standardized prophylactic hydration with 0.9% saline (0.5–1 mL/kg/h) before and after the procedure. Primary endpoint: CIN, defined as a ≥25% increase or ≥0.5 mg/dL rise in serum creatinine from baseline. Secondary endpoint: composite of cardiac death and dialysis within 30 days. Results and Conclusions: 882 patients were included (mean age 65 years; 35% >70 years; 67% male; 39% diabetic; 25% with prior renal dysfunction, CKD-EPI <60 mL/min/1.73m²). Low-osmolar contrast was used in 50.7% of cases. Mean pre- and post-procedure creatinine: 1.06 vs. 1.12 mg/dL; mean contrast volume: 92 mL. CIN occurred in 15.8% of patients. The composite endpoint at 30 days was observed in 43 patients (4.9%). Multivariate analysis identified independent predictors of death or dialysis: reduced GFR (OR 0.97 per mL/min/1.73m², p=0.009), heart failure (OR 4.81; p=0.013), cardiogenic shock (OR 17.63; p=0.001), CIN (OR 5.45; p<0.001), and contrast type (OR 2.33; p=0.049). Iodixanol use conferred a 2.3-fold higher risk of the composite endpoint compared to ioxaglate — a finding with direct implications for contrast agent selection in this population. CIN incidence was consistent with published literature, and its occurrence, combined with hemodynamic instability and contrast choice, was associated with adverse short-term prognosis.





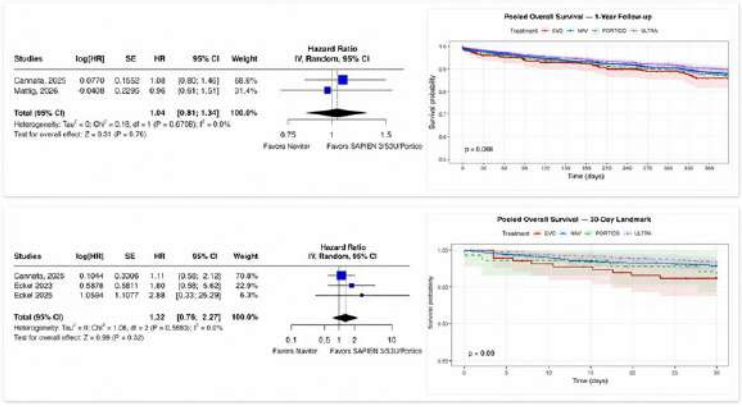
21297

TRANSCATHETER VALVE IMPLANTATION WITH NAVITOR™ FOR PATIENTS WITH SMALL AORTIC ANNULI: SYSTEMATIC AND META-ANALYSIS WITH RECONSTRUCTED TIME-TO-EVENT DATA

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(1) FACULDADE SANTA MARCELINA - SÃO PAULO - SP - BRASIL; (2) UNIVERSIDADE FEDERAL DE SERGIPE - ARACAJU - SE - BRASIL; (3) FACULDADE DE MEDICINA DO ABC - SÃO PAULO - SP - BRASIL; (4) UNIVERSIDADE FEDERAL DE CATALÃO - CATALÃO - GO - BRASIL; (5) PONTIFICIA UNIVERSIDADE CATOLICA PUC - CURITIBA - PR - BRASIL; (6) UNIVERSIDADE FEDERAL DE MINAS GERAIS - BELO HORIZONTE - MG - BRASIL; (7) CENTRO UNIVERSITARIO DE MACEIO - MACEIO - AL - BRASIL; (8) INCOR - INSTITUTO DO CORACAO DA UNIVERSIDADE DE SAO PAULO - SAO PAULO - SP - BRASIL;

Background/Introduction: Selecting the optimal prosthesis for TAVI is essential. Despite the availability of several transcatheter heart valve (THV) models, no systematic review with meta-analysis has compared Navitor™ against other contemporary systems in patients with small aortic annuli. Objectives: To compare Navitor™ to other contemporary THVs in patients with severe aortic stenosis and small aortic annuli undergoing TAVI. Methods: We systematically searched literature databases for studies comparing Navitor™ to other THVs in this population. Studies were screened per PRISMA guidelines. Individual patient data (IPD) were extracted from Kaplan-Meier curves using ScanIt (v.2.0.8.0) and reconstructed with IPDfromKM (v.1.2.5.0). A random-effects meta-analysis was performed in R. Results and Conclusions: At 1-year follow-up, two studies were included in the pooled analysis. The random-effects meta-analysis yielded a pooled hazard ratio of 1.04 (95% CI: 0.81–1.34; p=0.76), with no statistically significant difference in overall survival between Navitor™ and comparator platforms. No heterogeneity was detected (I²=0%; p=0.67), supporting the consistency of the pooled estimate. Kaplan-Meier reconstruction confirmed similar survival trajectories among all devices, with 1-year survival ranging from 85% to 90% across groups (log-rank p=0.088). At the 30-day landmark analysis, three studies were included. The pooled hazard ratio was 1.32 (95% CI: 0.76–2.27; p=0.32), likewise non-significant, with no heterogeneity (I²=0%; p=0.59). One estimate carried the smallest weight (6.3%) due to a wide confidence interval (0.33–25.29), reflecting a limited sample size. A borderline trend toward higher early mortality in the EVO group (log-rank p=0.09) did not reach statistical significance. IPD reconstruction yielded consistent estimates across studies, reinforcing the reliability of the survival analysis. No statistically significant difference in overall survival was observed between Navitor™ and contemporary THV platforms at 30 days or 1 year. The absence of heterogeneity supports result consistency. Navitor™ appears safe and effective in patients with small aortic annuli. Larger studies are needed to guide definitive device selection.



Neglected Cardiovascular Diseases



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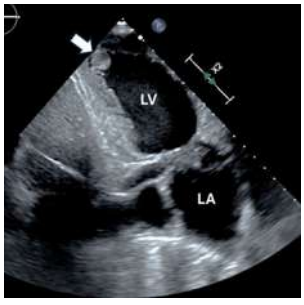
CARDIOEMBOLIC STROKE IN CHAGAS CARDIOMYOPATHY: THE INTERPLAY BETWEEN APICAL ANEURYSM, LEFT VENTRICULAR THROMBUS, AND CLINICAL OUTCOMES

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(1) UNIVERSIDADE FEDERAL DE MINAS GERAIS - BELO HORIZONTE - MG - BRASIL; (2) HOSPITAL DAS CLINICAS DA UFMG - BELO HORIZONTE - MG - BRASIL;

Background/Introduction: Chagas cardiomyopathy (CCM) is a major manifestation of a neglected tropical disease, that is an important cause of cardioembolic (CE) stroke. Although left ventricular (LV) apical aneurysm is a common feature of the disease and has been associated with thromboembolic events, its independent contribution to stroke risk is unclear. Objectives: To assess the association between apical aneurysm and CE stroke in CCM, examine the mediating role of LV thrombus, and evaluate the prognostic impact of CE stroke. Methods: This prospective cohort included 518 patients with CCM enrolled from 2007 to 2022 at a tertiary referral center. Diagnosis required two positive serologic tests for Trypanosoma cruzi and evidence of cardiomyopathy. Baseline assessment included clinical evaluation, ECG, and echocardiography with standardized definitions for apical aneurysm and LV thrombus. Stroke events were adjudicated by neurologists using the Causative Classification System. Multivariable logistic regression identified predictors of CE stroke. Age and sex matching estimated the independent effect of apical aneurysm, mediation analysis quantified the indirect effect through LV thrombus, and Cox models assessed predictors of all-cause mortality or heart transplantation. Results and Conclusions: At enrollment, 73 patients (14.1%) had a history of CE stroke. Reduced LV ejection fraction, increased left atrial volume, and LV thrombus were independently associated with CE stroke, whereas apical aneurysm was not after adjustment. However, matched analyses demonstrated an association between apical aneurysm and CE stroke, largely mediated by LV thrombus (63.3%). During a mean follow-up of 4.9 years, 174 patients died and 22 underwent heart transplantation. Mortality was predicted by NYHA III/IV, right-sided heart failure, left atrial enlargement, and LV dysfunction, but not by prior CE stroke or apical aneurysm. Incident CE stroke occurred in 41 patients (9%) and was independently associated with prior CE stroke and LV thrombus. To conclude, in CCM, CE stroke is primarily driven by LV thrombus formation. Apical aneurysm increases embolic risk mainly through thrombus mediation, while prior CE stroke identifies patients at increased risk for recurrence. These findings support targeted stroke prevention strategies focused on thrombus detection and anticoagulation.





21590

EARLY TRYPANOCIDAL THERAPY AFTER ORALLY TRANSMITTED ACUTE CHAGAS DISEASE AND CARDIAC OUTCOMES IN THE AMAZON BASIN: A PRISMA-BASED SYSTEMATIC REVIEW AND META-ANALYSIS

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Background/Introduction: Oral transmission has reshaped acute Chagas disease epidemiology in the Brazilian Amazon, but cardiac outcomes after early trypanocidal therapy remain insufficiently quantified. Objectives: To estimate post-treatment cardiac abnormalities and serological outcomes after benznidazole-treated acute Chagas disease in oral/Amazonian cohorts. Methods: A PRISMA-based systematic review and meta-analysis of cohort and outbreak studies was performed. Eligible studies included acute Chagas disease acquired in Amazonian or oral-transmission settings and treated with benznidazole. Outcomes were pooled as proportions using logit-transformed random-effects models with Hartung-Knapp adjustment; crude Wilson 95% confidence intervals (CI) were also calculated due to small samples, sparse events and possible overlap. Outcomes included post-treatment cardiac abnormalities, acute-phase cardiac/ECG abnormalities, serological cure, persistent anti-T. cruzi IgG and late gadolinium enhancement (LGE). Results and Conclusions: Ten studies were included; sample sizes ranged from 11 to 179 participants. Post-treatment cardiac abnormalities occurred in 31/375 treated participants in Brazilian cohorts (crude 8.3%; 95% CI 5.9-11.5), with a random-effects estimate of 14.2% (95% CI 1.9-58.9; I^2=91.3%). In Amazon-only cohorts, events occurred in 25/364 participants (crude 6.9%; 95% CI 4.7-9.9; random-effects 9.3%; 95% CI 0.7-58.3; I^2=91.4%). Serological cure occurred in 91/382 participants (crude 23.8%; 95% CI 19.8-28.3; random-effects 23.9%; 95% CI 10.7-45.2; I^2=70.2%), while persistent anti-T. cruzi IgG occurred in 258/382 (crude 67.5%; 95% CI 62.7-72.0; random-effects 67.5%; 95% CI 48.4-82.2; I^2=75.0%). Acute-phase cardiac/ECG abnormalities were frequent (85/252; crude 33.7%; 95% CI 28.2-39.8; random-effects 47.6%; 95% CI 21.5-75.2; I^2=82.8%). Post-treatment LGE was detected in 10/25 patients by cardiac magnetic resonance (40.0%; 95% CI 23.4-59.3; I^2=0.0%). Benznidazole-treated disease after oral/Amazonian transmission showed a low crude frequency of overt post-treatment cardiac disease, but persistent serological/imaging abnormalities were common. High heterogeneity supports standardized, non-overlapping long-term cardiac follow-up.

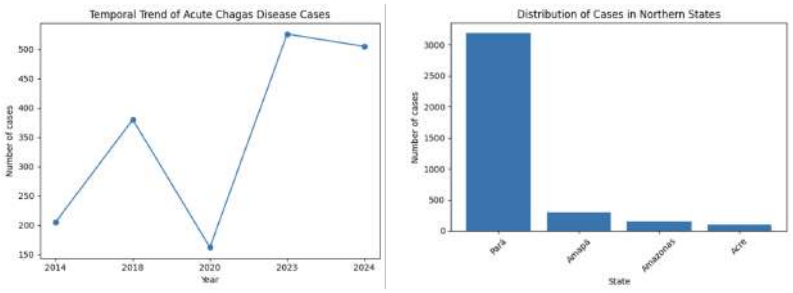
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EPIDEMIOLOGICAL PROFILE OF ACUTE CHAGAS DISEASE IN THE BRAZILIAN LEGAL AMAZON, 2014–2024

MARIA FERNANDA CAMPOS NEVES DOS SANTOS1; GIOVANNI MONTEIRO MATOS1; FABRÍCIO BACELAR MARINHO FILHO1; MELINA CONDE MAUÉS LIMA2; ESTHER ELGRABLY DE MELO E SILVA ZATZ1; HANNAH UNGER1; FABIANA MACHADO ALVES1; GABRIELA CARVALHO DE ASSUNÇÃO1; MARIELLE DE NAZARÉ GONÇALVES DE LIMA E SILVA1;

(1) CENTRO UNIVERSITARIO DO ESTADO DO PARA (CESUPA) - BELÉM - PA - BRASIL; (2) CENTRO UNIVERSITARIO METROPOLITANO DA AMAZONIA - BELÉM - PA - BRASIL;

Background/Introduction: Acute Chagas disease remains a significant public health issue in the Brazilian Legal Amazon, exhibiting a distinct epidemiological profile compared to other regions of the country. Transmission is predominantly oral, strongly associated with adverse socioenvironmental and sanitary conditions. The acute phase may involve early cardiac manifestations, including myocarditis, arrhythmias, and heart failure, with potential progression to chronic Chagas cardiomyopathy. Understanding its epidemiological pattern is essential to identify vulnerable populations and strengthen surveillance and control strategies. Objectives: To analyze the epidemiological profile of acute Chagas disease cases in the Brazilian Legal Amazon between 2014 and 2024 according to sociodemographic characteristics and temporal distribution. Methods: A cross-sectional, retrospective, and observational study was conducted using data from the Brazilian Notifiable Diseases Information System (SINAN/DATASUS). Confirmed cases of acute Chagas disease reported in the Legal Amazon from 2014 to 2024 were included. A descriptive analysis was performed considering sociodemographic, temporal, and seasonal variables. Results and Conclusions: Results: A total of 3,824 confirmed cases were recorded, with marked concentration in the Northern region (98.7%), particularly in Pará (83.4%), followed by Amapá (7.7%), Amazonas (3.9%), and Acre (2.5%). Cases outside the region were less frequent, including Maranhão (1.1%) and Mato Grosso (0.2%). An increasing temporal trend was observed, rising from 205 cases in 2014 to a peak of 526 cases in 2023, remaining high in 2024 (505 cases), with a temporary decline in 2020 (162 cases). Seasonal distribution showed higher incidence between July and November, peaking in October (14.0%). Most cases occurred in individuals aged 20–39 years (34.4%), predominantly males (54.0%), individuals of mixed race (86.0%), and those with low educational attainment. Conclusion: Acute Chagas disease remains highly concentrated in the Brazilian Legal Amazon, particularly in Pará, predominantly affecting young adults, males, and socially vulnerable populations. The observed increasing trend and seasonal pattern between July and November suggest predominance of oral transmission, because of the regional food consumption, like açaí . These findings reinforce the need to strengthen epidemiological surveillance, food safety measures, and preventive actions to reduce incidence and related complications.



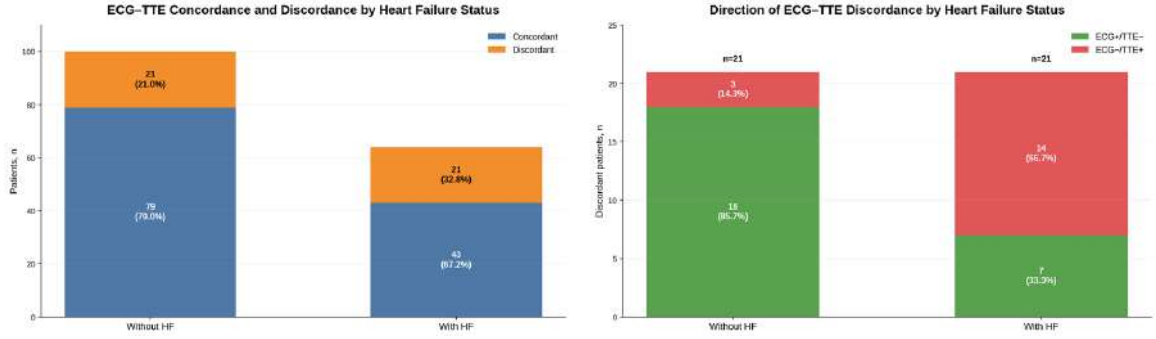
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IS ELECTROCARDIOGRAPHY SUFFICIENT FOR CARDIAC ASSESSMENT IN CHAGAS DISEASE? DISCORDANCE WITH ECHOCARDIOGRAPHY BY HEART FAILURE STATUS

FERNADA ESCARCEGA RAMIREZ1; LUISA FERNANDA AGUILERA MORA1;

(1) SALVANDO LATIDOS A.C - MEXICO;

Background/Introduction: In Chagas disease, electrocardiography (ECG) and transthoracic echocardiography (TTE) assess different aspects of cardiac involvement, and their findings do not always match. In routine practice, especially during initial evaluation or in resource-limited settings, ECG is often the main tool. However, relying on ECG alone may miss relevant structural or functional abnormalities. Although ECG–TTE discordance has been described, little is known about how its direction varies according to heart failure (HF) status. Objectives: To evaluate whether HF is associated with differences in the frequency and direction of discordance between ECG and TTE in patients with Chagas disease, and to assess the implications for the use of ECG as a stand-alone tool. Methods: We conducted an observational, analytical, retrospective, cross-sectional study using a clinical database of patients with Chagas disease, with one record per patient. Patients were grouped by HF status. ECG was considered positive when clinically relevant rhythm, conduction, or repolarization abnormalities were present. TTE was considered positive when relevant structural or functional abnormalities were identified; mild valvular regurgitation was counted only when accompanied by another relevant echocardiographic finding. Discordance was defined as ECG+/TTE− or ECG−/TTE+. Frequency and direction of discordance were compared using chi-square or Fisher's exact test. Results and Conclusions: Results A total of 164 patients were included. Overall ECG–TTE discordance was 25.6% (42/164). Among patients without HF (n=100), discordance was present in 21.0% (21/100), mainly ECG+/TTE− (18/21, 85.7%) rather than ECG−/TTE+ (3/21, 14.3%). Among patients with HF (n=64), discordance was present in 32.8% (21/64), with the opposite pattern: ECG−/TTE+ was more frequent than ECG+/TTE− (14/21, 66.7% vs 7/21, 33.3%). Discordance direction differed significantly between groups (p=0.001), whereas overall discordance frequency did not (p=0.101). Conclusions In Chagas disease, HF was associated with a clear shift in ECG–TTE discordance direction. The predominance of ECG−/TTE+ in patients with HF suggests that ECG alone may be insufficient for comprehensive cardiac assessment and supports the complementary use of echocardiography in this setting.



17552

LOW-COST WEARABLE DEVICE FOR ECG MONITORING IN CHRONIC CHAGAS CARDIOMYOPATHY: PRELIMINARY RESULTS OF AN AGREEMENT STUDY

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Background/Introduction: Chronic Chagas cardiomyopathy (CCC) is a severe and lethal manifestation of Chagas disease, with high arrhythmogenicity and a significant risk of sudden death. Morbidity and mortality are disproportionately concentrated in low-income regions, where access to specialized cardiac monitoring is restricted by sociodemographic barriers. In this context, the Polar H10 sensor, integrated with a proprietary mobile application, represents a low-cost technological alternative for ambulatory ECG recording, aimed at overcoming these socioeconomic hurdles and democratizing clinical surveillance. Objectives: To preliminarily assess the agreement and reliability of a proprietary mobile application for single-lead electrocardiogram acquisition at rest and under physiological stress, compared with a gold-standard device. Methods: Nine patients with CCC underwent cardiopulmonary exercise testing with simultaneous monitoring using a conventional ECG system (BioAmp) and the Polar H10 + proprietary mobile application. Segments containing 100 consecutive beats, sampled every 10 beats, were analyzed during rest and exercise phases. Temporal ECG metrics (RR, HR, PR, P-wave duration, QRS, QT, QTc, JT, and Tpeak-Tend) were extracted using LabChart Pro, totaling approximately 1,800 analyzed beats. Absolute agreement was assessed using the intraclass correlation coefficient (ICC) and Bland-Altman analysis (B&A). Results and Conclusions: At rest, excellent agreement was observed for RR (ICC=0.998), HR (ICC=0.997), and QT (ICC=0.937), with good agreement for QRS (ICC=0.865), QTc (ICC=0.839), PR (ICC=0.793), JT (ICC=0.786), P-wave duration (ICC=0.778), and Tpeak-Tend (ICC=0.719). Bland-Altman analysis confirmed low systematic bias for RR (-0.001±0.012s; 95%LoA: -0.025 to 0.023s) and QT (-0.004±0.018s; 95%LoA: -0.039 to 0.031s). During exercise, excellent agreement was observed for RR (ICC=0.990), HR (ICC=0.989), PR (ICC=0.962), P-wave duration (ICC=0.924), QRS (ICC=0.911), QT (ICC=0.932), and QTc (ICC=0.900), whereas JT (ICC=0.688) and Tpeak-Tend (ICC=0.744) showed moderate-to-good agreement (all p<0.001). Bland-Altman analysis demonstrated low systematic bias for RR (-0.003±0.016s; 95%LoA: -0.034 to 0.028s) and QT (0.003±0.014s; 95%LoA: -0.024 to 0.030s). The proprietary application + Polar H10 demonstrated high reliability for ECG acquisition in patients with CCC, including under physiological stress, showing potential to expand access to cardiovascular monitoring in resource-limited settings.

20377

PROPORTION AND RISK FACTORS FOR COMPLICATIONS IN PATIENTS WITH RHEUMATIC HEART DISEASE : A HOSPITAL BASED STUDY

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Background/Introduction: Rheumatic heart disease (RHD) is an irreversible disease of the heart valves that occurs after developing acute or recurrent rheumatic fever that in turn occurs after being infected with group A streptococcus (strep pharyngitis). RHD continues to be more prevalent in developing countries. Despite its significant impact, recent data on the burden of RHD in our population are lacking. Given that RHD is more prevalent in developing countries, it is crucial to identify the disease burden in the country, as well as factors contributing to both the disease and its complication. There is lack of scientific study to evaluate the complications and risk factors associated with RHD, leaving a significant gap in our understanding of its national burden. Objectives: Primary objective: To determine the proportion of complications in RHD patients Secondary objective:To determine the risk factors associated with complications in RHD patients Methods: This is a descriptive cross-sectional study involving 202 patients registered in the RHD registry during the one-year study period. Continuous demographic and clinical variables that followed a normal distribution were compared using the student's t-test. Categorical variables were analyzed using the Chi-square test or Fisher's exact test, depending on the expected cell counts. Results were summarized using frequencies and percentages. All hypothesis testing was two-tailed, and a p-value of less than 0.05 was considered indicative of statistical significance. A multivariable logistic regression analysis was conducted to identify factors independently associated with RHD complications and the occurrence of new RHD. Odds ratios (ORs) with 95% confidence intervals (CIs) were calculated to quantify the strength and direction of associations. Results and Conclusions: Among 202 RHD patients, 60.4% had atleast one complication—most commonly atrial fibrillation (54.9%) and heart failure (36%). Patients with complications were older (45.4 vs. 32.8 years; p<0.001) than those without. Multivariable logistic regression showed that every 10-year increase in age raised odds of complications by 72% (aOR=1.72, p=0.009). Lower-middle income patients had 31 times higher complication odds, and low-income patients 8 times higher odds versus high-income. Among anticoagulated patients, 33% had bleeding manifestations, with majority having poor INR control (mean TTR 36.7%). These findings highlight the need for early detection, awareness, and better healthcare training.

Table1 Socio-demographic characteristics of the patients with RHD at the national referral hospital, 2024-2025 (n=202)

Variables	Total 202 (100)	RHD, n (%) With complications, 122 (60)	Without complication, 80 (40)	P-value
Gender				
Female	154 (76.2)	94 (77)	60 (75)	0.740
Age, years, mean ±SD	40.4 ±15.3	45.4 ±14.4	32.8 ±13.4	<0.001
BMI, kg/m², mean ±SD	24.6 ±4.5	25.1 ±4.6	23.7 ±4.1	0.035
Comorbidity				
Any	68 (33.7)	47 (38.5)	21 (26.3)	0.094
Diabetes mellitus	13 (6.4)	10 (8.2)	3 (3.8)	0.250
Hypertension	43 (21.3)	29 (23.8)	14 (17.5)	0.380
Dyslipidemia	7 (3.5)	6 (4.9)	1 (1.3)	0.250
Obesity	21 (10.4)	16 (13.1)	5 (6.3)	0.160
Thyroid diseases	6 (3.0)	6 (4.9)	0 (0.0)	0.083
Epilepsy	5 (2.5)	2 (1.6)	3 (3.8)	0.390
COPD	3 (1.5)	2 (1.6)	1 (1.3)	1.000
CKD	3 (1.5)	3 (2.5)	0 (0)	0.280
SLE	3 (1.5)	2 (1.6)	1 (1.3)	1.000
Annual income of patients (Nu)				
Low	137 (67.8)	83 (68.0)	54 (67.5)	
Lower middle	46 (22.8)	30 (24.6)	16 (20.0)	
Higher middle	13 (6.4)	7 (5.7)	6 (7.5)	0.460
High	6 (3.0)	2 (1.6)	4 (5.0)	
Marital Status				
Single	54 (26.7)	27 (22.1)	27 (33.8)	
Married	141 (69.8)	92 (75.4)	49 (61.2)	0.130
Divorced	3 (1.5)	1 (0.8)	2 (2.5)	
Widowed	4 (2.0)	2 (1.6)	2 (2.5)	
Illiteracy				
Patient	67 (33.2)	52 (42.6)	15 (18.8)	<0.001
Mother	183 (90.6)	117 (95.9)	66 (82.5)	0.002
Father	168 (83.2)	112 (91.8)	56 (70.0)	<0.001
Occupation				
Patient				
Student	19 (9.4)	5 (4.1)	14 (17.5)	0.002
Farmer	17 (8.4)	15 (12.3)	2 (2.5)	0.018
Income earner	66 (32.7)	33 (27.1)	33 (41.2)	0.046
Housewife	67 (33.2)	47 (38.5)	20 (25	0.049
Unemployed	33 (16.3)	22 (18.0)	11 (13.8)	0.440
Mother				
Farmer	129 (63.8)	84 (68.9)	45 (56.2)	0.074
Housewife	63 (31.2)	36 (29.5)	27 (33.8)	0.540
Private	10 (5.0)	2 (1.6)	8 (10.0)	0.015
Father				
Farmer	165 (81.7)	106 (86.9)	59 (73.8)	0.025
Private	19 (9.4)	10 (8.2)	9 (11.3)	0.470
Civil servant	18 (8.9)	6 (4.9)	12 (15.0)	0.021
Distance from the hospital				
<5 kilometers	58 (28.7)	31 (25.4%)	27 (33.8%)	
5-10 kilometers	116 (57.4)	71 (58.2%)	45 (56.3%)	0.290
>10 kilometers	28 (13.9)	20 (16.4%)	8 (10.0%)	
Previous hospital admissions				
Yes	148 (73.3)	105 (86.1)	43 (54.3)	<0.001
No	54 (26.7)	17 (13.9)	37 (45.7)	

BMI: Body Mass Index; SD: Standard Deviation

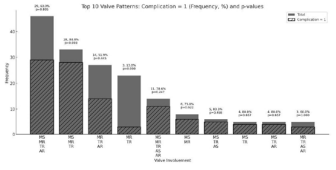


Figure 1: The 10 Most common Valve Patterns in RHD: Comparison Between Patients with and Without Complications

17517

TAKOTSUBO SYNDROME BEYOND THE ACUTE PHASE: HIGH IN-HOSPITAL BURDEN WITH FAVORABLE LONG-TERM OUTCOMES IN A CONTEMPORARY COHORT

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Background/Introduction: Takotsubo syndrome (TTS) is an acute, stress-induced cardiomyopathy that often mimics myocardial infarction. While short-term complications are well recognized, long-term prognosis and recurrence risk remain incompletely defined. Objectives: To characterize the clinical profile, in-hospital course, and long-term outcomes of patients with TTS in a real-world tertiary care setting. Methods: We conducted a retrospective cohort study including consecutive patients diagnosed with TTS between 2009 and 2026. Clinical, angiographic, in-hospital and long-term follow-up data were systematically collected. Results and Conclusions: Twenty-six patients were included, predominantly female (83%), with a mean age of 62 years. Hypertension (52%) and psychiatric comorbidities (17%) were frequent. Physical stress was the most common identifiable trigger (26%), although more than half of cases had no clear precipitating factor.Apical involvement predominated (90%), with heterogeneous distribution according to InterTAK classification.Despite the transient nature of TTS, the acute phase was marked by substantial clinical burden: 65% required intensive care, 38% vasoactive support, and 15% mechanical ventilation. Mechanical circulatory support was required in one case. One in-hospital death occurred, unrelated to cardiovascular causes.During long-term follow-up, no recurrences of TTS, myocardial infarction, coronary revascularization, or heart failure hospitalizations were observed. One patient developed ischemic stroke, and three died from non-cardiovascular causes.In this contemporary cohort, TTS was associated with high in-hospital morbidity but unexpectedly benign long-term cardiovascular outcomes, with no recurrence observed. These findings challenge the perception of TTS as a condition with significant late risk and underscore the importance of early recognition and supportive management during the acute phase as the key determinant of prognosis.

Clinical Outcomes (n = 26)

Outcome	Events, n/N (%)
MACCE	1/26 (3.8%)
Cardiovascular mortality	0/26 (0%)
Acute myocardial infarction	0/26 (0%)
Repeat revascularization (PCI or CABG)	0/26 (0%)
Stroke / transient ischemic attack	1/26 (3.8%)
Heart failure hospitalization	0/26 (0%)
Non-cardiovascular death	3/26 (11.5%)
All-cause mortality	3/26 (11.5%)
Takotsubo syndrome recurrence	0/26 (0%)

NURSING

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18639

DEVELOPMENT OF AN EDUCATIONAL VIDEO TO PROMOTE SELF-CARE IN PATIENTS WITH HEART FAILURE

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Background/Introduction: Digital health technologies play an important adjunctive role in the management of patients with heart failure, facilitating information sharing and enhancing patient–professional communication, which may contribute to improved self-care and early recognition of clinical deterioration. Objectives: To develop an educational video to support patients in recognizing the signs and symptoms of heart failure decompensation. Methods: This is a methodological development study guided by the ADDIE instructional design model (Analysis, Design, Development, Implementation, and Evaluation). A structured script and storyboard were developed to ensure content accuracy and facilitate visual planning. The video was produced using the Animaker® platform. The educational content focused on clinically relevant signs and symptoms of heart failure decompensation and incorporated a mnemonic strategy to enhance patient recall of those. This study was approved under the report nº 7.491.021, CAAE 86597825.3.0000.5327. Results and Conclusions: The final educational product is a 2.5-minute animated video designed to promote early recognition of heart failure decompensation. A color-coded mnemonic, “PISCA,” inspired by a traffic light system, was developed to categorize symptom severity and guide patient interpretation. Each letter represents a key clinical manifestation of heart failure. The integration of visual cues and simplified language aimed to improve health literacy and patient engagement. The developed video represents a feasible and potentially effective educational tool to support self-management in patients with heart failure. By facilitating early recognition of warning signs, it may contribute to timely patient-initiated contact with healthcare services and potentially reduce adverse outcomes related to delayed intervention.

16783

EFFECTIVENESS OF HOME-BASED CARDIAC REHABILITATION SUPERVISED BY HEALTHCARE PROFESSIONALS: A SYSTEMATIC REVIEW OF RANDOMIZED CONTROLLED TRIALS

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Background/Introduction: Cardiovascular diseases (CVDs) are the leading cause of global mortality, accounting for 17.9 million deaths annually, according to the World Health Organization (WHO). In Brazil, CVD-related expenditures may reach 0.7% of the Gross Domestic Product (GDP). Alignment with the Sustainable Development Goals (SDGs), particularly target 3.4, highlights the need for effective and cost-effective strategies to ensure continuity of care after hospital discharge. Home-based cardiac rehabilitation supervised by healthcare professionals emerges as a promising and accessible approach to expand access and improve adherence; however, its effectiveness compared to traditional models remains uncertain. Objectives: To evaluate the effectiveness of home-based cardiac rehabilitation supervised by healthcare professionals, compared with hospital- or center-based rehabilitation, in improving clinical outcomes and quality of life in patients with cardiovascular diseases. Methods: A systematic review was conducted in accordance with PRISMA guidelines, including randomized controlled trials on home-based cardiac rehabilitation published between 2000 and 2022. The search was systematically performed in MEDLINE/PubMed, Scopus, LILACS, SciELO, and Cochrane Library databases. Study selection was conducted independently by two reviewers, and methodological assessment was based on the PICOTT strategy. Outcomes included quality of life, functional capacity (peak VO□), hospital readmissions, and treatment adherence. Risk of bias was assessed using the RoB 2 tool, and quality of evidence was evaluated using the GRADE approach. Data extraction was also performed independently, and disagreements were resolved by consensus. Results and Conclusions: A total of 278 studies were identified, of which 15 randomized controlled trials were included in the analysis. Home-based cardiac rehabilitation supervised by healthcare professionals was found to be clinically equivalent to hospital-based programs, particularly regarding functional capacity and quality of life. It also showed a trend toward higher treatment adherence, without an increase in hospital readmissions. These findings suggest that the home-based model is a safe and effective alternative, with the potential to expand access to cardiovascular care, particularly in settings with geographic and structural barriers. Furthermore, this approach may contribute to improved quality of care and reduced clinical events, promoting a more comprehensive patient recovery.

18380

FUNCTIONAL DISABILITY AND THERAPEUTIC FOLLOW-UP BETWEEN TWO AND THREE YEARS AFTER ISCHEMIC STROKE

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Background/Introduction: Ischemic stroke (IS) is one of the leading causes of disability worldwide, requiring continuous therapeutic support to minimize sequelae and promote functional recovery. However, gaps remain in long-term follow-up, especially between two and three years after the event. Objectives: To analyze the association between received therapeutic support and the degree of functional disability between two and three years after IS, and to compare functional disability levels between 90 days and two to three years after the event. Methods: This prospective cohort included 155 IS survivors followed at a public hospital. Functional disability was assessed using the Modified Rankin Scale at 90 days and between two and three years, categorized as mild (0–2) and moderate to severe (3–5). Therapeutic support included secondary prevention and follow-up with healthcare professionals. Pearson's chi-square or Fisher's exact tests, odds ratios (OR) with 95% confidence intervals (95% CI), and McNemar's chi-square test were used. Statistical significance was set at 5% ($p<0.05$). Results and Conclusions: Between 90 days and two to three years after IS, transitions in functional disability levels were observed. Among initially asymptomatic individuals, 60.5% remained so, while 39.5% progressed to some degree of disability. Among those without significant disability, 17.6% became asymptomatic and 41.2% remained stable, while 41.2% worsened. Among those with mild disability, 66.7% improved, 22.2% remained unchanged, and 11.1% worsened. In moderate disability cases, 43.2% improved, 32.5% remained stable, and 24.3% worsened. Among those with moderately severe disability, 50% improved, 14.3% remained unchanged, and 35.7% worsened. Finally, among those with severe disability, 56.3% improved and 43.7% remained unchanged. Despite these variations, no statistically significant change in functional disability was observed over time ($p=0.6219$). Access to therapeutic support was limited and unequal: 56.6% had neurologist consultations, 45.8% received physiotherapy, and only 15% had nursing follow-up, while 53.6% reported secondary prevention. The association between therapeutic support and disability showed higher odds of moderate to severe disability among individuals followed by a physiotherapist (OR=3.34; 95% CI 1.63–6.89), with no significant association for other variables, suggesting severity bias in access to care. Gaps in support persist after IS despite disability; continuous multidisciplinary follow-up is essential for recovery

18156

PREVALENCE AND CHARACTERISTICS OF PATIENTS WITH CHRONIC CHAGAS DISEASE AND METABOLIC SYNDROME

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Background/Introduction: Chagas disease (CD) remains an important public health problem, with an estimated 6 to 7 million people infected worldwide, mainly in Latin America. In Brazil, millions of individuals live with the chronic form, whose main manifestation is Chagas cardiomyopathy, responsible for high morbidity and mortality. Metabolic Syndrome (MetS), in turn, has a high global prevalence, affecting approximately 30% to 40% of the adult population. The coexistence between CD and MetS has progressively increased and may worsen cardiovascular prognosis due to shared pathophysiological mechanisms such as chronic inflammation and metabolic dysfunction, although this interaction is not yet fully elucidated. Objectives: To describe the prevalence and characteristics of patients with chronic CD associated with the diagnosis of MetS. Methods: This is an analytical and exploratory cross-sectional study, with retrospective analysis of patients treated at the Chagas Disease Outpatient Clinic located in Montes Claros, MG, an endemic region for CD. MetS was defined according to the NCEP-ATP III criteria. Sociodemographic, clinical, and anthropometric variables were analyzed. Results and Conclusions: A total of 369 individuals with chronic CD were evaluated, of whom 18.4% had MetS. The sample was predominantly composed of women (61.5%), individuals of brown or black race/color (84.6%), and aged up to 59 years (50.7%). Regarding clinical variables, most participants presented overweight/obesity (53.3%), were hypertensive (60.6%), used antihypertensive medications (67.4%), were not diabetic (83.7%), presented the cardiac clinical form (57.5%), reported previous use of benznidazole (65.3%), did not have pacemaker or ICD implantation (91.7%), and had preserved ejection fraction (76.7%). In the bivariate analysis, the variables statistically associated with the presence of MetS were age ($p=0.011$), BMI ($p=0.056$), hypertension ($p=0.003$), and diabetes ($p<0.001$). These findings highlight the interaction between aging and metabolic alterations as determinants of cardiometabolic risk in patients with CD.

20032

TEACHING ELECTROCARDIOGRAPHY TO NURSING RESIDENTS: A QUASI-EXPERIMENTAL STUDY

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Background/Introduction: The 12-lead electrocardiogram (ECG) is an essential examination in clinical practice, and it is crucial for nurses to develop interpretive skills in order to contribute to the early diagnosis of cardiovascular events. Objectives: The objective of this study was to compare the knowledge gain of nursing residents in adult ECG interpretation using two distinct educational approaches: active methodology and traditional teaching. Methods: This is an interventional, quantitative study with a quasi-experimental, pre- and post-test design, guided by the TREND Statement. Seventeen first-year nursing residents from uni-professional and multi-professional programs participated. Assessment was conducted using the "Questionnaire for Assessing Nurses' Knowledge of Electrocardiography" (QVCEE), validated in Brazil. Nursing residents were divided into two groups (exposure group and control group). In both groups, the QVCEE questionnaire will be administered at two time points: (1) before the intervention (pre-test) and (2) after the intervention (post-test), with the aim of measuring participants' knowledge. In the exposure group, a dialogic expository lecture was conducted, followed by a practical workshop on ECG interpretation. In contrast, the control group received a traditional expository lecture. Results and Conclusions: Analyses were performed using GraphPad Prism software, adopting a significance level of $p < 0.05$. The groups showed no significant difference in the pre-test ($p = 0.139$) or in the delta of correct answers ($p = 0.48$). However, the group exposed to the active methodology achieved a higher mean score in the post-test (19.38 ± 1.4) compared to the traditional group (17.56 ± 1.94), with statistical significance ($p = 0.04$). Overall, both methods resulted in a substantial increase in mean scores, rising from 15.47 ± 1.70 to 18.41 ± 1.91 ($p < 0.0001$). It is concluded that structured educational interventions, regardless of the approach, promote significant improvement in residents' knowledge. However, active methodologies demonstrated a tendency toward superior performance, indicating potential to enhance clinical reasoning and foster more effective learning in ECG education.

Comparison of the Number of Correct Answers After the Class Between Teaching Groups

Group	Total (n = 17)	Mean ± SD
Traditional Methodology	9	17.56 ± 1.94
Active Methodology	8	19.38 ± 1.4
p-value		*0.04*

Paired t-test.
SD: standard deviation.
Significance level adopted: $p < 0.05$.

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Paired t-test.
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20990

VALIDATION OF AN EDUCATIONAL VIDEO SCRIPT ON SELF-CARE FOR PEOPLE WITH VENOUS ULCERS

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Background/Introduction: Venous ulcers represent the most severe manifestation of chronic venous insufficiency and constitute an important public health problem due to their high prevalence, recurrence, and socioeconomic impact. In addition to physical limitations, these lesions negatively affect quality of life, autonomy, and work capacity. In this context, self-care plays a fundamental role in the healing process and prevention of complications, involving adherence to compression therapy, wound care, adequate nutrition, and lifestyle changes. Educational technologies have been increasingly used in health education, promoting patient empowerment and active participation in treatment. However, there is still a scarcity of educational materials specifically designed for individuals with venous ulcers. Objectives: To validate the content of an educational video script on self-care for people with venous ulcers through evaluation by expert judges. Methods: This is a methodological study focused on the content validation stage. The video script was developed based on an integrative literature review and structured into 10 sections related to self-care in venous ulcers. Fourteen expert judges participated in the study, all of whom were nurses with experience in enterostomal therapy and wound care. Validation was conducted virtually using an instrument composed of a Likert scale divided into the following domains: objectives, structure and presentation, relevance, and effectiveness. Quantitative analysis was performed using the Content Validity Index (CVI), considering the material validated when CVI ≥ 80%. Qualitative suggestions provided by the specialists were incorporated into the final version of the script. Results and Conclusions: The script achieved an overall Content Validity Index of 84%, demonstrating a satisfactory level of agreement among the specialists. The main suggestions involved adjustments to technical terminology, reorganization of the content sequence, and simplification of language to improve understanding by the target audience. The validation of the script strengthens the development of educational technologies focused on self-care and may contribute to improved treatment adherence, patient autonomy, and quality of life among individuals with venous ulcers. It is concluded that the script presents valid and appropriate content to support the production of an educational health video.

Nutrition



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20840

BEYOND TRADITIONAL RISK STRATIFICATION IN HEART FAILURE: SIMPLE DIETARY MARKERS AS INDEPENDENT PREDICTORS OF ALL-CAUSE AND HEART FAILURE HOSPITALIZATION

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Background/Introduction: Heart failure (HF) is a complex syndrome in which clinical outcomes are influenced by multiple biological and functional domains beyond traditional disease severity measures. Nutritional status and simple dietary behavior indicators are often overlooked in routine HF assessment and their prognostic role in HF remains underexplored. Objectives: To evaluate the association between simple markers of nutritional intake, specifically reduced food intake and daily meal frequency, and the risk of hospitalization (all-cause and HF), as well as their incremental prognostic value in stable HF patients. Methods: This was a prospective cohort study including adult outpatients with stable HF. Reduced food intake was evaluated by self-reported unintentional decrease over the previous 3 months, and the number of meals per day was categorized as 1–2 meals/day vs. >3 meals/day. Outcomes (all-cause and HF hospitalizations) were monitored every six months via structured telephone interviews and confirmed by medical records. Patients were censored at the time of outcome occurrence, heart transplantation or end of follow-up period. Adjusted Cox models estimated HRs (95% CI), with discrimination assessed by the C-statistic (area under the ROC curve). Results and Conclusions: A total of 264 individuals were included (mean age 56.5±12.7 years; 67.4% male; body mass index 28.7±4.9 kg/m²). Most were in New York Heart Association functional class I–II (78.5%), with a mean left ventricular ejection fraction of 33.5±12.8%. Ischemic etiology accounted for 27.2%. Over a median follow-up of 24 months, 89 hospitalizations occurred, 40 of which were due to HF. In multivariable analysis, reduced food intake was independently associated with a 78% increased risk of all-cause hospitalization (HR 1.78; 95% CI 1.09–2.91), increasing the model's C-statistic from 0.679 to 0.695. Similarly, consuming 1–2 meals per day was associated with an approximately three-fold higher risk of HF hospitalization (HR 2.93; 95% CI 1.38–6.20) increasing the C-statistic from 0.702 to 0.756, indicating incremental prognostic value. Simple, easily obtainable markers of nutritional vulnerability, such as reduced intake and low meal frequency, predict hospitalization in stable HF. These findings suggest that incorporating basic dietary screening into routine clinical practice can enhance risk stratification without additional costs.

15885

CARDIOMETABOLIC RISK FACTORS AT BREAST CANCER DIAGNOSIS IS ASSOCIATED WITH MORTALITY IN WOMEN UNDERGOING DOXORUBICIN CHEMOTHERAPY

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Background/Introduction: Treatment with doxorubicin (DOX) is associated with cardiotoxic effects that may increase mortality in breast cancer (BC) patients, related to cumulative dose and pre-existing cardiovascular risk factors. Objectives: To investigate the association between cardiometabolic and lifestyle risk factors at BC diagnosis under DOX treatment and BC mortality in women with a mean follow-up of 646 days. Methods: A total of 129 women with BC without distant metastasis were included, with a mean age of 47.2 years. Of these, 59.4% were premenopausal. Most had T2 tumors (2–5 cm, 38.1%) and N1 lymph node involvement (45.3%). Traditional lipid profile [TC, HDL-c, LDL-c, TG] was assessed enzymatically, and HDL and LDL subfractions were determined using the Lipoprint® system. Results and Conclusions: No differences were observed between the death group (n=9) and survivors (n=120) for obesity (55.6% vs. 40.8%; p=0.49), hypertension (11.1% vs. 26.1%; p=0.45) or diabetes (11.1% vs. 7.6%; p=0.53). None had cardiovascular disease. Traditional lipid parameters were similar: TC (197.6 vs. 194.8 mg/dL; p=0.82), LDL-c (104.2 vs. 97.6 mg/dL; p=0.48), HDL-c (51.6 vs. 47.5 mg/dL; p=0.43), TG (169.6 vs. 144.5 mg/dL; p=0.33). However, large HDL (HDL-2) were reduced in the death group (3.37±1.19 vs. 5.11±2.46 mg/dL; p=0.026). All patients who died had a total large HDL (HDL-1 to HDL-3) below p50 (12.05 mg/dL), while none above this threshold died (p=0.01). Lower total large HDL was associated with reduced survival (median follow-up 949 vs. 1073 days; log-rank p=0.02). Large LDL (LDL-1) levels were also lower in the death group (9.32±4.87 vs. 14.57±7.47 mg/dL; p=0.047). These differences in lipoprotein subfractions suggest a more atherogenic profile, which may contribute to cardiotoxic events. Regarding lifestyle factors, smoking was not associated with outcomes (22.2% vs. 35.8%; p=0.49), but alcohol consumption was more frequent in the death group (100% vs. 58.3%; p=0.01) and associated with lower survival (median follow-up 1006 vs. 1073 days; log-rank p=0.043). These findings suggest that more atherogenic lipoprotein subfractions, beyond the conventional lipid profile and, alcohol consumption, may reduce survival in BC patients treated with DOX. Although preliminary, these data identify potential lipid biomarkers and lifestyle factors that may help in the early identification of vulnerable patients, supporting future investigations.

17965

DHA-ENRICHED KETOGENIC DIET INCREASES AKKERMANSIA AND IS ASSOCIATED WITH ENHANCED POLYUNSATURATED FATTY ACID INCORPORATION IN ERYTHROCYTE MEMBRANES

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Background/Introduction: Background: The gut microbiota plays a key role in lipid metabolism, and dietary fat quality modulates this interaction. The genus Akkermansia has been linked to beneficial metabolic profiles; however, it remains unclear how ketogenic diets differing in lipid composition affect its abundance and its relationship with erythrocyte fatty acid incorporation. Objectives: Objective: To assess the impact of ketogenic diets with different lipid compositions on Akkermansia abundance and its association with erythrocyte fatty acid profiles. Methods: Methods: Male Wistar rats (200–250 g, ~7 weeks old) were assigned for 75 days to standard diet (SD, n=6; AIN-93G), classic ketogenic diet (CKD, n=6; ~90% fat, rich in saturated fatty acids), or modified ketogenic diet (MKD, n=6; ~90% fat, rich in DHA, 1.8 g/kg). Erythrocyte membrane fatty acids were analyzed by gas chromatography. Gut microbiota was assessed from fecal samples using 16S rRNA gene sequencing. Results and Conclusions: Results: α-diversity differed across groups, with higher richness in CKD vs. SD and greater diversity (Shannon) in CKD and MKD vs. SD. β-diversity analysis showed distinct microbial structures ($p<0.05$), with MKD presenting the most distinct profile. Akkermansia was enriched in MKD and exhibited strong positive correlations ($r>0.80$, $p<0.001$) with polyunsaturated fatty acids, particularly omega-3 fatty acids (α-linolenic acid, EPA, DHA) and the omega-3 index in erythrocyte membranes. Positive associations were also observed with omega-6 fatty acids, including linoleic ($r=0.90$) and γ-linolenic acids ($r=0.96$), whereas strong negative correlations were found with arachidonic acid ($r=-0.93$) and the omega-6/omega-3 ratio ($r=-0.91$) (all $p<0.001$). Conclusion: Ketogenic diets modulate Akkermansia in a lipid-dependent manner. A DHA-enriched ketogenic diet increases Akkermansia and is associated with greater incorporation of polyunsaturated fatty acids into erythrocyte membranes, suggesting a link between dietary fat quality, microbiota, and lipid metabolism relevant to cardiometabolic health.

18078

NATTOKINASE SUPPLEMENTATION AS A STRATEGY FOR MANAGING LIPID PROFILE AND INFLAMMATORY LEVELS IN PATIENTS WITH DYSLIPIDEMIA

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Background/Introduction: Nattokinase is an enzyme from Natto, a traditional Japanese food made from fermented soybeans, that has been recognized for its direct fibrinolytic, antithrombotic, anticoagulant, and cardioprotective activities, potentially contributing to a reduced risk of certain cardiovascular diseases1. Objectives: This study aimed to evaluate the effects of nattokinase supplementation on inflammatory markers and cardiovascular risk parameters in participants with dyslipidemia Methods: This was a longitudinal, randomized, double-blind clinical trial. Participants received one capsule per day containing 100 mg of nattokinase standardized to 2,000 fibrinolytic units (FU) for 2 months, while the placebo group received an identical capsule containing cornstarch, administered at the same time of day. Dietary intake, blood pressure, and anthropometric parameters, as well as plasma levels of C-reactive protein and fibrinogen, were assessed at baseline and at the end of the intervention. Results and Conclusions: 52 patients completed the study: 27 in the nattokinase group (49.37 ± 14.91 years, 18 women, BMI: 28.80 ± 4.26 kg/m²) and 25 in the placebo group (49.56 ± 13.17 years, 22 women, BMI: 27.32 ± 4.04 kg/m²). The results of the lipid profile are shown in Table 1. The data showed a reduction in LDL levels in the nattokinase group ($p = 0.030$) and a trend toward decreased non-HDL cholesterol levels ($p = 0.087$). In the placebo group, reductions in total cholesterol ($p=0.041$) and HDL cholesterol ($p=0.009$) were observed, with no change in non-HDL cholesterol ($p=0.191$). There was also a trend towards increased levels of fibrinogen (pre: 292.27 ± 74.826; post: 324.00 ± 81.975; $p = 0.09$) and C-reactive protein (CRP) ($p = 0.06$), which was not observed in the nattokinase group ($p = 0.67$). Nattokinase supplementation may be a useful strategy for managing lipid profile and inflammatory status in patients with dyslipidemia.

Table 1: Lipidic profile in patients with dyslipidemia in nattokinase and placebo groups.

Parameters	Nattokinase (n=27)			Placebo (n=25)		
	Baseline	After	*p*-value	Baseline	After	*p*-value
Total Cholesterol (mg/dL)	228.67±39.48	218.00±38.13	0.089	234.96± 41.10	219.00±34.86	**0.041**
LDL (mg/dL)	150.04±35.29	138.78±34.69	**0.030**	148.28±38.10	138.68±31.75	0.181
HDL (mg/dL)	50.85 ± 11.78	49.56±12.55	0.115	56.52±16.49	51.36±14.29	**0.009**
Non-HDL Cholesterol (mg/dL)	177.70 ± 41.17	167.41 ± 42.84	0.087	180.72±44.91	170.08±36.41	0.191
Tryglicerides (mg/dL)	152.04±83.13	167.19±114.90	0.198	170.08±82.35	182.92±99.14	0.232

19411

RELATIONSHIP BETWEEN SERUM MAGNESIUM, BICEPS BRACHII AND RECTUS FEMORIS MUSCLE THICKNESS, AND HANDGRIP STRENGTH IN HOSPITALIZED PATIENTS WITH DECOMPENSATED HEART FAILURE

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Background/Introduction: Hospitalization for decompensated heart failure (DHF) is associated with muscle wasting, micronutrient deficiencies, and reduced functional capacity. Magnesium is an essential micronutrient involved in muscle metabolism and electrolyte balance and is frequently depleted in cardiac patients. However, its relationship with muscle-related parameters has not been fully elucidated in patients with DHF. Objectives: To investigate the association between serum magnesium levels and muscle-related parameters, including ultrasound-derived muscle thickness of the biceps brachii (BB) and rectus femoris (RF), and handgrip strength (HGS), in patients hospitalized with DHF, stratified by sex. Methods: Cross-sectional study including 44 patients (≥20 years, both sexes) hospitalized for DHF in a private hospital. Muscle thickness and subcutaneous fat were assessed by ultrasound (Vivid S6, GE Healthcare®; linear transducer L6-12-RS) at standardized sites (BB and RF). HGS was measured using a Jamar® dynamometer (dominant hand; three attempts; highest value recorded). Serum magnesium levels were obtained after a 12-hour fast. All assessments were performed within the first 48 hours of hospitalization. Statistical analyses were performed using Kolmogorov-Smirnov or Mann-Whitney tests, and Pearson or Spearman correlation tests, as appropriate ($p<0.05$). The study was approved by the Research Ethics Committees. Results and Conclusions: Of the 44 patients, 29 (65.9%) were male and 15 (34.1%) female. Men had greater RF muscle thickness (2.5 mm; $p=0.013$), less subcutaneous fat at the RF site ($p=0.0005$), and higher HGS (27.6 kgf; $p<0.0001$). Serum magnesium levels were similar between sexes (1.9 mg/dL). In men, BB and RF muscle thickness were positively correlated with HGS ($p=0.008$ and $p=0.001$). In women, BB thickness, RF thickness, and subcutaneous fat were positively correlated with serum magnesium levels ($p=0.015$, $p=0.001$, and $p<0.001$). Serum magnesium was associated with muscle-related parameters in a sex-specific manner in patients with DHF. These findings suggest that magnesium may play a role in muscle composition and function, with potential implications for nutritional and functional assessment in this population.

15744

ROYAL JELLY SUPPLEMENTATION INCREASES NRF2 GENE EXPRESSION IN HYPERTENSIVE PATIENTS: A PRELIMINARY CLINICAL TRIAL

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Background/Introduction: Hypertension is a major global health concern and a leading risk factor for cardiovascular disease, closely associated with chronic inflammation and oxidative stress. The nuclear factor erythroid 2–related factor 2 (Nrf2) is a key regulator of antioxidant defense and redox balance, with an important role in vascular protection. Royal jelly (RJ) has been described as a bioactive compound with antioxidant and anti-inflammatory properties, however, clinical evidence in humans remains limited. Objectives: To evaluate the effects of royal jelly supplementation on oxidative stress and inflammatory markers in patients with hypertension. Methods: This was a preliminary, randomized, double-blind, placebo-controlled clinical trial with hypertensive adult patients. Participants received either royal jelly (300 mg/day) or a placebo for 8 weeks. Clinical, anthropometric, and biochemical parameters were assessed at baseline and post-intervention. Nrf2 mRNA expression was quantified by quantitative real-time PCR (qPCR) in peripheral blood mononuclear cells (PBMCs) and normalized from the GAPDH reference gene using the ΔΔCt method. Lipid peroxidation was assessed by measuring thiobarbituric acid reactive substances (TBARS), including malondialdehyde (MDA). Results and Conclusions: 31 patients completed the study: 18 in the RJ group (62.5 ± 8.3 years, 13 women, BMI: 30.6 ± 6.2 kg/m²) and 13 in the placebo group (58.5 ± 12.3 years, 9 women, BMI: 27.7 ± 5.6 kg/m²). Baseline characteristics were comparable between groups. A significant increase in Nrf2 gene expression was observed in the RJ group ($p = 0.024$), whereas no change was observed in the placebo group. No significant changes were observed in lipid profile, glycemic parameters, inflammatory markers, anthropometric measures, or blood pressure. No differences between groups were found at the end of the intervention (Δ). However, the change in Nrf2 levels tended to be greater in the RJ group compared to placebo ($p = 0.056$). These results suggest that RJ may modulate the expression levels of NRF2 in hypertensive patients.

Table 1: Nrf2 mRNA expression, MDA and plasma levels of CRP of hypertensive patients in royal jelly and placebo groups.

Parameters	Royal Jelly (n=18)			Placebo (n=13)		
	Baseline	After	*p*-value	Baseline	After	*p*-value
Nrf2 (a.u)*	0.9 ± 0.24	1.36 ± 0.49	0.024	1.01 ± 0.19	1.02 ± 0.23	0.935
MDA (nmol/mL)	2.18 ± 1.18	2.94 ± 1.58	0.102	2.8 ± 2.19	3.0 ± 1.57	0.796
hs-CRP (mg/dL)	0.26 ± 0.24	0.31 ± 0.51	0.444	0.25 ± 0.36	0.29 ± 0.46	0.358

*The gene expression analysis included 8 patients in the royal jelly group and 7 patients in the placebo group, Arbitrary unit - a.u.
MDA = malondylaldehyde; hs-CRP = high sensitivity C-reactive protein

Pericardium / Endocardium / Valvular Heart Disease / Aortic Diseases



81º CONGRESSO BRASILEIRO DE CARDIOLOGIA together with WORLD CONGRESS OF CARDIOLOGY





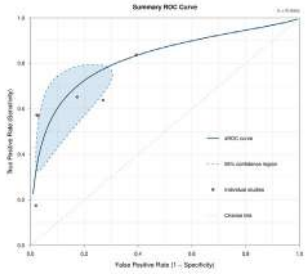
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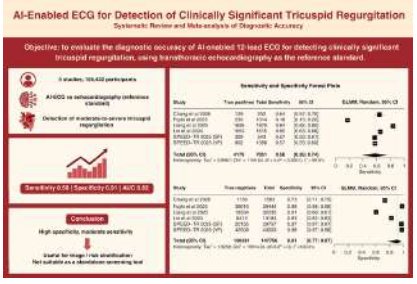
ARTIFICIAL INTELLIGENCE-ENABLED ELECTROCARDIOGRAPHY FOR THE DETECTION OF MODERATE-TO-SEVERE TRICUSPID REGURGITATION: A SYSTEMATIC REVIEW AND META-ANALYSIS OF DIAGNOSTIC ACCURACY

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Background/Introduction: Tricuspid regurgitation (TR) is a common valvular heart disease associated with adverse outcomes but frequently remains underdiagnosed, as diagnosis relies on echocardiography, requiring specialized equipment and expertise and typically performed only when disease is clinically suspected. Artificial intelligence–enabled electrocardiography (AI-ECG) has emerged as a potential tool for identifying structural heart disease using widely available data. Objectives: To evaluate the diagnostic accuracy of AI models applied to 12-lead ECG recordings for detecting clinically significant TR. Methods: We performed a systematic review and diagnostic test accuracy meta-analysis in accordance with PRISMA-DTA. PubMed, Embase, and CENTRAL were searched through February 2026 for retrospective studies evaluating deep learning–based 12-lead electrocardiographic models for the detection of clinically significant tricuspid regurgitation, using transthoracic echocardiography as the reference standard. Risk of bias and applicability were assessed with QUADAS-3, and pooled sensitivity and specificity were estimated using a bivariate random-effects model. Results and Conclusions: Five studies comprising 156,432 participants were included, of whom 7,050 had clinically significant tricuspid regurgitation. Across studies, sensitivity ranged from 0.18 to 0.84 and specificity from 0.61 to 0.98. The pooled sensitivity was 0.58 (95% CI, 0.39–0.74) and specificity was 0.91 (95% CI, 0.77–0.97), with an area under the summary receiver operating characteristic curve of 0.82, indicating good overall discriminatory performance. Substantial heterogeneity was observed (I^2 = 99.6% for sensitivity and 100% for specificity), with a strong threshold effect (ρ = 0.89, P = 0.019), suggesting that differences in decision thresholds contributed to variability in diagnostic accuracy. Overall, risk of bias was low, although 1 study showed high risk in the analysis domain due to pair-level rather than participant-level analysis, and 1 study had unclear risk in the index test and target condition domains. These findings indicate that AI-enabled electrocardiography demonstrates high specificity but moderate sensitivity for detecting clinically significant tricuspid regurgitation, supporting its role as an opportunistic risk stratification or pre-echocardiographic triage tool within cardiology workflows rather than as a standalone screening modality.





19948

BEYOND THE SCORE: IMPROVING MORTALITY PREDICTION IN INFECTIVE ENDOCARDITIS

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Background/Introduction: Infective endocarditis (IE) has an increasing incidence despite advances in diagnosis and remains associated with high morbidity and mortality. Several risk scores, including PALSUSE and modified AEPEI, have been developed to predict mortality; however, their performance remains suboptimal. Objectives: To compare the prognostic performance of AEPEI and PALSUSE and assess whether multivariable models improve mortality prediction in IE. Methods: We conducted a retrospective single-center cohort study including patients hospitalized with IE between January 2017 and October 2025. The predictive performance of AEPEI and PALSUSE, and their corresponding multivariable logistic regression models, was evaluated at four time points: in-hospital, 1 month, 6 months, and 12 months. Discrimination was assessed using receiver operating characteristic curves and area under the curve (AUC). Multivariable models incorporated each score with clinical covariates (age, sex, body mass index, immunosuppression, prosthetic material, and diabetes). Results and Conclusions: A total of 184 patients were included; 72.3% were male, with a mean age of 70.2 ± 12.5 years. AEPEI was significantly associated with mortality at all time points (p=0.001), with modest discrimination (AUC 0.678–0.684). PALSUSE was not significant at 6 and 12 months but was associated with in-hospital and 1-month mortality. After multivariable adjustment, discrimination improved for both scores. AEPEI achieved AUCs of 0.787, 0.785, 0.797, and 0.793, while PALSUSE achieved 0.772, 0.764, 0.776, and 0.769, for the respective time points. AEPEI and PALSUSE show limited discrimination when used alone. Integration into multivariable models significantly improves prognostic performance across all time points, supporting the use of combined clinical models over isolated risk scores in IE.

20984

DISTINCT VALVULAR PHENOTYPES IN RHEUMATIC HEART DISEASE WITH AND WITHOUT PRIOR ACUTE RHEUMATIC FEVER DIAGNOSIS

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Background/Introduction: A substantial proportion of patients with rheumatic heart disease lack a documented history of acute rheumatic fever, with more than half having no prior diagnosis in childhood. This suggests unrecognized subclinical carditis, which may progress and manifest as distinct patterns of valvular disease in the chronic phase. Objectives: To evaluate whether the absence of a documented history of acute rheumatic fever influences is associated with distinct patterns of valvular involvement in chronic rheumatic heart disease. Methods: This retrospective study included 393 adult patients with rheumatic heart disease from a tertiary referral center. Patients were stratified according to the presence or absence of prior acute rheumatic fever. Significant valvular lesions were defined based on standardized echocardiographic criteria. A phenotypic classification was developed using five mutually exclusive patterns: no significant lesion, isolated mitral stenosis, isolated mitral regurgitation, mixed mitral valve disease, and aortic or multivalvular involvement. Associations between acute rheumatic fever history and phenotypic distribution were analyzed. Results and Conclusions: Among the included patients, 165 (42%) had a history of acute rheumatic fever. Baseline characteristics were similar between groups (table 1). Patients without prior acute rheumatic fever more frequently exhibited isolated mitral stenosis (66.2% vs 47.3%; p < 0.001), (table 2). In contrast, patients with prior acute rheumatic fever demonstrated greater structural complexity, including a higher prevalence of moderate-to-severe mitral regurgitation (16% vs 7%; p = 0.010), aortic regurgitation (10% vs 4%; p = 0.024), and aortic stenosis (19% vs 10%; p = 0.009). The aortic or multivalvular phenotype was significantly more frequent in this group (20.0% vs 8.3%; p = 0.001; OR ≈ 2.75). Overall, phenotypic distribution differed significantly between groups (p = 0.001). These findings suggest that prior acute rheumatic fever is associated with greater valvular complexity, whereas its absence may reflect subclinical carditis with a more indolent disease course. A phenotypic approach may enhance disease characterization and risk stratification and may support earlier echocardiographic surveillance in patients without documented acute rheumatic fever.

Table 1: Baseline characteristics of the study population according to ARF diagnosis

Baselines values		Without (n=228)	With (n=165)	p value
Age (years)		48.8 ± 12.5	46.7 ± 12.1	0.114
Female		194 (85)	128 (77)	0.056
NYHA class	I-II	145 (65)	110 (64)	0.673
	III-IV	82 (36)	56 (34)	
Chest Pain		83 (36)	63 (38)	0.741
Right-sided heart Failure		48 (21)	41 (24)	0.502
Stroke		44 (19)	18 (11)	**0.037**
Diabetes		10 (4)	8 (5)	0.829
Hypertension		74 (33)	51 (31)	0.745
Heart rate (bpm)		71.2 ± 14.6	70.1 ± 13.3	0.499
Systolic blood pressure (mmHg)		118 ± 16.2	118 ± 19.1	0.986
Diastolic blood pressure (mmHg)		76 ± 10.5	74 ± 12.3	0.121
Atrial Fibrillation (ECG)		68 (30)	53 (32)	0.550
Diuretics		151 (66)	107 (65)	0.894
Beta-blockers		181 (79)	117 (71)	0.085
Digitalis		24 (10)	24 (15)	0.229
ACE Inhibitors/BRAs		219 (96)	156 (95)	0.810
Anticoagulants		96 (42)	70 (43)	0.813
Calcium Channel blockes		18 (8)	12 (7)	0.976
Antiplatelet		30 (9)	6 (4)	0.064
Benzathine penicillin		49 (21)	55 (34)	**0.007**

Table 2. Distribution of Valvular Phenotypic Patterns According to ARF Diagnosis

Valvular Phenotype	Non-ARF (n = 228)	ARF (n = 165)	p-value
No severe valvular lesion	43 (18.9%)	33 (20.0%)	0.79
Isolated mitral stenosis	151 (66.2%)	78 (47.3%)	**<0.001**
Isolated mitral regurgitation	9 (3.9%)	13 (7.9%)	0.09
Mixed mitral lesion	6 (2.6%)	8 (4.8%)	0.25
Aortic involvement or multivalvular significant disease	19 (8.3%)	33 (20.0%)	**0.001**
Global p-value (χ^2 test)			**<0.001**

15751

INFECTIONS RELATED TO CARDIAC IMPLANTABLE ELECTRONIC DEVICES: CLINICAL AND MICROBIOLOGICAL ANALYSIS IN A TERTIARY CENTER

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Background/Introduction: Infections related to cardiac implantable electronic devices (CIEDs) are significant complications in contemporary cardiology, with increasing incidence due to population aging, a higher comorbidity burden, and growing procedural complexity. These infections are associated with high morbidity and mortality, especially in infective endocarditis. Despite therapeutic advances, the global incidence of CIED infections has increased by more than 200% in the last 16 years, reflecting the complexity of treated cardiac conditions and the risks associated with invasive devices. Objectives: To describe the epidemiological, clinical, and microbiological characteristics of CIED-related infections in a tertiary cardiology center, identifying risk factors and clinical outcomes. Methods: An observational, retrospective, cross-sectional study was conducted at a tertiary cardiology center in Pernambuco, Brazil, between January and November 2024. Patients ≥ 18 years old with CIEDs admitted with infection defined by clinical, microbiological, and imaging criteria were included. Cases were classified as pocket infection or device endocarditis. Epidemiological and clinical variables, device type, and etiological agents were collected. Descriptive analysis was presented in absolute and relative frequencies, and associations with prolonged hospitalization (>42 days) and mortality were analyzed using Fisher's exact test. Results and Conclusions: Seventeen patients were included, with a predominance of males (70.6%) and a mean age of 67.1 ± 15.2 years. Hypertension (70.6%) and renal insufficiency (41.2%) were the most frequent comorbidities. Dual-chamber pacemakers were the most common device (76.4%). Pocket infection occurred in 58.8% and endocarditis in 41.2%. The main antecedents were prior hospitalizations (88.2%) and generator replacement (52.9%). Microbiological analysis (n=16) revealed bacterial growth in 50%, with Staphylococcus aureus (18.8%) and coagulase-negative staphylococci (25%) being the most frequent. Notably, fungal infections were found in 25% of cases, with Candida parapsilosis (18.8%) as the most prevalent agent. Most patients (88.2%) underwent system removal. The mean hospital stay was 52.4 ± 34.8 days, with 41.2% mortality. Endocarditis was the condition most associated with death (71.4% of deaths, p=0.058). The high mortality, particularly in endocarditis cases, highlights the severity of CIED infections and the need for effective prevention, early diagnosis, and timely management.

19084

LATE ONSET PROSTHETIC VALVE ENDOCARDITIS: RISK FACTORS ASSOCIATED WITH MORTALITY

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Background/Introduction: Late prosthetic valve infective endocarditis (LPVIE) is a challenging condition associated with high mortality; however, it remains understudied. This study aimed to assess the epidemiological, clinical, microbiological, imaging features, in-hospital mortality, and associated risk factors of LPVIE. Objectives: This study focused on patients diagnosed with late prosthetic valve infective endocarditis (LPVIE) at two leading Brazilian cardiology centres. It aimed to (1) assess the epidemiological, clinical, microbiological and imaging features and in-hospital outcomes of these patients and (2) describe the factors associated with in-hospital death. Methods: We conducted an observational study of LPVIE cases recorded between 2006 and 2023 at two cardiac surgery centres in Brazil. Data were obtained from prospective databases and medical record reviews. Patients aged ≥ 18 years with a definite diagnosis of LPVIE according to the modified Duke criteria were included. Results and Conclusions: Results: A total of 394 episodes were analysed, 63.2% of which affected males. The mean age was 54.8 ± 17.39 years. Predisposing conditions included poor dental health (55.4%), previous IE (22.6%) and recent vascular access (9.6%). Fever (77.9%) was the most common finding. Embolisation occurred in 20.6% of patients. Vegetations were present in 49.1% and paravalvular abscesses in 20.6% of patients. Blood cultures were negative in 21.12%. Surgery was indicated in 68.5% of cases and performed in 81.9%. The in-hospital mortality rate was 31%. Multivariate analysis demonstrated an association between mortality and acute renal failure, OR 44.65 (95% CI 18.63–106.99; p < 0.01); intracardiac fistulae, OR 11.31 (95% CI 1.26–101.32; p = 0.030); myocardial/paravalvular abscesses, OR 2.90 (95% CI 1.10–7.65; p = 0.031); hospital transfer, OR 3.90 (95% CI 1.43–10.63; p = 0.008); and failure to undergo surgery when indicated, OR 10.21 (95% CI 2.87–36.36; p < 0.001). Conclusion: LPVIE was associated with high in-hospital mortality and complications. Acute kidney injury, structural complications, prior hospital transfer and failure to undergo surgery when indicated were associated with an increased risk of death. These findings highlight the importance of early identification of structural complications and timely surgical assessment.

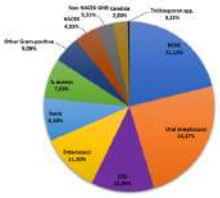


Figure 1 – Etiologic agents in 394 cases of LPVIE in adults, 2006-2023. BCNE: blood culture-negative endocarditis. CNS: coagulase negative staphylococci. *bovis*: group bovis streptococci. *S. aureus*: *Staphylococcus aureus*. Other Gram-positive: *Listeria monocytogenes* (5); group B streptococci (4); *Abiotrophi adjacens* (3); *Neisseria gonorrhoae* (2); *Abiotrophia defectiva* (1); *Corynebacterium diphtheriae* (1); *Gemella morbillorum* (1); *Granulicatella* spp. (1); *Streptococcus pneumoniae* (1); *Streptococcus pyogenes* (1); HACEK, *Haemophilus* spp; *Aggregatibacter* spp.; *Cardiobacterium hominis*; *Eikenella corrodens* e *Kingella* spp. Non HACEK GNB: Non-HACEK Gram-negative bacilli; *Enterobacter cloacae* (3); *Pseudomonas aeruginosa* (2); *Salmonella enteritidis* (2); *Acinetobacter* spp (1); *Achromobacter denitrificans* (1); *Proteus mirabilis* (1); * *Bartonella* (7: serology); *Coxiella* (5: four trough serology and one valve PCR); Non-HACEK Gram-negative bacilli (1: valve PCR). Other Gram-positive (1: valve PCR); *Candida* (3: valve PCR).

Table 1 – Factors associated with mortality from LPVIE, identified through multivariate analysis, 2006–2023.

Variables	OR	95% CI	p
AKI	44.646	8.629-106.998	<.001
Fistula	11.306	1.261-101.318	0.030
Indicated surgery not performed	10.211	2.868-36.355	<.001
Transferred	3.896	1.428-10.625	0.008
Myocardial/paravalvar abscess	2.901	1.101-7.646	0.031
Reduced risk of death			
Streptococcus bovis	0.029	0.001-0.447	0.011

LPVIE, late prosthetic valve infective endocarditis. OR, Odds ratio. CI 95%, Confidence interval. AKI, acute kidney injury.

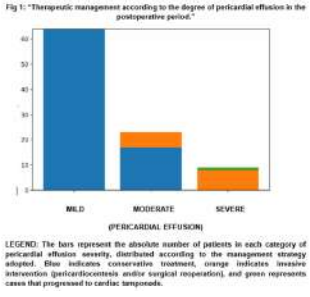
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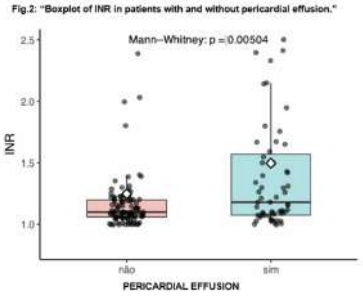
PERICARDIAL EFFUSION AFTER VALVULAR HEART SURGERY

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Background/Introduction: Valvular heart disease remains a major cause of morbimortality and surgery is the standard of care for symptomatic or hemodynamically significant cases. Pericardial effusion is a common postoperative complication, resulting from inflammatory and hemodynamic mechanisms related to surgical trauma, pericardiotomy, and cardiopulmonary bypass. In the late phase, post-pericardiotomy syndrome may contribute, increasing the risk of adverse outcomes such as cardiac tamponade. Clinical evaluation may be limited, particularly in insidious cases, making transthoracic echocardiography essential for diagnosis and management. This study evaluates the prevalence, clinical and echocardiographic features, and outcomes of postoperative pericardial effusion. Objectives: Evaluate the prevalence, clinical and echocardiographic characteristics, and outcomes of pericardial effusion following valve replacement surgery at a tertiary referral center, and to identify factors associated with its occurrence and complications, including demographic variables, comorbidities, and surgical characteristics, as well as its impact on length of stay, cardiac tamponade, need for pericardiocentesis, and surgical reintervention. Methods: Retrospective observational cohort study including adult patients undergoing valve replacement surgery at a tertiary referral center (2023–2024) with available postoperative transthoracic echocardiography. Clinical, surgical, and laboratory variables were collected, including International Normalized Ratio (INR) and use of anticoagulant and antiplatelet therapy. The primary endpoint was postoperative pericardial effusion; secondary outcomes included cardiac tamponade and need for intervention. Group comparisons used parametric and nonparametric tests. Multivariable logistic regression identified factors associated with outcomes, with adjusted odds ratios and 95% confidence intervals. Discriminative performance of INR ≥1.5 was assessed by receiver operating characteristic curve analysis. Results and Conclusions: Among 360 patients, 324 were analyzed; pericardial effusion occurred in 29.6%, predominantly mild and managed conservatively. Cardiac tamponade was rare (1%). INR ≥1.5 was the only independent predictor (adjusted OR 5.4), while clinical and surgical variables were not associated with the outcome. Pericardial effusion was associated with prolonged hospital stay, supporting systematic echocardiographic surveillance and careful anticoagulation management in the early postoperative period.





16238

RIGHT VENTRICULAR–PULMONARY ARTERIAL COUPLING AS A PROGNOSTIC MARKER IN RHEUMATIC MITRAL STENOSIS

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(1) HOSPITAL DAS CLINICAS DA UFMG - BELO HORIZONTE - MG - BRASIL;

Background/Introduction: Right ventricular-pulmonary arterial coupling, estimated by the TAPSE/PASP ratio (Figure 1), has emerged as a prognostic marker in various heart diseases. However, its role in rheumatic mitral stenosis remains poorly defined. Objectives: To evaluate the prognostic value of right ventricular-pulmonary arterial coupling in patients with mitral stenosis under medical management. Methods: Patients referred for management of mitral stenosis between 2016 and 2024 were included. Those with severe mitral stenosis who were referred for immediate valvular intervention following the initial echocardiographic assessment were excluded. The primary endpoint was a composite of death or need for mitral valve replacement. Impaired ventricular–arterial coupling was defined as TAPSE/PASP < 0.31 mm/mmHg. Results and Conclusions: Results: Of the 819 initially eligible patients, 436 were excluded due to immediate valve intervention, leaving 383 patients for analysis. The age was 47.8 ± 12.4 years, and the mitral valve area was 1.35 ± 0.9 cm²; 67% were in NYHA functional class I/II. The mean TAPSE/PASP ratio was 0.50 ± 0.2, and 63 patients (17%) exhibited impaired ventricular-arterial coupling. After a median follow-up of 3.4 years (IQR: 6 months to 5.9 years), 112 patients underwent surgery for mitral valve replacement and 28 died. In univariate Cox analysis, right ventricular-pulmonary arterial coupling was associated with a higher risk of events (HR: 2.26; 95% CI: 1.44–3.53; p < 0.001) (Figure 2). In multivariate analysis, impaired coupling remained an independent predictor (HR: 1.68; 95% CI: 1.04–2.71; p = 0.032), along with age (HR: 1.02; 95% CI: 1.01–1.04; p = 0.040), mitral stenosis severity (area < 1.5 cm²; HR: 2.47; 95% CI: 1.43–4.24; p = 0.001), and functional class III/IV (HR: 1.90; 95% CI: 1.24–2.91; p = 0.003). Conclusion: Right ventricular-pulmonary arterial coupling, assessed by the TAPSE/PASP ratio, is an independent prognostic marker in patients with rheumatic mitral stenosis under medical treatment, contributing to risk stratification and clinical decision-making.

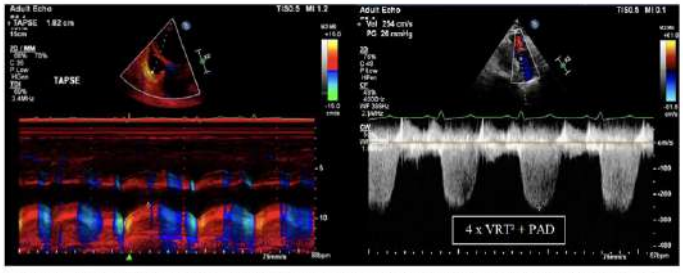


Figure 1. Echocardiographic variables used to calculate right ventricular-pulmonary arterial coupling.

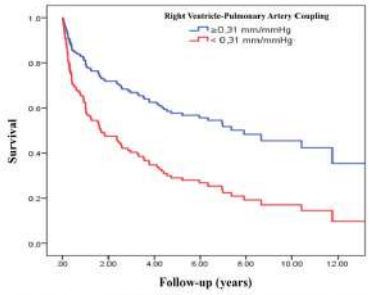


Figure 2. Survival curves of patients stratified by right ventricular-pulmonary arterial coupling.

Perioperative Evaluation



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17256

FACTORS ASSOCIATED WITH ACUTE KIDNEY INJURY AND IN-HOSPITAL MORTALITY IN PATIENTS UNDERGOING CARDIAC SURGERY.

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Background/Introduction: Cardiac surgery-associated acute kidney injury (CSA-AKI) is a serious complication. Its incidence can reach 30%, causing a significant impact on care and costs related to hospital admission. We have limited data on these complications in the South American population. Objectives: The primary objective was to describe the incidence and profile of patients with CSA-AKI. The secondary objective was to identify factors associated with the occurrence of CSA-AKI and in-hospital mortality. Methods: This retrospective cohort study included patients aged 18 years or older with data extracted from electronic medical records. All participants had undergone cardiopulmonary bypass(CPB) surgery between December 2023 and June 2025 and were classified according to their AKI stages using the Kidney Disease Improving Global Outcomes criteria. Those with an estimated glomerular filtration rate(eGFR) <15mL/min/1.73 m² or those who underwent renal replacement therapy prior to admission were excluded. Logistic regression was used to identify factors associated with AKI. The association between AKI and mortality was evaluated using Kaplan–Meier(K-M) survival curves and factors associated with mortality were estimated using Cox regression analysis. We used 95% confidence interval and p-value < 0.05. Results and Conclusions: A total of 127 patients. The incidence of CSA-AKI was 40.9% (stage 1 = 65.4%, stage 2 = 11.5%, stage 3 = 21.1%). In the AKI group, we observed a significant difference in age (65.6 [58.8 – 72.7] vs 61.3 [56.3 – 69.3]; p=0.035), lower eGRF (61.1 ± 20.7 vs 84.2 ± 23.7; p<0.001), LVEF (57 [52 – 65] vs 62 [58 – 68]; p=0.019), and higher baseline creatinine (1.37 [1.0 – 1.5] vs 1.0 [0.8– 1.2]), pulmonary arterial systolic pressure (PASP) (33.3 [24 -33] vs 27 [23 – 29]; p=0.026), CPB time (110 [70 – 106] vs 90 [60 –98]; p=0.015) and higher mortality [9 (17.3%) vs 0 (0%); p<0.001]. Logistic regression showed only PASP as a predictor of AKI with OR 1.08 (1.001 - 1.17; p=0.045). The K-M model showed lower 30-day survival in the AKI group (84% [73%-95.9%]), but there were no events in the control group (p=0.0036). The predictors of in-hospital mortality by the Cox model were age (HR 1.21 [1.001 -1.470]; p=0.045) and PASP (HR 1.13 [1.001 - 1.260]; p=0.041). Conclusion: We found a high incidence of CSA-AKI and higher PASP was an independent factor for acute renal dysfunction. AKI was also associated with higher in-hospital mortality; age and PASP were independent factors for its occurrence.

21949

PREOPERATIVE HBA1C ABOVE 7% IDENTIFIES DIABETIC PATIENTS AT HIGHER RISK OF EARLY ADVERSE OUTCOMES AFTER ISOLATED CABG: A PRISMA-GUIDED SYSTEMATIC REVIEW AND META-ANALYSIS

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Background/Introduction: Whether preoperative glycemic control influences early outcomes after isolated coronary artery bypass grafting (CABG) in patients with diabetes remains controversial. Objectives: We evaluated the association between elevated preoperative hemoglobin A1c (HbA1c) and short-term postoperative complications after isolated CABG. Methods: This systematic review and meta-analysis was conducted according to PRISMA 2020. PubMed, Embase, and Web of Science were searched for studies including adult patients with diabetes undergoing isolated CABG with available preoperative HbA1c data. Thirteen primary studies were identified as relevant to the review question; 10 met eligibility for qualitative synthesis, and 4 contributed directly to the main quantitative analysis of HbA1c >7% versus ≤7%. Short-term outcomes included postoperative infectious complications, in-hospital mortality, severe renal complications, and length of hospital stay. Pooled estimates were calculated using random-effects models. Results and Conclusions: Results: HbA1c >7% was associated with a markedly higher risk of postoperative infectious complications (OR 3.70, 95% CI 2.54-5.39; I²=0%). This signal remained consistent in sensitivity analysis focused on sternal wound-related outcomes (OR 3.48, 95% CI 1.94-6.24). Elevated HbA1c was also associated with higher crude in-hospital mortality (OR 3.29, 95% CI 1.82-5.92; I²=0%) and longer hospital stay (mean difference 1.28 days, 95% CI 0.48-2.07; I²=65%). Limited data suggested a possible increase in severe postoperative renal complications. Conclusions: In diabetic patients undergoing isolated CABG, preoperative HbA1c >7% identifies a subgroup at substantially higher risk of early postoperative morbidity, particularly wound and sternal infectious complications, and prolonged hospitalization. These findings support HbA1c as a practical perioperative risk stratification tool in candidates for isolated CABG.

16582

PREOPERATIVE PULMONARY FUNCTION AND PERIOPERATIVE FACTORS ASSOCIATED WITH POSTOPERATIVE PULMONARY COMPLICATIONS FOLLOWING CARDIAC SURGERY: A COMPARATIVE ANALYSIS

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(1) UFRN - NATAL - RN - BRASIL; (2) FAMENE - JOÃO PESSOA - PB - BRASIL; (3) UNIVERSIDADE FEDERAL DA PARAIBA - JOÃO PESSOA - PB - BRASIL;

Background/Introduction: Postoperative pulmonary complications (PPC) remain a significant cause of morbidity and mortality following cardiac surgery, contributing to prolonged hospitalization and increased healthcare resource utilization. Early identification of associated risk factors is essential to optimize perioperative management and improve clinical outcomes. Objectives: This study aimed to compare patients who developed PPC with those who did not after cardiac surgery, focusing on preoperative spirometric parameters, the Torrington-Henderson Scale, and perioperative factors associated with PPC occurrence. Methods: This was a documentary, observational, analytical, cross-sectional study including adult patients undergoing cardiac surgery. Sociodemographic, surgical, and preoperative spirometric data were obtained from medical records. Group comparisons were performed using Student's t-test or the Wilcoxon test, according to data distribution, with a significance level set at p<0.05. A total of 34 patients were analyzed. The study was approved by the institutional Research Ethics Committee. Results and Conclusions: Patients who developed PPC had significantly longer cardiopulmonary bypass time (79.67 ±38.44 vs. 55.20 ±25.69; p=0.001) and anoxia time (72.25 ±37.29 vs. 48.05 ±23.95; p=0.001). They also exhibited prolonged hospital length of stay (64.92 ±32.35 vs. 42.65 ±24.70; p=0.001) and longer duration of noninvasive ventilation use (9.58 ±8.91 vs. 5.40 ±2.68; p=0.003). Additionally, patients with PPC demonstrated significantly lower values of vital capacity, forced vital capacity, and forced expiratory volume in one second in the preoperative period. No significant differences were observed in the FEV1/FVC ratio, peak expiratory flow, or Torrington-Henderson score between groups. In conclusion, prolonged intraoperative exposure and reduced preoperative pulmonary function were significantly associated with the development of PPC after cardiac surgery. These findings highlight the importance of preoperative functional assessment as a key strategy for risk stratification and targeted perioperative interventions.

Table 1. Preoperative pulmonary function and postoperative pulmonary complications.

Variable (n=34)	Values
PPC	
Yes	12 (35.3%)
No	22 (64.7%)
Torrington-Henderson score	3.00 ±1.00
Predicted PPC risk (T-H)	
Low	28 (82.4%)
Moderate	6 (17.6%)
Preoperative spirometry (% predicted)	
VC	81.18 ±17.9
FVC	88.62 ±20.9
FEV1	75.35 ±18.58
FEV1/FVC	96.88 ±13.86
PEF	49.88 ±20.38
Obstructive ventilatory disorder	10 (29.4%)
Restrictive ventilatory disorder	6 (17.6%)

Note: Values expressed as mean ± standard deviation or n (%).
VC: vital capacity; FVC: forced vital capacity; FEV1: forced expiratory volume in 1 second; PEF: peak expiratory flow; PPC: postoperative pulmonary complications.

Table 2. Comparative analysis according to the presence of postoperative pulmonary complications (PPC).

Variable	PPC (Yes)	PPC (No)	p-value
Cardiopulmonary bypass time	79.67 ±38.44	55.20 ±25.69	.001
Anoxia time	72.25 ±37.29	48.05 ±23.95	.001
ICU length of stay	11.00 ±10.49	5.45 ±2.60	.004
Preoperative ward stay	32.00 ±26.65	23.10 ±20.08	.002
Postoperative ward stay	21.92 ±19.16	14.10 ±10.34	.002
Total hospital length of stay	64.92 ±32.35	42.65 ±24.70	.001
Days of noninvasive ventilation	9.58 ±8.91	5.40 ±2.68	.003
Spirometry (% predicted)			
Vital capacity (VC)	73.83 ±13.40	86.10 ±19.62	.001
Forced vital capacity (FVC)	80.50 ±19.17	94.15 ±21.61	<.001
Forced expiratory volume in 1 second (FEV1)	69.08 ±18.26	78.80 ±19.01	<.001
FEV1/FVC ratio	98.00 ±11.86	95.05 ±14.33	~0.52
Peak expiratory flow (PEF)	45.50 ±17.33	50.55 ±22.21	~0.47
Torrington-Henderson score	2.75 ± 0.75	2.90 ±0.96	~0.62

Note: Values are expressed as mean ± standard deviation.
PPC: postoperative pulmonary complications; ICU: intensive care unit.

18917

TAKOTSUBO SYNDROME AFTER MITRAL VALVE SURGERY: SYSTEMATIC LITERATURE REVIEW AND INSTITUTIONAL CASE SERIES

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Background/Introduction: Takotsubo Syndrome (TTS), or stress-induced cardiomyopathy, previously believed to be a benign and self-limiting condition usually associated with emotional triggers, has lately been related with physical stress scenarios, such as the perioperative period. In cardiac surgery, particularly mitral procedures, TTS remains rare and likely underdiagnosed, often mistaken for post-bypass myocardial dysfunction or acute coronary syndromes. Objectives: To analyze the occurrence, clinical profile, and outcomes of TTS in patients undergoing mitral valve surgery through a systematic literature review and a report of three consecutive institutional cases. Methods: A systematic review was conducted in accordance with PRISMA guidelines, using specific descriptors for TTS and mitral surgery via PubMed/MEDLINE. Inclusion criteria focused on case reports, series and systematic literature reviews with confirmed diagnosis and clear temporal association with surgery. Additionally, three institutional cases were analyzed, evaluating variables such as age, sex, procedure type, hemodynamic support, and hospital outcome. Results and Conclusions: Literature indicates a female predominance (80–90%) and mean age of 60–75 years, with early presentation (1st–4th postoperative day) and high incidence of cardiogenic shock (table 1). The institutional series included three mitral repair cases: two early-onset and one late-onset. Two patients required advanced circulatory support (VA-ECMO), resulting in two survivors and one death (table 2). Differential diagnosis was essential to exclude circumflex artery injury or surgical complications. TTS is a rare, but relevant and potentially severe complication after mitral valve surgery. This study reinforces the need for diagnostic vigilance in cases of unexplained hemodynamic instability, especially in women. Early recognition and physiology-guided support are crucial, as the condition carries significant mortality despite the potential for ventricular function recovery.

Table 1 – Characteristics of cases described in the literature

Study	n	Mean age	Procedure	Time to presentation	Shock	Advanced support	Outcome
Chiariello et al. (2016)	review	~65 years	Predominantly mitral	1–3 days	Frequent	Variable	Recovery in most
Devesa et al. (2020)	1	68	Mitral replacement	48h	Yes	Inotropic	Discharge
Gariboldi et al. (2011)	1	64	Mitral replacement	Early	Yes	Clinical support	Discharge
Attisani et al. (2013)	1	70	Minimally invasive mitral	Early	Yes	Inotropic	Discharge
Li et al. (2014)	1	37	Mitral repair	Immediate	Yes	ECMO	Discharge
Systematic review (2023)	81	68	86% mitral/ tricuspid	~4 days	High frequency	Frequent	Mortality present

Table 2 – Clinical cases from the service

Case	Age	Procedure	Timing	Shock	Support	Outcome
1	41	Mitral repair	Early	Yes	Conventional	Discharge
2	74	Mitral repair	Late (D7)	Yes	VA-ECMO	Death
3	74	Mitral repair	Early	Yes	VA-ECMO (7 days)	Discharge

17494

USE OF A PREOPERATIVE EVALUATION PROTOCOL IN LIVER TRANSPLANT CANDIDATES: A PATHWAY TO REDUCING PERIOPERATIVE MYOCARDIAL INFARCTION

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Background/Introduction: Cardiovascular disease significantly impacts outcomes after liver transplantation, accounting for up to 50% of hospitalizations in the first three months and 40% of deaths within the first month. The multifactorial pathophysiology of cirrhosis increases the risk of false-negative results in functional testing for coronary artery disease (CAD), commonly used in non-cardiac preoperative evaluation. Accurate identification of obstructive CAD is, therefore, essential. Objectives: To evaluate the impact of the CAD-LT score in identifying obstructive CAD in liver transplant candidates. Methods: Observational, retrospective, cross-sectional study conducted at a tertiary private hospital in Brazil. Adult patients who underwent liver transplantation between January and December 2024 were included. Data were obtained from electronic medical records, including demographics, cardiovascular risk factors, clinical data, obstructive CAD, and perioperative myocardial infarction. The primary outcome was perioperative myocardial infarction within 30 days, defined by elevated troponin with clinical, electrocardiographic, or imaging evidence of ischemia. Results and Conclusions: Twenty-nine patients were analyzed (83% male). Main etiologies were NASH (38%) and alcohol (21%), with mean MELD 14. Comorbidities included hypertension (45%), diabetes (59%), and obesity (21%). Intermediate-high and high CAD-LT scores were observed in 80% (n=23); 30% (n=7) underwent coronary angiography, and 57% (n=4) required coronary intervention and dual antiplatelet therapy. CAD-LT showed 100% sensitivity and 48% specificity. A standardized protocol using CAD-LT identified all cases of obstructive CAD, and there was zero events of periprocedural myocardial infarction, supporting its role in improving preoperative risk stratification in liver transplantation.

Physical Education / Exercise Science



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21753

DOES WALKING 4.000 STEPS A DAY IMPROVE CARDIOVASCULAR HEALTH IN PATIENTS WITH CHRONIC VENOUS INSUFFICIENCY?

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Background/Introduction: Chronic venous insufficiency (CVI) (CEAP C3-C6) is associated with increased cardiovascular risk and low physical activity levels. Although daily step thresholds (e.g., <4,000 vs. ≥4,000 steps/day) predict mortality and cardiovascular outcomes in the general population, their relevance for patients with CVI remains unknown due to disease-specific functional limitations, including pain, edema, and impaired calf muscle pump function. This knowledge gap limits the applicability of general physical activity guidelines to this clinical population. Objectives: To investigate whether daily step count (categorized as <4,000 vs. ≥4,000 steps/day) is associated with resting systolic blood pressure (SBP), diastolic blood pressure (DBP), heart rate (HR), and heart rate variability (HRV) indices (RR interval, SDNN, RMSSD, LF, HF) in patients with chronic venous insufficiency (CEAP C3-C6). Methods: This cross-sectional study included 112 patients with CVI (median age 59 years; 71.3% women; 54.5% with CEAP C5-C6). Daily step count was measured using waist-mounted triaxial accelerometers (ActiGraph GT3X) over seven consecutive days. Patients were categorized into low (<4,000 steps/day, n=40) and high (≥4,000 steps/day, n=47) step groups. Resting SBP, DBP, and HR were assessed using an automated monitor (Omron HEM-742). HRV was analyzed from 15-minute supine recordings using a Polar H10 chest strap and Kubios software, obtaining time-domain (SDNN, RMSSD) and frequency-domain (LF, HF normalized units) parameters. Linear regression models were applied (crude and adjusted for CEAP classification, sex, age, dyslipidemia, hypertension, diabetes, obesity, smoking, and race). Significance was set at p<0.05. Results and Conclusions: No significant differences between low vs. high step groups for SBP [132(32) vs. 129(19)mmHg; p=0.33], DBP [79(13) vs. 81(13)mmHg; p=0.27], HR [74(11) vs. 72(16)bpm; p=0.24], or HRV indices (RR, SDNN, RMSSD, LF, HF; all p>0.05). Regression models confirmed no associations (all p>0.05). Conclusion: A daily step count ≥4,000 steps is not associated with resting blood pressure, heart rate, or cardiac autonomic modulation in CVI patients, suggesting that step-based thresholds from general populations may not translate to this clinical group.

Table 1. Clinical characteristics of the sample (n = 112)

Variable	Value
Age, years	59.0 (13)
Sex, female (%)	71.3
Weight, kilograms	77.0 (15.8)
Height, meters	157 (0.14)
Body Mass Index, kg/m²	31.0 (6.5)
Disease severity (C5-C6), %	54.5
Time of disease diagnosis, years	17 (15)
Step/day	5957 (4392)
Comorbidities, %	
Hypertension	43.8
Diabetes	20.5
Dyslipidemia	24.1
Obesity	58.9
Medications, %	
Anti-hypertensive	44.6
Antidiabetic	17.0
Lipid-lowering	15.2
Vasoprotective	75.0
Antiplatelet	14.3

Note: Data presented as median and interquartile range, and frequency relative.

Table 2. Association between daily step count and cardiovascular parameters (blood pressure, heart rate, and heart rate variability) in patients with chronic venous insufficiency (n = 112).

Outcomes	Exposures	crude		Model 1		Model 2		Model 3	
	Step/day	*β (95% CI)*	*p*	*β (95% CI)*	*p*	*β (95% CI)*	*p*	*β (95% CI)*	*p*
SBP (mmHg)	≥4.000	ref	ref	ref	ref	ref	ref	ref	ref
	<4.000	5.01 (-2.68-12.71)	0.199	1.67 (-6.97-10.32)	0.701	0.64 (-7.65-8.94)	0.878	6.08 (-3.52-15.49)	0.202
DBP (mmHg)	≥4.000	ref	ref	ref	ref	ref	ref	ref	ref
	<4.000	-2.28 (-6.76-2.19)	0.313	-0.81 (-5.90-4.26)	0.750	-2.58 (-7.60-2.43)	0.309	-0.25 (-5.02-4.51)	0.916
HR (bpm)	≥4.000	ref	ref	ref	ref	ref	ref	ref	ref
	<4.000	3.28 (-2.51-9.08)	0.263	5.09 (-1.46-11.64)	0.126	2.57 (-3.63-8.77)	0.412	4.82 (-2.03-10.97)	0.190
RR (ms)	≥4.000	ref	ref	ref	ref	ref	ref	ref	ref
	<4.000	-34.0 (-118.8-50.8)	0.427	-58.9 (-155.5-37.6)	0.228	-28.1 (-119.0-62.7)	0.539	-38.3 (-130.4-53.7)	0.409
SDNN (ms)	≥4.000	ref	ref	ref	ref	ref	ref	ref	ref
	<4.000	-8.25 (-4.99-8.47)	0.954	0.66 (-9.38-10.71)	0.895	0.17 (-9.22-9.57)	0.971	0.72 (-8.59-10.03)	0.878

20280

EFFECT OF ISOMETRIC HANDGRIP TRAINING ON HEART RATE VARIABILITY IN INDIVIDUALS WITH HYPERTENSION: A MULTICENTER RANDOMIZED CONTROLLED TRIAL

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Background/Introduction: Arterial hypertension (AH) is the main risk factor for deaths from cardiovascular diseases, and its treatment involves medication and lifestyle changes, including physical exercise. Although resistance and aerobic training are effective in controlling blood pressure (BP), adherence to these modalities is still low due to barriers such as fatigue, lack of time, and physical limitations. In this context, isometric handgrip training (IHT) emerges as a promising alternative, as it is simple, fast, safe, and easy to apply. Despite the observed benefits related to this type of training in reducing BP, the mechanisms responsible for these effects are not yet fully understood, highlighting the need for further research on the subject, including assessments such as heart rate variability (HRV). Objectives: To analyze the effect of 12 weeks of IHT on HRV in individuals with hypertension. Methods: This is a multicenter randomized controlled clinical trial, conducted in four different cities in Brazil between April 2019 and September 2024. Participants were individuals with AH, medicated, over 18 years of age, and not participating in a regular physical exercise program. Participants were randomly assigned, by blocks, to two groups: IHT group (four sets, two in each arm with two minutes of isometric contraction at 30% of maximum voluntary contraction and two minutes of rest) and control group (CG, isotonic contractions with an anti-stress ball and stretching). HRV data were collected using a valid heart rate monitor (Vantage V2 - Polar), with R-R intervals exported and evaluated using Kubios HRV software, with analyses performed in the time and frequency domains. Data analysis was performed employing a 2-way analysis of covariance (ANCOVA) for repeated measures, with the baseline values used as covariates. The adopted significance was 0.05. Results and Conclusions: A total of 140 individuals were randomized and 61 completed the intervention (IHT=30; control=31). Baseline characteristics were similar between groups. An isolated time effect was observed for SDNN (IHT: Δ -9.63 vs control: Δ -1.27), RMSSD (IHT: Δ -15.95 vs control: Δ -5.6), and pNN50 (IHT: Δ 2.15 vs control: Δ -1.27). No significant group-by-time interaction was observed for any outcome analyzed. It was concluded that 12 weeks of IHT cannot modify autonomic modulation in individuals with hypertension.

Table 1. HRV analysis pre and post 12 weeks of intervention with adjusted mean by ANCOVA.

	Covariate	Control Group (n=31)		TIH Group (n=30)			p	
Variables	Mean	Mean Post	95% CI	Mean Post	95% CI	g	*t*	g*t
Mean RR (ms)	861.5	867.1	831.0 – 903.2	879.0	842.3 – 915.6	0.649	0.371	0.649
SDNN (ms)	42.29	41.02	33.68 – 48.37	32.66	25.44 – 39.88	0.112	0.037*	0.112
RMSSD (ms)	45.89	40.29	30.32 – 50.25	29.94	19.63 – 40.24	0.155	0.004*	0.155
PNN50 (%)	12.87	10.72	5.70 – 15.74	6.24	1.14 – 11.35	0.216	0.017*	0.216
LF (nu)	56.15	59.25	52.77 – 65.74	56.03	49.55 – 62.51	0.485	0.516	0.485
HF (nu)	42.78	40.38	33.66 – 47.10	44.06	37.34 – 50.78	0.443	0.814	0.443
LF/HF	1.846	2.470	1.702 – 3.238	2.095	1.315 – 2.876	0.497	0.116	0.497

Note: Data are presented as ANCOVA-adjusted means, controlling for pre-intervention values; 95% CI = 95% confidence interval (lower limit – upper limit); Mean RR = mean interval between heartbeats (ms); SDNN = standard deviation of all normal RR intervals (ms); RMSSD = root mean square of the successive differences between RR intervals (ms); pNN50 = percentage of RR intervals with a difference greater than 50 ms (%); LF = low-frequency spectral power (n.u.); HF = high-frequency spectral power (n.u.); LF/HF = low-frequency to high-frequency ratio; $p < 0.05$.

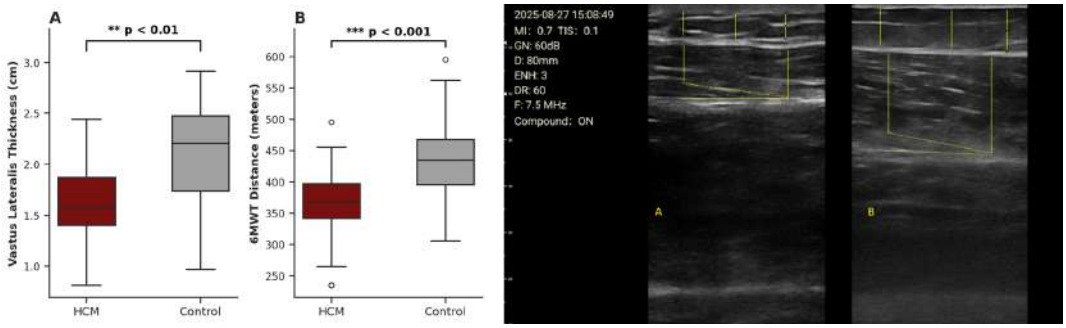
21070

FUNCTIONAL CAPACITY AND MUSCLE ARCHITECTURE IN HYPERTROPHIC CARDIOMYOPATHY: A CROSS-SECTIONAL STUDY

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Background/Introduction: Exercise intolerance in hypertrophic cardiomyopathy (HCM) is primarily driven by central hemodynamic dysfunction. However, the skeletal myopathy hypothesis suggests that functional decline is further aggravated by chronic changes in peripheral muscle architecture (secondary sarcopenia), acting as an additional limiter of submaximal aerobic and daily mechanical performance. Objectives: To analyze the association of peripheral muscle architecture parameters (thickness, pennation angle, and fascicle length) with functional capacity, assessed by the 6-Minute Walk Test (6MWT) and 30-Second Sit-to-Stand Test (30STST), and compare the morphofunctional profile between HCM patients and paired healthy controls. Methods: An observational cross-sectional study evaluated 77 subjects (25-60 years): 43 HCM outpatients and 34 controls. Quadriceps architecture was assessed via B-mode ultrasound. Multiple linear regression ($p<0.05$) quantified the independent predictive effect of morphological variables, clinical diagnosis, and body mass index (BMI) on functional outcomes. Results and Conclusions: Results: The sample comprised 43 HCM patients (46±10 years; BMI 29±5 kg/m²) and 34 controls (40±11 years; BMI 28±3.2 kg/m²). HCM patients exhibited generalized quadriceps atrophy, evidenced by lower total muscle and vastus lateralis (VL) thickness ($p<0.01$). Functionally, the HCM group covered 72 fewer meters in the 6MWT and performed fewer 30STST repetitions ($p<0.001$). VL thickness positively correlated with 6MWT ($\rho=0.383$; $p=0.001$) and 30STST ($\rho=0.421$; $p<0.001$), while pennation angle and fascicle length showed no association ($p>0.05$). Beta-blocker therapy did not influence performance ($p=0.878$). In the multivariable model, HCM diagnosis ($B=-59.03$; $p=0.001$) and BMI ($B=-2.92$; $p=0.044$) emerged as independent predictors of worse performance. Consequently, VL thickness did not retain statistical significance as an independent predictor in the adjusted model ($p=0.075$). Conclusions: HCM imposes severe structural degradation, and reduced muscle thickness is directly associated with functional decline. However, no significant differences occur in pennation angle and fascicle length. Thus, effort intolerance is multifactorial: intrinsic central limiters of the pathology and mechanical overload (BMI) outweigh isolated muscle atrophy as the primary independent predictors of mechanical failure.



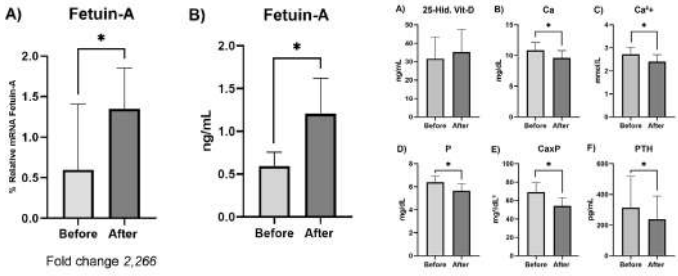
19654

INTRADIALYTIC RESISTANCE EXERCISE AS AN ADJUVANT STRATEGY TO REDUCE THE PROPENSITY FOR VASCULAR CALCIFICATION: MODULATION OF FETUIN-A AND BIOCHEMICAL MARKERS OF MINERAL METABOLISM – A PILOT STUDY.

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Background/Introduction: Chronic kidney disease (CKD) is associated with chronic kidney disease–mineral and bone disorder (CKD-MBD), which contributes to vascular calcification and increased cardiovascular risk in hemodialysis patients. Fetuin-A, an inhibitor of calcium–phosphate crystallization, is inversely associated with these outcomes. However, the effects of intradialytic resistance exercise on fetuin-A and mineral metabolism markers remain unclear. Objectives: Based on this, the present study aims to investigate the effects of intradialytic resistance exercise on circulating fetuin-A levels, gene expression, and mineral metabolism markers associated with a propensity for vascular calcification in hemodialysis patients. Methods: This prospective, interventional pilot study included 30 patients with chronic kidney disease (CKD) undergoing hemodialysis for ≥6 months. Participants underwent a structured resistance exercise program, performed three times a week during the first hour of hemodialysis sessions, for 12 weeks. Exercise intensity was maintained at a moderate level and monitored using the Borg scale (1960). Serum fetuin-A levels were measured by ELISA, and gene expression was assessed by RT-qPCR. Biochemical parameters of MBD-CKD included total calcium (Ca), ionized calcium (Ca^{2}□), phosphorus (P), calcium-phosphorus product (Ca×P), parathyroid hormone (PTH), and 25-hydroxyvitamin D. Statistical analysis included the Shapiro-Wilk test to assess data normality, followed by the paired Student's t-test. Results and Conclusions: Intradialytic resistance exercise significantly increased circulating fetuin-A levels (0.59±0.16 – 1.20±0.41; $p=0.023$), as well as its gene expression (0.59±0.81 – 1.34±0.50; $p=0.011$). Concomitantly, significant reductions were observed in the levels of Ca (10.82±1.28 – 9.61±1.17; $p=0.007$), Ca^{2}□ (2.71±0.31 – 2.40±0.29; $p=0.006$), P (6.38±0.53 – 5.63±0.61; $p=0.005$), Ca×P product (69.15±10.33 – 54.19±8.57; $p=0.012$) and PTH (313.78±203.30 – 239.16±150.16; $p=0.047$). In this context, intradialytic resistance exercise demonstrates potential as a non-pharmacological adjuvant strategy to modulate the fetuin-A axis and mineral metabolism, reducing markers of propensity for vascular calcification. These results reinforce their role by suggesting a possible reduction in cardiovascular risk in hemodialysis patients and indicate the need for confirmation in larger randomized clinical trials, particularly with longer follow-up periods and larger patient populations.



17339

IS BLOOD FLOW RESTRICTION RESISTANCE TRAINING A VIABLE ALTERNATIVE IN HEART FAILURE? RESULTS OF A 12-WEEK RANDOMIZED CONTROLLED TRIAL

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Background/Introduction: Heart failure (HF) is a prevalent clinical condition associated with significant functional impairment. Cardiopulmonary rehabilitation is recommended to improve the physical capacity and quality of life of these patients. In this context, blood flow restriction resistance training (BFRRT) emerges as a low-intensity alternative offering potential functional benefits. Objectives: To compare the effects of blood flow restriction resistance training (BFRRT) and conventional resistance training (CRT) on the cardiorespiratory fitness of patients with heart failure (HF), assessed by cardiopulmonary exercise testing (peak VO_2). Methods: This was a randomized, prospective, parallel-group clinical trial including 20 participants (13 men and 7 women; age: 62.05±13.27 years; weight: 75.00±10.98 kg; height: 1.67±0.12 m; body fat: 24.83±8.88%) classified as NYHA classes II and III. Patients were assigned to one of two groups (n=10 per group): BFRRT (50% BFR + 20–30% 1RM) and CRT (60–80% 1RM). Both groups trained twice a week for 12 weeks, with training loads adjusted based on 1RM. Cardiopulmonary exercise testing using an individualized ramp protocol was conducted pre- and post-training. Data were analyzed using the Wilcoxon signed-rank test for intra-group comparisons and the Mann-Whitney U test to compare relative changes between groups. Results and Conclusions: Data were expressed as median and interquartile range (IQR). In the BFRRT group, peak VO_2 changed from 19.19 (IQR: 13.84–28.45) to 22.91 (IQR: 17.45–26.91) $mL \cdot kg^{-1} \cdot min^{-1}$ (p=0.375). In the CRT group, peak VO_2 changed from 17.70 (IQR: 16.44–20.41) to 18.89 (IQR: 14.90–20.85) $mL \cdot kg^{-1} \cdot min^{-1}$ (p=0.275). Intergroup analysis of relative changes (Δ%) using the Mann-Whitney test showed no significant differences between the two training methods (p=0.791). BFRRT proved to be a viable clinical alternative comparable to CRT in the rehabilitation of patients with HF. Despite the lack of statistical significance—likely associated with the small sample size—BFRRT promoted the maintenance and clinically relevant improvements in cardiorespiratory fitness. Since BFRRT achieves these outcomes using substantially lower mechanical loads, it emerges as a promising strategy to enhance safety and exercise tolerance in functionally limited patients. Future clinical trials with larger sample sizes are warranted to confirm these findings.

Physiotherapy / Physical Therapy

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21426

ASSOCIATION BETWEEN CARDIOPULMONARY EXERCISE TESTING, SIT-TO-STAND PERFORMANCE, AND HANDGRIP STRENGTH IN CHRONIC CHAGAS CARDIOMYOPATHY

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Background/Introduction: Chronic Chagas cardiomyopathy (CCC) is associated with reduced functional capacity and exercise intolerance. Although cardiopulmonary exercise testing (CPET) provides objective assessment of aerobic capacity, simpler and low-cost functional measures may be useful in clinical and rehabilitation settings, especially when access to specialized testing is limited. Objectives: To investigate the association between the 1-minute sit-to-stand test, handgrip strength, and CPET-derived variables in patients with CCC. Methods: This cross-sectional observational study was derived from a cohort of patients with CCC and left ventricular ejection fraction >35%. Participants underwent echocardiographic assessment, CPET, the 1-minute sit-to-stand test, and peripheral muscle strength assessment using handgrip dynamometry. Data are presented as median and interquartile range. Associations were analyzed using Spearman's correlation coefficient. Results and Conclusions: Ten individuals were evaluated, with age of 62.0 (52.0–71.0) years, left ventricular ejection fraction of 44.0% (37.3–52.5), and body mass index of 26.3 (23.5–31.0) kg/m². Peak VO_2 was 19.8 (16.0–23.8) mL/kg/min, percentage of predicted VO_2 was 57.1% (44.9–83.6), and oxygen uptake at the anaerobic threshold was 13.2 (11.0–16.5) mL/kg/min. The number of repetitions in the 1-minute sit-to-stand test was 24.0 (20.8–28.5), and handgrip strength was 29.6 (20.4–39.6) kgf. Peak VO_2 showed a strong positive correlation with the number of sit-to-stand repetitions (rho=0.858; p=0.002). Sit-to-stand repetitions were also positively correlated with handgrip strength (rho=0.762; p=0.010). A positive, although not statistically significant, correlation was observed between peak VO_2 and handgrip strength (rho=0.572; p=0.084). In patients with CCC, better performance on the 1-minute sit-to-stand test was strongly associated with higher aerobic capacity assessed by CPET and with greater peripheral muscle strength. These findings suggest that the 1-minute sit-to-stand test may be a practical and accessible complementary tool for functional assessment in this population.

Table 1. Correlations between functional capacity, physical performance, and muscle strength.

Variables	Peak VO_2	1MSTS	Handgrip Strenght
Peak VO_2	—	0,858	0,572
1MSTS	0,002	—	0,762
Handgrip Strenght	0,084 †	0,010	—

Values are expressed as Spearman's correlation coefficient (r) and p-value. † Statistical trend (p<0.15).

17730

ASSOCIATION BETWEEN SEDENTARY BEHAVIOR AND CARDIAC AUTONOMIC MODULATION IN OLDER WOMEN

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Background/Introduction: Aging is associated with an increased risk of cardiovascular diseases. In this context, sedentary behavior (SB) is an important modifiable risk factor. Heart rate variability (HRV) is a relevant marker of cardiac autonomic regulation, a reduction that is more pronounced in postmenopausal women. However, the association between time spent in SB and cardiac autonomic modulation is not yet fully understood in older women, especially when considering objective measures of SB and linear HRV indices. Objectives: To analyze the association between SB and cardiac autonomic modulation, through linear HRV indices, in older women. Methods: This is a cross-sectional observational study including 90 older women (69.31 ± 5.96 years). Initially, data were collected to characterize the sample. Objective assessment of time spent in SB was performed using an accelerometer over seven consecutive days. For the analysis of cardiac autonomic modulation, heart rate was recorded beat-to-beat using a heart rate monitor for 30 minutes, and 1,000 RR intervals from the most stable period of the recording were selected for analysis. The association between SB and linear HRV indices was assessed using Pearson or Spearman correlation coefficients, according to data normality (Shapiro–Wilk test). A significance level of $p < 0.05$ was adopted. Results and Conclusions: A weak negative associationof low magnitude was found between time spent in SB and the LF ($r = -0.23$; $p = 0.023$) and SD2 ($r = -0.212$; $p = 0.045$) indices. No significant associations were observed for the other indices ($p \geq 0.05$). In older women, greater time spent in SB was associated with lower HRV indices reflecting global variability, suggesting worse cardiac autonomic modulation. These findings reinforce the importance of reducing SB as a strategy to improve autonomic modulation in older women.

Table 1. Sample characterization.

Clinical Characteristics	N = 90 Mean ± Standard Deviation
Age (years)	69,31 ± 5,96
Weight (kg)	66,19 ± 10,86
Height (m)	1,57 ± 0,06
BMI (kg/m²)	26,55 ± 4,76
Sedentary Behavior (hours/day)	9,63 ± 1,60
Cardiovascular Risk Factors	**N (%)**
Sedentary Behavior (> 8 hours/day)	74 (82%)
Family History	56 (62%)
Arterial hypertension	45 (50%)
Dyslipidemia	4 (49%)
Smoking	7 (8%)

Legend: kg = kilogram; m = meter; kg/m² = kilogram per square meter; h/day = hours per day; N = number of participants; % = percentage.

Table 2. Association between sedentary behavior and linear HRV indices.

	Sedentary Behavior
Global Variability Indices	
SDNN (ms)	-0,137 (0,196)
RRtri	-0,105 (0,326)
LF (ms²)	**-0,239 (0,023)**
SD2 (ms)	**-0,212 (0,045)**
Parasympathetic Modulation Indices	
RMSSD (ms)	-0,026 (0,809)
HF (ms²)	-0,035 (0,740)
SD1 (ms)	-0,025 (0,818)

Legend: ms = milliseconds; ms² = milliseconds squared; bold = significant correlation ($p < 0.05$).

18382

BODY MASS INDEX AND FUNCTIONAL CAPACITY PREDICT SARCOPENIA IN PATIENTS WITH CHAGAS DISEASE: A CROSS-SECTIONAL STUDY

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Background/Introduction: Sarcopenia is a common condition in chronic diseases and is associated with impaired functional performance and adverse clinical outcomes. In Chagas disease (CD), musculoskeletal alterations and reduced functional capacity are frequently observed; however, the determinants of sarcopenia in this population remain poorly understood. Identifying simple and clinically applicable markers may improve early detection and risk stratification. Objectives: To evaluate the clinical, functional, and body composition predictors associated with sarcopenia in patients with CD. Methods: This cross-sectional study included 149 patients with confirmed CD. Clinical, echocardiographic, functional, and body composition data were systematically collected. Sarcopenia was defined according to EWGSOP2 criteria. An exploratory analytical approach was performed using univariate logistic regression models including demographic, clinical, echocardiographic, behavioral, and functional variables (age, sex, Body Mass Index [BMI], diabetes, hypertension, NYHA class, clinical form [Clinical form was categorized according to cardiac involvement, with the cardiac form used as the reference category], LVD, LVEF, Human Activity Profile [HAP], Beck Depression Inventory [BDI], and TSL60). Variables achieving statistical significance were entered into a multivariate model using Firth's penalized logistic regression to account for the low event rate and reduce small-sample bias. Results and Conclusions: The sample was predominantly female (61.1%), with a mean age of 64.2±8.5 years, and most patients were classified as NYHA I–II (85.2%). The prevalence of sarcopenia was 11.4%. In univariate analyses, sex, BMI, clinical form of the disease, and TSL60 were associated with sarcopenia. In the multivariate model, BMI (OR = 0.75; 95% CI: 0.62–0.87; p < 0.001) and TSL60 (OR = 0.83; 95% CI: 0.71–0.94; p = 0.004) remained independently associated with the outcome, demonstrating consistent effects after adjustment. Sex (OR = 1.86; 95% CI: 0.58–6.20; p = 0.294) and clinical form (OR = 2.38; 95% CI: 0.65–10.54; p = 0.195) were not significant in the adjusted model. In patients with CD, BMI and TSL60 emerged as independent predictors of sarcopenia. These findings indicate that a simple functional test, combined with an anthropometric measure, may provide clinically relevant information beyond traditional diagnostic components, supporting their use as practical screening tools in this population.

Table 1. Univariate and multivariate Firth logistic regression analysis for predictors of sarcopenia in patients with Chagas disease (n=149).

Variable	β	p-value	OR (95% CI)	β	p-value	OR (95% CI)
Age	-0.009	0.768	0.991 (0.934 – 1.054)	-	-	-
Male sex	-1.199	0.026	0.302 (0.102 – 0.868)	0.620	0.294	1.86 (0.65 – 6.20)
BMI	-0.242	<0.001	0.785 (0.689 – 0.895)	**-0.292**	**<0.001**	**0.75 (0.62 – 0.87)**
Diabetes	0.156	0.772	1.169 (0.407 – 3.356)	-	-	-
Hypertension	-0.144	0.783	0.866 (0.311 – 2.414)	-	-	-
NYHA	0.292	0.712	1.339 (0.284 – 6.311)	-	-	-
Clinical form	-1.057	0.077	0.347 (0.108 – 1.121)	0.867	0.195	2.38 (0.65 – 10.54)
LVD	0.034	0.330	1.035 (0.966 – 1.108)	-	-	-
LVEF	0.000	0.982	1.001 (0.964 – 1.037)	-	-	-
HAP	0.002	0.870	1.002 (0.978 – 1.026)	-	-	-
BDI	0.009	0.804	1.009 (0.939 – 1.085)	-	-	-
60STS	-0.144	0.022	0.866 (0.765 – 0.980)	-0.188	0.003	0.83 (0.71 – 0.94)

Legend: *BMI: body mass index; NYHA: New York Heart Association; LVD: left ventricular diastolic diameter; LVEF: left ventricular ejection fraction; HAP: Human Activity Profile; BDI: Beck Depression Inventory; 60STS: 60-second sit-to-stand test. Clinical form was dichotomized according to the presence of cardiac involvement, with the cardiac form used as the reference category in the regression models. Multivariate analysis was performed using Firth's penalized logistic regression due to the low prevalence of sarcopenia.*

17933

DUKE ACTIVITY STATUS INDEX REFLECTS OBJECTIVE PHYSICAL PERFORMANCE IN PATIENTS WITH CHAGAS CARDIOMYOPATHY

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Background/Introduction: Functional assessment is a key component of clinical evaluation in patients with Chagas cardiomyopathy, helping estimate physical capacity and guide care strategies. The Duke Activity Status Index (DASI) is a simple, validated questionnaire that assesses self-reported functional capacity through daily activities and reports results in metabolic equivalents. Although widely used in other cardiovascular conditions, its performance in patients with Chagas cardiomyopathy has not been well characterized. Objectives: To describe DASI scores in patients with Chagas cardiomyopathy and examine their association with subjective and objective measures of physical performance. Methods: This study analyzed data from a cohort of 92 patients with Chagas cardiomyopathy (67.5 ± 8.8 years). Participants completed the DASI and the Human Activity Profile (HAP) and underwent handgrip dynamometry, the Short Physical Performance Battery (SPPB), the five-repetition sit-to-stand test, and usual gait speed assessment over 4 meters. Correlations between DASI scores and functional measures were analyzed. Results and Conclusions: The mean DASI score was 26.1 points (SD 12), ranging from 7.25 to 58.2, with a median of 23.45, indicating marked variability in self-reported functional capacity. DASI showed a strong positive correlation with HAP score (r=0.71; p<0.001), supporting convergence between self-reported functional measures. DASI was also positively correlated with SPPB score (r=0.24; p=0.021) and maximal handgrip strength (r=0.20; p=0.049). In addition, inverse correlations were observed with five-repetition sit-to-stand time (r=-0.23; p=0.025) and 4-meter gait time (r=-0.30; p=0.004), indicating that better objective physical performance was associated with higher self-reported functional capacity. These findings support the DASI as a practical and valid tool for functional assessment in patients with Chagas cardiomyopathy. Its significant associations with objective performance measures suggest that it may provide clinically meaningful information in both research and routine care, particularly in settings where rapid, low-cost functional evaluation is needed.

18724

EFFECTS OF A COMBINED PATIENT EDUCATION EXERCISE PROGRAM ON RESTING HEART RATE VARIABILITY OF INDIVIDUALS WITH PREDIABETES OR DIABETES

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Background/Introduction: Individuals with prediabetes or diabetes present reduced heart rate variability (HRV), reflecting worse cardiac autonomic modulation and increased cardiovascular risk. Although physical exercise and patient education are recommended, their combined effects remain underexplored. Objectives: To investigate the effects of patient education combined with a structured exercise program on cardiac autonomic modulation of individuals with prediabetes or diabetes. Methods: This study stems from a secondary outcome of a multicenter randomized clinical trial that involved two parallel groups: an exercise-only program (Ex) and a patient education program associated with exercise (EdEx). The Ex group included aerobic and muscle-strengthening exercises, while the EdEx group combined the exercise program with a patient education program adapted for the Brazilian population. Cardiac autonomic modulation was assessed through linear and nonlinear HRV measures. For heart beat recording, a heart rate monitor (Polar®, model V800) was used. During data collection, participants remained in the supine position and were instructed to maintain a relaxed posture, not to talk, avoid movements, not to sleep, keep their eyes open, and breathe spontaneously. Assessments were carried out in the morning or afternoon periods, without control of environmental conditions, such as temperature, humidity, or external noise. The effects of the interventions were analyzed using a linear mixed model (LMM), considering the group effect (EdEx vs. Ex), time effect (pre vs. post-intervention), and the group × time interaction. The level of significance adopted was P < 0.05. Results and Conclusions: A total of 252 participants were included (Table 1), and all LMM results are presented in Table 2. Overall HRV measures, such as the standard deviation of normal RR intervals (SDNN) and the dispersion of points along the line of identity of the Poincaré plot (SD2), increased significantly at post-intervention (Table 2). However, this improvement in cardiac autonomic control was not influenced by the addition of patient education to the exercise program, as indicated by the absence of a significant group × time interaction (P = 0.150 and P = 0.090).

Table 1. Comparison of sociodemographic and clinical characteristics of the participants.

Variables	EdEx (n = 120)	Ex (n = 132)	*P* value
Demographic Characteristics			
Age (years)	55.5 [43.3-60.8]	52.0 [42.0 -62.8]	0.828
Female	75 (63%)	92 (70%)	0.227
Clinical Characteristics			
Glycated hemoglobin (%)	6.5 [5.9-7.6]	6.6 [6.2-7.7]	0.222
Diagnosis			0.092
Prediabetes	51 (43%)	41 (31%)	
Type 1 diabetes	11 (9%)	21 (16%)	
Type 2 diabetes	58 (48%)	70 (53%)	
Time elapsed since diagnosis (years)	6 [2-6]	6 [3-6]	0.976
Body mass index (kg/m²)	30.0 [36.8-30.0]	29.5 [25.5-29.5]	0.182
Oral antidiabetics	88 (73%)	96 (73%)	0.914
Insulin therapy	27 (23%)	30 (23%)	0.948
Hypertension	58 (48%)	64 (49%)	0.981
Stroke	2 (2%)	1 (1%)	0.605
Dyslipidemia	56 (50%)	76 (60%)	0.110
Peripheral vascular disease	14 (12%)	13 (10%)	0.625
Coronary Syndrome	1 (1%)	5 (4%)	0.217
Angina	3 (3%)	2 (2%)	0.670
Heart surgery	1 (1%)	2 (2%)	1.000
Coronary artery disease	3 (3%)	4 (3%)	1.000

Values are presented as median [1st quartile – 3rd quartile] or absolute (percentage).

Table 2: Results of linear mixed models (LMM) for comparisons of the trial outcomes between groups and time points.

HRV Measures (n=252)	Beta	Standard Error	IC 95%
SDNN (ms)			
Group (EdEx)[a]	-2.00	2.38	-6.67; 2.66
Time (post-intervention)[b]	4.09	1.95	0.26; 7.91
Group x time interaction	-3.90	2.75	-9.30; 1.49
RMSSD (ms)			
Group (EdEx)[a]	-2.18	2.43	-6.96; 2.59
Time (post-intervention)[b]	2.57	1.88	-1.12; 6.28
Group x time interaction	-2.34	2.66	-7.57; 2.87
LF (nu)			
Group (EdEx)[a]	-1.97	2.60	-7.08; 3.12
Time (post-intervention)[b]	0.34	2.48	-4.52; 5.21
Group x time interaction	1.04	3.50	-5.82; 7.91
HF (nu)			
Group (EdEx)[a]	1.97	2.60	-3.12; 7.06
Time (post-intervention)[b]	-0.34	2.47	-5.20; 4.51
Group x time interaction	-1.03	3.40	-7.88; 5.82
Total Power (ms²)			
Group (EdEx)[a]	-60.27	150.75	- 355.74; 235.19
Time (post-intervention)[b]	212.66	124.87	-32.08; 457.41
Group x time interaction	-184.82	176.28	-530.53; 160.68
SD1 (ms)			
Group (EdEx)[a]	-1.60	1.72	-4.99; 1.77
Time (post-intervention)[b]	1.71	1.33	-0.90; 4.34
Group x time interaction	1.46	1.88	-5.16; 2.24
SD2 (ms)			
Group (EdEx)[a]	-2.40	3.07	-8.44; 3.63
Time (post-intervention)[b]	5.58	2.53	0.60; 10.56
Group x time interaction	-5.99	3.58	-13.01; 1.03

[a] Reference category: exercise group; [b] Reference category: baseline; All models were adjusted for intervention delivery mode, sex, age, diagnosis, and regular physical activity; Random effect (*P* value): <0.001; SDNN: standard deviation of normal RR intervals; RMSSD = root mean square of the differences between successive normal RR intervals; LF (nu) = low-frequency spectral band expressed in normalized unit; HF (nu) = low-frequency spectral band expressed in normalized unit; SD1 = Poincaré plot standard deviation perpendicular the line of identity; SD2: dispersion of points along the Poincaré plot identity line.

18133

FRAILTY AND FUNCTIONAL STATUS AS PREDICTORS OF CLINICAL OUTCOMES AFTER CARDIOVASCULAR SURGERY: A PRELIMINARY ANALYSIS

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Background/Introduction: The physiological stress of open heart surgery (OHS) can lead to a decline in functional status, particularly in frail patients. Assessing these aspects in the postoperative period may help identify a higher risk of readmission and death within 90 days, optimizing clinical management and care transition strategies. Objectives: To investigate the association of functional status and frailty at hospital discharge with clinical outcomes such as falls, hospital readmission, and mortality 90 days after OHS. Methods: This is a prospective cohort study of patients undergoing coronary artery bypass grafting (CABG) and valve replacement surgery (VRS). Functionality was assessed using the Katz Index and frailty was measured via the Clinical Frailty Scale at the time of discharge. A 90-day follow-up was conducted through teleconsultations and medical record reviews to track falls, all-cause readmissions and deaths. Descriptive analysis was performed, and associations between categorical variables were evaluated using Fisher's Exact Test with a 5% significance level. The study was approved (CAAE 79476524.7.0000.5327) by the local Ethics Committee. Results and Conclusions: At the time, 54 participants were included (age 64±10years, 67% male), comprising VRS (52%), CABG (37%) or combined procedures (11%). At discharge, the functionality score was 2±0.8, indicating dependence in two basic activities of daily living. During the 90-day follow-up, 14 readmissions and 2 deaths were recorded. The readmission rate was 30% among functionally dependent patients compared to 14% in independent patients (RR=0.48; 95% CI 0.07-3.41; p=0.657). Furthermore, 4 falls and 2 deaths occurred, all within the functional dependence group. Regarding frailty, 16(29.6%) patients were classified as non-frail, 24(44.4%) as pre-frail, and 14(25.9%) as frail. Two falls were reported in the pre-frail and two in the frail group, with one death occurring in each category. The association of falls and mortality was limited by the low event frequency and the findings were interpreted descriptively. Patients with functional dependence had a higher number of readmissions within 90 days, besides unfavorable outcomes such as falls and death. This suggests the need for targeted rehabilitation and care transition strategies after OHS. The increase of the sample size and the follow-up will allow us to understand the impact of functionality and frailty after hospital discharge.

18395

FUNCTIONAL FRAILTY IN PATIENTS WITH HEART FAILURE WITH PRESERVED EJECTION FRACTION

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Background/Introduction: INTRODUCTION: Heart failure (HF) has been a public health problem due to its increasing incidence and high mortality rate. Special attention has been given to HF with preserved ejection fraction (HFpEF), as it has shown a high incidence due to its strong relationship with population aging. Its pathophysiology is complex, multifactorial, and followed by functional decline. Objectives: OBJECTIVE: To evaluate the functional frailty of individuals diagnosed with HFpEF. Methods: METHODS: Cross-sectional study with patients over 40 years of age, referred to a specialized Heart Failure Clinic in Niterói-RJ. Participants underwent laboratory tests, electrocardiogram, and echocardiogram. They were subjected to a battery of functional tests that assess respiratory and peripheral muscle strength and cardiorespiratory fitness. Results and Conclusions: RESULTS: Preliminary results from 12 individuals, predominantly female (75%), with an average age of 67.5 ± 11.1, show a functional decline expressed by a reduction in inspiratory muscle strength (PImax 87.1% ± 37.1 of expected), expiratory flow deficit (Peak flow 56.7% ± 17.6 of expected), and loss of peripheral strength (FPM 76.9% ± 29.4 of expected). CONCLUSION: Results show functional changes with a reduction in respiratory and peripheral muscle strength, highlighting the functional frailty of these participants with HFpEF. Heart failure with preserved ejection fraction; Frailty; Functional status;

17957

GAIT SPEED AS A FUNCTIONAL ASSESSMENT TOOL IN PATIENTS WITH CHAGAS CARDIOMYOPATHY LIVING IN AN ENDEMIC REGION.

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Background/Introduction: Chagas disease remains an important cause of cardiomyopathy and heart failure in endemic areas and is increasingly observed among older adults. Functional assessment is essential to guide rehabilitation and clinical management, since physical limitations may emerge early in the course of cardiac involvement. Gait speed is a simple, inexpensive, and feasible measure of mobility and physical performance, particularly useful in aging populations and in settings where less demanding tests are needed. However, its relationship with other functional measures and body composition variables in patients with Chagas cardiomyopathy and cardiac dysfunction has not been sufficiently explored. Objectives: To evaluate the applicability of gait speed in patients with Chagas cardiomyopathy by examining its association with functional and body composition variables. Methods: This cross-sectional study included 57 patients (65.3 ± 7.7 years) with Chagas cardiomyopathy and systolic or diastolic dysfunction, all living in an endemic region. Usual gait speed was assessed by recording the time required to walk 4 meters at a habitual pace. This variable was correlated with the Human Activity Profile (HAP), the five-repetition sit-to-stand test, the 1-minute sit-to-stand test, handgrip strength, and appendicular lean mass index measured by dual-energy X-ray absorptiometry. Correlations were analyzed using Pearson's or Spearman's coefficients, as appropriate. Results and Conclusions: Gait speed showed significant correlations with all evaluated variables, including maximum HAP score (r=-0.371; p=0.008), adjusted HAP score (r=-0.327; p=0.020), five-repetition sit-to-stand time (r=0.363; p=0.014), 1-minute sit-to-stand performance (r=-0.434; p=0.002), handgrip strength (r=0.323; p=0.021), and appendicular lean mass index (r=-0.308; p=0.048). Overall, slower gait performance was associated with poorer self-reported functional status, worse lower-limb performance, reduced muscle strength, and less favorable muscle composition. These findings support gait speed as a relevant marker of functional status in patients with Chagas cardiomyopathy and cardiac dysfunction. Given its simplicity, low cost, and feasibility in older adults, gait speed may be particularly useful for routine assessment in endemic and resource-limited settings, helping detect functional decline and support rehabilitation planning and individualized care.

17840

GLITTRE-ADL TEST FOR FUNCTIONAL ASSESSMENT IN BREAST CANCER SURVIVORS IN CARDIO-ONCOLOGY: PRELIMINARY PILOT DATA

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Background/Introduction: Breast cancer survivors frequently experience functional limitations and reduced capacity for activities of daily living (ADL) due to oncological treatment side effects, negatively affecting quality of life and autonomy. To prevent function decrease, early and accurate physical assessment should be performed, particularly in resource-limited clinical settings. The Glittre-ADL test is a promising tool which simulates multi-dimensional tasks, however its validity has not been established in the breast cancer population. Objectives: This pilot study aim to investigate the association between Glittre-ADL performance and 6MWT distance in breast cancer survivors, exploring the test's potential as a functional assessment tool. Methods: Approved by the ethics committee, this study recruited participants from a physical therapy outpatient service. Inclusion criteria were a diagnosis of breast cancer and completion of chemotherapy at least 3 months before assessment. Assessment included clinical and oncological data, Mini-Mental State Examination (Mini-Mental), cardiovascular risk stratification (SAS and Framingham Score); physical activity levels (IPAQ); and quality of life (EORTC QLQ-C30 and BR23). Exclusion criteria included physical or cognitive impairments hindering test execution. Participants performed the tests in randomized order. Physiological parameters and Modified Borg scores were recorded. Statistical analysis included Shapiro-wilk, and Pearson or Spearman correlation tests ($p<0,05$). Results and Conclusions: The sample (n=7) had mean age of 60.57±10,65 years, BMI of 27,30±3,39 kg/m², and median time since diagnosis of 4,21 years (1,46-43,83). Cardiovascular risk factors and comorbidities were diabetes (71.4%) and hypertension (28.6%), chemotherapy (42.9%), radiotherapy in the left breast (28.6%). Median Glittre-ADL completion time was 176,28 (142,17-233,05) seconds; mean 6MWT distance was 454,25 ± 112,23 meters. A strong inverse correlation was found between Glittre-ADL and 6MWT ($r= −0,786$; $p= 0,036$). Furthermore, Glittre-ADL performance had strongly negatively correlated with Mini Mental scores ($r= -0,954$; $p =0,001$). Preliminary data suggest that Glittre-ADL performance is inversely associated with 6MWT distance, supporting its potential as a feasible, low-cost complementary tool for functional assessment in breast cancer survivors. Larger studies are needed to confirm its validity and to clarify the influence of cognitive function on test performance.

18703

IMPACT OF TRANSITIONAL CARE PROGRAMS AFTER DISCHARGE ON CLINICAL OUTCOMES IN PATIENTS WITH HEART FAILURE: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CLINICAL TRIALS

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Background/Introduction: Transitional care programs for patients with Heart Failure (HF) have been proposed to improve clinical outcomes. Although evidence points to a reduction in readmissions and mortality, the effects on functional outcomes and quality of life are not yet fully established. Objectives: To evaluate the effectiveness of post-hospital discharge transitional care programs in patients with HF regarding mortality, hospital readmissions, quality of life, and physical function. Methods: Systematic review and meta-analysis (PROSPERO - CRD420251241032). Randomized clinical trials were included involving adult patients with HF undergoing post-discharge transitional care interventions that assessed all-cause and cardiovascular mortality, hospital readmissions (up to 30 days and after 30 days), quality of life, and physical function (functional capacity and functional status). The search was conducted in the MEDLINE, EMBASE, CENTRAL, and LILACS databases, including grey literature, up to February 2026. The meta-analysis utilized a random-effects model, and the effect size was synthesized using relative risk (RR) and standardized mean difference (SMD). Results and Conclusions: A total of 47 studies (n=15,484 participants) were included, which primarily focused on transitional care programs based on home-visiting, primarily educational, telemonitoring, outpatient clinic–based and structured telephone support. It was observed that interventions reduced all-cause mortality (RR 0.84; 95% CI 0.74–0.95) and hospital readmissions after 30 days discharge (RR 0.83; 95% CI 0.76–0.91), with home-visiting programs being the most effective strategy (RR 0.84; 95% CI 0.74–0.95). Furthermore, an improvement in patients' quality of life was observed (SMD -0.25; 95% CI -0.43 to -0.08). No effect was observed on readmissions within 30 days (RR 0.96; 95% CI 0.80–1.15). Physical function was assessed in three studies, indicating greater variation in functional capacity outcomes, with limited and heterogeneous evidence. Transitional care programs are associated with a reduction in mortality and readmissions, as well as improved quality of life in patients with HF; however, their impact on post-discharge physical function still requires further investigation.

16050

MUSCLE OXYGENATION DURING WALKING IN PERIPHERAL ARTERIAL DISEASE AND TYPE 2 DIABETES

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Background/Introduction: Peripheral arterial disease (PAD) is characterized by impaired blood flow, leading to changes in skeletal muscle oxygenation and reduced functional capacity. Type 2 diabetes mellitus (DM) is a major risk factor for PAD and may compromise microvascular responses during exercise. However, the combined impact of PAD and DM on muscle oxygenation and functional capacity remains unclear. Objectives: To compare muscle oxygenation and functional capacity among individuals with PAD and DM (PADDM), PAD without DM (PADNDM), DM only (DM), and healthy controls (HEALTH). Methods: This cross-sectional study included 96 participants equally allocated into four groups (PADDM, PADNDM, DM, and HEALTH) and matched for age and sex. Functional capacity was assessed using the Incremental Shuttle Walking Test (ISWT), and muscle oxygenation was measured using Near-infrared Spectroscopy (NIRS) during the test. Data normality was assessed using the Shapiro-Wilk test. Group comparisons were performed using one-way ANOVA with Bonferroni post-hoc tests. For statistical significance, an alpha value of 5% was considered ($p<0.05$). Results and Conclusions: All groups had similar mean initial saturation values during the ISWT ($p=0.979$). A reduction in saturation was observed across all groups during the test ($p<0.001$). PADDM and PADNDM groups demonstrated a faster deoxygenation, lower mean saturation and a greater desaturation at the end of the test compared to DM and HEALTH groups ($p<0.001$). Reoxygenation time was significantly longer in PADDM group compared to DM and HEALTH groups ($p<0.001$) and in PADNDM compared to HEALTH ($p=0.034$). In addition, PADDM and PADNDM groups walked shorter distances than DM and HEALTH groups ($p<0.001$). These findings suggests that PAD is associated with impaired muscle oxygenation and reduced functional capacity, regardless of DM status, highlighting its impact on oxygen delivery and recovery, which may contribute to reduced functional capacity.

Table 1. Sample characterization

	PADDM (n=24)	PADNDM (n=24)	DM (n=24)	HEALTH (n=24)	p
Age, years	65 ± 7.64	64.46 ± 8.26	63.50 ± 8.40	63.67±8.69	0.915
Sex, f n (%)	12 (50%) / 12 (50%)	12 (50%) / 12 (50%)	12 (50%) / 12 (50%)	12 (50%)	1.000
BMI, Kg/m²	31.11 ± 8.94	29.01±13.99	29.34 ±4.31	26.75±3.69	0.390
ABI	0.67 ± 0.13*↓	0.65 ± 0.16*↓	1.12 ± 0.09	-	<0.001+

Legend: PADDM: participants with PAD + DM; PADNDM: participants with PAD without DM; DM: participants with DM; HEALTH: healthy participants; BMI: body mass index; ABI: ankle-brachial index; *statistically significant differences compared with the DM group;

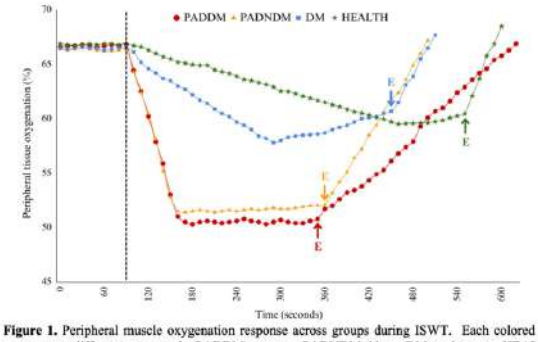


Figure 1. Peripheral muscle oxygenation response across groups during ISWT. Each colored line represents a different group: red - PADDM, orange - PADNDM, blue - DM, and green - HEALTH. The vertical dashed line indicates the start of the test, and colored arrows indicate the end of the test for each group.

17936

PREDICTIVE VALUE OF VENTILATORY VARIABLES ASSESSED AT THE ANAEROBIC THRESHOLD DURING CARDIOPULMONARY EXERCISE TESTING IN PATIENTS WITH CHAGAS CARDIOMYOPATHY

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Background/Introduction: Chagas cardiomyopathy has a variable prognosis, and functional assessment using cardiopulmonary exercise testing (CPET) has proven useful for risk stratification. Peak exercise variables such as peak oxygen uptake (VO2peak), VE/VCO2 slope, and end-tidal carbon dioxide pressure (PETCO2) are recognized prognostic markers. However, many patients with Chagas cardiomyopathy do not achieve maximal effort due to functional limitations, making variables obtained at the anaerobic threshold potentially more feasible and clinically relevant. Despite this, data on the prognostic value of submaximal ventilatory variables in this population remain limited. Objectives: To investigate whether ventilatory variables assessed at the anaerobic threshold, including oxygen uptake (VO2 at AT), VE/VCO2 slope at AT, and PETCO2 at AT, predict adverse events in patients with Chagas cardiomyopathy. Methods: This prospective longitudinal study included 44 patients with Chagas cardiomyopathy (50 ± 12 years; NYHA class I–III; left ventricular ejection fraction 40 ± 10%) who underwent CPET. VO2, VE/VCO2 slope, and PETCO2 were analyzed at the anaerobic threshold. Patients were followed for 18 ± 8 months for the occurrence of adverse events, defined as cardiovascular death, heart failure hospitalization, or need for transplantation. Predictive performance was assessed using receiver operating characteristic (ROC) curves, and the association with events was analyzed using Cox regression adjusted for age, NYHA class, and left ventricular ejection fraction. Results and Conclusions: During follow-up, 11 patients (25%) experienced adverse events. The areas under the ROC curve for VO2 at AT, VE/VCO2 slope at AT, and PETCO2 at AT were 0.85, 0.79, and 0.79, respectively. The optimal cutoff values were VO2 at AT <17 mL/kg/min, with 90% sensitivity and 65% specificity; VE/VCO2 slope at AT >30, with 80% sensitivity and 70% specificity; and PETCO2 at AT <34 mmHg, with 90% sensitivity and 70% specificity. In adjusted Cox analysis, only VO2 at AT remained in the final model as an independent predictor of adverse outcomes (HR 0.831; 95% CI 0.72–0.96; $p=0.015$). These findings suggest that ventilatory variables obtained at the anaerobic threshold, particularly VO2 at AT, have relevant prognostic value in patients with Chagas cardiomyopathy. CPET may therefore contribute to risk stratification not only through maximal exercise responses but also through submaximal analysis, which may be especially useful in patients with limited exercise tolerance.

18650

PROBABLE RESPIRATORY SARCOPENIA AND MORTALITY IN PATIENTS WITH HEART FAILURE: A MULTICENTER COHORT ANALYSIS

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Background/Introduction: Heart failure with reduced ejection fraction (HFrEF) is associated with reduced cardiac output, hypoperfusion, and chronic catabolism, leading to muscle wasting. Peripheral sarcopenia is an established predictor of mortality; however, the role of respiratory sarcopenia—affecting ventilatory muscles and respiratory function— is not yet fully understood in patients with HFrEF. Objectives: To evaluate the association between probable respiratory sarcopenia with mortality in patients with HFrEF. Methods: Retrospective multicenter cohort including 125 outpatients (≥18 years) with HFrEF followed at heart failure outpatient clinics, with available data on maximal inspiratory pressure (MIP) and appendicular skeletal muscle mass (ASM). Respiratory muscle weakness was defined as MIP ≥ -80 cmH□O. Low muscle mass was defined by ASM/height² according to EWGSOP2 criteria (<7.0 kg/m² for men and <5.5 kg/m² for women). Probable respiratory sarcopenia was defined as the coexistence of both conditions. The outcome was all-cause mortality within 24 months. Logistic regression was used to estimate odds ratios (OR) with 95% confidence intervals (CI), including adjustment for age and sex. Survival analysis was performed using Kaplan–Meier curves and the log-rank test. Statistical significance was set at $p < 0.05$. The study followed Resolution CNS 466/2012 and was approved by the institutional ethics committee (CEP n° 5.468.501). Results and Conclusions: Mean age was 53.9 ± 11.2 years, and 69.6% were female. The prevalence of respiratory muscle weakness was 52%, and low muscle mass was 24.8%. Probable respiratory sarcopenia was identified in 17.6% of patients, being more frequent in men (55.3% vs. 1.1%). During follow-up, 13 deaths occurred (10.4%). No significant association was found between respiratory sarcopenia and mortality in crude (OR 0.36; 95% CI 0.04–2.93; p=0.341) or adjusted analysis (OR 0.73; 95% CI 0.05–10.98; p=0.821), respectively. Survival analysis showed no difference between groups (log-rank p=0.38). Probable respiratory sarcopenia was not associated with mortality at 24 months in patients with HFrEF.

18713

RECOVERY HEART RATE AS A MARKER OF OFF HEART RATE KINETICS AFTER 6MWT IN HOSPITALIZED CARDIAC PATIENTS.

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Background/Introduction: Heart rate (HR) recovery after exercise reflects autonomic regulation, with clinical and prognostic value. Heart rate monitoring during recovery models a physiological parameter of autonomic dynamics (t½ of OFF kinetics). Although recovery HR (HRC), measured by pulse oximetry (PO), is an accessible measure, its association with OFF kinetics is not yet established in hospitalized cardiac patients. Objectives: We evaluated the correlation between HRC measured by PO and the half-recovery time (t½) derived from the OFF kinetics of HR measured by heart rate monitor during the 6MWT, and analyzed possible clinical and physiological predictors obtained during the t½ test of OFF kinetics. Methods: Observational study with hospitalized adult cardiac patients of both sexes undergoing the 6MWT. The HR was monitored using a Polar® H10 heart rate monitor, and HRR was measured using a G-Tech oximeter, defined as the difference between the HR at the end of the 6MWT and at minutes 1, 3, and 5 of recovery. Off-energy kinetics was given by the HR recovery half-life (t½). Peripheral oxygen saturation (SpO□) and the subjective perception of effort using the Borg scale were obtained during the 6MWT and recovery. Associations between parameters were assessed using correlation analyses and a generalized linear model (GzLM). Results and Conclusions: We analyzed 72 patients with a mean age of 74±57.8, who covered 443±114m in the 6MWT, with a half-life (½) of 68s (51.5) and HRR1-min of 15.5±12.3 bpm, 3 min of 21.4±14.5 bpm, and 5 min of 24.5±14.5 bpm. A negative correlation was observed between ½ and HRR1-min ($\rho=-0.309$; p=0.009), but there was no significant association with HRR at 3 and 5 min. There was a significant association ($X2=5.91$; p=0.015) between the presence of slow off-kilometer kinetics (½>105s) and reduced HRR1-minn (≤12 bpm). The independent predictors for t½ were HRR1-min (β=−1.772;IC95%:−2.765 a −0.714;p=0.002)) and the HR achieved at the end of the 6MWT (β=+0.690;IC95%:0.123 a 1.275;p=0.025) and the presence of diabetes (p=0.026) in the GzLM with gamma distribution ($R2=0.19$, $Chi^2/DF=0.286$, residuals p=0.935). The HRR1-min measured by pulse oximetry partially reflected the t½ of the OFF kinetics, serving as a simple marker of chronotropic recovery after the 6MWT. Early recovery of HRR1 and the final HR of the 6MWT are independent predictors of recovery kinetics, reinforcing the potential of HRR1 as a practical tool for estimating autonomic recovery in a hospital setting.

18887

RESPIRATORY DIAGNOSTIC ASSISTANT: AN INNOVATIVE DEVICE FOR CHARACTERIZATION OF THE BREATHING PATTERN IN CHRONIC HEART DISEASE - A PILOT STUDY

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Background/Introduction: Patients with chronic heart disease may present important alterations in the breathing pattern (BP). However, the assessment of this dysfunction remains predominantly subjective and poorly investigated. Objectives: To evaluate the BP of individuals with chronic heart disease using an innovative prototype named Respiratory Diagnostic Assistant (RDA). Methods: Cross-sectional study (REC n. 6.387.631) conducted with patients with chronic heart disease, of both sexes, aged 18 to 60 years. Data on inspiratory capacity (IC), slow vital capacity (SVC), respiratory rate (RR), tidal volume (TV), minute ventilation (MV), and inspiration–expiration ratio (I:E) were collected using the RDA, in the seated position, at rest. Additionally, qualitative analysis of respiratory curves was performed using the RDA analysis software. Variables were described as mean±standard deviation and frequency, and respiratory measurements were compared with reference values. Results and Conclusions: The sample included 10 individuals, with 8 diagnosed with heart failure (HF), 1 with coronary artery disease (CAD), and 1 in the post–heart transplant period. Six patients were male and four were female, with a mean age of 48.1±14.2 years and mean BMI of 28.5±4.9. Eighty percent of participants presented RR within normal limits; 60% of individuals showed alterations in TV; 100% presented altered MV, exceeding the 5–6 L/min range. The I:E ratio was preserved in 20% of individuals. IC analysis indicated that 50% of participants were within the range considered normal. One hundred percent of individuals presented SVC below reference values. Qualitative analysis demonstrated ventilatory instability at rest, characterized by irregularity of respiratory cycles, variability in volume amplitude, and presence of transient respiratory events. The RDA prototype demonstrated potential to identify relevant alterations in the ventilatory pattern in cardiac patients. This study was funded by: CNPQ (312587/2022-8, 408281/2023-5, 420408/2025-8, and 449721/2025-6); FACEPE (APQ-0679-4.08/25)

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20576

IS IT THE PANDEMIC? COMPARISON OF DEPRESSIVE SYMPTOMS IN MEDICINE STUDENTS DURING AND AFTER COVID-19 AND IMPLICATIONS FOR CARDIOVASCULAR HEALTH

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Background/Introduction: Depression is showing significant global growth, affecting approximately 3.8% of the world's population. Along with the COVID-19 pandemic, mental health gained awareness due to it's impact on people. Meanwhile, depression is recognized as a risk factor for cardiovascular diseases, worsening their course and influencing the development of risk factors. Objectives: To compare the prevalence of depressive symptoms in medicine students during and after the COVID-19 pandemic. Methods: An observational, cross-sectional, quantitative study on the self-reporting of symptoms of depression, according to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), between the per-pandemic (2020) and post-pandemic (2025) periods among medical students. Application of an anonymous questionnaire, after signing an informed consent form. Approved by the Research Ethics Committee. Results and Conclusions: A total of 434 students were interviewed, being 229 in 2020 and 205 in 2025. Significant positive associations were found between the pandemic period and increased prevalence of the following symptoms: decreased interest/pleasure (p=0,039); unintentional weight gain/loss (p<0,001); excessive/inappropriate guilt and feelings of inutility (p<0,001); decreased capacity to think/concentrate (p=0,031); and symptoms's impact on daily life (p<0,001). However, there was no significant correlation when it came to the following symptoms: depressed mood (p=0,143); quality of sleep (p=0,677); psychomotor agitation/retardation (p=0,151); fatigue or lack of energy (p=0,388); and suicidal ideation (p=0,472). The prevalence of self-reported depressive symptoms was significantly higher within the context of the pandemic for a minority of symptoms. Even in those, the difference was no higher than 20% in weight gain/loss and feelings of uselessness/guilt or 10% in lack of interest/pleasure and decreased capacity to think/concentrate. In fact, the percentage of students that reported suicidal ideation post pandemic is higher than per-pandemic. It seems that, while the pandemic probably worsened the prevalence of depressive symptoms in medicine students, it doesn't appear to have been as impactful on that population, considering the prevalence is still high even 3 years past the critical period. Given the profound impact depression can have in the cardiovascular system, it is reasonable to consider medicine students as a possibly vulnerable group for cardiovascular complications.

Spirituality and Cardiovascular Medicine



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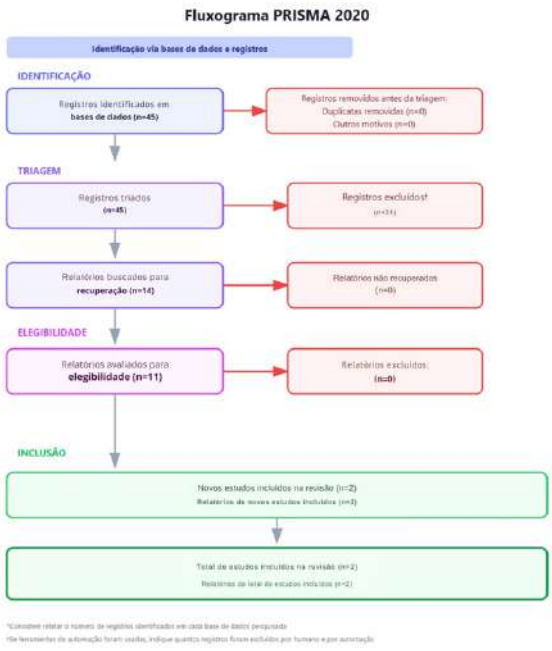
20522

MIND–BODY INTERVENTIONS IN STRESS MODULATION AND THEIR IMPACT ON CARDIOVASCULAR OUTCOMES: A SYSTEMATIC REVIEW

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Background/Introduction: Chronic stress and dysregulation of the hypothalamic–pituitary–adrenal axis play a central role in the pathophysiology of cardiovascular diseases, influencing hemodynamic, inflammatory, and behavioral parameters. Mind–body and spirituality-based interventions have been investigated as complementary strategies to modulate these mechanisms. Objectives: To evaluate the impact of mind–body and spirituality-based interventions on stress modulation, considering psychophysiological, neuroendocrine, and behavioral parameters, including cortisol, perceived stress, anxiety, and depressive symptoms, and to analyze their influence on cardiovascular outcomes, functional capacity, quality of life, and associated risk factors, as well as to explore mechanisms linking chronic stress to cardiovascular diseases. Methods: A systematic review was conducted following PRISMA guidelines. Searches were performed in PubMed, SciELO, and Scopus using terms related to “yoga,” “stress,” “spirituality,” and “cardiovascular.” Randomized clinical trials and quasi-experimental studies assessing psychophysiological and cardiovascular outcomes were included. A total of 45 studies were identified, of which 11 met eligibility criteria. For this specific analysis, 6 studies focusing on stress-related outcomes were selected. Study selection was performed by independent reviewers. Results and Conclusions: The included studies (n=6) demonstrated significant reductions in perceived stress (p<0.001), cortisol levels (p<0.001), anxiety (p=0.01), and depressive symptoms (p=0.005), along with improvements in quality of life across different populations. Yoga-based and breathing interventions showed beneficial effects on fatigue and dyspnea in patients with heart failure. Spirituality-based strategies, particularly community interventions, exhibited indirect effects on cardiovascular risk modulation through behavioral changes and improved coping mechanisms. Despite the lack of consistent effects on structural cardiac outcomes, findings suggest that stress modulation is a central pathway in reducing cardiovascular risk. These results support mind–body and spirituality-based interventions as effective complementary approaches in the psychophysiological management of cardiovascular diseases.



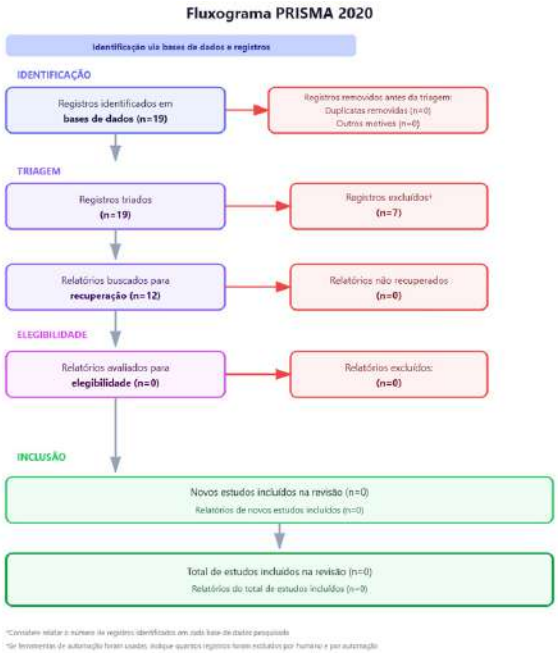
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SPIRITUALITY AND CLINICAL AND BEHAVIORAL OUTCOMES IN CARDIOVASCULAR DISEASES: A SYSTEMATIC REVIEW

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Background/Introduction: Cardiovascular diseases remain the leading cause of global mortality and are associated with clinical, behavioral, and psychosocial factors. In this context, spirituality and religiosity have been increasingly investigated as potential modulators of these outcomes, particularly through their influence on stress regulation, therapeutic adherence, and cardiovascular physiological responses. Objectives: To comprehensively evaluate the influence of spirituality and religiosity on clinical, physiological, and behavioral outcomes in patients with cardiovascular diseases, including clinical events, hemodynamic parameters, and cardiometabolic biomarkers. Methods: A systematic review was conducted in accordance with PRISMA guidelines, using a PICO-based strategy. Searches were performed in PubMed, SciELO, and Scopus databases. A total of 19 studies were identified, of which 12 were selected after applying eligibility criteria. Screening was performed in a double-blind manner by independent reviewers through title, abstract, and full-text analysis. Randomized clinical trials and observational studies published within the last 10 years, preferably in English, were included. Eligible studies evaluated spirituality-related interventions, including yoga-based practices and faith-based programs. Results and Conclusions: Among the 12 included studies, approximately 75% demonstrated significant improvements in cardiovascular outcomes. Spirituality-related interventions were associated with reductions in clinical events, including decreased episodes of syncope (up to 72%) and a higher proportion of event-free patients (43.3% vs 16%). Consistent improvements were observed in cardiometabolic parameters, including reductions in blood pressure (up to −8.3 mmHg), body mass index (up to −1.0 kg/m²), and global cardiovascular risk scores (QRISK3 reduction of approximately 29%). Additionally, favorable changes in biomarkers were reported, including reductions in LDL cholesterol (up to −22 mg/dL) and triglycerides, along with increases in HDL cholesterol (up to +6 mg/dL). Physiological benefits were also identified, such as improved vascular function and autonomic modulation. From a behavioral perspective, approximately 66% of studies reported increased treatment adherence and adoption of healthier lifestyles. Overall, spirituality appears to play a relevant role in modulating clinical and physiological outcomes in cardiovascular diseases, supporting its use as a complementary strategy in comprehensive cardiovascular care.



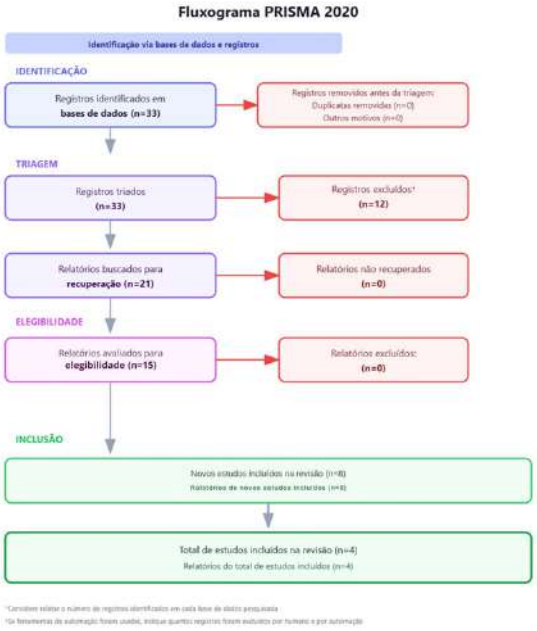
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SPIRITUALITY AND MIND–BODY INTERVENTIONS IN REDUCING CARDIOVASCULAR RISK FACTORS: A SYSTEMATIC REVIEW

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Background/Introduction: Cardiovascular diseases remain the leading cause of global mortality and are strongly linked to modifiable risk factors such as stress, hypertension, and metabolic syndrome. Mind–body and spirituality-based interventions, particularly yoga, have emerged as adjunct strategies with potential physiological and behavioral benefits in cardiovascular prevention and rehabilitation. Objectives: To assess the effects of spirituality-based and mind–body interventions on cardiovascular risk factors and outcomes, focusing on hemodynamic, metabolic, inflammatory, and psychophysiological parameters, including stress modulation, and their role in cardiovascular prevention and rehabilitation. Methods: A systematic review was conducted following PRISMA guidelines. Searches were performed in PubMed, SciELO, and Scopus using terms related to “yoga,” “spirituality,” and “cardiovascular risk.” Randomized clinical trials and quasi-experimental studies published in the last 10 years were included. From 33 identified records, 15 studies met eligibility criteria after screening. Study selection was performed by independent reviewers. Outcomes included hemodynamic, metabolic, inflammatory, and functional parameters. Results and Conclusions: Included studies (n=15) consistently demonstrated significant reductions in systolic blood pressure ($p<0.05$), waist circumference ($p<0.05$), and cortisol levels ($p<0.001$), alongside improvements in cardiometabolic and inflammatory markers. In individuals with metabolic syndrome, yoga-based interventions achieved higher reversal rates compared to controls (45.4% vs 32.3%). Improvements were also observed in functional capacity, exercise tolerance, and quality of life, particularly among heart failure patients, with significant reductions in anxiety and depressive symptoms. In elderly populations, yoga was associated with improved diastolic function and favorable hemodynamic changes compared to conventional exercise. Additionally, spirituality-based community interventions showed indirect benefits through enhanced behavioral adherence and lifestyle modification. However, no consistent improvements were observed in structural cardiac outcomes, including ejection fraction and echocardiographic parameters. Overall, mind–body and spirituality-based interventions exert beneficial effects primarily through psychophysiological, metabolic, and behavioral pathways, representing a promising complementary approach in cardiovascular risk reduction and rehabilitation.



Sports Cardiology, Exercise, Ergometry and Cardiovascular Rehabilitation



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20833

ACUTE HEMODYNAMIC EFFECT OF CONTINUOUS POSITIVE AIRWAY PRESSURE IN AMBULATORY PATIENTS WITH HEART FAILURE WITH PRESERVED EJECTION FRACTION: A PILOT STUDY.

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Background/Introduction: Heart failure (HF) with preserved ejection fraction (HFpEF) affects 50% of HF patients. Non-invasive ventilation (NIV) has been used as a non-pharmacological treatment in chronic HF by reducing ventricular preload and afterload and improving exercise tolerance in HF with reduced ejection fraction (HFrEF). Little is known about the acute hemodynamic effects of CPAP mode in patients with HFpEF. Objectives: OBJECTIVE: To determine the acute hemodynamic effect of NIV in CPAP mode in patients with HFpEF. Methods: Prospective, randomized, crossover, double-blind study. Five patients with HFpEF (diagnosed more than six months ago) from a HF clinic were evaluated. Na initial consultation (anamnesis/physical examination) was performed. The Berlin Questionnaire was applied. Patients with optimized medication and clinical stability were included. Patients underwent a single session of non-invasive ventilation (NIV) in CPAP or placebo mode (1 cmH2O), on alternate days (30 minutes), in the recumbent position, monitored by impedance cardiography (ICG) – afternoon shift. Data were recorded before, during, and after CPAP (7 cmH2O). Pre- and post-CPAP data were analyzed (therefore, the Student's t-test was used for data analysis). Patients with previous decompensation, COPD, or complex arrhythmias were excluded. The p-value was considered significant if ≤ 0.05. Results and Conclusions: Five patients were evaluated (two males/three females, age 70.6±11 years and LVEF 61.9±3.5%, NYHA Class II/III). A significant increase occurred in the following variables: cardiac output (4.02±1.8 vs 5.04±1.3 l/min; p=0.04), stroke volume (SV; 70.6±18 vs 74.8±19 ml; p=0.01), left ventricular ejection time (LVET; 325.6±32.06 vs 357.4±53.39 ms; p=0.04), left ventricular work (LCW; 5.05±1.6 vs 5.54±1.74 kg/m2; p=0.04) and a reduction in the LV acceleration/Cardiac Index (ACI; 71.4±34.7 vs 61.8±30.2 100/s2; p=0.01), Heather Index (HI 13.14±3.10 vs 11.5±2.55 Ohms/s2; p=0.019) and Systemic Vascular Resistance (SVR; 1383.6±485.1 vs 1324.8±285.8 dynas.s.cm-5; p=0.04) after the CPAP session. This suggests that CPAP mode may improve LV ventricular function in patients with HFpEF. The sample size is small. Therefore, it should be increased to improve the reliability of the results.



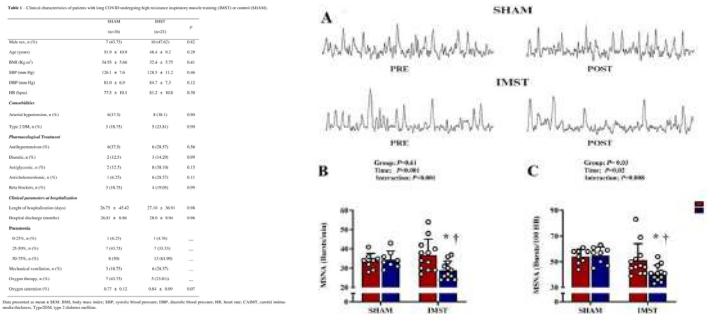
18371

BASED-HOME HIGH-RESISTANCE INSPIRATORY MUSCLE STRENGTH TRAINING DECREASES SYMPATHETIC NEURAL DRIVE, IMPROVES ENDOTHELIAL FUNCTION, AND REDUCES EXTRACELLULAR VESICLES IN LONG COVID PATIENTS: A RANDOMIZED, DOUBLE-BLIND, SHAM-CONTROLLED TRIAL

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(1) IDOR - RIO DE JANEIRO - RJ - BRASIL; (2) PROGRAMA DE POS GRADUACAO EM CIENCIAS CARDIOVASCULARES - UFF - NITERÓI - RJ - BRASIL; (3) INCOR - INSTITUTO DO CORACAO DA UNIVERSIDADE DE SAO PAULO - SAO PAULO - SP - BRASIL;

Background/Introduction: Previous evidence has shown that Long COVID patients have an increased risk of cardiovascular disease, which may be explained, in part, by sympathetic- cardiovascular dysfunction and alterations in the circulating milieu. Therefore, it is vital to propose strategies to restore cardiovascular health in this population. Objectives: To investigate whether inspiratory muscle strength training (IMST) reduces muscle sympathetic neural activity (MSNA), improves endothelial function, lowers blood pressure and reduces extracellular vesicles, and oxidative stress in Long COVID patients. Methods: A randomized, double-blind, sham-controlled clinical trial(NCT06091384) tested the effects of 6 weeks of IMST (30 breaths/day, 6 days/week at 75% PImax) versus SHAM (30 breaths/day, 6 days/week at 15% PImax) on PImax (manovacuometry), MSNA burst frequency (MSNABF, microneurography), brachial artery flow-mediated dilation (FMDBA, ultrasound), systolic and diastolic arterial pressure (SAP and DAP, semiautomated system), platelet and endothelial cell-derived extracellular vesicles (flow-cytometry), and oxidative stress markers. Complementary experiments were conducted on human umbilical vein endothelial cells (HUVEC) cultured with plasma samples from patients. Results and Conclusions: Thirty-seven patients completed the study (21 IMST: 48.4±9.2 yrs; 16 SHAM: 51.9±10.9 yrs). IMST increased PImax and reduced MSNABF, SAP and DAP and improved FMDBA (p<0.05 for all). Also, IMST reduced platelet and endothelial cell-derived VEs and increased SOD and CAT (p<0.05 for all), with no changes in NADPH oxidase or TBARS (p>0.05). HUVEC cultured with patient serum sampled after IMST exhibited lower ROS bioactivity, but there were no changes in NO. No changes were observed in the SHAM. Taken together, our findings indicate that IMST restores the sympathetic-cardiovascular function, suggesting it may be a promising strategy for reducing cardiovascular risk in this population.



20709

CARDIOMETABOLIC AND CARDIOVASCULAR IMAGING PROFILE OF FEMALE ATHLETES: A SPORTS CARDIOLOGY COHORT STUDY

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(1) INSTITUTO DANTE PAZZANESE DE CARDIOLOGIA - SAO PAULO - SP - BRASIL;

Background/Introduction: The rising participation of women in high-intensity endurance sports contrasts with the paucity of epidemiological data characterizing this population. The cardiometabolic burden, prevalence of cardiovascular disease (CVD), and findings on exercise testing and multimodal imaging in female athletes remain poorly described, limiting sex-specific risk stratification and preventive strategies in sports cardiology. Objectives: To describe the clinical, cardiometabolic, and cardiovascular profile — including exercise testing and imaging findings — of female athletes followed at a specialized sports cardiology outpatient clinic. Methods: Single-center, retrospective observational study of female athletes seen at a sports cardiology clinic in Brazil. Data extracted from electronic medical records comprised demographics, comorbidities, cardiovascular risk factors, type of sport, resting 12-lead EKG, maximal cardiopulmonary or symptom-limited exercise testing, echocardiography, and coronary CT angiography (CCTA) when available. Descriptive statistical analyses were performed. Results and Conclusions: A total of 347 women (age range 13–91 years; mean 57 years) were included, predominantly runners. Functional capacity was excellent in over 90% of participants (>10 METs). The most prevalent cardiovascular risk factors were dyslipidemia (50%), hypertension (34%), smoking (14%), and diabetes mellitus (11%); more than one-third met criteria for high or very high cardiovascular risk. Established CVD was identified in 68 athletes (19.5%): coronary artery disease in 24 — frequently detected by CCTA — and complex arrhythmias in 21. Ventricular dysfunction was present in only one patient. Resting ECG showed left bundle branch block in 8 and right bundle branch block in 9 participants. Echocardiography demonstrated preserved biventricular function in virtually the entire cohort, with low frequency of relevant structural abnormalities. Despite a substantial burden of traditional risk factors, structural heart disease prevalence was low. Female athletes with preserved functional capacity exhibit a favorable structural cardiac phenotype compared to the general population, yet carry a significant cardiometabolic risk burden - underscoring the need for individualized, sex-specific cardiovascular assessment in sports cardiology.



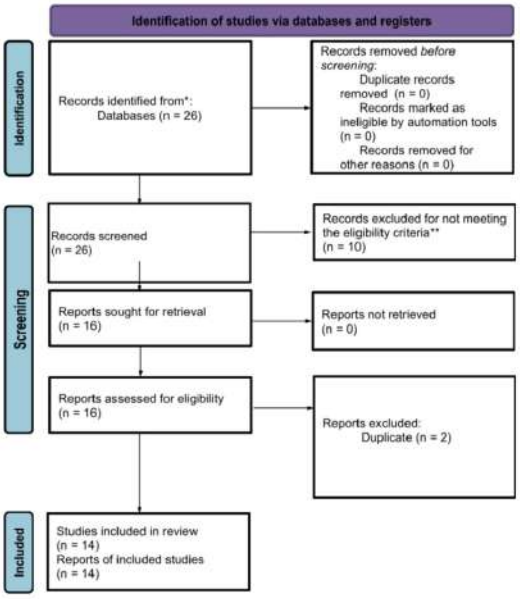
18358

CARDIOVASCULAR STRUCTURAL EFFECTS OF ANABOLIC STEROID USE IN ADULTS: A SYSTEMATIC REVIEW

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Background/Introduction: Anabolic steroids (AS) increase vascular stiffness and impair endothelial function, raising cardiovascular risk, which may persist even after discontinuation Objectives: This study aimed to evaluate the association between AS use and early cardiovascular dysfunction in adults. Methods: This is a systematic review conducted according to PRISMA guidelines. The research question was structured based on PICO. Searches were performed in PubMed and BVS using descriptors combined with Boolean operators, along with manual reference screening. Observational studies and clinical trials published in the last 10 years, in English, Portuguese, or Spanish, with full text available, were included. Pediatric studies, reviews, and case reports were excluded. Study selection was performed by three independent reviewers using Rayyan, with blinded screening and full-text assessment, resulting in 14 included studies. Data extraction was standardized, including methodological characteristics and outcomes. Results and Conclusions: A total of 1,420 participants were included, predominantly male, aged 30–43 years. AS use was associated with reduced left ventricular systolic function. Chronic users showed significantly lower left ventricular ejection fraction (50% a 63%; P<0,001), with heart failure in 11%. Biventricular global longitudinal strain (P<0.05) and myocardial flow reserve were impaired. Increased left ventricular mass (up to 106 g/m²; P<0.001) and wall thickness were observed, indicating hypertrophy with fibrosis and tricuspid regurgitation (77.1%). Coronary artery disease prevalence ranged from 17% to 25%, with calcifications and endothelial dysfunction. Reduced HDL-c and increased inflammatory biomarkers were observed. Electrophysiological alterations, atrial remodeling, and slowed sodium conduction increased arrhythmia risk. AS use is associated with endothelial dysfunction, increased vascular stiffness, and cardiac remodeling, with reduced function. These alterations may persist after discontinuation, suggesting long-term impact. Findings indicate an early cardiovascular risk factor and reinforce the need for cardiovascular screening in users of these substances.



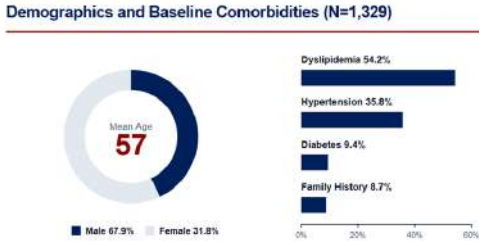
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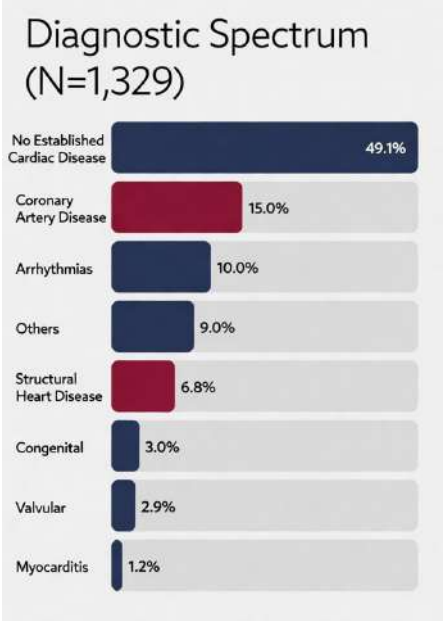
CLINICAL-EPIDEMIOLOGICAL PROFILE AND SPORTS ELIGIBILITY CRITERIA IN 1,329 PATIENTS OF A TERTIARY SPORTS CARDIOLOGY CLINIC

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(1) INSTITUTO DANTE PAZZANESE DE CARDIOLOGIA - SAO PAULO - SP - BRASIL;

Background/Introduction: Cardiovascular evaluation of athletes and physically active individuals is among the most complex challenges in modern Cardiology, requiring specialized infrastructure for screening, diagnosis, and individualized sports eligibility definition. Large-scale real-world data from tertiary Sports Cardiology referral centers remain scarce in the national literature. Objectives: To describe the clinical-epidemiological profile, diagnostic spectrum, comorbidity burden, electrocardiographic findings, and sports eligibility criteria of patients seen at a tertiary specialized Sports Cardiology outpatient clinic. Methods: Cross-sectional descriptive study based on primary real-world data from a tertiary Sports Cardiology outpatient clinic (2023–2026). All patients with registered records and structured data were included. Variables: sex, age, cardiovascular diagnosis, comorbidities, ECG findings, and sports eligibility. Descriptive statistics: absolute/relative frequencies, mean ± SD, and median with interquartile ranges (IQR). Results and Conclusions: A total of 1,329 patients were analyzed. Male predominance was observed (n=903; 67.9% vs. n=423; 31.8% female), with mean age 57.0 ± 15.5 years (median 59; IQR 49–67; range 12–95). Diagnostic distribution: No Established Cardiac Disease 653 (49.1%), CAD 200 (15.0%), Arrhythmias 133 (10.0%), Other 119 (9.0%), Structural Cardiomyopathy 91 (6.8%), Congenital 40 (3.0%), Valvular 39 (2.9%), and Myocarditis 16 (1.2%). Most prevalent comorbidities: dyslipidemia (54.2%), hypertension (35.8%), diabetes mellitus (9.4%), and positive family history (8.7%). ECG findings: normal (69.2%), athlete pattern (10.6%), and abnormal (20.1%). Sports eligibility: unrestricted clearance (72.4%), restricted clearance (20.8%), and disqualification (3.5%). Notably, among CAD patients (n=199), 51.8% received restricted clearance versus only 7.0% disqualified; a similar pattern was observed in structural cardiomyopathy (55.1% vs. 6.7%). This cohort represents one of the largest primary real-world series from a specialized tertiary Sports Cardiology setting, demonstrating high cardiovascular complexity. Restricted clearance markedly exceeded absolute disqualification, reflecting the modern paradigm of individualized and safe exercise prescription over indiscriminate sports exclusion.





17846

COMPARISON OF ECCENTRIC AND CONCENTRIC CYCLING ON FUNCTIONAL CAPACITY IN POST CORONARY ARTERY BYPASS GRAFTING PATIENTS

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Background/Introduction: Coronary Artery Bypass Grafting (CABG) results in reduced functional capacity and lower-limb muscle weakness, limiting mobility and delaying recovery. Cardiac Rehabilitation (CR) plays a pivotal role in restoring physical performance; however, optimal exercise modalities remain uncertain. Eccentric (ECC) cycling enables higher force generation with lower metabolic cost compared to traditional concentric (CON) cycling, making it a potentially more suitable option for post-CABG patients with limited cardiopulmonary endurance. Objectives: To compare the effect of Eccentric (ECC) verses Concentric (CON) cycling during CR on functional capacity in post-CABG patients using Six-Minute Walk Test (SMWT) and Short Physical Performance Battery (SPPB) scores. Methods: A randomized controlled trial was conducted at a tertiary cardiac rehabilitation center. Post CABG patients were randomly assigned to either ECC or CON cycling in addition to standard CR protocol. Functional capacity was assessed at baseline and after completion of 6–8 weeks of supervised rehabilitation using 6MWT and SPPB. Participants who completed all prescribed sessions were included in the final analysis. Between-group comparisons were performed for changes from baseline and post-intervention outcomes. Results and Conclusions: Of 133 enrolled patients, 59 (44.3%) completed the rehabilitation program (ECC n=31; CON n=28), with a mean age of approximately 60 years. Baseline functional capacity was comparable between groups. Following intervention, both groups demonstrated improvement; however, gains were greater in the ECC group. Post-rehabilitation 6MWT distance was higher in ECC compared with CON (452 m vs 396 m). ECC participants also showed superior performance in SPPB components, including faster gait speed (2.6 s vs 3.48 s), shorter chair stand time (13.27 s vs 17.75 s), higher chair stand scores (3 vs 1), and better overall SPPB scores (11 vs 9). Eccentric cycling during cardiac rehabilitation resulted in greater improvements in functional capacity and lower-limb performance compared with concentric cycling in post-CABG patients. These findings suggest that integrating eccentric exercise modalities into CR programs may accelerate recovery, improve mobility and optimize physical outcomes after CABG.

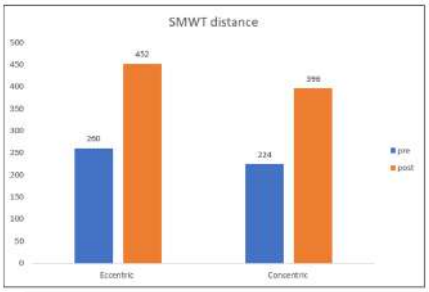


Figure 45 SMWTD at P0 and P1 in both groups

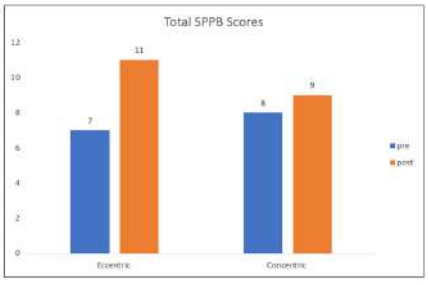


Figure 50 Total SPPB scores at P0 and P1 in both groups

15387

COMPARISON OF ELECTROCARDIOGRAPHIC CHARACTERISTICS BETWEEN UNDER-20 AND PROFESSIONAL FOOTBALL ATHLETES AT AN ELITE CLUB

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(1) UNIVERSIDADE VILA VELHA - VILA VELHA - ES - BRASIL;

Background/Introduction: High-performance athletes, including football players, exhibit increased vagal tone as well as structural and electrical cardiac remodeling, leading to enlargement and increased wall thickness of cardiac chambers, along with changes in rhythm, electrical conduction, and ventricular repolarization. These adaptations may be reflected on the electrocardiogram (ECG). Among other factors, the type of exercise performed, its intensity, and the duration of continuous physical activity may directly influence the ECG characteristics of these athletes. Objectives: To evaluate electrocardiographic changes in high-performance football athletes and to compare these changes between two diferent competitive categories, as well as to assess the influence of training duration and years of physical activity practice on electrocardiographic findings between the two groups. Methods: A total of 57 electrocardiograms were performed in professional athletes and 46 in under-20 category athletes from a professional football club during pre-participation evaluations conducted over two consecutive seasons (2025 and 2026). Data are presented as mean ± standard deviation or standard error of the mean. Tukey's test was used to compare diferences between groups. Results and Conclusions: In the under-20 category, age ranged from 16 to 19 years; ethnicity: 71.8% White and 28.2% Black; BMI: 18.6Kg/m2 to 24.8 kg/m2. In the professional category, age ranged from 21 to 38 years; ethnicity: 68.2% White and 31.8% Black; BMI: 19.1 Kg/m2 to 25.3 kg/m2. The mean duration of continuous training practice was 6 ± 2 years in the under-20 category and 12 ± 5 years in professional athletes. Electrocardiographic parameters — Under-20 athletes: sinus bradycardia: 21 (45.6%); left ventricular hypertrophy: 13 (28.2%); incomplete right bundle branch block: 7 (15.2%); first-degree atrioventricular block: 2 (4.3%); T-wave inversion from V1 to V3: 3 (6.5%); early repolarization: 20 (43.4%). Professional athletes: sinus bradycardia: 30 (52.6%); left ventricular hypertrophy: 24 (42.1%); incomplete right bundle branch block: 7 (12.28%); first-degree atrioventricular block: 3 (5.3%); T-wave inversion from V1 to V3: 4 (7.0%); early repolarization: 34 (59.6%). Early repolarization and sinus bradycardia were the most prevalent findings in both groups. Left ventricular hypertrophy and early repolarization were more prevalent in the professional athlete group, likely secondary to greater training load and cumulative years of practice.

21152

CPAP IMPROVES CARDIAC VAGAL ACTIVITY IN INDIVIDUALS WITH OBSTRUCTIVE SLEEP APNEA

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(1) UNIVERSIDADE FEDERAL DE MINAS GERAIS - BELO HORIZONTE - MG - BRASIL; (2) FACULDADE DE CIENCIAS MEDICAS E DA SAUDE DE JUIZ DE FORA - JUIZ DE FORA - MG - BRASIL;

Background/Introduction: Obstructive sleep apnea (OSA) is characterized by recurrent upper airway collapse, leading to intermittent hypoxia and sleep fragmentation. This condition imposes continuous stress on the autonomic nervous system, resulting in sympathetic hyperactivity and significantly increasing cardiovascular risk. Continuous positive airway pressure (CPAP) therapy acts mechanically by maintaining upper airway patency and preventing airway collapse during sleep. Previous studies suggest that consistent CPAP use may reduce sympathetic hyperactivity; however, little is known about its effects on cardiac vagal activity (CVA). In this context, the use of methods capable of more specifically assessing the branches of the autonomic nervous system becomes relevant. The 4-second exercise test (4sET), a low-cost tool with good external validity, allows isolated assessment of CVA through the cardiac vagal index, representing a feasible alternative for autonomic evaluation in this population. Objectives: To evaluate CVI in patients with OSA before and after 30 days of CPAP treatment. Methods: This was a longitudinal observational study conducted at a sleep physiotherapy clinic in XXXX. 21 participants with polysomnography-confirmed OSA were included. Cardiac vagal activity was assessed using the CVI, with values expressed as mean ± standard deviation. Paired Student's t-test was used for comparisons before and after treatment. The study was approved by the Research Ethics Committee of XXXXXXX (CAAE: XXXXX). Results and Conclusions: After 30 days of CPAP therapy, a significant increase in CVI was observed (1,24 ± 0,17 vs. 1,32 ± 0,19; p = 0,035). This increase suggests improvement in cardiac vagal activity and favorable modulation of the autonomic nervous system after the intervention, evidenced by greater parasympathetic predominance and possible reduction in sympathovagal imbalance associated with OSA. Conclusion. The findings of the present study suggest that patients with OSA treated with CPAP demonstrate increased cardiac vagal activity after 30 days of treatment, indicating a favorable effect on sympathovagal modulation, with increased parasympathetic predominance and potential relevance for understanding the cardiovascular risk associated with the disease.

17272

EFFECTS OF BLOOD FLOW RESTRICTION TRAINING ON CARDIAC AUTONOMIC FUNCTION: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CLINICAL TRIALS

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Background/Introduction: Blood flow restriction (BFR) training is a popular technique aimed at enhancing physical performance in athletes. However, its application has recently broadened to a range of clinical populations. Considering the potential applicability of BFR training in cardiac rehabilitation patients, understanding its effects on the cardiac autonomic function is pertinent, as heart rate variability (HRV) can be helpful for cardiovascular risk stratification. While there is inconsistent evidence about cardiovascular adaptations to BFR training, its influence on measures of HRV is yet to be elucidated. Objectives: This systematic review and meta-analysis of randomized clinical trials (RCTs) assessed the effects of exercise training with BFR on sympathovagal balance and time-domain measures of HRV in adults. Methods: CENTRAL, Embase, and PubMed were searched for RCTs comparing the effects of ≥4 weeks of exercise training with versus without BFR on resting HRV in adults. After deduplication, 659 records were screened and seven studies were included. Between-group mean differences (MD) in changes from pre- to post-intervention were calculated for root mean square of successive differences (RMSSD), standard deviation of normal-to-normal intervals (SDNN), and sympathovagal balance (LF/HF) assuming a correlation of 0.5. Random-effects meta-analyses were conducted in RStudio using the DerSimonian and Laird model. Estimates were reported with 95% confidence intervals (CI). Heterogeneity was quantified using I^2. Sensitivity analysis was performed using a leave-one-out analysis. Results and Conclusions: Seven RCTs (n=230) reported RMSSD, a marker of cardiac parasympathetic modulation, showing an increased pooled effect estimate in the BFR group (MD, 2.29 ms; 95% CI, 0.97 to 3.62 ms; P=0.0007; I^2=1.3%). Leave-one-out analysis confirmed robustness. Five RCTs (n=170) reported SDNN, with no significant between-group difference (MD, 1.77 ms; 95% CI, -1.76 to 5.30 ms; P=0.33; I^2=39.5%). Four RCTs (n=100) reported LF/HF, also showing no significant between-group difference (MD, -0.35; 95% CI, -1.25 to 0.55; P=0.45; I^2=94.6%). Key limitations include diversity in demographic characteristics, training protocols, and assessment procedures across studies. The findings of this review suggest BFR training may enhance cardiac parasympathetic modulation in adults, although larger and standardized studies should further evaluate its effects on heart rate variability.

18350

INSTANTANEOUS HEART RATE RESPONSE DURING THE 6-MINUTE WALK TEST IN HOSPITALIZED CARDIAC PATIENTS: FEASIBILITY OF ON AND OFF KINETIC ANALYSIS

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Background/Introduction: Heart rate (HR) response to physical exercise is an important marker of cardiovascular function, cardiorespiratory fitness, and prognosis in cardiac patients. Despite its widespread use in tests conducted in controlled environments, evidence on the feasibility of analyzing instantaneous HR responses during submaximal functional tests performed in hospital settings is limited. Objectives: The aim of the study was to analyze the instantaneous HR response during the six-minute walk test (6MWT) in hospitalized cardiac patients, assessing the feasibility of analyzing on- and off-kinetics in the hospital setting. Methods: This was a cross-sectional study including individuals hospitalized for clinical or surgical treatment of cardiovascular conditions. Adults of both sexes were included, with a confirmed clinical diagnosis based on echocardiography, coronary angiography, and clinical history. The 6MWT was performed with continuous HR monitoring using the Polar® H10. HR on-kinetics were analyzed using a monoexponential model, based on the time constant (τ). Off-kinetics were determined by the heart rate recovery half-time ($t½$). Data were described according to the nature of the variables and compared using parametric and non-parametric tests, with a significance level of 5%. Results and Conclusions: A total of 99 patients were evaluated, with a mean age of 57.3±13.6 years and a predominance of females (76.7%), with a left ventricular ejection fraction of 50% (IQR: 25). Patients walked a distance of 442±115 m in the 6MWT, with an HR τ of 67.2±40.2 s, indicating a slow chronotropic response and prolonged recovery, with a $t½$ of 84.5±52.2 s. It was possible to model on-kinetics in 83.8% of cases due to the presence of a steady state, whereas off-kinetics were obtained in 94.9% of individuals. Of the participants, 47.5% were hospitalized for clinical reasons and 52.5% for surgical treatment. There were no statistically significant differences in the acquisition of on- and off-kinetics parameters between hospitalization profiles. The analysis of instantaneous HR response during the 6MWT proved to be feasible, with a high rate of successful estimation of on- and off-kinetics parameters, indicating that HR kinetics assessment can be feasibly incorporated into functional evaluation in the hospital setting, regardless of clinical or surgical hospitalization profile, thereby expanding the potential of the 6MWT as a tool for analyzing cardiovascular response to exercise in this population.

16438

PREDICTORS OF NON-COMPLETION OF CARDIAC REHABILITATION IN A LOW-MIDDLE-INCOME COUNTRY SETTING: A SINGLE-CENTRE OBSERVATIONAL ANALYSIS OF THE INTERNATIONAL CARDIAC REHABILITATION REGISTRY (ICRR)

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Background/Introduction: Cardiac rehabilitation (CR) improves functional capacity, quality of life and cardiovascular outcomes in cardiac patients. Despite of its well-known benefits, a substantial proportion of patients fail to complete the prescribed CR sessions, limiting their potential benefits, particularly In Low-Middle-Income Countries (LMICs). Understanding factors associated with non-completion of CR is critical to identify patients at risk and to develop targeted strategies to improve adherence. Objectives: To identify predictors of non-completion of cardiac rehabilitation in a single-centre program from an LMIC using data from the International Cardiac Rehabilitation Registry (ICRR). Methods: This observational study analyzed registry data from patients enrolled in a single cardiac rehabilitation centre contributing to the ICRR between 2022 and 2025. Baseline variables examined as a predictor includes age, gender, referral diagnosis, referral intervention, education, work status, Body Mass Index, Blood Pressure, functional capacity (Peak METs), diabetes, self-rated Quality of Life (QoL), depression screening (PHQ-2), tobacco use, physical activity status, fruit and vegetable intake and medication adherence. Multivariable logistic regression was performed with adjustment for all clinically relevant covariates. Findings are expressed as adjusted odds ratios (aOR) (95% CI); statistical significance was at $p<0.05$. Results and Conclusions: Among 1,416 participants with complete data, 859 (60.7%) were classified as non-completers (<15 supervised CR sessions). Referral following PCI was associated with higher odds of non-completion compared with CABG (aOR 1.53, 95% CI 1.16–2.00; p=0.002). Greater depressive symptoms independently predicted non-completion (aOR 1.12 per point increase, 95% CI 1.05–1.21; p=0.001). Higher baseline Peak METs was independently protective (aOR 0.80 per SD increase, 95% CI 0.64–0.99; p=0.041), indicating lower functional capacity at baseline may predict non-completion. Higher self-rated QoL was associated with greater odds of non-completion (aOR 1.15 per SD increase, 95% CI 1.02–1.29; p=0.026), suggesting that patients who feel clinically well may be less motivated to continue rehabilitation. No other variables independently predicted non-completion. These findings determine that identifiable baseline characteristics such as referral intervention, depressive symptom burden and functional capacity emerged as modifiable and measurable predictors.

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BODY COMPOSITION IN OLDER WOMEN WITH HEART DISEASE FROM A TERTIARY CENTER IN SOUTHERN BRAZIL

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Background/Introduction: Changes in body composition, particularly increased visceral adiposity, have been associated with higher cardiometabolic and cardiovascular risk. Visceral adipose tissue (VAT) is strongly linked to systemic inflammation, insulin resistance, and the development of cardiovascular disease. However, data on fat distribution in older women with established heart disease remain limited, especially in the Brazilian population. Objectives: To evaluate body composition in older women with established heart disease. Methods: Cross-sectional study including women ≥60 years with a diagnosis of atrial fibrillation, ischemic heart disease, significant valvular disease or prior valve replacement, or heart failure. A control group of women without established heart disease was also included. Body composition was assessed using dual-energy X-ray absorptiometry (DXA). Results and Conclusions: A total of 51 patients were included (31 with heart disease and 20 without), with a median age of 69 (65–73) years; body mass index (BMI) of 31 (28–33) kg/m²; 42 (82.3%) had hypertension; 15 (29.4%) had diabetes; 18 (35.2%) had an estimated glomerular filtration rate <60 mL/min/1.73 m²; and 6 (11.8%) were smokers. There were no differences between groups in the following body composition measures: BMI (30.5 ± 3.9 vs. 30.2 ± 3.3 kg/m²; p = 0.837); weight (76.3 ± 12.6 vs. 75.6 ± 9.3 kg; p = 0.822); total lean mass (39.8 ± 4.8 vs. 38.9 ± 4.7 kg; p = 0.513); appendicular lean mass (17.5 ± 2.7 vs. 17.6 ± 2.5 kg; p = 0.947); appendicular lean mass index (7.02 ± 0.91 vs. 7.05 ± 1.03 kg/m²; p = 0.918); total fat mass (33.8 ± 8.5 vs. 34.4 ± 7.1 kg; p = 0.805); and fat mass index (13.5 ± 3.0 vs. 13.7 ± 2.6 kg/m²; p = 0.738). A significant difference was observed in visceral adipose tissue (VAT) (1,514 ± 618 g vs. 1,187 ± 418 g; p = 0.044). After excluding patients with diabetes mellitus, the difference in VAT between groups remained significant (1,559 ± 696 g vs. 1,124 ± 390 g; p = 0.029). In conclusion, older women with heart disease had higher visceral adipose tissue (VAT) compared with those without heart disease, despite similar values in other body composition parameters, including body weight, BMI, and fat and lean mass indices. These findings suggest that visceral fat accumulation may be associated with the presence of heart disease in this population, even in the absence of differences in overall body composition measures.

17654

CAROTID ULTRASOUND IN THE STRATIFICATION OF SUBCLINICAL ATHEROSCLEROSIS IN YOUNG WOMEN WITH SYSTEMIC LUPUS ERYTHEMATOSUS: A SYSTEMATIC REVIEW

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Background/Introduction: Systemic Lupus Erythematosus (SLE) is associated with premature atherosclerosis and subclinical vascular disease, increasing cardiovascular risk even in patients with low apparent risk. Carotid ultrasound (US) stands out as a non-invasive tool for monitoring. However, it is necessary to understand the efficacy of these sonographic markers in risk prediction for specific demographic profiles Objectives: To evaluate the role of carotid US in the diagnosis of subclinical atherosclerosis in young women with SLE. Methods: A systematic review was conducted based on the PRISMA protocol and the PICO acronym ("What is the utility of carotid US in identifying subclinical atherosclerosis in young women with SLE compared to controls?"). Double-blind selection was performed in the first semester of 2026 across PubMed, LILACS, and Scopus databases. The search included clinical trials and case-control studies published in the last 10 years in English, Portuguese, and Spanish Results and Conclusions: Analysis of 11 studies (n=1085; age range 16–45.2 years) revealed a substantially higher atherosclerotic risk in SLE patients. Most studies demonstrated a significant increase in bilateral carotid intima-media thickness (CIMT) ($p < 0.001$) and the presence of plaques in up to 48.1% of young patients—findings underestimated by traditional risk scores. Morphologically, plaques in SLE are predominantly non-calcified and echolucent; higher echogenicity was associated with persistent disease activity (OR=7.9; p=0.010). Prognostically, Total Plaque Area (TPA) > 16 mm² predicted a 6.4-fold higher risk for cardiovascular outcomes (OR=6.44; p=0.028), while plaques in ≥3 bifurcations increased the risk nearly tenfold (OR=9.9; p=0.009). Longitudinal data confirm accelerated progression (IRR=2.26; p=0.002). Lupus nephritis correlated with severe endothelial dysfunction, while sustained clinical remission (DORIS criteria) reduced the risk of new atherosclerosis by 43%. Carotid US is a sensitive tool for the detection and stratification of subclinical atherosclerosis in young women with SLE. Parameters such as TPA possess high prognostic value, surpassing traditional scores and assisting in the prediction of cardiovascular events.

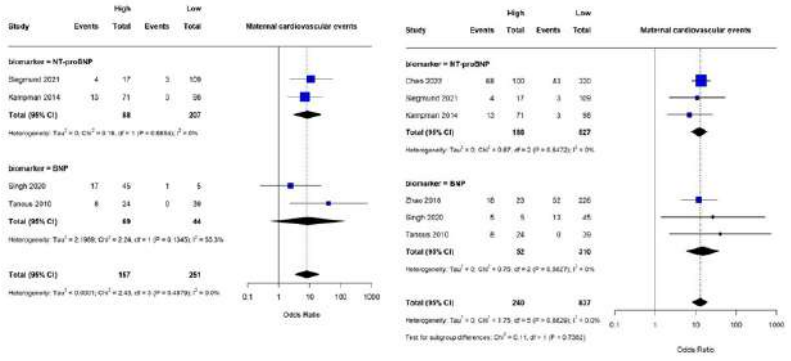
20554

ELEVATED BNP AND NT-PROBNP AS PREDICTORS OF MATERNAL CARDIOVASCULAR EVENTS IN PREGNANT WOMEN WITH CARDIOVASCULAR DISEASE: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background/Introduction: Pregnancy imposes substantial hemodynamic stress on women with cardiovascular disease. Brain natriuretic peptide (BNP) and N-terminal pro-B-type natriuretic peptide (NT-proBNP) may help identify patients at increased risk of adverse maternal cardiovascular outcomes, but available evidence remains scattered across heterogeneous cardiac populations. Objectives: To evaluate whether elevated BNP or NT-proBNP levels are associated with maternal cardiovascular events in pregnant women with cardiovascular disease. Methods: We conducted a systematic review and meta-analysis of observational studies by systematically searching PubMed, Embase, and Cochrane databases from inception to April 2026. Eligible studies included pregnant patients with structural heart disease, congenital heart disease, pulmonary hypertension, or mixed cardiovascular disease, and reported maternal cardiovascular outcomes stratified by elevated versus low/normal natriuretic peptide levels. The primary outcome was maternal cardiovascular events, including heart failure, clinically significant arrhythmias, cardiac death, thromboembolic events, urgent cardiovascular intervention, or composite maternal cardiovascular outcomes as defined by each study. When adjusted estimates were not consistently available, crude odds ratios were calculated from extractable 2 × 2 data. Odds ratios were pooled using a random-effects model. Sensitivity analyses included exclusion of studies with extreme or zero-cell distributions, restriction to structural/congenital or acquired heart disease cohorts, and leave-one-out analysis. Results and Conclusions: Six studies comprising 1,077 analyzable pregnancies were included in the primary quantitative analysis. Elevated BNP or NT-proBNP was significantly associated with higher odds of maternal cardiovascular events compared with low/normal biomarker levels (pooled OR 12.78; 95% CI 8.41–19.41; p < 0.0001; I² = 0%). Results were consistent across BNP and NT-proBNP subgroups. Sensitivity analysis excluding studies with extreme or zero-cell distributions yielded similar findings (OR 12.27; 95% CI 8.01–18.81; I² = 0%). In the analysis restricted to structural, congenital, or acquired heart disease cohorts, the association remained robust (OR 8.06; 95% CI 3.35–19.41). Leave-one-out analysis confirmed that no individual study materially changed the overall pooled effect estimate. Elevated BNP or NT-proBNP levels are strongly associated with maternal cardiovascular events in pregnant women with cardiovascular disease.



21430

EPIDEMIOLOGICAL PROFILE OF ACUTE MYOCARDIAL INFARCTION SECONDARY TO SPONTANEOUS CORONARY ARTERY DISSECTION

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Background/Introduction: Spontaneous Coronary Artery Dissection (SCAD) causes Acute Myocardial Infarction (AMI), mainly in young to middle-aged women without cardiovascular risk factors. Despite its importance, epidemiological data and outcomes remain limited. Objectives: Characterize the epidemiological, clinical, and angiographic profiles of patients with AMI due to SCAD and identify predictors of combined outcomes during hospitalization and follow-up. Methods: A multicenter cross-sectional study with prospective follow-up included angiographically confirmed SCAD cases from 2013 to 2025 in Rio de Janeiro. Sociodemographic and clinical data were gathered. In-hospital combined outcomes included recurrent ACS, hemodynamic instability, or coronary intervention. Post-discharge outcomes included recurrent chest pain requiring medical care, new ACS episodes, or rehospitalization for ACS with hemodynamic instability, with a follow-up period of up to 10 years. Statistical analysis used descriptive stats, chi-square/Fisher's exact, and Shapiro-Wilk tests; p < 0.05. Results and Conclusions: Seventy SCAD patients were analysed, mostly female (86%), mean age 49.4 ± 12.7 years. Most (64%) were admitted via public healthcare. NSTEMI occured in 70%. The LAD artery was affected in 67%, Type 1 dissection in 41%, and tortuosity in 59%. Moderate to severe left ventricular systolic dysfunction (LVSD) occurred in 24%, segmental wall motion abnormalities in 75%. Conservative treatment was implemented in 87%, including aspirin (96%), clopidogrel (67%), ACE inhibitors/ARBs (53%), beta-blockers (69%), and statins (71%). PCI was performed in 13% initially and 4% after recurrent ACS. In-hospital outcomes occurred in 26%, associated with Type 3 dissection (p=0.032), angioplasty (p<0.0001), and hemodynamic instability (p<0.0001). Among 40 patients followed up to 10 years, 62% had post-discharge combined outcomes associated with impaired TIMI flow (p=0.045) and LVSD (p=0.012). Recurrent chest pain affected 27% in-hospital and 77% post-discharge. No gender association was found. Cardiac rehabilitation rate was 31%. No in-hospital deaths; one cardiovascular death occurred within a year post-discharge. SCAD mainly affects middle-aged women, often as NSTEMI. Conservative management usually leads to favorable outcomes. Hight chest pain recurrence indicate ongoing morbidity and the need for specialized follow-up. Low cardiac rehabilitation referral highlights care gaps. Early diagnosis, risk evaluation, and treatment are crucial to prognosis and prevent recurrence.

Table 1. Baseline Characteristics and Clinical Profile

Variable, n (%)	Total Sample (n=70)	Female (n=60)	Male (n=10)
Age (years), mean ± SD	49.4 ± 12.7	49.6 ± 12.5	48.2 ± 14.5
White Race	38 (62.3%)	33 (63.5%)	5 (55.6%)
Hypertension	35 (50.0%)	29 (48.3%)	6 (60.0%)
Dyslipidemia	18 (25.7%)	14 (23.3%)	4 (40.0%)
Diabetes Mellitus	11 (15.7%)	9 (15.0%)	2 (20.0%)
Smoking (Current/Former)	26 (37.1%)	21 (35.0%)	5 (50.0%)
Obesity (BMI ⩾ 30)	27 (38.6%)	23 (38.3%)	4 (40.0%)
Anxiety	26 (37.1%)	24 (40.0%)	2 (20.0%)
Depression	12 (17.1%)	11 (18.3%)	1 (10.0%)
Migraine	9 (12.9%)	9 (15.0%)	0 (0.0%)
Intense Physical Effort	6 (8.6%)	4 (6.7%)	2 (20.0%)
Intense Emotional Stress	12 (17.1%)	11 (18.3%)	1 (10.0%)
Hormone Replacement	2 (2.9%)	2 (3.3%)	0 (0.0%)
Post-COVID-19 (⩽ 15 days)	3 (4.3%)	3 (5.0%)	0 (0.0%)
Typical Chest Pain	52 (74.3%)	44 (73.3%)	8 (80.0%)
Killip Class I	67 (95.7%)	57 (95.0%)	10 (100%)
NSTEMI Presentation	49 (70.0%)	42 (70.0%)	7 (70.0%)
LAD Involvement	47 (67.1%)	41 (68.3%)	6 (60.0%)
Conservative Management	61 (87.1%)	53 (88.3%)	8 (80.0%)

Table 2. Predictors of Adverse Events

Predictor Variable	In-Hospital Event (p-value)	Post-Discharge Event (p-value)
Gender (Female vs. Male)	0.732	0.680
Age ⩾ 50 years	0.340	0.460
Angiographic Type 3	0.032	0.680
Coronary Angioplasty	<0.0001	0.600
Hemodynamic Instability	<0.0001	0.250
Impaired TIMI Flow (0/1/2)	0.310	0.045
LV Systolic Dysfunction (Mild/Severe)	0.510	0.012
New ACS Event	0.018	0.0004

17925

HOSPITAL OUTCOMES OF ACUTE MYOCARDIAL INFARCTION IN WOMEN IN BRAZIL (2014–2024): A NATIONWIDE DESCRIPTIVE CROSS-SECTIONAL STUDY

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Background/Introduction: Acute myocardial infarction (AMI) remains a leading cause of morbidity and mortality worldwide, with growing evidence of sex-specific disparities in clinical presentation and outcomes. In Brazil, comprehensive nationwide analyses focusing on women are still limited, particularly regarding temporal trends and regional inequalities. Objectives: To analyze the temporal trends and regional disparities in hospitalization rates and in-hospital mortality due to acute myocardial infarction among women in Brazil, from 2014 to 2024, providing insights into the epidemiology of AMI in this specific population. Methods: This nationwide observational cross-sectional study analyzed secondary data from the Brazilian Unified Health System Hospital Information System (SIH/SUS), accessed via DATASUS. Female patients hospitalized with AMI (ICD-10 code I21) were included. Age-standardized hospitalization rates per 100,000 inhabitants and in-hospital mortality were assessed. Temporal trends were analyzed using Annual Percentage Change (APC) with 95% confidence intervals, and stratified by Brazilian macro-regions. Results and Conclusions: AMI hospitalization rates among women increased significantly over the study period (APC: +5.21%; 95% CI: 4.92–5.50; $p < 0.001$), rising from 45.71 per 100,000 in 2014 to 76.19 in 2024. All regions demonstrated upward trends, with the highest rates observed in the North and Northeast. In contrast, in-hospital mortality declined modestly (APC: −1.46%; $p < 0.001$), decreasing from 11.96% to 10.32%. Marked regional disparities persisted, with consistently higher mortality rates in the Northeast compared to the South. A transient increase in mortality was observed in 2020, coinciding with the COVID-19 pandemic. The burden of AMI among women in Brazil has increased substantially over the past decade, accompanied by only modest improvements in in-hospital mortality. Persistent regional inequalities underscore structural gaps in cardiovascular care delivery. These findings highlight the urgent need for region-specific strategies focused on improving access, early diagnosis, and quality of care for women, particularly in underserved areas.

16590

PROFESSIONAL DETERMINANTS AND GENDER DISPARITIES BETWEEN RECENTLY GRADUATED BRAZILIAN CARDIOLOGISTS.

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Background/Introduction: Introduction: Findings on “Medical Demographics in Brazil 2025” (MDB), describe the profile of 20,414 cardiologists in Brazil. In 2019, a study reported the profile of the members of the Brazilian Society of Cardiology (SBC) but the response rate was low (15.6%). This study analyzes the profile of recently graduated cardiologists, highlighting demographic characteristics to identify possible changes in the scenario. Objectives: Objectives: This study aims to establish the profile of cardiologists recently graduated at a reference center (University of São Paulo - USP), identifying predictors of income and structural socioeconomic characteristics. Methods: Methods: A quantitative cross-sectional study was conducted with 376 cardiologists who graduated from USP between 2016 and 2025. Data were collected via a digital questionnaire (30.85% response rate). Analysis employed Chi-square tests (X^2) and Ordinal Logistic Regression Modeling. Findings were compared with data from MDB and a study describing the profile of the members of the SBC. Results and Conclusions:

Logistic regression analysis of income level according to sex and weekly working hours

Predictor	Estimate	Z value	Adjusted Odds Ratio	p value
Weekly Working Hours:				
30 - 40 hours – 20 - 30 hours	0.659	0.610	1.932	0.542
40 - 60 hours – 20 - 30 horas	1.317	1.301	3.731	0.193
60 - 80 hours – 20 - 30 hours	1.710	1.623	5.528	0.105
80 - 100 hours – 20 - 30 hours	2.042	1.748	7.703	0.080
>100 horas – 20 - 30 hours	0.474	0.343	1.607	0.731
Gender:				
Feminino – Masculino	-0.944	-2.198	**0.389**	**0.028**



Results: The sample is mainly young (31-37 years old), with 75.9% lacking postgraduate degrees and 38% practicing exclusively in clinical cardiology; Echocardiography (n=33) is the most prevalent subspecialty. Following the trend shown in MDB, cardiologists were concentrated in the Southeast, followed by the Northeast, South, Central-West, and North regions. Validating the macro-trend, 96.5% of physicians work in private healthcare, which serves as the primary driver for income growth ($p < 0.001$). Respondents were 75% male and 25% female. This gender gap is more pronounced than the national average reported by MDB (64.2% men vs. 35.8% women). Gender inequality was robust, an ordinal regression suggested that gender remains an independent predictor of lower income ($p = 0.028$; OR = 0.389), even after adjusting for weekly workload - which is significantly higher among men; ($p = 0.018$). This inequality aligns with the SBC member’s profile, that shows that 66% of men earn more than R$ 20,000 vs 31% of women. In our study, contrary to expectations, holding a subspecialty title did not provide a significant salary advantage ($p = 0.314$). Conclusion: Despite being performed in one center, our data came from a representative sample from a reference Hospital and suggests that cardiologists’ profile reproduces structural gender barriers and a remuneration model focused on private sector activity, regardless of workload or academic subspecialization.

15062

QUERCETIN REDUCES RESIDUAL DYSGLYCEMIA IN POSTMENOPAUSAL WOMEN WITH ESTABLISHED CORONARY ARTERY DISEASE: A RANDOMIZED DOUBLE-BLIND TRIAL.

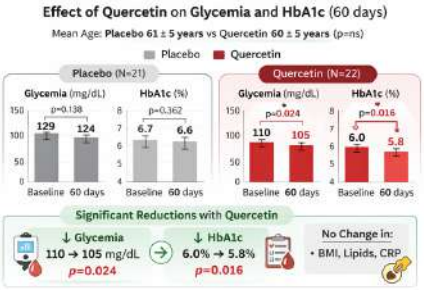
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Background/Introduction: Postmenopausal women with chronic coronary artery disease (CAD) remain at high residual cardiometabolic risk despite contemporary therapy. Dysglycemia and insulin resistance contribute to endothelial dysfunction, plaque progression, and recurrent events. Although flavonoid-rich diets are associated with metabolic benefits, randomized evidence supporting the use of isolated flavonoid supplementation in secondary prevention is lacking. Quercetin is a bioactive flavonoid with antioxidant and insulin-sensitizing properties. Objectives: To determine whether quercetin supplementation improves glycemic control in postmenopausal women with established atherosclerotic CAD. Methods: In this prospective, randomized, double-blind, placebo-controlled trial, 43 naturally postmenopausal women (<70 years) with angiographically documented CAD (≥70% stenosis in ≥1 major epicardial vessel) were randomized to quercetin 500 mg/day (n=22) or placebo (n=21) for 60 days. All participants completed a 40-day washout of lipid-lowering therapy and maintained their habitual diet. Anthropometric, metabolic, and inflammatory parameters were assessed at baseline and 60 days. Results and Conclusions: Mean age was similar between groups, being 61±5 years in the placebo group and 60±5 years in the quercetin group. At baseline, anthropometric and metabolic parameters were comparable between the groups. In the placebo group, body mass index, glycemia, HbA1c, lipid profile, and C-reactive protein levels remained unchanged after 60 days of follow-up (p>0.05 for all). In contrast, in the quercetin group, glycemia decreased significantly from 110±17 to 105±13 mg/dL (p=0.024) and HbA1c from 6.0±0.70% to 5.8±0.67% (p=0.016). No significant changes were observed in body mass index, triglycerides, total cholesterol, LDL-C, HDL-C, or C-reactive protein levels during the study period (p> 0.05 for all), indicating a glucose-specific metabolic effect independent of weight loss, lipid modulation, or systemic inflammation. No adverse metabolic signals were observed. In postmenopausal women with established CAD, short-term quercetin supplementation significantly improved glycemic control without affecting weight or lipids. These findings provide randomized evidence that a single bioactive flavonoid can directly target residual dysglycemia in secondary prevention.

Table. Body Mass Index (BMI) and Laboratory Parameters in Placebo and Quercetin Groups.

Parameters	Placebo Group (N=21)			Quercetin Group (N=22)		
	Baseline	60 days	p	Baseline	60 days	p
BMI (Kg/m²)	29.69±5.61	29.60±5.44	0.976	28.38±6.12	28.55±5.90	0.325
Glycemia (mg/dL)	129±58	124±60	0.138	110±17	105±13	0.024
HbA1c (%)	6.7±1.8	6.6±1.8	0.362	6.0±0.70	5.8±0.67	0.016
Triglycerides (mg/dL)	154±61	155±54	0.924	155±76	151±86	0.736
Total cholesterol (mg/dL)	231±41	242±54	0.198	235±64	253±61	0.139
LDL-C (mg/dL)	151±36	161±48	0.214	152±53	169±52	0.123
HDL-C (mg/dL)	50±12	51±16	0.476	52±13	53±13	0.118
CRP (mg/dL)	7.0±8.2	6.1±5.6	0.545	3.4±5.0	3.3±4.0	0.924



15825

TYPE OF MENOPAUSE AND HEART FAILURE RISK IN WOMEN: A SYSTEMATIC REVIEW OF OBSERVATIONAL STUDIES

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Background/Introduction: Heart failure is a major cause of cardiovascular morbidity and mortality in women. The menopausal transition has been recognized as a period of accelerated cardiovascular risk, and surgical menopause may further modify this risk because of the abrupt decline in ovarian hormone production. This study aimed to synthesize the available evidence on the association between type of menopause, particularly natural versus surgical menopause, and heart failure outcomes in women. Objectives: This study aimed to synthesize the available evidence on the association between type of menopause, particularly natural versus surgical menopause, and heart failure outcomes in women. Methods: A systematic review of observational studies was conducted according to PRISMA 2020. Cohort and case-control studies evaluating natural menopause, surgical menopause, bilateral oophorectomy, or age at menopause in relation to heart failure outcomes were considered. The primary outcome was incident heart failure. Secondary outcomes included heart failure hospitalization and heart failure phenotype, when available. Results and Conclusions: Available evidence suggests that surgical menopause is associated with a less favorable cardiovascular profile than natural menopause, although direct evidence specifically focused on heart failure remains limited. In a recent meta-analysis of cardiovascular outcomes after bilateral oophorectomy, surgical menopause was associated with a higher risk of heart failure compared with controls (pooled HR 2.25, 95% CI 1.15–4.41). In addition, the American Heart Association scientific statement highlights surgical menopause as a relevant reproductive factor in cardiovascular risk assessment. Earlier cohort data also indicate that younger age at menopause, including surgical menopause, is associated with increased incident heart failure risk. However, the literature remains heterogeneous regarding exposure definitions, menopausal subtype, age at surgery, covariate adjustment, and heart failure phenotyping. Current evidence suggests that surgical menopause may be associated with greater heart failure risk than natural menopause, but direct comparative data remain limited. Menopausal history, particularly surgical menopause and age at menopause, may represent relevant sex-specific factors in cardiovascular risk stratification. Further studies are needed to clarify differences according to natural versus surgical menopause and heart failure phenotype.

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YOUNG RESEARCHER POSTER – CASE REPORT



81º CONGRESSO BRASILEIRO DE CARDIOLOGIA together with WORLD CONGRESS OF CARDIOLOGY





Acute and Chronic Coronary Syndrome / Thrombolysis



81º CONGRESSO BRASILEIRO DE CARDIOLOGIA together with WORLD CONGRESS OF CARDIOLOGY





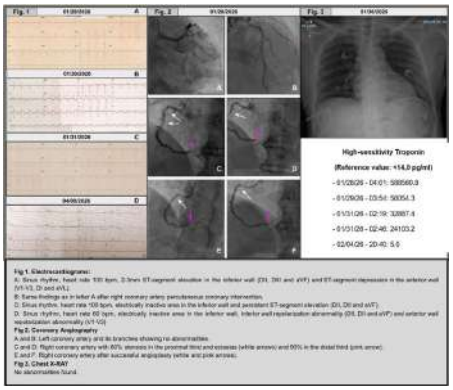
16468

A NEW MURMUR AFTER INFERIOR STEMI: ATYPICAL VENTRICULAR SEPTAL RUPTURE AND CARDIOGENIC SHOCK FROM RIGHT CORONARY ARTERY OCCLUSION

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Introduction: Post–myocardial infarction ventricular septal rupture (VSR) is a rare mechanical complication of acute myocardial infarction, with an incidence of 0.1% to 0.4%, reduced in the reperfusion era. Despite this, it remains associated with high mortality, approaching 100% in the absence of intervention. It is classically associated with infarctions involving the left anterior descending artery (LAD); however, cases related to right coronary artery (RCA) occlusion are less frequent. We report a case of VSR secondary to RCA occlusion, highlighting the importance of early recognition of this potentially fatal complication Case Description: A 66-year-old man, a former smoker (47 pack-years), with no known comorbidities or family history of cardiovascular or cerebrovascular disease, was diagnosed with a ST-segment elevation myocardial infarction of the inferior wall. He initially underwent thrombolysis (no angiography feasible) without evidence of reperfusion and was subsequently referred for coronary angiography, which revealed significant lesions in the RCA (80% proximal and 90% distal stenosis) without other obstructive disease. Two drug-eluting stents were successfully implanted. Transthoracic echocardiography (TTE) demonstrated a reduced left ventricular ejection fraction (41%) with akinesia of the inferolateral wall, mid and basal segments of the inferior wall, and the basal inferoseptal segment. The patient was started on guideline-directed medical therapy and discharged a week later. On the following day, he presented with chest pain similar to the initial event, though less intense, associated with nausea. He remained hemodynamically stable, with downtrending troponin levels. On physical examination, a new holosystolic murmur was noted at the lower left sternal border. Repeated TTE revealed a 17 mm ventricular septal rupture in the mid-basal septum with a left-to-right shunt, along with hypokinesia of other ventricular segments. The patient subsequently developed cardiogenic shock, requiring dobutamine and supplemental oxygen, and was referred for urgent surgical repair. Postoperatively, the patient evolved with hemodynamic stability on optimized medical therapy. Follow-up TTE confirmed successful repair, and he remained stable during outpatient follow-up Conclusions: Post–MI ventricular septal rupture is rare but highly lethal. Although typically linked to LAD infarction, it can occur with right coronary occlusion and early recognition and intervention are critical to improve outcomes.

18712

ACUTE CORONARY OCCLUSION MASKED BY SUPRAVENTRICULAR TACHYCARDIA IN A PATIENT WITH WOLFF-PARKINSON-WHITE SYNDROME: A DIAGNOSTIC CHALLENGE

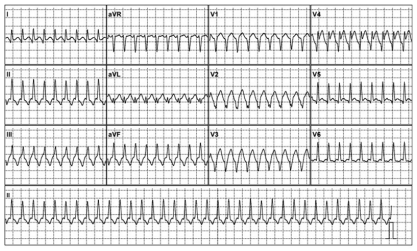
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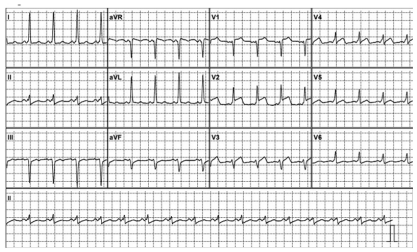
Introduction: The occurrence of Acute Coronary Occlusion (ACO) concomitant with supraventricular tachyarrhythmias is a rarely described entity. While literature reports ST-segment depression and Type 2 myocardial infarction during supraventricular tachycardias (SVT), the manifestation of a Type 1 Infarction (ACO) associated with an accessory pathway is scarce. In Wolff-Parkinson-White (WPW) syndrome, secondary repolarization changes can mimic or mask primary injury currents, requiring a high clinical suspicion to avoid misdiagnosis of non-ischemic injury. Case Description: A 55-year-old male presented with typical chest pain and diaphoresis. The initial ECG showed orthodromic Atrioventricular Reentrant Tachycardia (AVRT) with associated ST-segment elevation. Following adenosine-induced reversal, the baseline ECG revealed persistent ST-segment elevation in the anterior wall, superimposed on a pre-excitation pattern consistent with a right posteroseptal accessory pathway. Fibrinolytic therapy was initiated, and subsequent coronary angiography confirmed a 95% sub-occlusion of the distal left anterior descending artery, treated with a drug-eluting stent (TIMI III). The patient later underwent successful ablation of the posteroseptal pathway. Conclusions: Persistent ST-segment elevation after SVT reversal is a crucial marker of true ischemia, differentiating it from functional tachyarrhythmia changes. In WPW syndrome — analogous to left bundle branch block — the lack of validated algorithms for myocardial infarction diagnosis makes dynamic ECG analysis and clinical correlation determinant. In this case, the prompt identification of ACO, despite the morphological distortions of the accessory pathway, was decisive for the efficacy of reperfusion therapy.



Coronary angiography revealed a 70% stenosis in the proximal segment and a 95% stenosis in the distal third of the left anterior descending artery



Initial ECG showing orthodromic Atrioventricular Reentrant Tachycardia (AVRT) with associated ST-segment elevation



Post-adenosine ECG revealed persistent ST-segment elevation in the anterior leads, superimposed on a pre-excitation pattern consistent with a right posteroseptal accessory pathway

19772

ACUTE MYOCARDIAL INFARCTION ASSOCIATED WITH ANABOLIC-ANDROGENIC STEROID USE IN YOUNG ADULTS: A CASE SERIES

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Introduction: The use of anabolic-androgenic steroids (AAS) for aesthetic or performance-enhancing purposes represents a growing public health concern, with an estimated prevalence of 4–6% among resistance training practitioners. AAS users have an approximately three-fold higher risk of acute myocardial infarction (AMI) and up to a nine-fold higher risk of cardiomyopathies. This case series describes the clinical presentation and outcomes of five male patients, AAS users, admitted for AMI at a teaching hospital in São Paulo in 2025. This is a retrospective analysis of clinical, electrocardiographic, laboratory, and angiographic data. Case Description: In this sample, the mean age was 36.8 years (range: 30–47 years), and no high-performance athletes were included. None of the patients had comorbidities. All presented with anginal chest pain, troponin levels above the 99th percentile with a significant delta, and ECG findings meeting criteria for acute coronary occlusion: three cases with ST-segment elevation, one with the De Winter pattern, and one with hyperacute T-waves. Only one patient received thrombolytic therapy in their city of origin. All patients reported using injectable AAS at supraphysiological doses, despite significant imprecision regarding dosages and formulations (testosterone derivatives and trenbolone). Angiography revealed heterogeneous presentations: thrombotic occlusion without atherosclerosis (Figure 1), classic obstructive atherosclerosis (Figure 2), mixed etiology, and coronaries without obstructive lesions, suggesting spasm or prior thrombus lysis. Two patients progressed with left ventricular systolic dysfunction, one moderate and one severe. The latter experienced cardiac arrest due to ventricular fibrillation upon admission, with return of spontaneous circulation after resuscitation, requiring mechanical ventilation, vasoactive drugs, inotropes, and renal replacement therapy. The mean hematocrit was 48.1% (range: 40–61%), with the highest value recorded in the most severe case of the series. The mean LDL was 99 mg/dL. There were no deaths. The absence of comorbidities in this sample reinforces AAS use as the primary etiopathogenic factor. Conclusions: This series highlights the impact of systemic hormonal exposure to AAS—frequently underestimated—as a trigger for a prothrombotic state and coronary instability, predisposing young individuals to severe ischemic events even in the absence of traditional cardiovascular risk factors.



Figure 1: Coronary angiography image demonstrating acute total occlusion of the proximal third of the left anterior descending artery, with a large thrombus burden observed after guidewire passage.

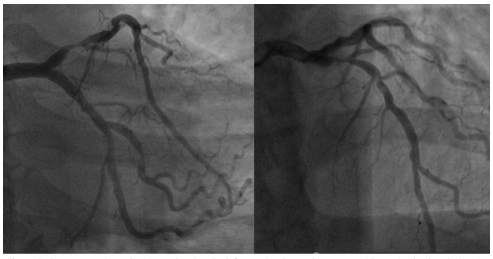


Figure 2: Coronary angiography image showing the left anterior descending artery with proximal subocclusion, in addition to mild/moderate lesions in the remainder of the demonstrated territory.

20971

ACUTE MYOCARDIAL INFARCTION WITH HIGH THROMBOTIC BURDEN IN A PATIENT WITH KLINEFELTER SYNDROME: PATHOPHYSIOLOGICAL IMPLICATIONS AND THE ROLE OF TESTOSTERONE REPLACEMENT THERAPY

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Introduction: Klinefelter syndrome (47,XXY) is associated with increased thromboembolic risk, possibly related to hypogonadism, endothelial dysfunction, and procoagulant alterations. In acute myocardial infarction, cases with high thrombotic burden and no obstructive coronary disease represent a diagnostic and therapeutic challenge, particularly regarding the role of testosterone replacement therapy. Case Description: A 44-year-old man with hypertension, dyslipidemia, obesity, smoking history, Klinefelter syndrome (47,XXY), and hypogonadism, previously on testosterone replacement therapy, which had been discontinued after a prior myocardial infarction without significant coronary lesions, was admitted with typical chest pain and inferior ST-segment elevation myocardial infarction. Coronary angiography demonstrated the absence of obstructive atherosclerotic disease, but revealed distal right coronary artery occlusion associated with coronary ectasia and a high thrombotic burden. Percutaneous coronary intervention with thrombus aspiration was performed, achieving final TIMI 3 flow, although residual thrombus remained. The patient evolved clinically stable, with preserved left ventricular ejection fraction. The angiographic pattern associated with coronary ectasia suggests a non-atherosclerotic mechanism related to blood stasis and a prothrombotic state. Klinefelter syndrome is recognized as a condition associated with increased thromboembolic risk, possibly mediated by endothelial dysfunction and metabolic abnormalities. Although testosterone replacement therapy raises concerns regarding cardiovascular risk, recent evidence has not demonstrated a consistent increase in thrombotic events and may even improve the metabolic profile. Recurrence of the event despite discontinuation of hormonal therapy reinforces the role of the underlying condition as the main determinant of thrombotic risk. An individualized strategy with clopidogrel for 1 year and anticoagulation was adopted, with favorable clinical evolution and thrombus resolution on follow-up angiography. Conclusions: This case highlights a thrombotic-profile AMI in a patient with Klinefelter syndrome without obstructive coronary artery disease, suggesting a central role of the prothrombotic state associated with the underlying condition. Recurrence of the event regardless of TRT reinforces the need for an individualized approach, including anticoagulation, and for a broader perspective on the impact of hormonal replacement therapy in these patients.

18183

ANOMALOUS RIGHT CORONARY ARTERY WITH INTERARTERIAL COURSE: A MALIGNANT VARIANT PRESENTING WITH SUDDEN CARDIAC ARREST

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Introduction: Coronary artery anomalies are rare and usually benign. However, variants like interarterial course between the aorta and pulmonary artery above the pulmonary valve are considered malignant since they are associated with myocardial ischemia and sudden cardiac death in young individuals. Anomalous origin of the right coronary artery from the left sinus of Valsalva represents a high-risk subtype, especially when associated with features such as acute take-off angle and proximal compression. Case Description: A 22-year-old previously healthy male presented after out-of-hospital sudden cardiac arrest preceded by emotional distress. Initial rhythm was ventricular fibrillation, with return of spontaneous circulation after 26 minutes of cardiopulmonary resuscitation. The patient had a prior history of unexplained syncope seven months earlier and reported use of cocaine, suggesting a possible vasospastic trigger. Upon admission, the patient exhibited impaired level of consciousness consistent with post-resuscitation encephalopathy. Initial electrocardiography showed ST-segment elevation in inferior and lateral leads, which resolved spontaneously. Coronary angiography revealed no obstructive lesions but identified an anomalous right coronary artery (RCA) arising from the left coronary sinus, with suspected proximal extrinsic compression. Coronary computed tomography angiography confirmed an interarterial course of the RCA between the aorta and pulmonary artery, with acute take-off angle and proximal narrowing consistent with suspected extrinsic compression. The patient was admitted to the cardiac intensive care unit and remained hemodynamically stable after initial support. Subsequently, surgical correction with transposition of the RCA, including creation of a neo-ostium in the right coronary sinus was performed. The postoperative course was uneventful, with complete neurological recovery upon hospital discharge 8 days after surgery. Conclusions: Malignant coronary artery anomalies should be considered in young patients presenting with sudden cardiac arrest without evidence of atherosclerotic disease. This case underscores the importance of recognizing warning symptoms, such as unexplained syncope, which may precede life-threatening events. Timely diagnosis and appropriate surgical management are essential to prevent fatal outcomes.

Figure 1. Anomalous Right Coronary Artery with Interarterial Course on Coronary CT Angiography

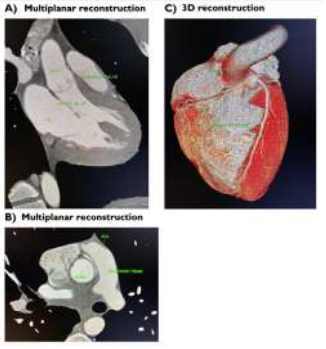


Figure 2. Anomalous Right Coronary Artery on Coronary Angiography

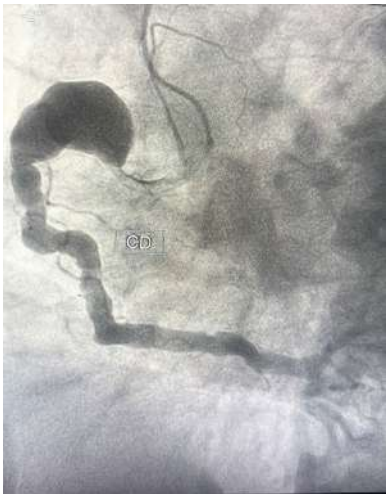


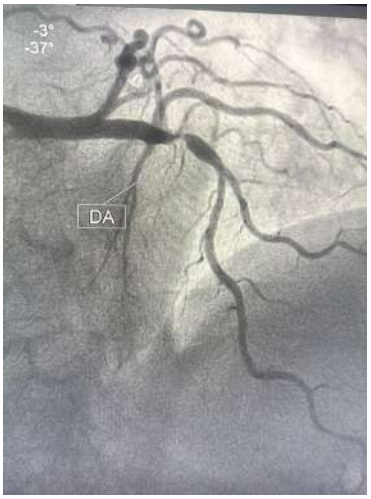
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BETWEEN SURGICAL AND THROMBOEMBOLIC RISK: MANAGEMENT OF GIANT CORONARY ARTERY ANEURYSM

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Introduction: Coronary artery aneurysms (CAA) are rare conditions, defined as dilatations exceeding 1,5 times the diameter of the adjacent vessel. In adults, atherosclerosis is the main etiology, although vasculitis and Kawasaki disease should be considered in the differential diagnosis. Clinical management is challenging due to the lack of robust guidelines and randomized clinical trials, particularly when giant aneurysms are associated with obstructive coronary artery disease and clinical frailty. Case Description: A 73-year-old male, former smoker, hypertensive, with stage G3b chronic kidney disease and prior prostate cancer (2023), was evaluated preoperatively for knee arthroplasty. He reported stable angina (CCS II) and dyspnea (NYHA II) for two years. Investigation revealed bilateral popliteal artery aneurysms (19 and 26 mm). Cardiac evaluation showed a 90% proximal lesion in the left anterior descending artery (LAD) and a giant (>20 mm) fusiform aneurysm in the right coronary artery (RCA) with mural thrombi. Despite low surgical risk scores (EuroSCORE II 2.33%; STS 1.01%), he was moderately frail (Clinical Frailty Scale = 6). After Heart Team discussion, surgery was deemed high risk considering age, frailty, and comorbidities. A less invasive strategy was adopted: percutaneous coronary intervention (PCI) of the LAD and conservative management of the RCA aneurysm. Medical therapy included statins, beta-blockers, and dual antithrombotic therapy (low-dose aspirin and warfarin, INR 2.0–3.0). The challenge of choosing between cardiac surgery and long-term anticoagulation in elderly patients lies in balancing thromboembolic risk against bleeding risk. Frailty, fall risk, and multiple comorbidities further complicate anticoagulation management, while surgical risk is also increased in this population, requiring individualized decision-making that considers life expectancy and quality of life. The patient improved clinically, without thrombotic or hemorrhagic events on follow-up. Conclusions: This case highlights the complexity of managing giant coronary artery aneurysm associated with advanced atherosclerotic disease in a frail elderly patient. It underscores the limitations of traditional risk scores and the importance of individualized, Heart Team–based decision-making. In selected cases, percutaneous intervention of the culprit lesion combined with anticoagulation for the aneurysm may represent a safe and effective alternative to conventional surgery.

16112

BEYOND THE MISSING PULSE: CORONARY-SUBCLAVIAN STEAL PRESENTING AS REFRACTORY ANGINA AND PRESYNCOPE IN A POST-CABG PATIENT

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Introduction: Coronary-subclavian steal syndrome (CSSS) is an underrecognized complication in patients who underwent coronary artery bypass grafting (CABG) using a left internal mammary artery (LIMA) graft. It occurs when proximal left subclavian artery stenosis reverses LIMA graft flow, diverting blood away from the coronary circulation. Clinical manifestations include refractory angina, heart failure decompensation, presyncope, and upper limb ischemia — findings often misattributed to native disease progression or graft failure. Case Description: A 57-year-old woman with hypertension, dyslipidemia, and former smoking presented with refractory angina (CCS II–III), NYHA class III heart failure, presyncope, and absent left upper limb pulse. In 2023, she suffered a non-ST-elevation myocardial infarction and underwent CABG with a LIMA-to-LAD graft and a saphenous vein graft to the marginal branch, subsequently developing ischemic cardiomyopathy with reduced ejection fraction. Echocardiography showed moderate left ventricular systolic dysfunction, diffuse mid-distal akinesia, and an apical aneurysm. Repeat catheterization revealed a patent aorto-marginal venous graft, severe ostial stenosis of the right coronary artery, and significant stenosis at the origin of the left subclavian artery — identified as the cause of CSSS compromising LIMA graft flow. After multidisciplinary discussion, the patient underwent elective percutaneous transluminal angioplasty with stent implantation in the left subclavian artery. Given documented paroxysmal atrial fibrillation and prior rivaroxaban use, dual therapy with oral anticoagulation and clopidogrel was maintained for three months. At follow-up, she demonstrated complete resolution of angina, improvement to NYHA class II, and restoration of the left radial pulse. Conclusions: This case highlights that absent or asymmetric upper limb pulses may be the critical diagnostic clue in post-CABG patients with refractory angina. Bilateral blood pressure measurement and pulse assessment should be part of routine evaluation in this population, ensuring a potentially correctable extracardiac cause is not overlooked. Percutaneous subclavian revascularization proved effective, with outcomes comparable to open surgical repair.

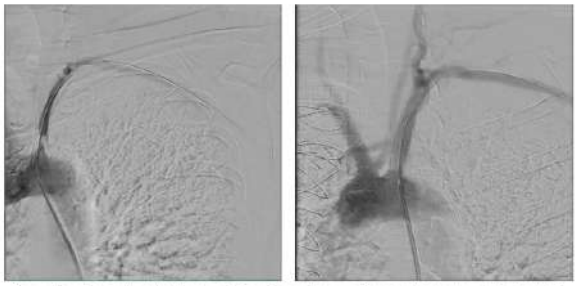


Figura 1: realização de cateterismo pela cirurgia vascular com inserção de stent em óstio de artéria subclávia esquerda estenosado com melhora de fluxo.



Figura 2: realização do estudo de pontes pela equipe da hemodinâmica pré-stent (esquerda) e pós-stent (direita) em artéria subclávia esquerda, notada a melhora de fluxo de enxerto MIE-DA.

Acute Cardiovascular Care / Cardiovascular Emergencies



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21407

MEDIASTINAL MASS WITH PERICARDIAL EFFUSION AND SEVERE PULMONARY HYPERTENSION AS THE INITIAL MANIFESTATION OF PRIMARY MEDIASTINAL LARGE B-CELL LYMPHOMA

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Introduction: Pericardial effusion may be the initial manifestation of severe underlying conditions, particularly in young patients with unexplained hemodynamic instability. Mediastinal masses, especially lymphomas, may present with pericardial effusion, secondary pulmonary hypertension due to extrinsic vascular compression, and cardiopulmonary compromise. Case Description: A 31-year-old man with a history of alcohol use, illicit drug use, and previously treated pulmonary tuberculosis presented with progressive dyspnea, chest pain, and lower-limb edema. Transthoracic echocardiography showed a large pericardial effusion with cardiac tamponade, requiring surgical pericardial drainage. Despite drainage, the patient developed cardiogenic shock, severe pulmonary hypertension, and acute respiratory failure, requiring orotracheal intubation and intensive care support. Chest computed tomography revealed a large mediastinal mass measuring 10 × 6 cm, compressing the pulmonary trunk and its main branches. Pericardiectomy, pericardial biopsy, and mediastinal biopsy were performed. Histopathological analysis confirmed the diagnosis of primary mediastinal large B-cell lymphoma. The patient underwent initial cytoreductive therapy followed by rituximab, cyclophosphamide, doxorubicin, vincristine, and prednisone chemotherapy, with an early favorable clinical response. Conclusions: This case highlights the diagnostic and therapeutic complexity of cardiac tamponade associated with severe pulmonary hypertension secondary to extrinsic vascular compression. In this setting, pericardial drainage may paradoxically worsen hemodynamic instability, requiring close monitoring and multidisciplinary management. Early recognition of mediastinal mass syndrome and prompt initiation of specific oncologic therapy are essential to reduce complications and improve outcomes.

17576

RECURRENT ACUTE CORONARY SYNDROME IN A YOUNG PATIENT WITH DIFFUSE CORONARY ECTASIA AND CLOPIDOGREL RESISTANCE

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Introduction: Acute coronary syndrome (ACS) in young patients frequently involves non-atherosclerotic mechanisms. Coronary ectasia, defined as dilation of a coronary segment ≥1.5 times the adjacent vessel diameter, is an uncommon but clinically relevant condition. It significantly alters coronary hemodynamics, leading to reduced flow velocity, turbulence, and blood stasis, which promote platelet activation and intracoronary thrombosis. Additionally, variability in response to antiplatelet therapy, particularly clopidogrel resistance related to impaired metabolic activation, may further increase thrombotic risk and contribute to recurrent ischemic events. Case Description: A 35-year-old male with hypertension, dyslipidemia, obesity, and type 2 diabetes mellitus presented with acute chest pain associated with dyspnea and diaphoresis. Electrocardiogram showed nonspecific repolarization abnormalities, and high-sensitivity troponin was elevated, consistent with non-ST elevation myocardial infarction. Coronary angiography revealed diffuse coronary ectasia with aneurysmal dilation involving the left anterior descending and right coronary arteries, with a large thrombus burden in the proximal left anterior descending artery, without significant stenosis. Initial management included tirofiban infusion, anticoagulation, and dual antiplatelet therapy with aspirin and clopidogrel, with clinical improvement. Ten months later, the patient presented with recurrent chest pain and elevated troponin. Repeat angiography demonstrated recurrent intracoronary thrombosis in the same territory. Platelet function testing revealed high on-treatment platelet reactivity, confirming clopidogrel resistance. Therapy was switched to ticagrelor, resulting in clinical stabilization. Conclusions: Coronary ectasia represents an important non-atherosclerotic cause of ACS in young patients due to its prothrombotic hemodynamic profile. The coexistence of clopidogrel resistance may significantly increase the risk of recurrent events by impairing platelet inhibition. Platelet function testing is a valuable tool for identifying inadequate therapeutic response and guiding treatment optimization. The use of more potent P2Y12 inhibitors, such as ticagrelor, may improve outcomes in selected patients. An individualized approach, integrating anatomical findings and pharmacodynamic response, is essential to reduce recurrence and improve prognosis.

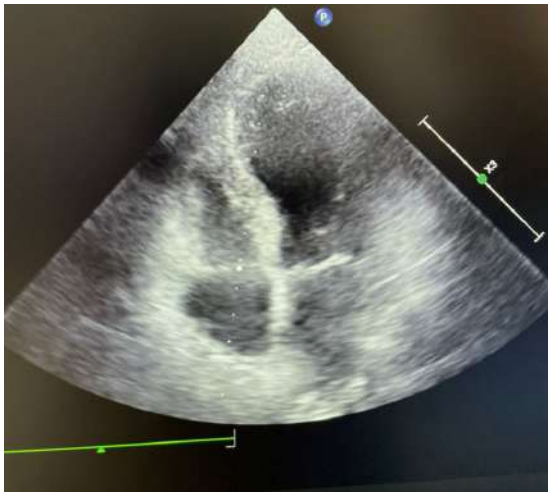
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TAKOTSUBO SYNDROME ASSOCIATED WITH SIGNIFICANT CPK ELEVATION AND ADRENAL INSUFFICIENCY: A POSSIBLE SYSTEMIC MANIFESTATION OF A CATECHOLAMINE STORM

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Introduction: Takotsubo syndrome is a transient cardiomyopathy, triggered by physical or emotional stress, characterized by a reversible left ventricular dysfunction and a clinical presentation similar to acute coronary syndrome. Although it is considered a predominantly cardiac condition, recent evidence suggests systemic inflammatory mechanisms and a catecholamine surge is involved in its pathophysiology. We report a case of Takotsubo syndrome associated with a significant elevation of creatine phosphokinase (CPK) and progression to adrenal insufficiency. Case Description: A 55-year-old female patient with poorly controlled diabetes was admitted with severe lower limb pain for two days, associated with difficulty walking. On admission, she presented sudden retrosternal chest pain. Laboratory tests showed CPK 11,972 U/L, CK-MB 532 U/L, and elevated troponin levels. The electrocardiogram revealed diffuse T-wave inversion, the echocardiography also revealed left ventricular systolic dysfunction with apical akinesia and basal hypercontractility, with an estimated ejection fraction of 38%, and the coronary angiography showed no obstructive coronary artery disease, findings consistent with Takotsubo syndrome. Initially misdiagnosed as rhabdomyolysis, intravenous hydration was iniciated. The patient developed with severe hypoglycemia, hypotension, hyponatremia, requiring vasopressor support. Due to these symptoms, an endocrine investigation was performed, revealing undetectable serum cortisol levels, which confirmed adrenal insufficiency. After intensive treatment and hydrocortisone replacement, the patient achieved clinical stabilization and progressive recovery. Conclusions: Takotsubo syndrome may present systemic manifestations associated with an inflammatory response and a catecholamine surge. The marked elevation of CPK suggests possible systemic muscle injury related to a hypercatecholaminergic state and raises the hypothesis that this enzyme may serve as a marker of poor prognosis, thereby potentially contributing to improved clinical management. The association with adrenal insufficiency is rare and poorly described in the literature, raising the possibility of a pathophysiological interaction between glucocorticoid deficiency and myocardial vulnerability to stress. The recognition of these manifestations may contribute to a better understanding of the pathophysiology and clinical management of this syndrome.



Cardiac Arrhythmias / Electrophysiology / Electrocardiography / Cardiac Pacing



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18859

ADDITIONAL LEAD IN THE AZYGOS VEIN: A STRATEGY TO REDUCE DEFIBRILLATION THRESHOLD IN A PATIENT WITH AN IMPLANTABLE CARDIOVERTER-DEFIBRILLATOR.

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(1) HOSPITAL PRO CARDIACO - RIO DE JANEIRO - RJ - BRASIL;

Introduction: The implantable cardioverter-defibrillator (ICD) is essential in the prevention of sudden death in patients with structural heart disease. Elevated defibrillation threshold (DFT) represents a challenging condition, associated with increased risk of therapeutic failure and worse prognosis, requiring early identification and appropriate management. Case Description: A 62-year-old male patient with non-ischemic dilated cardiomyopathy secondary to post-myocarditis, with heart failure with reduced ejection fraction (NYHA functional class III), on optimized pharmacological therapy. He had a biventricular ICD implanted for primary prophylaxis of sudden death seven years prior, as well as atrioventricular node ablation due to atrial fibrillation with high ventricular response. Echocardiography revealed severe biventricular systolic dysfunction, with an ejection fraction of 17% (Simpson method). The patient developed recurrent episodes of convulsive syncope and multiple device therapies. ICD analysis demonstrated a ventricular tachycardia episode in the ventricular fibrillation zone, with delivery of seven shocks at maximum energy (41 J), all ineffective, with reversion only after the eighth shock, characterizing an elevated defibrillation threshold. Given the clinical picture and the prospect of cardiac transplantation, additional lead implantation in the azygos vein was performed. Subsequent defibrillation testing demonstrated effective reversion with a 41 J shock. The patient was followed on an outpatient basis for 10 months, without recurrence of arrhythmic events or inappropriate therapies. Conclusions: Elevated defibrillation threshold occurs in a subset of ICD patients and represents a major therapeutic challenge. Factors such as advanced cardiomyopathy, significant ventricular remodeling, and antiarrhythmic drug use may contribute to its occurrence. The addition of leads to the defibrillation system is an effective strategy for modifying the shock vector, increasing the probability of successful reversion of malignant arrhythmias. In this context, azygos vein lead implantation emerges as an uncommon yet potentially useful alternative in selected cases, with a favorable impact on clinical outcomes.



21278

ARRHYTHMIC MITRAL VALVE PROLAPSE IN MARFAN SYNDROME WITH A CONCOMITANT PATHOGENIC LMNA VARIANT: AN OVERLAP SUBSTRATE FOR SUDDEN CARDIAC ARREST

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(1) INCOR - INSTITUTO DO CORACAO DA UNIVERSIDADE DE SAO PAULO - SAO PAULO - SP - BRASIL;

Introduction: Sudden cardiac arrest (SCA) in young athletes requires evaluation integrating phenotype, imaging, exercise testing, family history, and genetic testing. Arrhythmic mitral valve prolapse (AMVP) is a substrate for malignant ventricular arrhythmias, particularly in female patients with bileaflet prolapse, myocardial fibrosis, and complex complex premature ventricular contractions (PVCs). Overlapping inherited conditions may modify risk. Case Description: A 20-year-old professional volleyball player presented with SCA due to a shockable rhythm while walking between volleyball matches and survived after prolonged resuscitation. An implantable cardioverter-defibrillator was placed for secondary prevention. Her father had exertional sudden cardiac death (SCD) at age 43 and atrial fibrillation (AF). The paternal history included heart failure, SCD, pacemaker, AF, and myocardial fibrosis in relatives with an LMNA-related phenotype; the maternal lineage suggested Marfan syndrome, with several relatives requiring surgery for aortic ectasia. Examination showed marfanoid habitus and a systemic score compatible with Marfan syndrome. ECG showed atrial pacing, mildly prolonged QRS, fragmented low-voltage QRS in lateral leads, and normal QTc. Echocardiography demonstrated bileaflet MVP, moderate mitral regurgitation, and preserved left ventricular function. Cardiac magnetic resonance showed preserved biventricular function, MVP with pseudo-mitral annular disjunction, and extensive ring-like myocardial fibrosis, with anterior/inferolateral subendocardial-transmural involvement and mid-wall basal septal enhancement. Exercise testing induced frequent polymorphic PVCs, including couplets, suggestive of mitral apparatus origin; convex ST-segment depression in inferior and lateral leads, with T-wave inversion, was also observed. Genetic testing identified a pathogenic truncating LMNA variant [c.1560G>A; p.(Trp520*)] and a likely pathogenic FBN1 variant [c.5825G>A; p.(Cys1942Tyr)]. Conclusions: Coexistence of FBN1-related AMVP and a truncating LMNA variant may generate a double-hit phenotype, combining mechanical mitral triggers with inherited myocardial fibrosis and electrical vulnerability. In this patient, SCA was plausibly triggered by AMVP before full age-dependent penetrance of LMNA-related cardiomyopathy. This case highlights the role of genetic testing and precision medicine in refining diagnosis, guiding family screening, and individualizing management.

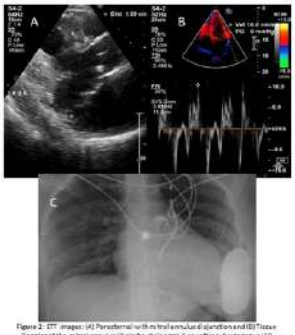
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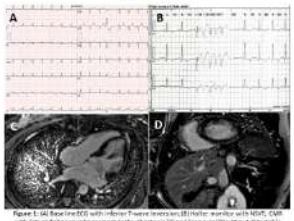
ARRHYTHMOGENIC PHENOTYPE OF MITRAL VALVE PROLAPSE IN A YOUNG PREGNANT WOMAN PROGRESSING TO ABORTED SUDDEN CARDIAC DEATH: APPROACH WITH SUBCUTANEOUS ICD WITHOUT FLUOROSCOPY

TALITA DÂMARIS OLIVEIRA DA SILVA1; ALAYNE SOUSA MIRANDA ÁVILA1; FILIPE RAMON ANGELO MATIAS1; ANDRES PAULO ANDIA DO NASCIMENTO2; RAFAEL MICHEL DE MACEDO1; VINICIUS NICOLAU WOITOWICZ1; SERGIO GUSTAVO TARBINE1; COSTANTINO COSTANTINI ORTIZ1; MARIA DANNIELLA GIROTO1; LEONARDO IEZZI DE MORAES2; MARCIO MORENO LUIZE1; COSTANTINO ROBERTO COSTANTINI FRACK1;

(1) HOSPITAL CARDIOLÓGICO COSTANTINI - CURITIBA - PR - BRASIL; (2) HOSPITAL COSTANTINI COSTANTINO - CURITIBA - PR - BRASIL;

Introduction: Mitral annular disjunction (MAD) is a structural abnormality characterized by separation of the insertion point of the posterior mitral leaflet from the ventricular wall, allowing systolic displacement of the annulus. It is strongly associated with mitral valve prolapse and malignant ventricular arrhythmias and sudden cardiac death (SCD), composing the spectrum of arrhythmogenic MVP. The pathophysiology involves chronic mechanical stress on papillary muscles and the inferobasal left ventricular wall, leading to fibrosis and formation of a reentry substrate. Risk stratification integrates clinical, electrocardiographic, and imaging findings. High-risk features include syncope, NSVT/complex ventricular ectopy on Holter, inferior T-wave inversion, late gadolinium enhancement on cardiac magnetic resonance (CMR), and, on echocardiography, bileaflet prolapse, valvular redundancy, greater MAD extent, and Pickelhaube sign. Management is risk-guided: in high-risk patients, implantable cardioverter-defibrillator (ICD) is indicated; ablation and mitral valve surgery are options in selected cases. Case Description: A 27-year-old female with MVP since childhood and initially mild mitral regurgitation (MR) was lost to follow-up.She progressed to moderate MR, inferior T-wave inversion, and complex ventricular arrhythmia with NSVT on cardiopulmonary exercise testing, while CMR demonstrated valvular degeneration and excluded late gadolinium enhancement. In early pregnancy, she presented with palpitations, and transthoracic echocardiography showed bileaflet prolapse, moderate-to-severe MR, MAD, and Pickelhaube sign. At 14 weeks of gestation, she was hospitalized after syncope, with worsening ventricular arrhythmia burden on Holter. During hospitalization, she developed aborted SCD, without sequelae. A subcutaneous ICD without fluoroscopy was chosen to protect the mother–fetus dyad, performed without complications, with good evolution associated with optimization of medical therapy, and discharge for follow-up and planning of ablation or valve surgery after pregnancy. Conclusions: MAD may constitute an important arrhythmogenic substrate even in the absence of fibrosis on CMR, being associated with risk of malignant arrhythmias and SCD in young patients. Pregnancy may act as a decompensating factor, limiting therapeutic options. Early recognition is essential to reduce mortality, with systematic use of imaging, allows appropriate risk stratification and implementation of preventive measures, including ICD.





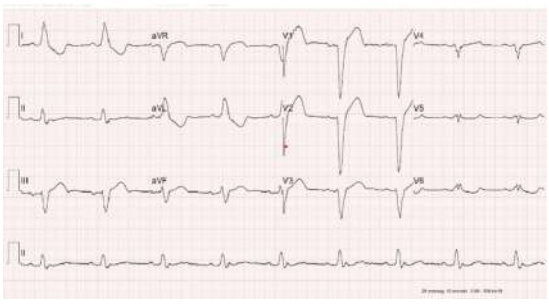
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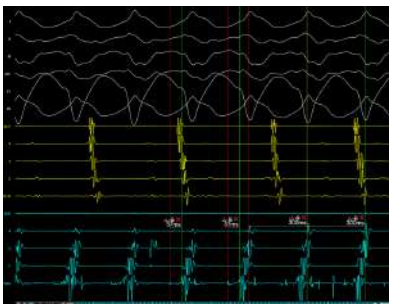
BUNDLE BRANCH REENTRANT VENTRICULAR TACHYCARDIA IN A STRUCTURALLY NORMAL HEART IN A 52-YEAR-OLD WOMAN WITH A PATHOGENIC SCN5A GENE VARIANT IDENTIFIED DURING INVESTIGATION: A CASE REPORT

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Introduction: Bundle branch reentrant ventricular tachycardia (BBRVT) is a form of ventricular tachycardia (VT) in which both bundle branches of the His-Purkinje system participate in the reentry circuit. This arrhythmia is typically observed in patients with acquired structural heart disease; however, recent reports suggest a potential genetic background in selected cases. We report a case of BBRVT in a structurally normal heart associated with a pathogenic SCN5A variant. Case Description: A 52-year-old woman presented with presyncope and palpitations, with documented monomorphic VT requiring synchronized electrical cardioversion. Baseline electrocardiogram showed first-degree atrioventricular block and left bundle branch block. Transthoracic echocardiography demonstrated a structurally normal heart, and coronary angiography revealed no obstructive coronary artery disease. Cardiac magnetic resonance imaging showed no myocardial edema or late gadolinium enhancement. During follow-up, the patient experienced a new episode of unstable monomorphic VT and was referred for electrophysiological study. No accessory pathways or inducible arrhythmias were initially identified; however, the HV interval was prolonged at 80 ms, leading to implantation of a dual-chamber pacemaker. During subsequent follow-up, recurrent sustained VT and episodes of atrial fibrillation/atrial tachycardia were detected on device telemetry, prompting a repeat electrophysiological study. Bundle branch reentrant ventricular tachycardia was then diagnosed and successfully treated with catheter ablation, with no further VT recurrence during follow-up. Subsequent genetic testing identified a heterozygous pathogenic SCN5A variant (c.673C>T; p.Arg225Trp), affecting the S4 segment of the Nav1.5 sodium channel and resulting in a leftward shift in channel activation and inactivation. Similar variants have previously been associated with ventricular arrhythmias and progressive conduction system disease. Cascade family screening is currently underway. Conclusions: BBRVT is a rare clinical entity and is only infrequently associated with structurally normal hearts. We highlight a case of recurrent monomorphic VT and conduction system disease treated with BBRVT ablation, followed by identification of a pathogenic SCN5A variant associated with Nav1.5 voltage-sensing impairment. This case highlights the importance of genetic testing in apparently idiopathic cases, helping clarify challenging arrhythmic phenotypes.





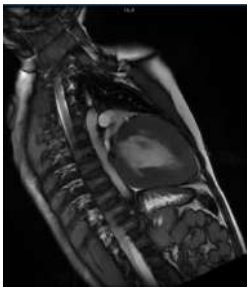
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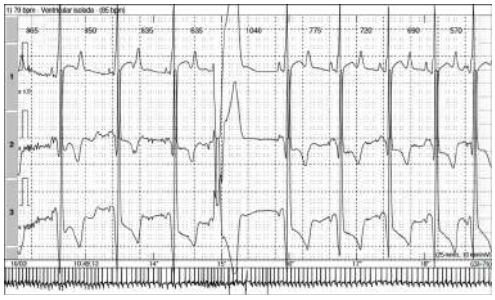
DANON DISEASE AS A PHENOCOPY OF LEFT VENTRICULAR HYPERTROPHY IN A CHILD WITH VENTRICULAR PRE-EXCITATION: IMPORTANCE OF EARLY DIAGNOSIS

ABNER FERNANDES DA SILVA1; GABRIEL BRANT MOREIRA FERREIRA2; GUSTAVO CAMPOS SABINO2; JÚLIA KROEHLING GIL2; PEDRO MIGUEL VIVAS CASTELO BORGES2; SARAH ALVES PEREIRA DOMINGOS2; ISABELLA MOREIRA GONZALEZ FONSECA1; ANNA TERRA FRANÇA1; GIOVANNI HENRIQUE SOARES DE ARAÚJO1; THAÍS LANY DE OLIVEIRA LEÃO1; RAFAEL RODRIGUES LOPES2; JÚLIA MOREIRA DINIZ2;

(1) HOSPITAL DAS CLINICAS DA UFMG - BELO HORIZONTE - MG - BRASIL; (2) UNIVERSIDADE FEDERAL DE MINAS GERAIS - BELO HORIZONTE - MG - BRASIL;

Introduction: Danon Disease (DD) is a rare X-linked lysosomal condition caused by LAMP2 gene mutations, representing a severe and penetrant form of hereditary cardiomyopathy. In males, it manifests early with an aggressive phenotype, marked by ventricular hypertrophy and high arrhythmic risk. Frequent ECG findings include pre-excitation and conduction disturbances. Skeletal myopathy and cognitive impairment may coexist. Poor prognosis reinforces the need for early diagnosis and timely intervention. Case Description: A 10-year-old male, undergoing treatment with methylphenidate due to cognitive impairment, was referred for evaluation following chest pain, dyspnea, and palpitations. Family history included sudden death in first-degree paternal relatives. Physical examination revealed a grade III systolic ejection murmur, accentuated by the Valsalva maneuver. ECG showed a short PR interval and delta waves (ventricular pre-excitation), and echocardiography revealed obstructive symmetric concentric hypertrophic cardiomyopathy. Treatment with metoprolol was initiated, and the diagnostic workup was extended. Holter monitoring confirmed intermittent Wolff-Parkinson-White (WPW) pre-excitation. Complementary investigation revealed significantly elevated transaminases, creatine phosphokinase (CPK), lactate dehydrogenase (LDH), and NT-proBNP (8,200 pg/mL), suggesting a systemic phenocopy of hypertrophic cardiomyopathy. Cardiac MRI demonstrated diffuse left ventricular wall thickening and heterogeneous mesocardial late gadolinium enhancement, suggesting the presence of fibrosis (not quantified in the exam), suggestive of non-ischemic myocardial injury. Genetic testing identified a pathogenic deletion of exons 1-9 in the LAMP2 gene, confirming DD. Amiodarone was started for arrhythmia prevention, and methylphenidate was discontinued under neurological supervision. Currently, the patient is followed by an arrhythmia specialist, awaiting electrophysiological study, ablation, and genetic screening of first and second-degree relatives. Conclusions: This case illustrates a classic DD presentation and emphasizes clinical suspicion when hypertrophic cardiomyopathy coexists with pre-excitation and systemic signs. Multimodal imaging and genetic testing were decisive for early diagnosis. Timely recognition enables precision medicine, accurate risk stratification, and early referral for emerging therapies.





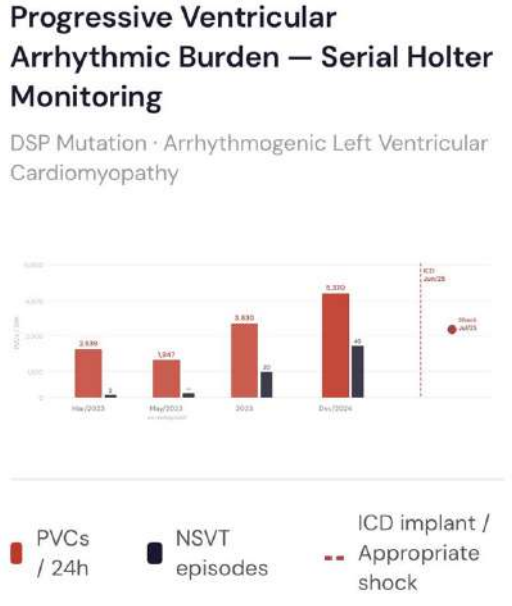
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DESMOPLAKIN MUTATION WITH CARVAJAL-LIKE PHENOTYPE: A CASE REPORT OF ARRHYTHMOGENIC LEFT VENTRICULAR CARDIOMYOPATHY IN A YOUNG FEMALE PATIENT

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(1) IDOR - RIO DE JANEIRO - RJ - BRASIL;

Introduction: Desmoplakinopathy is a rare genetic condition caused by heterozygous mutations in the DSP gene, encoding desmoplakin, a key desmosomal protein essential for cardiomyocyte and keratinocyte integrity. Unlike the classic autosomal recessive Carvajal Syndrome, heterozygous DSP mutations follow autosomal dominant inheritance and may present with a Carvajal-like phenotype: woolly hair, palmoplantar keratoderma, and arrhythmogenic left ventricular cardiomyopathy (ALVC). ALVC is characterized by extensive mesial-subepicardial fibrosis, malignant ventricular arrhythmias, and high risk of sudden cardiac death in young patients. Early recognition and timely ICD implantation are critical for prevention of fatal outcomes. Case Description: An 18-year-old female presented with recurrent syncope since age 10, preceded by palpitations, visual darkening and dizziness, occurring predominantly in orthostatic position. Physical examination revealed woolly hair and palmoplantar skin thickening. Family history was notable for maternal arrhythmia with the same DSP mutation. ECG showed intraventricular conduction delay with S-wave notching in V1-V2. Serial Holter monitors demonstrated progressive ventricular ectopic burden: up to 5,370 PVCs with 40 episodes of non-sustained ventricular tachycardia (NSVT). Cardiac MRI revealed moderate LV dilatation with extensive ring-like mesial-subepicardial fibrosis compatible with ALVC. LVEF was 44%. Genetic testing confirmed a heterozygous DSP mutation (p.Cys682Ter), a likely pathogenic variant — establishing the diagnosis of desmoplakinopathy with Carvajal-like phenotype. Given confirmed DSP mutation, recurrent syncope, high NSVT burden and extensive myocardial fibrosis, the patient was classified as high-risk for sudden death and underwent subcutaneous ICD implantation. An appropriate ICD shock for ventricular tachycardia was recorded 20 days post-implant, confirming the arrhythmic risk. Pharmacological therapy was optimized with metoprolol, amiodarone, enalapril, dapagliflozin and sertraline. Conclusions: Desmoplakinopathy with Carvajal-like phenotype is a rare and potentially fatal condition. This case highlights the role of genetic confirmation, cardiac MRI fibrosis pattern, and cutaneous findings in accurate diagnosis. Timely ICD implantation was validated by an appropriate shock for VT. First-degree relative screening is mandatory. Multidisciplinary management is essential in arrhythmogenic cardiomyopathies.



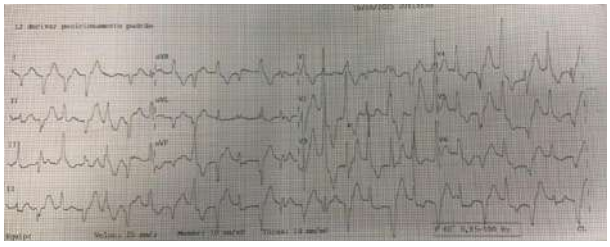
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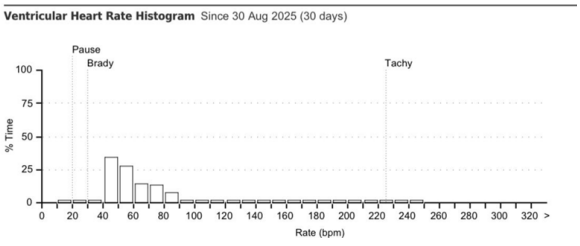
FAMILY-CENTERED AUTOMATED EXTERNAL DEFIBRILLATOR STRATEGY IN HIGH-RISK PEDIATRIC CATECHOLAMINERGIC POLYMORPHIC VENTRICULAR TACHYCARDIA

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(1) REDE DOR - RIO DE JANEIRO - RJ - BRASIL;

Introduction: Catecholaminergic polymorphic ventricular tachycardia (CPVT) is a rare inherited channelopathy characterized by adrenergically mediated ventricular arrhythmias and a high risk of sudden death in structurally normal hearts. Risk stratification in pediatric patients without a clear indication for implantable cardioverter-defibrillator (ICD) remains challenging, with persistent residual risk despite optimized therapy. We report a high-risk pediatric case highlighting an alternative safety strategy based on continuous access to an automated external defibrillator (AED) combined with structured family-centered education. Case Description: A previously healthy 9-year-old girl presented with aborted sudden cardiac death due to ventricular fibrillation, successfully terminated by defibrillation. She had recurrent exertional and emotional syncope and a positive family history of sudden death. Isoproterenol infusion induced bidirectional ventricular tachycardia (Figure 1), supporting the diagnosis of CPVT. Baseline evaluation, including echocardiography and cardiac magnetic resonance, was normal. Holter monitoring showed sinus bradycardia, prominent U waves, normal QTc, and atrial arrhythmias. Genetic testing is ongoing. Propranolol was initiated, and exercise testing with a cycle ergometer and electrophysiological study with isoproterenol failed to induce arrhythmias up to 140 bpm, suggesting adequate beta-blockade. Despite this, given the malignant initial presentation, a portable AED was incorporated as an immediate-response safety strategy, with strict recommendation for continuous availability. Intensive family training focused on early recognition of cardiac arrest and prompt AED use. A multidisciplinary Heart Team ensured close follow-up. Monitoring with an implantable loop recorder showed adequate rate control and no significant arrhythmic events (Figure 2). Conclusions: Non-selective beta-blockers remain the cornerstone of CPVT management, while ICD implantation in children should be individualized. In this setting, a structured AED-based strategy combined with caregiver empowerment may represent a pragmatic and potentially life-saving approach. This case underscores the critical role of early defibrillation access in high-risk pediatric CPVT.





21182

NECK SWELLING FOLLOWING PACEMAKER IMPLANTATION: AN ATYPICAL PRESENTATION OF LEAD-RELATED VENOUS THROMBOSIS

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Introduction: Neck swelling is an unusual presentation of lead-related venous thrombosis following cardiac device implantation. While pacemaker implantation is a common procedure and thrombosis is not infrequent, this is more often in the form of upper limb redness and swelling. We present an unusual case of a South-Asian gentleman in his late 50s who presented with a painful neck mass twenty-five days following implantation of a Cardiac Resynchronisation Therapy Device (CRT-D). Case Description: A South-Asian gentleman in his late 50's presented to hospital with a swelling in his neck that had been present for approximately two weeks. While initially painless, for one week prior to the patient's admission it had started to cause him mild, tolerable pain and prompted him to self-present to our hospital. The swelling was located at the lateral border of the left anterior triangle, at the base of his left sternocleidomastoid muscle. It was ellipsoid in shape, measuring 2x3 cm. He had undergone implantation of a CRT-D twenty five days prior to his presentation. Past medical history included Ischaemic Cardiomyopathy, Hypertension, Diabetes and Tuberculosis. His CRT-D had been implanted without immediate complication. Venous access had been obtained via the Left Axillary vein, with 3 Axillary vein punctures. A total of three leads were deployed. His blood tests revealed no drop in his Haemoglobin or Platelets. He had normal inflammatory markers. However, his D-dimer was abnormally elevated. He went on to have an Ultrasound Doppler of his neck to better understand the nature of his small, tender neck mass. The Ultrasound Doppler revealed no colour flow across his left external jugular vein, confirming occlusive thrombus. His subclavian vein had partial flow across it as well, demonstrating partial occlusion. These scans confirmed the suspicion of DVT, which was likely as a result of having had a recent implantation of his Cardiac Device. He was treated with a Direct Oral Anticoagulant (DOAC) in the form of Apixaban 5mg twice daily for 3 months duration due to it being a provoked DVT. Earlier follow-up in the Pacing Clinic with closer monitoring was also planned. Since discharge this gentleman has remained well without re-admission to hospital. Conclusions: This case highlights the importance of considering jugular venous thrombosis in patients presenting with neck swelling following ipsilateral cardiac device implantation, even in the absence of limb symptoms.

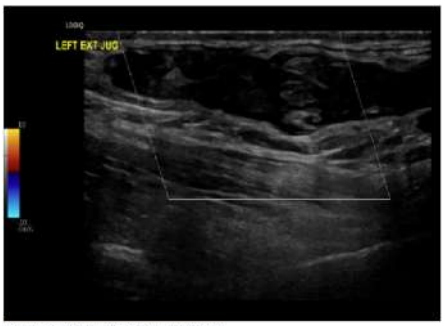


Figure 1 Occluded Left External Jugular Vein



Figure 2 Partially Occluded Left Subclavian Vein

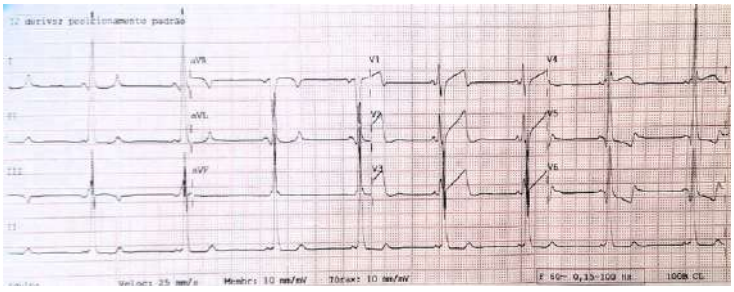
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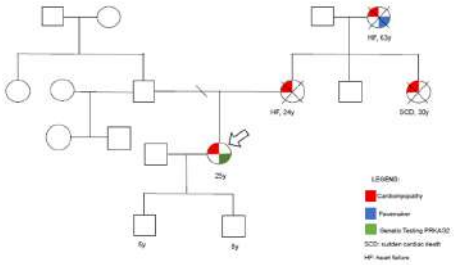
PRKAG2 SYNDROME: A PHENOCOPY OF HYPERTROPHIC CARDIOMYOPATHY WITH VENTRICULAR PRE-EXCITATION

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(1) HOSPITAL DAS CLINICAS DA UFMG - BELO HORIZONTE - MG - BRASIL;

Introduction: Myocardial hypertrophy is characterized by increased ventricular mass and may arise from hemodynamic, metabolic, or genetic conditions. It encompasses a broad phenotypic spectrum, ranging from sarcomeric hypertrophic cardiomyopathy to phenocopies, including amyloidosis, Fabry disease, PRKAG2 syndrome, and Danon disease. PRKAG2 gene variants are associated with a rare glycogen storage cardiomyopathy characterized by myocardial hypertrophy and prominent conduction system abnormalities, frequently mimicking sarcomeric hypertrophic cardiomyopathy. Accurate etiological differentiation is essential. We report a case of myocardial hypertrophy associated with a PRKAG2 variant. Case Description: A 25-year-old woman was evaluated for ventricular pre-excitation. In 2016, she underwent an electrophysiological study, which identified a low-risk fasciculoventricular accessory pathway. Serial electrocardiograms and 24-hour Holter monitoring confirmed persistent ventricular pre-excitation. Cardiac magnetic resonance imaging (October 2024) demonstrated left ventricular hypertrophy involving the basal and mid segments, with a basal septal thickness of 15 mm and a lateral wall thickness of 14 mm. Genetic testing (July 2025) identified an H401Q variant in the PRKAG2 gene, classified as a variant of uncertain significance (VUS). She has a significant family history of cardiomyopathy: her mother died at age 24 while awaiting heart transplantation; her grandmother had hypertrophic cardiomyopathy in its dilated phase, associated with anteroseptal ventricular pre-excitation and sinus node dysfunction requiring pacemaker implantation; and an aunt had sudden cardiac death. Given the clinical, imaging, and genetic findings suggestive of PRKAG2 syndrome, a repeat electrophysiological study was requested to reassess accessory pathways potentially amenable to ablation. Conclusions: This case highlights a rare phenotypic presentation suggestive of PRKAG2 syndrome, a phenocopy of sarcomeric hypertrophic cardiomyopathy. It emphasizes the importance of a detailed family history and early screening of at-risk relatives. Owing to its rarity, the absence of established criteria for sudden cardiac death risk stratification, and uncertainties regarding cardiac device indication, management remains particularly challenging.





20038

RIGHT ATRIAL APPENDAGE ISOLATION USING THREE PULSED-FIELD ABLATION PLATFORMS DURING REDO ATRIAL FIBRILLATION ABLATION: A MULTIPLATFORM CASE SERIES

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Introduction: The right atrial appendage (RAA) may be an underrecognized non-pulmonary vein driver of atrial fibrillation (AF). It fires spontaneously in ~7% of cases and can sustain AF. Pulsed-field ablation (PFA) may allow safe, effective lesion delivery in this anatomically complex region. Case Description: Three patients presented for redo AF ablation. All underwent biatrial mapping. RAA isolation was performed when mapping in AF demonstrated complex fractionation and high frequency of firing more prominently in the RAA compared to other atrial regions. Intraprocedural response and arrhythmia recurrence were evaluated. First case (64-year-old): LA mapping showed chronically isolated PVs and PWI. RA mapping identified high-frequency RAA signals. Farapulse ablation of the RAA and SVC achieved complete isolation with immediate AF termination. Second case (74-year-old): LA mapping again demonstrated durable PVI and PWI. During AF, tip and basal RAA fractionation outpaced LA activation. Varipulse lesions resulted in termination during ablation with confirmed block. Third case (54-year-old): LA showed low posterior wall voltage and left-sided reconnection requiring reisolation. In AF, the RAA was the fastest, most disorganized region. Sphere-9 PFA around and within (plus one RF lesion for coronary proximity) produced entrance/exit block after cardioversion. All patients remained free of AF recurrence at ≥6 months with no sinus-node or phrenic-nerve injury. Conclusions: RAA isolation using three distinct PFA platforms was safe and feasible in all cases. AF terminated acutely in two patients despite previously durable PV isolation, implicating the RAA as the operative driver. These cases support prospective investigation of PFA-based RAA isolation as a targeted strategy for non-PV AF triggers in selected patients undergoing redo ablation.

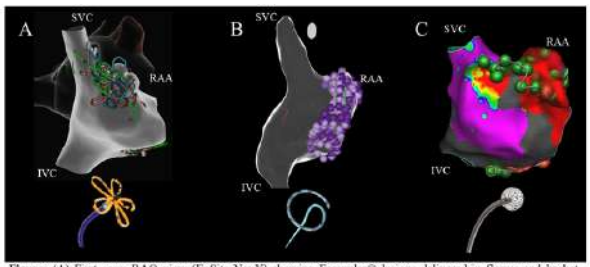


Figure: (A) First case: RAO view (EnSite NavX) showing Farapulse® lesions delivered in flower and basket configurations to isolate the RAA. (B) Second case: RAO view (CARTO) demonstrating Varipulse® lesion set with extension toward the CTI line due to rapid, fractionation activation in the lower anterior RA. (C) Third case: RAO view (Affera) illustrating Sphere-9® lesions encircling/internal the RAA achieving isolation. **Abbreviations:** SVC, superior vena cava; IVC, inferior vena cava; RAA, right atrial appendage.

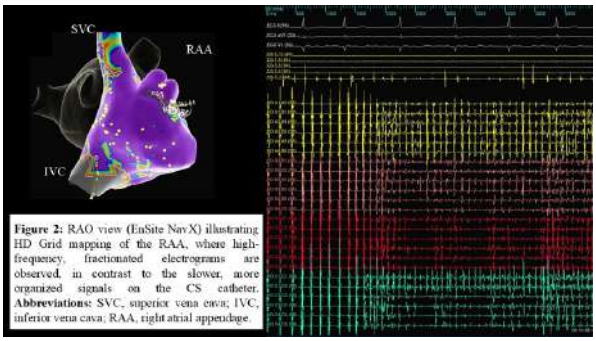


Figure 2: RAO view (EnSite NavX) illustrating HD Grid mapping of the RAA, where high-frequency, fractionated electrograms are observed, in contrast to the slower, more organized signals on the CS catheter. **Abbreviations:** SVC, superior vena cava; IVC, inferior vena cava; RAA, right atrial appendage.

21358

SUCCESSFUL ABLATION OF AN ACCESSORY PATHWAY IN EBSTEIN ANOMALY WITH ABSENCE OF PHYSIOLOGICAL ATRIOVENTRICULAR CONDUCTION: A SEQUENTIAL STRATEGY WITH PERMANENT PACEMAKER IMPLANTATION

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(1) INSTITUTO DANTE PAZZANESE DE CARDIOLOGIA - SAO PAULO - SP - BRASIL;

Introduction: Ebstein anomaly is a rare congenital heart disease frequently associated with ventricular pre-excitation and atrioventricular accessory pathways. Catheter ablation is challenging because of tricuspid annular distortion, right ventricular atrialization, surgical scars, and possible multiple or decremental pathways. Case Description: An 18-year-old female patient with Ebstein anomaly, severe tricuspid regurgitation, and manifest ventricular pre-excitation underwent cone reconstruction with tricuspid valve repair and surgical accessory pathway ablation on April 25, 2022, with persistent pre-excitation during follow-up. In an electrophysiological study on August 18, 2025, sinus rhythm with pre-excitation was observed. Right septal mapping failed to identify a His potential. Anterograde and retrograde conduction through the accessory pathway were demonstrated, and pre-excited atrial fibrillation was induced, with a shortest RR interval of 196 ms. Fragmented and late potentials in the septal right ventricle suggested scar tissue. As no physiological AV conduction was demonstrated, AV conduction dependent on the accessory pathway was suspected, and ablation was deferred due to the risk of complete AV block. In a subsequent procedure, left posteroseptal ablation was unsuccessful. Remapping of the tricuspid annulus identified the right posteroseptal region as the main target; radiofrequency applications produced intermittent pathway elimination but advanced AV block, supporting absent physiological AV conduction. The procedure was interrupted, and a permanent pacemaker was implanted. On January 5, 2026, after device protection, a new study identified a right posteroseptal accessory pathway with decremental properties. After initial failure with a non-irrigated catheter, an irrigated-tip catheter allowed successful pathway elimination, followed by complete AV block with junctional escape rhythm, persisting after observation and adenosine. The pacemaker was programmed to DDD mode, 60–150 bpm. Conclusions: This case highlights an uncommon scenario in Ebstein anomaly after cone reconstruction: persistent pre-excitation, a right posteroseptal decremental accessory pathway, septal scar substrate, and absence of physiological AV conduction. The sequential strategy — risk recognition, pacemaker implantation, and subsequent ablation — allowed safe treatment, with functional confirmation of complete AV block after accessory pathway elimination.

Cardio-Oncology

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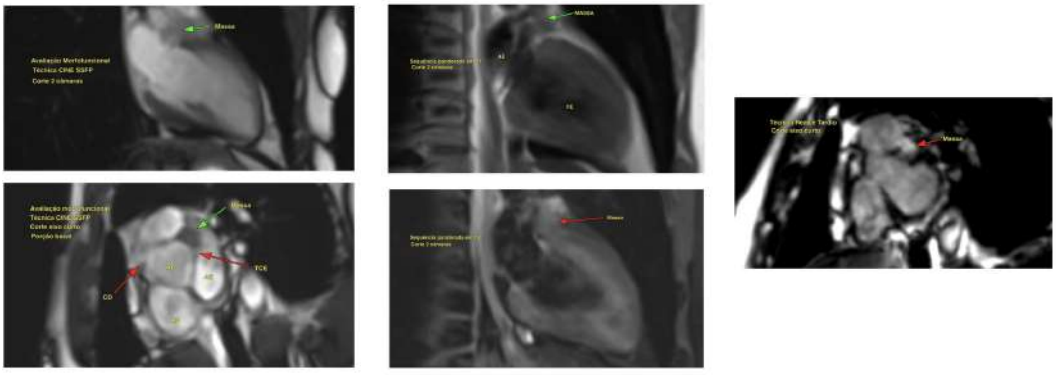
19275

EXTRINSIC CORONARY COMPRESSION BY PROBABLE SOLITARY FIBROUS TUMOR SIMULATING CHRONIC CORONARY SYNDROME IN A YOUNG PATIENT

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(1) HOSPITAL GETULIO VARGAS - TERESINA - PI - BRASIL; (2) HOSPITAL GETÚLIO VARGAS - TERESINA - PI - BRASIL;

Introduction: Coronary artery disease in young adults represents a diagnostic challenge, especially when the underlying etiology is non-atherosclerotic. Unconventional causes of myocardial ischemia, such as extrinsic compression by mediastinal masses, are rare and frequently underdiagnosed. Extra-cardiac Solitary Fibrous Tumor (SFT) is an uncommon mesenchymal neoplasm, predominantly benign, that may affect mediastinal structures with significant hemodynamic impact when adjacent to coronary vessels. Case Description: A 32-year-old male, smoker and hypertensive, presented with progressive anginal syndrome. Initial episodes occurred during exertion with intense precordial pain radiating to the back and dyspnea, evolving to rest angina. A beta-blocker was introduced without symptom relief. Echocardiography showed preserved ejection fraction (62%). Coronary CT angiography revealed zero calcium score with significant luminal reduction of the left main, anterior descending, and circumflex arteries, associated with a 12x10x8mm mediastinal mass causing extrinsic compression. Cardiac MRI identified a well-defined extra-cardiac mass of 20x14x13mm adjacent to the left coronary sinus, with imaging features suggesting probable SFT. Invasive angiography confirmed subocclusive lesions (90-95%) unresponsive to intracoronary vasodilator, supporting extrinsic compression. The patient underwent surgical revascularization and mass resection. Pathology showed atypical lymphomononuclear infiltrate within fibrosis; immunohistochemistry is pending for definitive diagnosis. Conclusions: This case highlights an uncommon cause of severe ischemia in a young adult due to extrinsic coronary compression by a probable mediastinal SFT. Zero calcium score and cardiac MRI were essential diagnostic tools. Non-atherosclerotic etiologies must be considered in young patients with coronary syndrome.



20460

SEVERE PERICARDIAL EFFUSION WITH HEMODYNAMIC COMPROMISE: A DIAGNOSTIC CHALLENGE OF PRIMARY CARDIAC LYMPHOMA

LORENA MOREIRA LAVOYER1; CAMILA CALDEIRA UBIDA1; CINTIA PERINETTI ALVES MARTINS2; BARBARA MARIA COUTINHO SILVA2; PAULO GONCALVES MARTIN2; LIVIA MARIANA LIMA GAVA2; ADIEL CARVALHO JUNIOR3; EMMANUEL SALES MACEDO4; PATRICIA SILVA DE MARCO2; THALITA DA SILVA CANEVARI1; ELZO THIAGO BRITO MATTAR1;

(1) FAMERP- HOSPITAL DE BASE - SÃO JOSÉ DO RIO PRETO - SP - BRASIL; (2) FAMERP - HOSPITAL DE BASE - SÃO JOSÉ DO RIO PRETO - SP - BRASIL; (3) FAMERP - HOSPITAL DE BASE - SAO - SP - BRASIL; (4) FAMERP- HOSPITAL DE BASE - S - SP - BRASIL;

Introduction: Pericardial effusion (PE) results from fluid accumulation in the pericardial space (>50 mL), classified by volume, distribution, and chronicity, and may cause hemodynamic compromise. Although etiologies vary, nearly 50% of cases are idiopathic, and malignancies are a relevant cause of unexplained PE. Such effusions frequently present with negative cytology for malignancy, delaying diagnosis and requiring multimodal investigation. Case Description: A 74-year-old female presented with progressive dyspnea and edema for 7 days. On admission: poor peripheral perfusion, pulmonary congestion, jugular venous distension, atrial fibrillation with rapid ventricular response, hyperlactatemia, and a pro-BNP of 1500 pg/mL. Point-of-care ultrasound demonstrated PE. Urgent echocardiography confirmed significant PE with diastolic filling restriction, a plethoric inferior vena cava, and a dyskinetic right ventricular (RV) free wall. She underwent a pericardial window with drainage of 660 mL of hematic fluid and pericardial biopsy; pathology revealed pericardial thickening and nonspecific chronic inflammatory infiltrate. Cytology and acid-fast bacillus smear were negative, despite an ADA of 122 U/L. Workup for breast, lung, and gastrointestinal malignancies was negative. Cardiac magnetic resonance revealed extensive infiltrative pericardial mass involving the atrioventricular groove, right coronary artery, right atrium, RV outflow tract, tricuspid valve, and aortic root, with diffuse pericardial late gadolinium enhancement and thickening. Positron emission tomography/computed tomography (PET/CT) showed intense hypermetabolism isolated to the heart. Surgical biopsy via sternotomy revealed a thickened pericardium and a friable, fibroelastic mass infiltrating the right atrium with calcified areas. Pathology confirmed Diffuse Large B-Cell Lymphoma. R-CHOP chemotherapy was initiated. The patient remains under multidisciplinary follow-up with a satisfactory initial response to treatment confirmed by follow-up PET/CT. Conclusions: This report reinforces that PE may be both an indicator of occult malignancy and its sentinel manifestation. Hemodynamic compromise demands prompt diagnosis to prevent cardiac tamponade. Although metastatic diseases are common causes of cardiac masses and PE, clinical presentation can be nonspecific and cytology has a low sensitivity. Multimodal imaging is essential for characterizing pericardial infiltration, and surgical assessment may be required for definitive diagnosis and therapy.

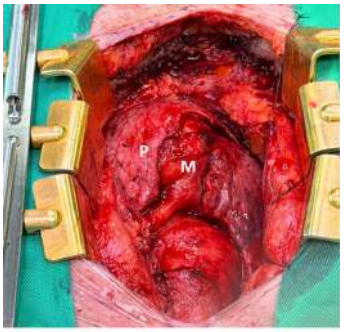


Figure 2: Intraoperative findings during sternotomy showing the thickened pericardium **(P)** and an infiltrative mass **(M)** in close contact with the pericardial layers, invading the right atrium.

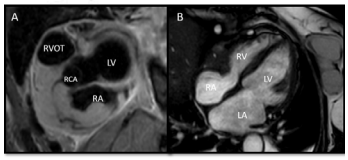


Figure 1: Cardiac magnetic resonance demonstrating an extensive infiltrative mass involving the RVOT and the RA, with perivascular extension and involvement of the RCA, shown in T1-weighted sequence (A) and cine-SSFP images (B). **RVOT**, right ventricular outflow tract; **RCA**, right coronary artery; **RA**, right atrium; **RV**, right ventricle; **LV**, left ventricle; **LA**, left atrium.

Cardiovascular Imaging – Echocardiography



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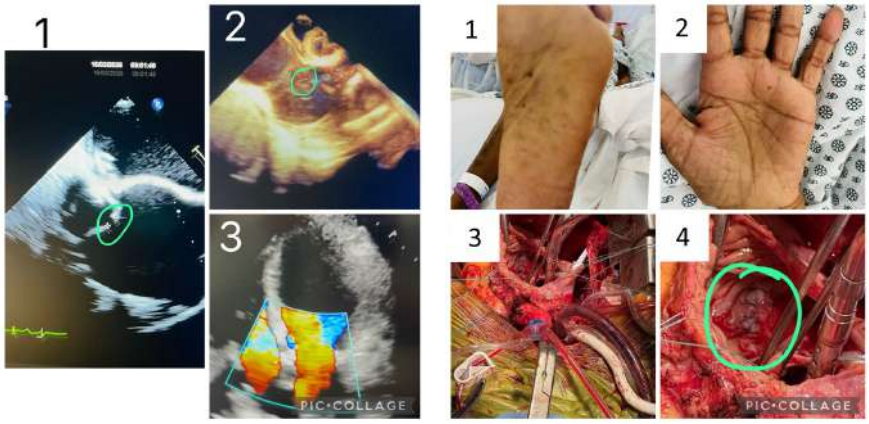
17922

ACQUIRED LEFT VENTRICLE–RIGHT ATRIUM SHUNT (GERBODE DEFECT) IN A POST-VALVE SURGERY PATIENT WITH POSSIBLE INDOLENT INFECTIOUS ETIOLOGY

RAQUEL PEREIRA DA SILVA1; ANDRÉ LUIZ LUIZ XAVIER CANEVAROLI1; FERNANDA GARCIA FLEURY1; BRUNA MORENO BARBOSA1; CAROLINE BARRETO CAVALCANTI1; SANDRA DE BARROS COBRA NEGREIROS1; RAFAELA MELO MACEDO1; ANA GIULLIA MARTINS CAPPELE1; SARA MARTINS PEREIRA1; MAGALI MEIRELLES E SILVA1; MONIQUE ALMEIDA VAZ1; ALINE ALINE AKIKO KOMATSU RABELO1;

(1) HOSPITAL DE BASE DO DISTRITO FEDERAL - BRASÍLIA - DF - BRASIL;

Introduction: Background: Left ventricle–right atrium (LV–RA) shunt, or Gerbode defect, is a rare condition that may be congenital or acquired. Acquired forms are typically associated with prior cardiac surgery or infective endocarditis and may present with subacute or indolent progression, particularly in atypical or culture-negative contexts. Case Description: A 58-year-old woman with rheumatic heart disease underwent double valve replacement (aortic and mitral bioprostheses) on February 19, 2024. Over the following months, she developed progressive right-sided heart failure with refractory edema and ascites. Transthoracic and transesophageal echocardiography demonstrated preserved left ventricular ejection fraction, marked right chamber enlargement, torrential tricuspid regurgitation with leaflet malcoaptation and systolic flow reversal in suprahepatic veins, and an aneurysmal formation in the mitral annulus (18×21 mm) associated with a direct LV–RA communication (5–8 mm) with high-velocity systolic flow, consistent with an acquired Gerbode defect. Peripheral stigmata of infective endocarditis were present. Blood cultures during hospitalization and intraoperative samples were negative; however, prior isolation of Burkholderia cepacia on February 22, 2024 had been documented. Empirical antimicrobial therapy included trimethoprim-sulfamethoxazole, levofloxacin, and meropenem; trimethoprim-sulfamethoxazole was discontinued due to sulfonamide-related thrombocytopenia, while levofloxacin was maintained. The regimen remained active against the previously isolated organism. Given the significant left-to-right shunt, severe tricuspid regurgitation, and progressive right-sided volume overload, the patient underwent tricuspid valve replacement and closure of the LV–RA defect and is currently in postoperative recovery. Conclusions: Acquired Gerbode defects should be considered in patients with prior cardiac surgery and unexplained right-sided heart failure. This case suggests a possible indolent infectious process in the context of prior Burkholderia cepacia isolation, an atypical pathogen associated with subacute presentation and limited microbiological confirmation. Multimodal imaging and integrated clinical assessment are essential to guide surgical management.



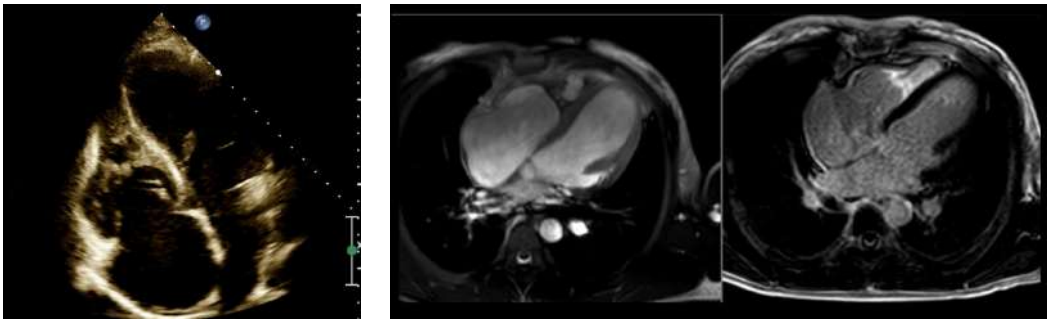
18115

ISOLATED RIGHT VENTRICULAR ENDOMYOCARDIAL FIBROSIS SECONDARY TO HYPEREOSINOPHILIC SYNDROME: AN UNCOMMON PRESENTATION

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Introduction: Endomyocardial fibrosis associated with hypereosinophilic syndrome, also known as Löffler endocarditis, is a rare form of restrictive cardiomyopathy with an unknown exact prevalence. It is characterized by endomyocardial damage mediated by eosinophilic infiltration, leading to necrosis, thrombotic complications, and myocardial fibrosis. The most common pattern of involvement is biventricular disease, followed by isolated left ventricular involvement, while isolated right ventricular (RV) involvement is rare. Case Description: A 21-year-old previously healthy man presented with weight loss, night sweats, and fatigue. Initial laboratory evaluation revealed anemia, thrombocytopenia, and marked leukocytosis with eosinophilia (26,470/mm³), in addition to splenomegaly. The patient was admitted for investigation and management of a myeloproliferative syndrome. Bone marrow examination and immunohistochemistry demonstrated a hypercellular marrow with marked eosinophilia, and immunophenotyping confirmed the diagnosis of hypereosinophilic syndrome associated with the FIP1L1-PDGFRA gene mutation. Assessment of target organ involvement included transthoracic echocardiography (TTE), which showed right chamber dilation with mild right ventricular dysfunction, severe tricuspid regurgitation, and diastolic filling restriction at the RV apex, with no abnormalities in the left-sided chambers. Cardiac magnetic resonance imaging confirmed the TTE findings and demonstrated apical obliteration of the RV by fibrotic material, consistent with endomyocardial fibrosis. Treatment of the underlying disease included corticosteroids, hydroxyurea, and imatinib, along with heart failure management. The patient initially showed an excellent hematologic response, later impaired by poor treatment adherence. At 6-month outpatient follow-up, he was in NYHA functional class I and clinically stable from a cardiovascular standpoint. Conclusions: This case illustrates the association between hypereosinophilic syndrome and endomyocardial fibrosis, with an isolated right ventricular involvement pattern. Cardiac involvement in this syndrome is a major cause of morbidity and mortality, and imaging modalities played a key role in establishing the diagnosis. Early recognition of the underlying etiology allowed the initiation of targeted therapy, potentially modifying the natural history of the disease.



Cardiovascular Pharmacology



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20694

ACUTE GENERALIZED EXANTHEMATOUS PUSTULOSIS FOLLOWING CORONARY ARTERY BYPASS GRAFTING ASSOCIATED WITH AMIODARONE USE: A CASE REPORT

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Introduction: Acute generalized exanthematous pustulosis (AGEP) is a rare and severe adverse cutaneous reaction, although antibiotics are the most frequent triggers, antiarrhythmic drugs, such as amiodarone, have also been linked to the condition. Case Description: A 64-year-old male patient, a Jehovah's Witness, with a history of hypertension, diabetes, and multi-vessel coronary artery disease, underwent coronary artery bypass grafting on April 23, 2026. The immediate postoperative period was complicated by total atrioventricular block, requiring temporary ventricular pacing, and atrial fibrillation on the first postoperative day with a high ventricular response, treated with high-dose amiodarone infusion (300 mg + 900 mg) over 24 hours.On the second postoperative day, the patient developed erythematous plaques in the bilateral inguinal region, which progressed to extensive and painful erythematous plaques associated with non-follicular micropustules, predominantly involving intertriginous areas, including the abdomen, inguinal folds, gluteal region, and proximal thighs. No fever was associated. The differential diagnosis included AGEP and symmetrical drug-related intertriginous and flexural exanthema (SDRIFE). Relevant recent drug exposures included cefazolin during anesthetic induction, amoxicillin for dental treatment 14 days prior, and amiodarone postoperatively.A dermatological evaluation was requested, and the skin biopsy showed subcorneal pustules associated with superficial dermal edema and a dense perivascular inflammatory infiltrate rich in eosinophils, favoring the diagnosis of AGEP. Amiodarone was promptly discontinued, and systemic corticosteroid therapy with prednisone 40 mg/day was initiated along with topical corticosteroids, resulting in progressive improvement of the lesions, followed by desquamation and resolution of the pustules. Conclusions: AGEP should be considered in the differential diagnosis of acute pustular eruptions in the postoperative period of cardiac surgery, especially in patients exposed to multiple high-risk medications. Although uncommon, amiodarone may act as a potential trigger. Histopathological confirmation and early discontinuation of the suspected agent are essential for favorable clinical outcomes.





Cardiovascular Prevention / Atherosclerosis / Dyslipidemia / Cardiovascular Risk Factors / Immunotherapy and Vaccines



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16951

COCAINE-INDUCED ANTIPHOSPHOLIPID SYNDROME MIMICRY: TRANSIENT ANTICARDIOLIPIN POSITIVITY ASSOCIATED WITH CATASTROPHIC THROMBOEMBOLIC EVENTS AND FUNCTIONAL RECOVERY

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Introduction: Antiphospholipid syndrome (APS) is an autoimmune disorder characterized by recurrent thrombotic events associated with persistent antiphospholipid antibodies (aPL), requiring laboratory confirmation on 2 measurements at least 12 weeks apart. However, transient aPL positivity may occur under specific conditions, including infections and illicit drugs exposure, particularly cocaine adulterated with levamisole, potentially mimicking APS and leading to misdiagnosis with important therapeutic implications. Case Description: A 50-year-old man with a 26-year history of chronic cocaine use who presented with ischemic stroke at age 48, followed in the same month by acute myocardial infarction. He subsequently developed severe ventricular dysfunction, with a left ventricular ejection fraction (LVEF) of 22% and a large mobile intracavitary thrombus in the LV detected on echocardiography. During hospitalization, he developed additional systemic thromboembolic events, including critical lower limb ischemia with bilateral popliteal artery occlusion confirmed by Doppler ultrasound, requiring bilateral above-knee amputations. He also presented dyspnea, generalized edema, and cutaneous lesions suggestive of vasculitis. APS was suspected due to the severity and multiplicity of thrombotic events. Immunological testing revealed high-titer anticardiolipin IgM antibodies (107 MPL-U/mL), with negative lupus anticoagulant, antinuclear antibodies, and ANCA. A severe systemic presentation of APS was initially considered. However, repeat testing after 12 weeks demonstrated complete antibody negativation, excluding definite APS according to international criteria. Following cocaine cessation and optimization of medical therapy, LVEF improved significantly (54%), supporting a toxic trigger and partial cardiovascular reversibility. Conclusions: This case illustrates extensive systemic thromboembolic manifestations with transient anticardiolipin positivity in chronic cocaine use, representing APS mimicry. Levamisole exposure may induce immune activation with autoantibody production and vasculopathic manifestations. Recognition of this association is essential to avoid misdiagnosis of definite APS and unnecessary lifelong anticoagulation. Serial aPL testing and systematic investigation of illicit drug exposure are critical in patients with multiple thrombotic events and isolated aPL positivity, allowing individualized management directed toward the underlying cause.

Cardiovascular Surgery



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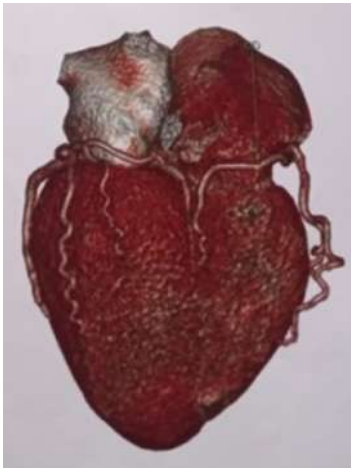


18613

ANOMALOUS ORIGIN OF THE RIGHT CORONARY ARTERY WITH AN INTERARTERIAL COURSE ASSOCIATED WITH THREE-VESSEL CORONARY ARTERY DISEASE: THE ROLE OF COMPUTED TOMOGRAPHY ANGIOGRAPHY AND SURGICAL MANAGEMENT

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Introduction: Anomalous origin of the coronary arteries is a rare condition associated with myocardial ischemia, arrhythmias, and sudden cardiac death. Variants with an interarterial course present a higher risk, especially when associated with atherosclerotic coronary artery disease. Imaging methods, such as coronary CT angiography, are essential for diagnosis and risk stratification. Case Description: A 62-year-old male patient with stable angina and an exercise stress test positive for ischemia at low workload. Cardiac catheterization revealed proximal occlusion of the left anterior descending artery (with an intramyocardial course in the mid segment), a significant lesion in the first marginal branch, and inability to catheterize the right coronary artery. Therefore, coronary CT angiography was requested for further evaluation of coronary anatomy. The exam (coronary CT angiography) demonstrated an anomalous origin of the right coronary artery from the left coronary sinus, with an interarterial course (between the aorta and the pulmonary artery trunk), an intramural segment, and a slit-like ostium (Figure 1), in addition to three-vessel coronary artery disease (Figure 2). Given the presence of symptoms, documented ischemia, and high-risk anatomy, myocardial revascularization surgery was performed using grafts from the Right Internal Thoracic Artery to the Left Anterior Descending Artery, the Great Saphenous Vein to the First Marginal Branch, and the Great Saphenous Vein branch to the posterior interventricular artery. Conclusions: The association between anomalous origin of the coronary arteries with an interarterial course and coronary artery disease represents a high-risk condition for major cardiovascular events. Coronary CT angiography is essential for anatomical definition and therapeutic planning. Myocardial revascularization is an effective strategy in symptomatic patients with evidence of ischemia and unfavorable anatomy.

18020

CARDIAC LEFT VENTRICULAR HEMANGIOMA MIMICKING MYXOMA: A CASE REPORT AND DIAGNOSTIC CHALLENGE

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Introduction: Primary cardiac tumours are rare, with an estimated prevalence of 0.01% to 0.03% in the general population. Myxomas are the most common type and are predominantly located in the left atrium, whereas their occurrence in the left ventricle is uncommon. More than 90% of these tumours are benign, and both myxomas and hemangiomas are generally treated with surgical resection, with a favourable prognosis. Clinical manifestations vary according to tumour location and characteristics and may include arrhythmias, embolic events, flow obstruction, syncope, and ventricular dysfunction. This case illustrates the diagnostic and therapeutic challenges posed by these uncommon presentations. Case Description: A 51-year-old male Jehovah's Witness with a history of systemic arterial hypertension and dyslipidaemia was being evaluated for non-sustained supraventricular tachycardia detected on an exercise stress test on October 21, 2024. Transthoracic echocardiography revealed an intracavitary left ventricular mass measuring 16 × 10 mm, with a hyperechoic border. Cardiac magnetic resonance imaging confirmed the lesion and showed no impairment of ventricular function. Imaging findings suggested myxoma. The patient underwent surgical resection on February 13, 2025, without the need for blood transfusion. Although the gross appearance of the specimen was also suggestive of myxoma, histopathological examination established the diagnosis of capillary-type cardiac hemangioma. In the postoperative period, the patient developed atrial fibrillation, requiring electrical cardioversion on February 26, 2025. Anticoagulation with apixaban 5 mg twice daily was initiated in association with amiodarone, and the patient had a favourable clinical course. Conclusions: Primary cardiac tumours may have heterogeneous clinical presentations depending on their anatomical location, relationship to the myocardium, and haemodynamic impact. Although many cases are asymptomatic, some patients may present with arrhythmias, embolic events, or signs of intracardiac obstruction. In this case, distinguishing myxoma from cardiac hemangioma was diagnostically challenging, since clinical, surgical, and imaging findings may overlap, making histopathological examination essential for diagnosis. Surgical resection remains the main therapeutic strategy, and recognition of these rare presentations may help guide the management of similar cases.

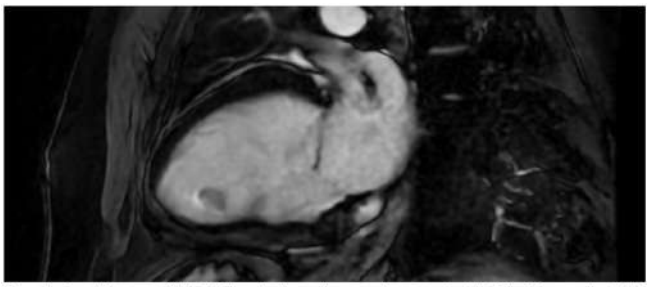


Figure 1. Rounded mass within the left ventricular cavity, measuring approximately 10.4 × 10 mm, attached to the inferoapical segment, pedunculated, mobile, well-circumscribed, and without intrinsic contractility. It is isointense relative to the myocardium on T1-weighted imaging and hyperintense on T2-weighted imaging.

19111

CASE REPORT: ASYMPTOMATIC AORTIC INTUSSUSCEPTION WITH HIGH-RESPONSE ATRIAL FIBRILLATION — INCIDENTAL FINDING AND COMPLEX SURGICAL MANAGEMENT

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Introduction: Type A aortic dissection is a high-mortality cardiovascular emergency, with rates reaching 1 to 2% per hour in the first 48 hours without surgical intervention. Aortic intussusception is an extremely rare complication, characterized by prolapse of the intimal flap into the vascular lumen, potentially occluding coronary ostia, aortic arch branches, and causing acute severe aortic regurgitation. Its exact incidence remains undefined in the literature, reflecting both its rarity and high pre-diagnosis mortality. Recognition requires strong clinical suspicion and relies on aortic computed tomography angiography for precise anatomical characterization. The association with atypical presentations, such as absence of pain and new-onset arrhythmias, makes diagnosis even more challenging and demands careful structured clinical reasoning. Case Description: A 51-year-old male, with no known comorbidities, presented for a routine outpatient visit completely asymptomatic. High-response atrial fibrillation was identified during cardiological evaluation, prompting referral to the emergency department. Physical examination revealed blood pressure discrepancy between upper limbs. Transthoracic echocardiography showed severe aortic regurgitation and a 64mm aortic aneurysm. Computed tomography angiography demonstrated intussusception of the ascending aorta extending to and obstructing the brachiocephalic trunk, along with an additional flap in the descending aorta. Frozen Elephant Trunk surgery was performed with implantation of an endoprosthesis in the descending aorta, a bifurcated graft in the aortic arch, and a valved conduit with coronary reimplantation, plus closure of the left atrial appendage, which contained an intracavitary thrombus. The procedure totaled 240 minutes of cardiopulmonary bypass, 210 minutes of aortic clamping, and 60 minutes of circulatory arrest. A hemoadsorption cartridge was used to mitigate systemic inflammatory response, and the postoperative course was favorable, with ICU discharge on the fifth day. Conclusions: This case highlights the importance of thorough investigation in new-onset arrhythmias, even in asymptomatic patients. The incidental diagnosis of aortic intussusception reinforces that symptom absence does not exclude life-threatening conditions. The Frozen Elephant Trunk approach, combined with perioperative inflammatory control using emerging biotechnologies, yielded a satisfactory outcome contributing to the literature on management of this condition.





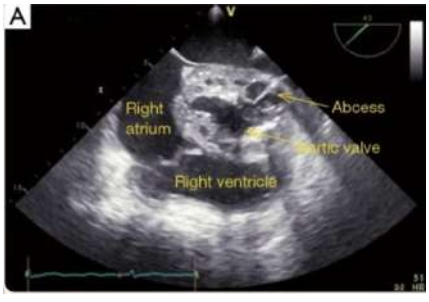
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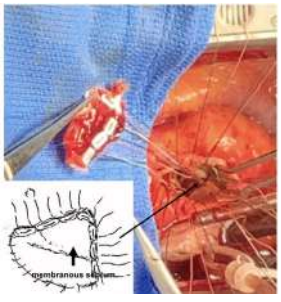
GERBODE'S DISEASE WITH UNUSUAL ANATOMICAL PRESENTATION AND UNCONVENTIONAL SURGICAL CORRECTION: A CASE REPORT

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Introduction: Gerbode's defect is an anomalous communication between the left ventricle and the right atrium, of congenital or acquired etiology, and represents a rare condition in clinical practice. It corresponds to approximately 0.08% of intracardiac shunts and less than 1% of congenital heart diseases. A case of Gerbode's defect is reported below, emphasizing its diagnostic difficulty and therapeutic complexity. Case Description: A 34-year-old male patient was admitted with a history of approximately three months of recurrent fever, predominantly nocturnal, associated with chills, cold sweats, hyporexia, unmeasured weight loss, asthenia, and progressive dyspnea. Initially, infective endocarditis was suspected, and empirical antibiotic therapy was instituted. During the investigation, blood cultures remained negative and the transesophageal echocardiogram did not show vegetations. The echocardiogram revealed a true Gerbode defect, with communication between the left ventricle and right atrium in the region of the atrioventricular membranous septum, associated with a bicuspid aortic valve with significant aortic insufficiency, significant tricuspid insufficiency, aneurysmal deformation of the tricuspid septal leaflet, significant dilation of cardiac chambers, and a left ventricular ejection fraction of 40%. Following discussion within the Heart Team, surgical correction was indicated, consisting of resection of the native aortic valve and implantation of a metallic valve prosthesis, correction of the Valsalva sinus aneurysm, occlusion of the right aorto-atrial fistula, and tricuspid valve repair. Due to the unusual anatomical presentation of the defect, the fistula repair was performed transaortically, during the same surgical procedure as the resection of the native aortic valve and the implantation of the mechanical prosthesis, with the right atrium being addressed only for tricuspid valve repair. In the postoperative period, the echocardiogram showed no residual flow at the level of the membranous septum, and the patient remained under clinical follow-up. Conclusions: The diagnosis of Gerbode's defect can be challenging, especially in unusual presentations and in scenarios initially suggestive of infective endocarditis. This case reinforces the importance of magnetic resonance imaging, echocardiography, and individualized therapeutic planning.





19697

LATE AND UNUSUAL INFECTIOUS COMPLICATION OF THE ASCENDING AORTA AFTER COMPLEX CARDIAC SURGERY: A CASE REPORT

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Introduction: Late infectious complications of the ascending aorta following cardiac surgery are rare events, yet they are associated with high mortality. Clinical presentation may be nonspecific, delaying diagnosis, and determining the optimal timing for surgical intervention represents a significant challenge, particularly in frail and multimorbid patients. Case Description: 69-year-old male with diabetes mellitus, end-stage renal disease on dialysis, and frailty underwent in July surgical correction of a right coronary artery–to–pulmonary trunk fistula, aortic valve replacement, and coronary artery bypass grafting (CABG). In November, he developed fever and hypotension during dialysis, initially attributed to a probable urinary source. Due to persistent symptoms, further investigation in his hometown revealed a collection at the aortic root, and he was subsequently to our institute for advanced evaluation. Computed tomography demonstrated a large periaortic mediastinal collection containing saccular formations with direct communication with the ascending aorta (AA) at two sites, consistent with infectious pseudoaneurysms and contained rupture of the aortic wall—findings associated with a high risk of imminent rupture, located near the prior aortotomy site. Despite the indication for urgent surgery, the patient was toxemic, with an elevated operative mortality risk. A decision was made to defer surgery, acknowledging the risk of clinical deterioration during this interval, in an attempt to reduce infectious burden and optimize clinical status prior to a complex procedure. After partial stabilization, the patient underwent reoperation. Intraoperatively, an infectious pseudoaneurysm of the AA was confirmed, and reconstruction was performed using a Dacron graft, along with repeat CABG. The aortic valve prosthesis was functioning normally, with no evidence of infectious involvement on PET-CT; therefore, it was preserved to avoid prolonging operative time. The postoperative course was favorable, with discharge from the intensive care unit on postoperative day 5. The patient received six weeks of targeted antibiotic therapy for Pseudomonas aeruginosa, with good clinical response and subsequent hospital discharge in stable condition. Conclusions: Although early surgery is generally recommended due to the high risk of rupture, in highly complex scenarios, determining the optimal surgical timing becomes as critical as the indication itself and should be individualized.



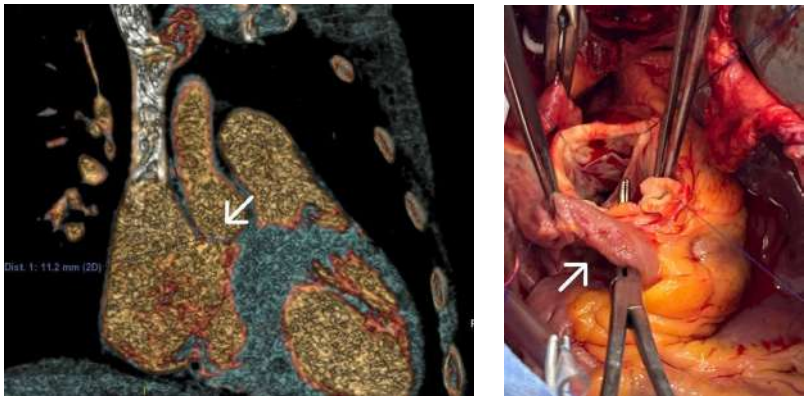
17108

SAVE THE VALVE, REMODEL THE ROOT: HEMI-YACOUB TECHNIQUE - A CASE REPORT

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Introduction: Ruptured sinus of Valsalva aneurysm (SVA) is a rare cardiac anomaly, accounting for less than 1% of congenital heart defects. Although traditional repair focuses on fistula closure, this approach may be insufficient by overlooking that rupture reflects structural failure of the sinus wall rather than a simple fistulous communication. We describe a case of ruptured right SVA treated with localized root remodeling to preserve the native valve and coronary anatomy. Case Description: A 29-year-old male patient presented with a 2-month history of progressive exertional chest pain and dyspnea. Initial echocardiography, subsequently confirmed by computed tomography angiography, demonstrated a ruptured right sinus of Valsalva aneurysm with communication to the right atrium, resulting in a high-gradient left-to-right shunt and volume overload. Intraoperative inspection confirmed localized disease of the right coronary sinus, with a pinpoint rupture and preserved surrounding tissue. Localized valve-sparing root remodeling was performed using the hemi-Yacoub technique, with resection of the diseased sinus, Dacron graft reconstruction to restore the physiologic geometry of the root, and right coronary artery reimplantation, thereby correcting the shunt and restoring sinus morphology. Intraoperative echocardiography demonstrated correction of the communication and preservation of aortic valve function. Conclusions: This case reinforces that the ruptured sinus of Valsalva aneurysm should not be interpreted only as a focal defect to be closed, but as a manifestation of localized aortic root disease. In this setting, in addition to correction of the rupture and the communication, preservation of the physiologic morphology of the sinus through graft reconstruction and reimplantation of the coronary ostium are fundamental components of an anatomically proportionate and functionally more appropriate repair.

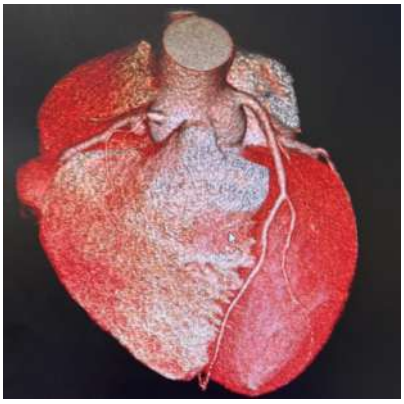


20957

SURGICAL REVASCULARIZATION OF A GIANT RIGHT CORONARY ARTERY PSEUDOANEURYSM SECONDARY TO BEHÇET DISEASE AND THE USE OF THE PATIENT BLOOD MANAGEMENT (PBM) STRATEGY

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Introduction: Behçet disease generally affects young adults between 20 and 40 years of age, with no sex predominance. It is characterized by a recurrent multisystem inflammatory syndrome of unknown etiology. Clinical manifestations include mucocutaneous involvement with oral ulcers, genital ulcers, skin lesions, uveitis, and erythema nodosum. The histopathological features of the disease are vasculitis and thrombosis. Involvement of arteries and veins of all calibers may be observed in 25% of patients, more commonly in men. Arterial vasculitis may involve vessels of any caliber and may be accompanied by aneurysms or occlusions. Case Description: A 26-year-old male patient with a history of pulmonary thromboembolism and recurrent oral aphthous ulcers was hospitalized for endovascular repair of a descending thoracic aortic aneurysm. Two months later, the patient was readmitted with chest pain and underwent coronary angiography, which revealed two giant pseudoaneurysms in the proximal and mid thirds of the right coronary artery. Clinical evaluation showed elevated inflammatory markers and persistent chest pain. Therefore, treatment for the underlying disease was initiated with corticosteroid therapy and cyclophosphamide. Less than 3 months after clinical treatment, the patient required myocardial revascularization with a sequential saphenous vein graft. A PBM strategy was used, including intraoperative and postoperative cell salvage and administration of ferric carboxymaltose on the fourth postoperative day. The patient progressed without the need for transfusion and was discharged on the fifth postoperative day. Conclusions: Suspicion of the diagnosis of Behçet disease arose from the fact that the patient had vascular involvement in multiple territories, including aortic dissection, coronary aneurysm, and a history of venous thromboembolism. After reviewing the literature, it was observed that this clinical case is rare, especially in terms of the clinical presentation of this pathology. Thus, clinical management and surgical treatment aimed to minimize the patient's inflammatory response. The PBM strategy was an additional resource used that contributed to this goal.

16441

TORRENTIAL PRIMARY TRICUSPID REGURGITATION DUE TO MYXOMATOUS DEGENERATION: INNOVATION IN PERCUTANEOUS REPAIR WITH THE PASCAL ACE SYSTEM

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Introduction: Significant tricuspid regurgitation has been historically underrecognized, despite its association with increased morbidity and mortality and impaired quality of life. Although the functional form is more prevalent, primary etiologies such as myxomatous degeneration are rare and poorly described in the literature. In recent years, advances in transcatheter therapies have expanded treatment options for patients at high surgical risk, with the PASCAL ACE system emerging as a promising strategy for percutaneous valve repair, showing encouraging early results in regurgitation reduction and clinical improvement. Case Description: Severe primary tricuspid regurgitation is rare and often underdiagnosed, and is associated with worse prognosis. The development of percutaneous approaches, such as the PASCAL ACE system, provides an alternative in selected cases. A 67-year-old female patient with primary tricuspid regurgitation due to myxomatous degeneration presented with mild exertional dyspnea (NYHA II) and bilateral lower limb edema. She was on bisoprolol and indapamide and was admitted for percutaneous tricuspid valve repair. The procedure was performed via right femoral access, with implantation of two PASCAL ACE devices in the anteroseptal and posteroseptal positions, achieving adequate leaflet grasping and significant reduction of the central regurgitant jet. The immediate postoperative course was uneventful, with the patient stable on room air, no access site complications, and normal laboratory tests. She was discharged early and remained under outpatient follow-up. Conclusions: This case highlights that percutaneous tricuspid valve repair using the PASCAL ACE system is safe and effective, providing significant regurgitation reduction and immediate clinical improvement. The presence of primary tricuspid regurgitation due to myxomatous degeneration further underscores the relevance of this report, given the rarity of the condition and the potential of percutaneous techniques in elderly patients with favorable valvular anatomy.

16326

TRANSCATHETER TRICUSPID VALVE REPAIR WITH THE EVOQUE SYSTEM: THE SECOND CASE PERFORMED IN LATIN AMERICA

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Introduction: Tricuspid regurgitation (TR), particularly in its severe forms, is associated with significant morbidity and mortality, driven by progressive right-sided heart failure and systemic congestion. Despite its clinical impact, TR remains historically undertreated, largely due to the high surgical risk of affected patients and the limited effectiveness of medical therapy. In recent years, transcatheter therapies have emerged as a transformative alternative for patients deemed inoperable or high risk for surgery. Case Description: A 78-year-old woman with torrential functional tricuspid regurgitation of atrial etiology, permanent atrial fibrillation, and prior anticoagulation with apixaban presented with progressive functional decline (NYHA class II), bilateral lower limb edema, and mild fatigue. Pre-procedural evaluation demonstrated preserved left ventricular ejection fraction (62%), biatrial enlargement, moderate pulmonary hypertension, and massive tricuspid regurgitation, with favorable anatomy for transcatheter intervention using the EVOQUE system. The patient was admitted for transcatheter tricuspid valve repair, which was successfully performed via right femoral venous access, without significant hemodynamic complications. Post-procedurally, she was monitored in the intensive care unit for 24 hours, remaining hemodynamically stable, with adequate respiratory status on low-flow oxygen therapy, no signs of congestion or bleeding, and an intact femoral access site. Chest X-ray and electrocardiogram showed no significant abnormalities, with appropriate device positioning. The patient was discharged 48 hours after the procedure, in good clinical condition, with outpatient follow-up. Conclusions: This report describes only the second case of transcatheter tricuspid valve repair with the EVOQUE system performed in Latin America, reinforcing the feasibility and safety of this cutting-edge approach. In a population historically limited by high surgical risk and few therapeutic options, this strategy provides rapid hemodynamic improvement, early functional recovery, and short hospital stay. This case highlights the evolving role of transcatheter therapies in the management of tricuspid valve disease and supports their use as a transformative and expanding frontier in structural heart interventions.

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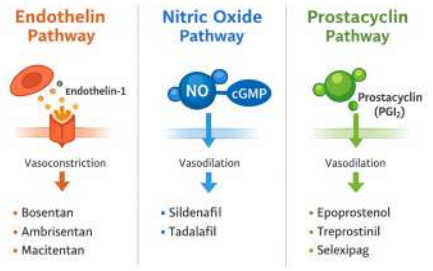
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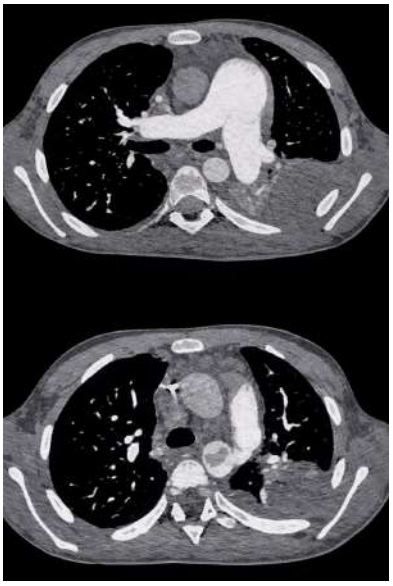
BMPR2-RELATED HERITABLE PULMONARY ARTERIAL HYPERTENSION IN A CHILD: A CASE WITH CLINICAL INSIGHTS AND EMERGING THERAPEUTIC PERSPECTIVES

EDUARDA FÉLIX PONTE1; YURI OSMAR DE ARAÚJO COSTA2; MONIQUE RODRIGUES TARDIN DE FIGUEIREDO3; DIEGO VIEIRA BARRETO3; APRISCLA MENDES COSTA3; THALES DE MELO MASCI VALADÃO CARDOSO3; TEREZA LÚCIA DE MELO MASCI3; MARIA DA GLÓRIA CRUVINEL HORTA3;

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Introduction: Heritable pulmonary arterial hypertension (HPAH) is a rare and severe disease, most commonly associated with BMPR2 mutations, present in up to 80% of familial cases. It is characterized by early onset and poor prognosis, making early recognition and family screening essential, particularly in pediatric populations. Case Description: A 7-year-old boy presented with progressive dyspnea (mMRC grade 4), exercise intolerance, chest pain, and perioral cyanosis over six months. Family history was remarkable for pulmonary hypertension in multiple first-degree relatives, including his mother (on ambrisentan and tadalafil, awaiting lung transplantation), as well as his grandmother and aunt, both with early mortality. A sibling died at 2.5 years of age with similar symptoms and no established diagnosis. Physical examination revealed an accentuated P2 and a tricuspid regurgitation murmur. Echocardiography demonstrated severe pulmonary hypertension (estimated systolic pulmonary artery pressure 101 mmHg), right heart enlargement, and moderate right ventricular systolic dysfunction. Right heart catheterization confirmed severe pulmonary arterial hypertension with mean pulmonary artery pressure of 57 mmHg, pulmonary capillary wedge pressure of 18 mmHg, and markedly elevated pulmonary vascular resistance (PVR ~29.6 Wood units). Genetic testing identified a BMPR2 mutation, confirming heritable PAH. Given disease severity, a Potts shunt was performed. Despite intervention, the patient remained with severe pulmonary hypertension, requiring tadalafil and bosentan, with partial stabilization, remaining oxygen-dependent. Conclusions: This case highlights the importance of early recognition of heritable PAH in children with suggestive family history, enabling timely genetic testing and proper management. Symptoms and physical findings may support early suspicion. Management requires a multimodal strategy, including invasive hemodynamic confirmation and early combination therapy targeting the endothelin, nitric oxide, and prostacyclin pathways, with escalation in high-risk patients. In advanced disease, palliative approaches such as Potts shunt and lung transplantation should be considered. Emerging therapies targeting pulmonary arterial remodeling, such as sotatercept, may offer disease-modifying potential by acting on pathways involved in BMPR2-related disease. Early recognition and family screening may be critical to improving outcomes.





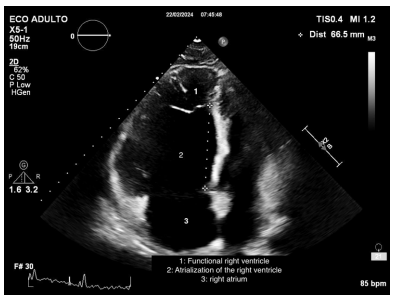
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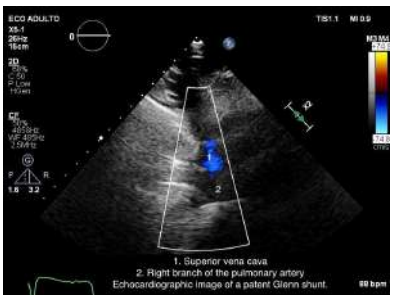
GLENN SURGERY AS RESCUE THERAPY IN A PATIENT WITH LATE-CORRECTED EBSTEIN ANOMALY

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Introduction: Ebstein anomaly (EA) is a rare congenital heart disease, characterized by the apical displacement of the tricuspid leaflets, which results in the atrialization of the right ventricle (RV) and a reduction in its functional portion. Clinical presentation and prognosis vary by anatomical severity, with mortality reaching 18% in severe cases untreated during childhood. We report an uncommon severe EA case diagnosed in adulthood with an atypical clinical course. Case Description: A 28-year-old male presented with exertion intolerance, asthenia, a holosystolic murmur at the tricuspid area, and jugular venous distention. Transthoracic echocardiogram (TTE) showed findings consistent with EA: severe right atrial dilation (77 ml/m²), apical displacement of the septal tricuspid leaflet (6 cm from the valvular plane; Carpentier type C), severe tricuspid regurgitation (TR), moderate right ventricular (RV) dysfunction, and a 16x10 mm ostium secundum atrial septal defect (ASD). He underwent tricuspid valve replacement (TVR) with a bioprosthesis, ASD closure, and epicardial pacemaker implantation due to intraoperative third-degree heart block. At one-year follow-up, he developed RV dysfunction symptoms, with anasarca and hepatomegaly. A new TTE revealed bioprosthetic failure, characterized by stenosis due to a large thrombus on its atrial surface (mean gradient 12 mmHg). Despite anticoagulation therapy, he developed hemodynamic instability. Redo-TVR was indicated, combined with a bidirectional Glenn shunt (superior cavopulmonary anastomosis) as a one-and-a-half ventricle repair strategy for hemodynamic rescue of the RV overload. Postoperative follow-up showed a normally functioning prosthesis (mean gradient 6 mmHg), patent Glenn flow, and clinical improvement, with NYHA class reduction and no further hospitalizations. Conclusions: In the setting of EA, the Glenn procedure is typically indicated during childhood as a physiological unloading for severe right ventricular (RV) dysfunction. However, its application in adults remains rare. With the rising prevalence of adults with congenital heart disease, challenges regarding the management of late-stage RV failure become more frequent. This report describes the possibility of applying a bidirectional Glenn shunt as rescue therapy for RV dysfunction after failed isolated valve surgery in an adult with EA, therefore highlighting the applicability of a well-known therapy, in an uncommon scenario.





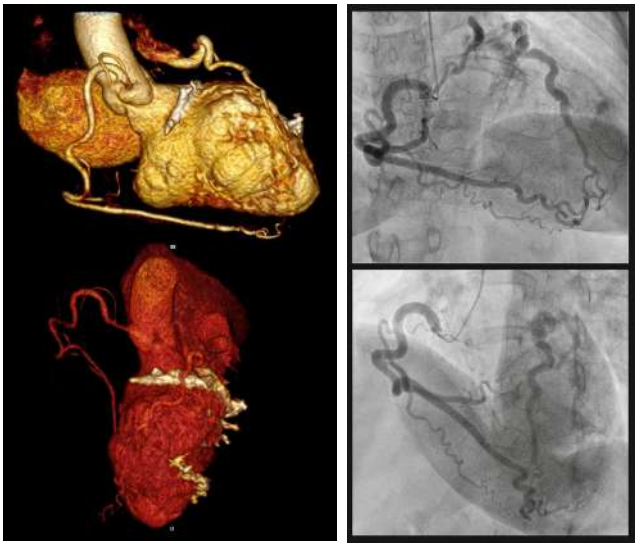
16493

HEART FAILURE WITH REDUCED EJECTION FRACTION IN AN ADULT PATIENT CAUSED BY ANOMALOUS ORIGIN OF THE LEFT CORONARY ARTERY FROM THE PULMONARY ARTERY.

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Introduction: Anomalous left coronary artery originating from the pulmonary artery (ALCAPA), also known as Bland-White-Garland syndrome, is a rare coronary anomaly (1 in 300,000 live births), mainly diagnosed in neonates. Survival into adulthood is uncommon and depends on the development of extensive collateral circulation from the right coronary artery. In the absence of early intervention, mortality may reach 90% during the first year of life. Additionally, cases of sudden cardiac death have been reported in previously undiagnosed patients, and those who survive into adulthood frequently develop heart failure with reduced ejection fraction. Case Description: A 46-year-old woman was admitted to a tertiary cardiology referral center with a 3-year history of progressive dyspnea, now occurring with minimal exertion, associated with orthopnea, paroxysmal nocturnal dyspnea, and lower-limb edema. She also reported occasional exertional angina. On physical examination, she was in good general condition, with a blood pressure of 100/70 mmHg and no signs of congestive heart failure. The electrocardiogram showed sinus rhythm with left bundle branch block. Transthoracic echocardiography demonstrated a dilated left ventricle, left ventricular ejection fraction of 46%, moderate mitral regurgitation, and pulmonary hypertension (estimated pulmonary artery systolic pressure of 53 mmHg). Coronary angiography revealed absence of the left coronary ostium in the aortic sinus, with a dominant and enlarged right coronary artery supplying the left system via collaterals and drainage into the pulmonary artery, consistent with ALCAPA. Hemodynamic assessment showed severe mixed pulmonary hypertension and reduced cardiac index (2.34 L/min/m²). The case was discussed by a multidisciplinary Heart Team, and optimization of medical therapy followed by surgical correction was recommended. Conclusions: ALCAPA is a rare cause of dilated cardiomyopathy in adults and, if left untreated, may progress to severe heart failure and death. Early diagnosis is essential, as surgical correction is the definitive treatment to prevent sudden cardiac death and reverse ventricular dysfunction, even in late presentations.



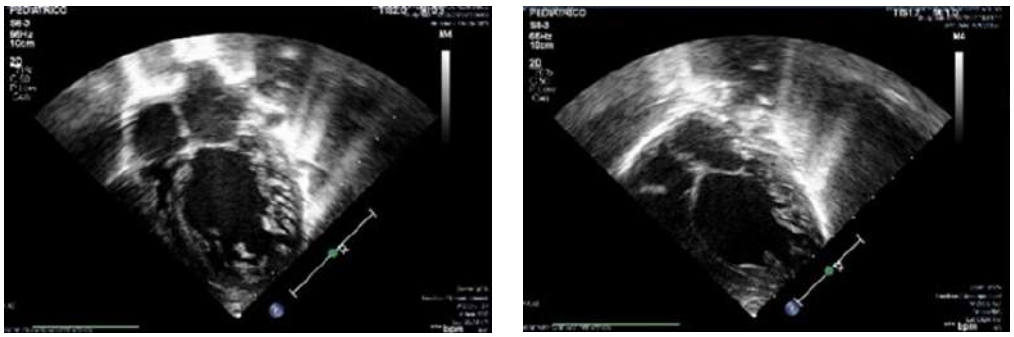
16623

LEFT VENTRICAL HYPERTRABECULATION IN TWINS: A MIRROR INTO PEDIATRIC CARDIOGENETICS

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(1) INSTITUTO NACIONAL DE CARDIOLOGIA - RIO DE JANEIRO - RJ - BRASIL;

Introduction: Left ventrical hypertrabeculation is a phenotype of cardiac muscle caused by the failure of myocardial compaction during fetal development, resulting in deep and coarse trabeculations that affect cardiac function. It presents itself with a range of phenotypic manifestations, from asymptomatic adults to children with severe heart failure. The genetics behind this condition are also varied, potentially arising from autosomal dominant mutations (usually encoding sarcomeric protein genes), mitochondrial defects, or complex chromosomal anomalies. With advancements in genomics, more genes have been implicated in the development of this condition, but studies demonstrating a clear correlation between genotype and phenotype of the disease are lacking. This divergence can be observed in the case of monozygotic twins with left ventricle hypertrabelulation and a unknown genotype, with different manifestations of cardiomyopathy and heart failure. Case Description: The twins began follow-up at around 4 months of age, where a diagnosis was made and optimized medical treatment for heart failure was initiated. In the first echocardiogram (ECHO), Twin I had an ejection fraction by the Simpson method of 8%, while Twin II had a fraction of 24%. Twin II remained asymptomatic, while Twin I required an increase in medications, with the first hospitalization for congestive heart failure (CHF) at 3 years old. During this hospitalization, there was a need for inotropes (2 cycles of Levosimendan), followed by re-hospitalization one month post-discharge for a new cycle of inotropes, remaining hospitalized until undergoing orthotopic heart transplant in March 2025 at 3 years and 9 months old. He progressed with graft acceptance and was discharged after 3 months of hospitalization; the first cardiac biopsy showed no signs of rejection. Twin II continues outpatient follow-up with the cardiomyopathy team, with the last ECHO showing an ejection fraction by the Teicholz method of 33.8%, without hospitalizations for CHF. Genetic testing for both patients has been requested but not yet performed. Conclusions: Genetic sequencing of the twins and cardiological exams for family members would be advisable. Left ventricular hypertrabeculation remains an anatomical variant with a wide spectrum of presentations and no clear correlation between genetics and clinical presentation. More studies comparing these characteristics are needed for better elucidation.



16912

RARE ASSOCIATION OF A GIANT NONCORONARY SINUS OF VALSALVA ANEURYSM AND A LEFT CORONARY SINUS ANEURYSM WITH RIGHT VENTRICULAR OUTFLOW TRACT COMPRESSION IN NOONAN SYNDROME.

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Introduction: Noonan syndrome (NS), an autosomal dominant genetic disorder, is the most common syndromic cause of congenital heart disease after trisomy 21. The most frequent cardiac abnormalities include pulmonary stenosis, hypertrophic cardiomyopathy, and septal defects. We report a rare presentation of this condition associated with a giant noncoronary sinus of Valsalva aneurysm and a left coronary sinus of Valsalva aneurysm, leading to right ventricular outflow tract (RVOT) compression and severe aortic regurgitation. Case Description: A female patient with a history of Noonan syndrome (NS) presented at 56 years of age with progressive dyspnea and palpitations. On physical examination, she was cachectic, with webbed neck, low-set ears, and ptosis. Cardiac rhythm was irregular, with a grade 4/6 systolic–diastolic murmur, most prominent at the accessory aortic area. Bibasilar crackles and lower limb edema were noted. Electrocardiography showed atrial fibrillation. Computed tomography revealed an expansile mediastinal mass. Transthoracic echocardiography demonstrated aneurysmal dilation of the aorta at the level of the sinuses of Valsalva/sinotubular junction measuring 62 mm, resulting in severe aortic regurgitation; a saccular aneurysm of the sinus of Valsalva measuring 3.0 × 3.1 cm; interatrial communication; and severe aortic, mitral, tricuspid, and pulmonary regurgitation. Cardiac magnetic resonance imaging demonstrated external compression of the right atrium and the mid and basal portions of the right ventricle, as well as the right ventricular outflow tract (RVOT), caused by the aneurysm. The patient did not undergo cardiac surgical intervention and, at 67 years of age, developed pulmonary sepsis associated with decompensated heart failure, ultimately resulting in in-hospital death. Conclusions: Sinus of Valsalva aneurysms are uncommon in the general population, with an estimated incidence of approximately 0.1%. The association between Noonan syndrome (NS) and sinus of Valsalva aneurysms is extremely rare, with only a few cases reported in the literature. These aneurysms may remain clinically silent until reaching sizes that lead to compression of adjacent structures, such as the right ventricular outflow tract (RVOT) and coronary ostia, as well as aneurysm rupture. This case report contributes to the recognition of this unusual association and its potential clinical implications.

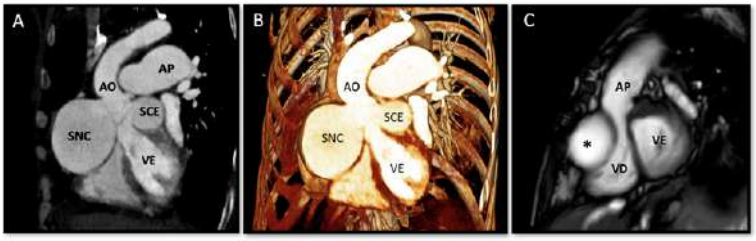


Figure 1. Computed tomography angiography of the thoracic aorta. (A) Multiplanar reconstruction and (B) three-dimensional reconstruction demonstrating a giant noncoronary sinus of Valsalva aneurysm associated with a left coronary sinus aneurysm. (C) Cardiac magnetic resonance imaging showing compression of the right ventricular outflow tract (RVOT) by the giant aneurysm. LV: left ventricle; NCS: noncoronary sinus; LCS: left coronary sinus; AAo: ascending aorta; PA: pulmonary artery; RV: right ventricle.

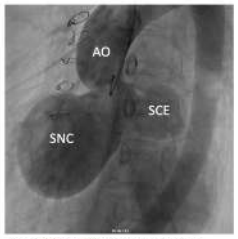


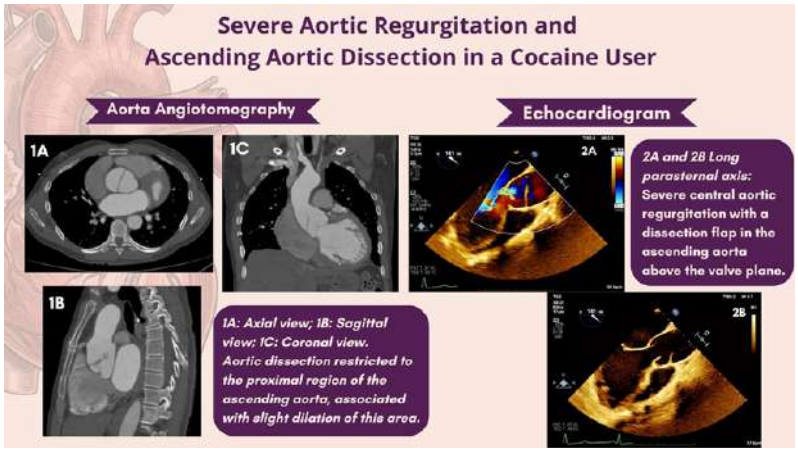
Figure 2. Arteriography in the left anterior oblique (LAO) view. NCS: noncoronary sinus; LCS: left coronary sinus; AAo: ascending aorta.

18331

SEVERE AORTIC REGURGITATION AND ASCENDING AORTIC DISSECTION IN A COCAINE USER: A CASE FOR THE DAVID PROCEDURE

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(1) INSTITUTO NACIONAL DE CARDIOLOGIA - RIO DE JANEIRO - RJ - BRASIL;



Introduction: Illicit substance abuse presents a significant public health challenge. Cocaine is associated with an increased risk of cardiovascular events. Aortic dissection, a condition associated with high morbidity and mortality, is among the severe cardiovascular complications linked to cocaine use. Case Description: A 50-year-old male, cocaine user with no known comorbidities, presented with progressive dyspnea and chest pain with exertion starting 4 months prior. Transthoracic echocardiography (Echo) revealed severe aortic regurgitation (AR) associated with aortic dissection, with a flap in the ascending aorta just above the aortic valve plane and tubular dilation measuring 46 mm, severe left ventricular systolic dysfunction, with an ejection fraction of 37% by Simpson, left ventricular end-diastolic diameter of 62 mm. Computed tomography (CT) angiography confirmed the diagnosis and he underwent valve-sparing aortic root surgery (David procedure). In the postoperative period, the patient developed bradypsychia, and a brain computed tomography scan revealed a large, old ischemic area. After clinical recovery, a more objective investigation revealed that the patient reported syncope with aphasia 12 months prior to hospitalization. The patient partially recovered, but maintained a condition of alexia, which had not been previously reported. The echocardiogram findings of volume overload with ventricular dilation associated with a stroke 12 months prior to hospitalization led to the conclusion that this was a natural survival of a chronic ascending aortic dissection. Conclusions: This case highlights the catastrophic consequences of cocaine use, including aortic dissection in young patient without significant aortic dilation and without traditional risk factors. The sympathomimetic effects of cocaine—notably hypertensive peaks and increased stress on the aortic wall—likely contributed to the development of the dissection. Left ventricular dysfunction, chamber dilation, and the previous stroke suggest a chronic process. David's procedure is a safe and effective approach, allowing for the preservation of the native valve and avoiding the use of oral anticoagulants in young patients.

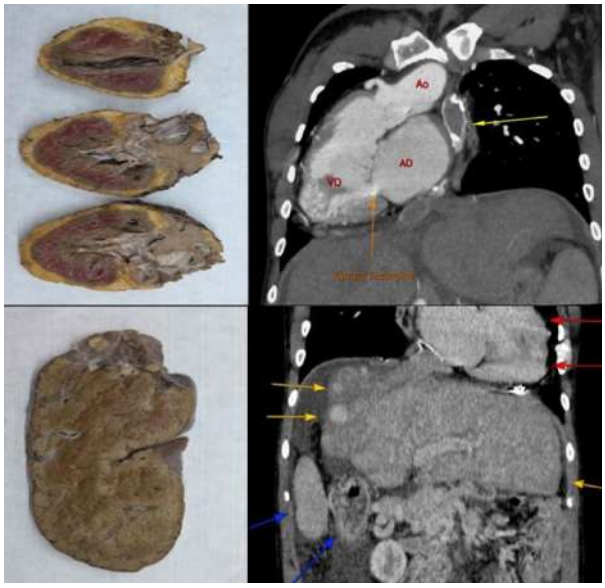
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SINGLE-VENTRICLE HEART DISEASE CORRECTED WITH THE FONTAN PROCEDURE PROGRESSING TO COMBINED HEART AND LIVER TRANSPLANTATION: A CASE REPORT

MARIANNA RAMALHO DE SOUSA1; ROBERTO MONTEIRO LEITAO1; NICOLLE CAVALCANTE GAGLIONONE1; GIULIA MUNIZ CUNHA1; ALINE LIMA DA SILVA1; LARA VEIGA SORIA CATULADEIRA1; BRUNO MIRANDA MARQUES1;

(1) REDE DOR - RIO DE JANEIRO - RJ - BRASIL;

Introduction: Univentricular circulation represents one of the rarest and most complex forms of congenital heart disease (CHD), characterized by the presence of a single functional ventricle. The Fontan procedure is crucial for establishing a circulation capable of improving patient survival by separating pulmonary and systemic blood flows; however, in the long term, it may lead to dysfunction in multiple organ systems Case Description: A 25-year-old female patient with a univentricular heart, mitral atresia, double outlet right ventricle with transposed great vessels, right-sided aortic arch, and situs inversus. She underwent bilateral Glenn surgery at 1 year of age and the Fontan procedure with valvuloplasty at 9 years of age. The patient subsequently developed Fontan-associated liver disease (FALD) and end-stage heart failure, requiring combined heart and liver transplantation (CHLT). Cardiac pathology revealed a single valve, a single ventricle, and an incomplete interventricular septum. The hepatic explant revealed two nodules (segments V and VII) of moderately differentiated hepatocellular carcinoma. Conclusions: The Fontan procedure is characterized by increased central venous pressure (CVP), low cardiac output, and lymphatic leakage with obstruction, leading to progressive cardiac and especially hepatic failure, substantially increasing morbidity and mortality in patients with this type of circulation. Hepatocellular carcinoma occurs in approximately 0.18–1.3% of cases of FALD, as observed in the present case. The preferred treatment is combined heart and liver transplantation due to the nearly universal presence of advanced fibrosis in these patients.



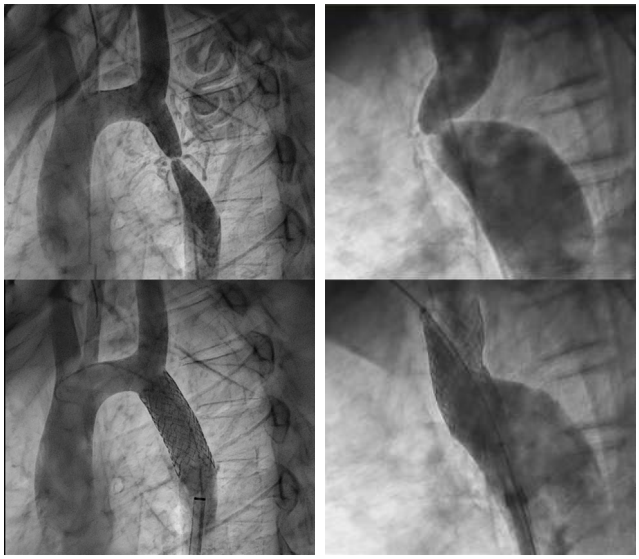
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SUBARACHNOID HEMORRHAGE AS THE INITIAL MANIFESTATION OF UNDIAGNOSED COARCTATION OF THE AORTA: A TWO-CASE REPORT

MARIANA ALMEIDA PEREIRA1; MAHER MAHMUD KARIM1; KIMBERLY MARIA BENTES VIANA1; MICHELE PELLISARI VIANA GHISI1; JESSICA DE CASSIA DOS SANTOS PELOSO1; INGRID APARECIDA MESQUITA LIMA1; HEIGLON ESTEVÃO BONELLA DENTI1; JUNIOR CHARLY FLORERO PEREIRA1; VICTOR MANUEL OPORTO LOPEZ1; GUSTAVO ROCHA FEITOSA SANTOS1; CAMILA GOMES SILVEIRA1; CÉLIA MARIA CAMELO SILVA1;

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Introduction: Coarctation of the aorta (CoA) is associated with systemic hypertension and an increased prevalence of intracranial aneurysms, resulting in a higher risk of subarachnoid hemorrhage (SAH). SAH as the initial presentation of CoA is uncommon and may reflect under-recognition of classic clinical signs, such as blood pressure discrepancy between upper and lower extremities and diminished femoral pulses. Case Description: Case 1: A 15-year-old previously healthy male presented with sudden-onset severe headache during a soccer match. He was diagnosed with SAH secondary to rupture of a left middle cerebral artery aneurysm and underwent endovascular embolization. Physical examination revealed marked blood pressure discrepancy between upper extremities (147/85 mmHg) and lower extremities (70/40 mmHg), along with diminished femoral pulses. Transthoracic echocardiography demonstrated CoA (peak gradient of 56 mmHg with diastolic runoff), bicuspid aortic valve with mild regurgitation, mild left ventricular hypertrophy, and preserved ejection fraction (73%). Computed tomography angiography confirmed severe CoA, with a 3 mm narrowing of the descending aorta distal to the left subclavian artery and extensive collateral circulation. The patient underwent percutaneous implantation of a covered stent (16×38 mm), resulting in complete resolution of the invasive pressure gradient (34 mmHg to 0 mmHg). Case 2: A 21-year-old male with poorly controlled hypertension had a history of two prior SAH episodes (2020 and 2022) due to ruptured intracranial aneurysms, both treated with surgical clipping. Abdominal ultrasound suggested CoA due to reduced aortic flow, confirmed by computed tomography angiography showing isthmic narrowing of 5 mm and prominent collateral circulation. He underwent percutaneous implantation of a covered stent (16×48 mm), with reduction of the invasive pressure gradient (27 mmHg to 5 mmHg). Conclusions: Subarachnoid Hemorrhage may represent a sentinel event of previously undiagnosed Coarctation of the aorta in young patients. Routine blood pressure measurement in all four extremities and assessment of femoral pulses are simple yet high-yield practices that may facilitate early diagnosis and prevent severe complications. Screening for CoA should be considered in young patients with SAH, particularly in the presence of hypertension or suggestive findings.



16565

TRANSCATHETER TRICUSPID VALVE-IN-VALVE IMPLANTATION IN COMPLEX CONGENITAL HEART DISEASE WITH MULTIPLE PRIOR SURGERIES: FOUR-YEAR CLINICAL AND ECHOCARDIOGRAPHIC FOLLOW-UP

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Introduction: Bioprosthetic tricuspid valve degeneration in patients with multiple prior cardiac surgeries represents a high-risk therapeutic challenge. Transcatheter valve-in-valve implantation in the tricuspid position has emerged as an option for patients with prohibitive reoperation risk, with published experience in this specific anatomical and clinical setting remaining limited. Case Description: A 30-year-old woman with complex congenital heart disease — pulmonary atresia with ventricular and atrial septal defects, Ebstein's anomaly, and patent ductus arteriosus — had undergone seven cardiac surgeries since 1995, including Waterston-Cooley anastomosis, right ventricular outflow tract augmentation with monocuspid patch, right pulmonary artery angioplasty, and two pulmonary valve replacements. In 2017, she underwent concomitant biological tricuspid (31 mm) and pulmonary (23 mm) valve replacement with additional outflow tract reconstruction. She subsequently developed NYHA class III dyspnea and lower-limb edema refractory to optimized medical therapy. Preoperative transesophageal echocardiography demonstrated structural dysfunction of the tricuspid bioprosthesis with a mixed lesion (mean gradient 10 mmHg; moderate-to-severe regurgitation), marked right atrial dilation, and impaired inferior vena cava collapsibility consistent with elevated systemic venous pressure. In 2022, she underwent transcatheter tricuspid valve-in-valve implantation using a 29 mm balloon-expandable prosthesis. At four-year follow-up she was fully asymptomatic, maintained on semiannual specialized cardiology review. Transthoracic echocardiography in 2026 demonstrated a normally functioning prosthesis with thin, mobile leaflets, absent regurgitation on Doppler, mean gradient of 5 mmHg, mild residual right chamber dilation with preserved right ventricular systolic function, and left ventricular ejection fraction of 62%. Pulmonary prosthesis function remained stable without significant regurgitation. Conclusions: Transcatheter tricuspid valve-in-valve implantation was feasible and effective in a patient with complex congenital anatomy and prohibitive surgical risk, yielding complete symptomatic resolution and durable hemodynamic benefit at four-year follow-up, meeting established criteria for procedural success.

Congenital and Pediatric Cardiology



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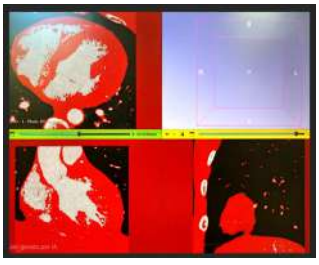
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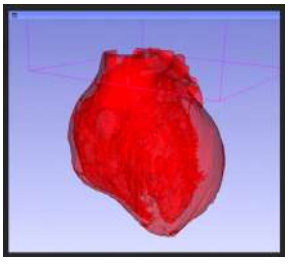
BEYOND THE HYPERTROPHIC PHENOTYPE: 3D CARDIAC PRINTING AS A TOOL FOR CLINICAL REASONING AND FAMILY EDUCATION IN FABRY DISEASE-ASSOCIATED HYPERTROPHIC CARDIOMYOPATHY.

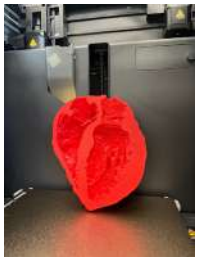
JOSE GREGORIO VALERO RODRIGUEZ1; ANA LUIZA BORGES DE AMORIM2; ANA BEATRIZ COSTA DO COUTO2; LUCAS MATIAS GALVÃO VITÓRIA2; NATHALIA SALIM SAUD2; GUILHERME CESAR FERNANDES DE OLIVEIRA DA COSTA2; ANNA CECÍLIA DE OLIVEIRA MACHADO2; WESLEY RODRIGO NOGUEIRA DIAS2; ANDRÉ CAMARGO MAZZOCCHI2; ISABELA LIRA VIEIRA2; CLAUDIO TINOCO MESQUITA2; EVANDRO TINOCO MESQUITA2;

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Introduction: Fabry Disease (FD) is a rare lysosomal storage disorder that requires a high index of clinical suspicion, as it is a major cardiovascular phenocopy. Early diagnosis is currently based on diagnostic multimodality, where Cardiovascular Magnetic Resonance (CMR) and strain Echocardiography (ECG) overcome the limitations of conventional assessment by detecting early lipid accumulation. Additionally, the use of personalized 3D models emerges as a strategic facilitator: beyond assisting multidisciplinary team decisions, these models function as engagement tools for the patient and their family, streamlining cascade screening and the initiation of specific therapy. Case Description: A 42-year-old male amateur athlete presented with progressive headache, muscle spasms, and reduced exercise tolerance with episodes of pre-syncope. Physical examination revealed hypertension (150/90 mmHg). A detailed family history was crucial, revealing relatives diagnosed with FD and cases of early sudden death in male family members. Laboratory tests showed severe renal dysfunction (Cr 11.08 mg/dL) and elevated NT-proBNP. The ECG showed a short PR interval and voltage criteria for Left Ventricular Hypertrophy (LVH). Global longitudinal strain Echocardiography demonstrated reduced deformation in the basal segments, differing from the apical sparing pattern seen in other amyloidoses. CMR confirmed severe LVH (23 mm; mass of 430 g) without Late Gadolinium Enhancement (LGE), suggesting a sphingolipid accumulation phase without extensive fibrosis. Etiological confirmation was achieved via genetic testing, identifying a pathogenic variant in the GLA gene in hemizygosity. Educational Intervention and 3D Printing: To optimize health literacy, a personalized 3D cardiac model was created using the Fused Deposition Modeling technique based on CT angiography. The physical model allowed for tactile visualization of concentric hypertrophy and cavity reduction, facilitating the family's understanding of the pathology. This tool was decisive for engagement in family screening, resulting in the identification of two additional affected family members. Conclusions: FD is a mandatory differential diagnosis in unexplained LVH associated with "red flags" (renal failure and short PR interval). 3D printing emerges as an innovative bridge between advanced cardiovascular imaging and patient-centered education, enhancing genetic counseling and early detection in hereditary cardiomyopathies.







21652

EUGLYCEMIC DIABETIC KETOACIDOSIS IN THE POSTOPERATIVE PERIOD OF CARDIAC SURGERY: THE CHALLENGES OF SGLT2 INHIBITORS

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Introduction: Sodium-glucose cotransporter 2 inhibitors (SGLT2i) are fundamental in the treatment of patients with heart failure, diabetes, and kidney disease, due to their cardiometabolic effects and reduction of cardiovascular events. Euglycemic diabetic ketoacidosis (DKA) is a rare (0.6%) and severe adverse event, attributed to the failure to discontinue the medication during the perioperative period. Glycosuria and reduced insulin levels, associated with increased counter-regulatory hormones, such as glucagon and cortisol, which are already elevated due to surgical stress, lead to severe metabolic imbalance. Diagnosis is challenging, since hyperglycemia is absent, and metabolic acidosis in the postoperative period of complex surgeries may be attributed to tissue hypoperfusion and vasoplegic shock. Case Description: A 74-year-old male patient with diabetes, in regular use of empagliflozin, presented with acute coronary syndrome and indication for coronary artery bypass grafting. In the immediate postoperative period, he developed severe hemodynamic instability, suggestive of vasoplegic shock secondary to cardiopulmonary bypass. Despite the treatment instituted, he persisted with metabolic acidosis: pH 7.24 and bicarbonate 9 mEq/L, associated with an elevated anion gap of 20 mEq/L, normal blood glucose levels, and no proportional lactatemia, with lactate of 2.3 mmol/L. After reviewing the patient's clinical history and identifying recent empagliflozin use, the hypothesis of euglycemic DKA was raised. Confirmation was obtained after urinary investigation, which showed ketonuria 3+ and glycosuria 3+. Intravenous treatment was promptly directed with rigorous hydration, insulin, hypertonic glucose, and potassium replacement. The patient's metabolic condition was stabilized, with rapid clinical improvement. Conclusions: The diagnosis of euglycemic DKA associated with failure to discontinue SGLT2i before cardiac surgery is challenging, since the presence of acidosis in this context may be attributed to other more likely causes, given the systemic inflammatory response. As SGLT2i becomes increasingly common in cardiology practice, it is essential to incorporate their assessment into the preoperative routine. Proper discontinuation and active postoperative suspicion are fundamental measures to prevent diagnostic delay and reduce morbidity and mortality. Discontinuation of SGLT2i at least 72 hours before elective procedures is essential to prevent this potentially lethal complication.

Experimental Cardiology (Basic Science)



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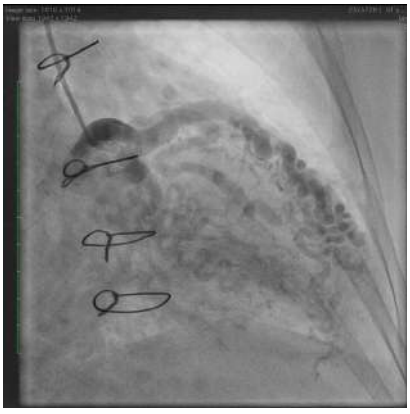
17695

A RARE ASSOCIATION BETWEEN YAMAGUCHI SYNDROME AND CORONARY ARTERY FISTULA DRAINING INTO THE LEFT VENTRICLE AS A CAUSE OF SYNCOPE: A CASE REPORT

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Introduction: Yamaguchi syndrome is a rare variant of hypertrophic cardiomyopathy linked to MYH7 and MYBPC3 mutations. It features left ventricular apical hypertrophy (≥15 mm) and the classic “ace of spades” sign. Patients are often asymptomatic but may have fatigue, dyspnea, angina, arrhythmias, or syncope. Complications include myocardial infarction, stroke, and sudden cardiac death. Coronary abnormalities, such as fistulas draining into Thebesian veins, can worsen oxygen supply–demand imbalance. When significant, they may intensify the coronary steal phenomenon, aggravating ischemia and requiring surgical or catheter-based treatment. Case Description: An 81-year-old woman, with a history of hypertension, previous coronary artery bypass grafting and pulmonary fibrosis, was admitted for evaluation after falling from standing height, associated with transient loss of consciousness while walking. The episode occurred abruptly, without prodromal symptoms, and the patient was unable to recall the event afterward. On cardiovascular examination, heart rhythm was regular, heart sounds were normal, and a grade 3/6 systolic murmur was heard at the aortic area. Transthoracic echocardiography showed normal left ventricular dimensions, preserved systolic function, grade I diastolic dysfunction, mild biatrial enlargement, mild aortic regurgitation, and mild mitral regurgitation. In addition, there was marked asymmetric hypertrophy of the apical left ventricular segments, a pattern consistent with apical hypertrophic cardiomyopathy, also known as Yamaguchi syndrome. Coronary angiography demonstrated the absence of significant obstructive coronary stenoses, but disclosed extensive coronary venous drainage into the left ventricle through the Thebesian venous plexus, resulting in a high-flow coronary pattern. Taken together, the findings supported the diagnosis of a rare association between apical hypertrophic cardiomyopathy and anomalous coronary fistulous drainage to the left ventricle, identified during the investigation of unexplained syncope. Conclusions: This case highlights the rare association between Yamaguchi Syndrome and anomalous coronary drainage through Thebesian veins. Even without obstructive coronary disease, severe ischemia can occur; thus, identifying such vascular anomalies is essential for accurate risk stratification and clinical management in patients with apical hypertrophy.

20162

DILATED CARDIOMYOPATHY ASSOCIATED WITH DMD GENE MUTATION PRESENTING AS AN ISOLATED CARDIAC PHENOTYPE IN ADULTHOOD: A RARE PRESENTATION

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(1) PRONTO SOCORRO CARDIOLOGICO DE PERNAMBUCO - PROCAPE - RECIFE - PE - BRASIL;

Introduction: Dilated cardiomyopathy associated with the dystrophin gene (DMD) is classically linked to Duchenne and Becker muscular dystrophies. Presentation as an isolated cardiac phenotype, also referred to as Duchenne type 3, particularly in adults and in the absence of skeletal muscle involvement, is rare and often underdiagnosed. Case Description: A 41-year-old male has been under follow-up since 2015 due to heart failure and palpitations. Initial echocardiography demonstrated dilated cardiomyopathy with diffuse left ventricular (LV) hypokinesia, progressing to a left ventricular ejection fraction (LVEF) of 26% in 2022. Investigation excluded ischemic (normal coronary arteries) and infectious etiologies. Serial evaluations showed progressive LV dilation (LV end-diastolic diameter up to 60 mm), systolic dysfunction with inferolateral akinesia and diffuse hypokinesia, as well as diastolic dysfunction and mild left atrial enlargement. Cardiac magnetic resonance imaging was not performed due to limited availability at the institution. A 24-hour Holter monitor in 2024 revealed a high burden of ventricular ectopy (~1300/24 h) and an episode of non-sustained ventricular tachycardia, with similar findings documented since 2015. Genetic testing (January 2024) identified a hemizygous c.5794C>T (p.Gln1932Ter) variant in the DMD gene, classified as likely pathogenic. Family history was positive for cardiomyopathy in siblings, suggesting X-linked inheritance, without reported skeletal muscle involvement. The patient is currently on enalapril, bisoprolol, digoxin, and furosemide. He showed improvement in LVEF to 45%, remains in New York Heart Association functional class I, and is not receiving SGLT2 inhibitor therapy. Conclusions: This case illustrates a rare presentation of DMD gene–associated cardiomyopathy with an isolated cardiac phenotype in an adult, without skeletal muscle involvement. This pattern may delay diagnosis when initially classified as idiopathic. The combination of non-ischemic echocardiographic findings and a positive family history was key to raising suspicion, later confirmed by genetic testing. This report highlights the importance of genetic investigation in apparently idiopathic dilated cardiomyopathies, with implications for family screening and clinical management.

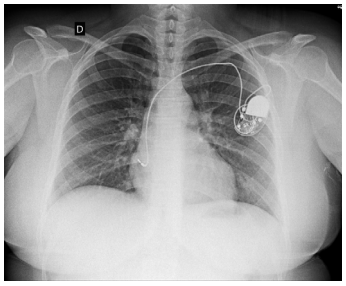
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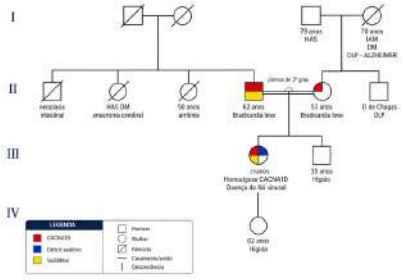
GENETICS CLARIFIES INTRAUTERINE BRADYCARDIA: HOMOZYGOUS CACNA1D + TTR V50M IN SEVERE CONDUCTION SYSTEM DISEASE

JOÃO ANCELMO DOS REIS NETO1; FLÁVIA RENNÓ TROIANI2; GABRIELA FERNANDA ESQUERDO SAMPAIO3; CAROLINE CORDEIRO BARROSO BRAGA4; LARISSA VENTURA RIBEIRO BRUSCKY3; PLINIO JOSE WHITAKER WOLF3; EDUARDO MIKIO SASSAKI3; SARA REGINA ALCADE DOMINGOS3; EDILEIDE DE BARROS CORREIA3;

(1) BENEFICENCIA PORTUGUESA - SAO PAULO - SP - BRASIL; (2) HOSPITAL SÃO LUIZ MORUMBI - SÃO PAULO - SP - BRASIL; (3) INSTITUTO DANTE PAZZANESE DE CARDIOLOGIA - SAO PAULO - SP - BRASIL; (4) PONTIFÍCIA UNIVERSIDADE CATÓLICA DE CAMPINAS - CAMPINAS - SP - BRASIL;

Introduction: Hereditary transthyretin amyloidosis (ATTRv), particularly associated with the V50M variant of the TTR gene, is characterized by variable penetrance and a broad phenotypic spectrum, including neuropathic and cardiac involvement. Although cardiac manifestations typically occur later in life, early electrical abnormalities may precede overt structural disease. In parallel, the CACNA1D gene encodes the Cav1.3 L-type calcium channel, which plays a critical role in sinoatrial node automaticity and atrioventricular conduction. Pathogenic variants in CACNA1D have been associated with severe, early-onset conduction system disorders, including fetal and childhood bradyarrhythmias. Increasing evidence suggests that the interaction between variants in distinct genes may underlie oligogenic inheritance models, contributing to atypical or more severe phenotypes. In this context, the coexistence of TTR and CACNA1D variants may represent a combined genetic substrate influencing early conduction disease and long-term cardiovascular risk. Case Description: A 29-year-old obese female presented with significant bradycardia since intrauterine life, prompting consideration of pregnancy termination. She required atrial pacemaker implantation at 3 years of age. Mild hearing impairment was also present, expanding the extracardiac phenotype. Born to consanguineous parents (third-degree cousins), she was referred for cardiomyopathy evaluation after identification of the pathogenic V50M variant in the TTR gene (2023). A homozygous variant of uncertain significance (VUS) in CACNA1D was also identified. Both parents were heterozygous for CACNA1D, with sinus bradycardia; the father also carried the V50M variant without clinical amyloidosis. The combination of early conduction disease and hearing impairment suggests an expanded phenotype related to Cav1.3 dysfunction, supporting the pathogenic role of the homozygous CACNA1D variant. Conclusions: This case supports a potential oligogenic model involving CACNA1D and TTR, in which the homozygous CACNA1D variant may explain the severe and very early-onset conduction system dysfunction, present since fetal life, while the ATTR V50M variant represents an additional risk for future infiltrative cardiomyopathy. These findings highlight the importance of comprehensive genetic evaluation in patients with unexplained early conduction disease, not only for etiological clarification but also for prognostic stratification and familial risk assessment.





16763

HOT PHASES CARDIOMYOPATHY DUE TO DESMOPLAKIN PHATOGENIC GENE MUTATION

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(1) HOSPITAL FELICIO ROCHO - BELO HORIZONTE - MG - BRASIL; (2) HOSPITAL FELÍCIO ROCHO - BELO HORIZONTE - MG - BRASIL;

Introduction: Introdution: Hot phases are a challenging clinical presentation in some genetic cardiomyopathies, among them a Desmoplakin (DSP) cardiomyopathy . Hot phase is marked by acute chest pain and elevated cardiac troponins. Case Description: Case report: A 18 - year- old fit and health male presented with chest pain and dyspneia. Physical examination was normal. ECG: sinus rhythm, small Q waves in leads II, III and aVF. Laboratory markers were normal, except troponin and NT proBNP. Echocardiogram:Left ventricular ejection fraction (LVEF) of 66% and CMR showed LVEF of 44%, myocardial edema assessed using T2-weighted Imaging and extensive subepicardial fibrosis, detected via late gadolinium enhancement (LGE). Coronary angiography: normal coronary arteries. Heart failure (HF) therapy was started. Ten months later: No cardiac symptoms; troponin, NT proBNP and LVEF of 62%. CMR:LVEF of 46%, no edema; presence of subepicardial fibrosis. 24 hour Holter monitor: Sinus rhythm and 1588 ventricular extrasistoles. Sixteen months later he presented with severe chest pain e dyspneia at rest. A new CMR showed LVEF of 26%, RVEF of 29%, no edema, but extensive subepicardial LGE. Endomyocardial Biopsy: No signs of inflammatory cardiomyopathy or acute myocarditis, no giant cell myocarditis, no sarcoidosis. No infiltration with lymphocytes (CD3, LFA-1, CD45R0), cytotoxic cells (perforin) and macrophages (Mac-1), no enhanced endothelial expression of cell adhesion molecules (HLADR). No signs of storage disease. Negative PCR results for enteroviruses (Cox), herpesvirus type 6 A/B, cytomegalievirus, Epstein Barr virus, and parvoviruses. Normal PET Scan. Genetic test demonstrated a pathogenic variant in the DSP gene. An ICD was implanted. HF treatment optimized. LVEF improved to 49%. Follow up 27 months later:He presented, again, with severe chest pain e dyspneia at rest. He was hospitalized and the CMR showed a LVEF of 42%, presence of edema and extensive subepicardial LGE. Troponin:12970 ng/mL and NT proBNP: 16640 pg/mL. Despite the treatment of DSP- myocarditis is still unknown, we treated him with 1,000 mg intravenous methylprednisolone for 3 days with a taper to oral steroids over a 2- to 3-week period. The patient was discharged home and 14 days later, a new Echocardiogram showed a LVEF of 50%. He improved symptoms, troponin and NT proBNP were normal. Conclusions: Conclusion: This case suggests a possible involvement of DSP pathogenic mutation in a hot phases cardiomyopathy.

Heart Failure / Transplantation / Ventricular Assist Devices / Cardiomyopathies



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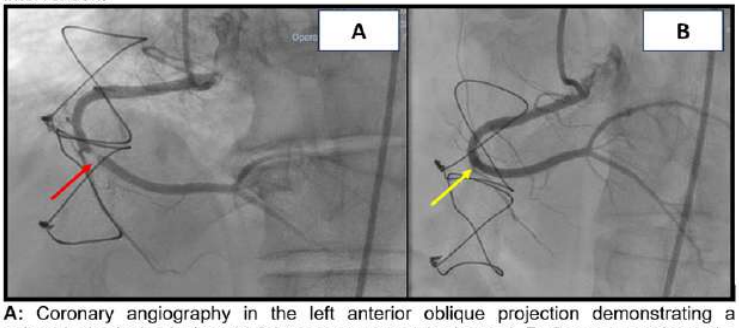
ANGINA AS A MARKER OF LATE CARDIAC REINNERVATION AFTER TRANSPLANTATION: A CASE REPORT WITH 24-YEAR SURVIVAL

PLÍNIO JOSÉ WHITAKER WOLF1; EDILEIDE DE BARROS CORREIA1; MARCOS OLIVEIRA VASCONCELLOS1; ANA CRISTINA MURTA1; YONA AFONSO FRANCISCO1; LARISSA VENTURA BRUSCKY1; SARA REGINA ALCALDE DOMINGOS1; EDUARDO MIKIO SASSAKI1; GABRIELA ESQUERDO1; THAIS GRECCA ANDRADE1; FERNANDA DE BRITO FORTUNA1; VICTOR BEMFICA1;

(1) INSTITUTO DANTE PAZZANESE DE CARDIOLOGIA - SAO PAULO - SP - BRASIL;

Introduction: Heart transplantation (HTx) is the definitive, gold-standard therapy for patients with advanced, refractory heart failure, significantly improving survival, with a mean post-transplant survival of approximately 7–12 years. However, one of the main factors limiting long-term survival is cardiac allograft vasculopathy (CAV), which leads to ischemia, fibrosis, and ventricular dysfunction, often presenting with minimal or atypical symptoms due to post-transplant cardiac denervation. We describe a case of a transplant recipient with survival beyond the international average who developed symptomatic CAV. Case Description: A 68-year-old man, with a history of hypothyroidism prior to HTx, underwent bicaval orthotopic heart transplantation 24 years ago (donor aged 19 years) for advanced valvular heart disease, without perioperative complications. He had an uneventful post-transplant course, developing dyslipidemia but no major complications, including cellular or antibody-mediated rejection, malignancy, or cytomegalovirus infection. Over the past 10 years, he has been treated with simvastatin, levothyroxine, and aspirin, along with immunosuppressive therapy consisting of cyclosporine and mycophenolate sodium. During follow-up, the patient remained asymptomatic, with echocardiography demonstrating preserved biventricular function, and coronary CT angiography at 17 years post-transplant showing no obstructive coronary lesions. At 24 years post-HTx, the patient developed progressive, typical angina (CCS class III), associated with exertional dyspnea. Echocardiography showed a left ventricular ejection fraction of 67%, global longitudinal strain of 23%, normal chamber dimensions and contractility, and no valvular disease or pulmonary hypertension. Coronary angiography revealed a subocclusive lesion in the mid right coronary artery, which was successfully treated with percutaneous coronary intervention. The patient subsequently remained asymptomatic. Conclusions: Post-transplant survival is primarily limited by CAV. This case highlights that optimal control of comorbidities, appropriate immunosuppression, and favorable donor/graft characteristics may delay the onset of CAV, contributing to survival beyond the international average. Moreover, the presence of typical angina suggests cardiac reinnervation (particularly sympathetic), which may facilitate the clinical recognition of CAV and could be associated with the favorable prognosis observed in this patient.

Figure 1. Coronary angiography before (A) and after (B) percutaneous coronary intervention.



A: Coronary angiography in the left anterior oblique projection demonstrating a subocclusive lesion in the mid right coronary artery (red arrow). **B:** Coronary angiography in the left anterior oblique projection following percutaneous coronary intervention of the mid right coronary artery lesion (yellow arrow).

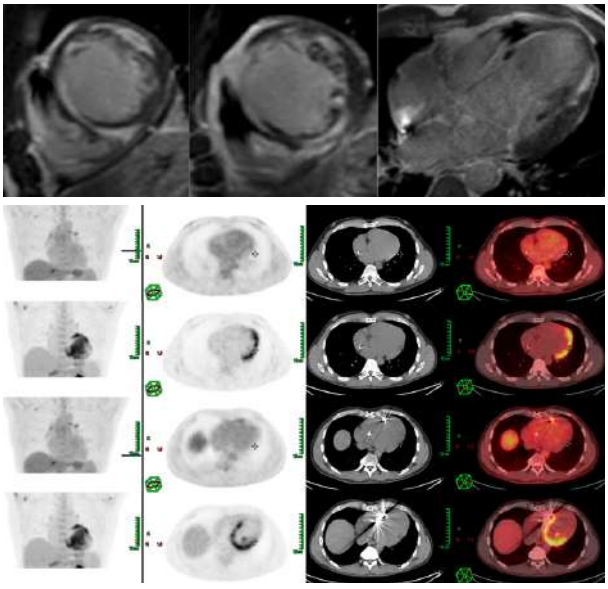
13794

ELECTRICAL STORM ASSOCIATED WITH REACTIVATION OF CARDIAC SARCOIDOSIS FOLLOWING OXANDROLONE USE

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Introduction: Sarcoidosis is a multisystem granulomatous disease of unknown etiology, characterized by non-caseating inflammation. Clinically manifest cardiac involvement occurs in 5% of cases, although advanced imaging and autopsy studies suggest an underdiagnosed prevalence of up to 25–30%. Cardiac Sarcoidosis (CS) is an important cause of atrioventricular blocks, cardiomyopathy, and malignant ventricular arrhythmias, which frequently occur due to reentry involving fibrotic scars interspersed with active granulomatous inflammatory foci. We report a case of electrical storm (ES) in a patient with CS in metabolic remission, presenting isolated inflammatory reactivation in the context of recent oxandrolone use. Case Description: A 46-year-old male patient started follow-up in 2022 due to dyspnea and complete atrioventricular block (CAVB), undergoing permanent pacemaker implantation. In 2023, he presented with sustained ventricular tachycardia (VT) and reduced ejection fraction (LVEF 37%). Cardiac Magnetic Resonance revealed extensive mid-wall and epicardial late gadolinium enhancement with a non-ischemic fibrosis pattern (Figure 1). Ablation of the arrhythmogenic substrate and upgrade to an Implantable Cardioverter-Defibrillator (ICD) were performed. Screening for secondary etiologies and exome sequencing were negative. Given the findings, an 18F-FDG PET/CT was performed in April 2024, confirming systemic sarcoidosis with cardiac uptake (SUVmax 11.4). Following immunosuppression (prednisone and methotrexate), a new PET/CT in November 2024 demonstrated complete remission. In January 2026, the patient was admitted with an ES (>20 episodes of VT/VF) after oxandrolone use in the past 3 months and alcohol consumption. Management included deep sedation, amiodarone, lidocaine, magnesium sulfate, and left stellate ganglion block. A new PET/CT in January 2026 confirmed isolated reactivation of CS (SUVmax 6.6 in the LV), without systemic foci. Pulse therapy was initiated, followed by an Adalimumab and Methotrexate regimen. He was discharged on optimized immunosuppression and referred for heart transplant evaluation due to the severity and refractoriness of the disease. Conclusions: Electrical storm can be the sole manifestation of isolated cardiac sarcoidosis reactivation, despite systemic remission. This case highlights the risk of exogenous triggers, such as oxandrolone, in vulnerable myocardium. Following clinical stabilization, PET/CT is essential for patient follow-up and to guide immunosuppressive therapy.



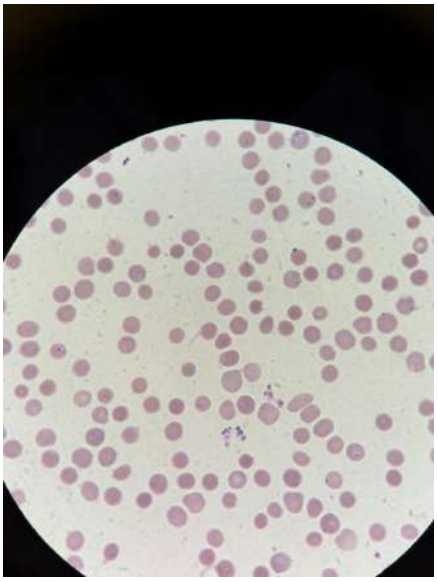
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EVANS SYNDROME FOLLOWING INOTERSEN THERAPY IN HEREDITARY ATTR AMYLOIDOSIS WITH CARDIAC INVOLVEMENT: A RARE HEMATOLOGIC COMPLICATION

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Introduction: Hereditary transthyretin amyloidosis (ATTRv) is an autosomal dominant condition marked by systemic amyloid deposition, mainly affecting peripheral nerves and the myocardium. Inotersen, an antisense oligonucleotide that suppresses hepatic transthyretin synthesis, is an established treatment option, although it may lead to hematologic toxicity. Autoimmune hemolytic anemia related to this therapy is exceptionally uncommon and remains poorly described in the literature. Case Description: A 70-year-old man with a history of hypertension and diabetes presented with progressive distal paresthesia, proximal muscle weakness, and fatigue over two years, initially attributed to polyneuropathy. His condition evolved with weight loss and gait impairment, leading to a diagnosis of stage II familial amyloid polyneuropathy. Tafamidis 20 mg/day was initiated, and inotersen was added four years later. Cardiac involvement was confirmed by bone scintigraphy and cardiac magnetic resonance imaging, both consistent with amyloid cardiomyopathy. Genetic testing identified a Val50Met mutation in the transthyretin gene, confirming ATTRv. During follow-up, the patient developed clinical worsening and required hospitalization due to severe anemia (hemoglobin 6 g/dL), thrombocytopenia, and elevated NT-proBNP levels (2,068 pg/mL). Further investigation revealed autoimmune hemolytic anemia with associated thrombocytopenia, including microspherocytes on peripheral smear, consistent with Evans syndrome and strongly suggestive of a drug-induced mechanism. Inotersen was discontinued, and treatment was subsequently adjusted. Conclusions: While thrombocytopenia and systemic reactions are recognized adverse effects of inotersen, this case highlights a rare occurrence of Evans syndrome potentially related to its use. It underscores the need for close hematologic surveillance and a high index of suspicion when unexplained cytopenias arise during antisense therapy, enabling timely diagnosis and management of this unusual complication.



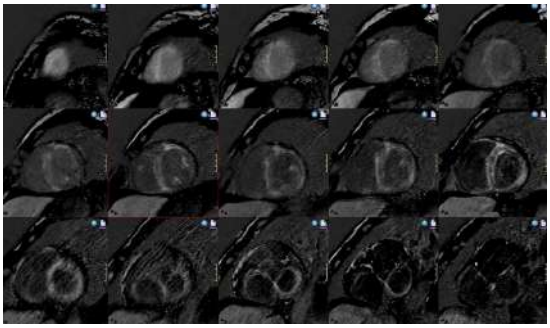
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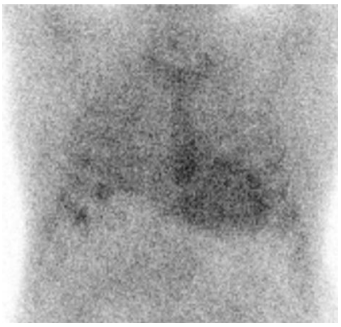
NON-INVASIVE DIAGNOSIS OF HEREDITARY TRANSTHYRETIN CARDIAC AMYLOIDOSIS: APPLICATION OF THE DIAGNOSTIC ALGORITHM IN A PATIENT WITH VAL122ILE VARIANT

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Introduction: Hereditary transthyretin cardiac amyloidosis (ATTRv-CM) is a progressive disease caused by TTR gene variants that promote transthyretin protein misfolding, resulting in myocardial amyloid deposition. The Val122Ile variant is the most prevalent in the United States, present in 3.4% of African Americans, manifesting as cardiomyopathy after age 60. The modern diagnostic approach allows non-invasive diagnosis through monoclonal protein screening, technetium-99m pyrophosphate scintigraphy, and TTR gene sequencing. This report describes a case of ATTRv-CM with the Val122Ile variant, demonstrating the practical application of the contemporary non-invasive diagnostic algorithm. Case Description: A 71-year-old male presented with progressive dyspnea evolving to functional class IV. Electrocardiogram showed atrial fibrillation with diffusely low QRS voltage. Echocardiogram revealed biventricular dysfunction (LVEF 34.6%), septal thickening with hyperrefringence, and valvular disease. The discordance between low voltage and myocardial thickening raised suspicion of infiltrative disease. Cardiac MRI showed diffuse transmural late enhancement suggestive of storage disease (Figure 1). Following the diagnostic algorithm, AL amyloidosis was excluded through normal serum and urine immunofixation and light chain assays. Technetium-99m pyrophosphate scintigraphy demonstrated grade 2 uptake, confirming ATTR-CM (Figure 2). Genetic testing identified the pathogenic Val122Ile mutation, establishing hereditary transthyretin cardiac amyloidosis diagnosis. Conclusions: This case demonstrates the systematic application of the non-invasive diagnostic algorithm for ATTRv-CM, achieving diagnosis without endomyocardial biopsy. Identification of the Val122Ile variant has important implications for family screening and genetic counseling of asymptomatic carriers at risk.The voltage-mass discordance remains a key clinical clue for infiltrative cardiomyopathy suspicion. Early recognition is essential, as TTR stabilizer therapy reduces mortality and hospitalizations.





21854

PHENOTYPIC PROGRESSION FROM HYPERTROPHIC CARDIOMYOPATHY TO DILATED AND ARRHYTHMOGENIC PHENOTYPE IN A PATIENT CARRYING A TPM1 VARIANT

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Introduction: Hypertrophic cardiomyopathy (HCM) is a primary myocardial disease characterized by left ventricular hypertrophy resulting from pathogenic variants in genes encoding sarcomeric proteins. Progression to dilated cardiomyopathy (DCM) is observed in only 3–5% of cases and is considered a marker of worse prognosis. Variants in the TPM1 gene, which encodes alpha-tropomyosin, account for 1–5% of HCM cases and present heterogeneous phenotypes, including hypertrophic, dilated, or arrhythmogenic forms. Case Description: A 66-year-old hypertensive woman presented with a 20-year history of progressive dyspnea associated with atypical chest pain, dizziness, and syncope. There was no family history of cardiomyopathy or sudden cardiac death. Initial investigation with transthoracic echocardiography (TTE) demonstrated interventricular septum (IVS) thickness of 14 mm, a maximum left ventricular outflow tract gradient of 51 mmHg, and preserved left ventricular ejection fraction (LVEF). Subsequent cardiac magnetic resonance (CMR) revealed IVS thickness of 26 mm and multifocal diffuse midwall late gadolinium enhancement with a non-ischemic pattern, without ventricular dysfunction despite 40% myocardial fibrosis. Coronary angiography showed no obstructive lesions. Twenty-four-hour Holter monitoring demonstrated first-degree atrioventricular block (AVB), with episodes of complete AVB and atrial fibrillation, leading to pacemaker and implantable cardioverter-defibrillator (ICD) implantation and anticoagulation. Genetic testing identified a pathogenic heterozygous TPM1 variant. After 9 years of follow-up, the patient developed progressive ventricular dysfunction (LVEF: 24%), requiring upgrade to CRT-D. Despite optimized heart failure medical therapy, the patient progressed to NYHA functional class III. Conclusions: This case illustrates the progression of hypertrophic cardiomyopathy to a dilated phenotype in a patient carrying the p.Arg21Leu TPM1 variant. Extensive myocardial fibrosis identified by cardiac magnetic resonance, involving 40% of the myocardium, had already suggested a higher risk of adverse progression associated with this genetic variant. This report reinforces the phenotypic heterogeneity of variants related to hypertrophic cardiomyopathy and highlights the importance of early surveillance for markers of poor prognosis in patients carrying pathogenic TPM1 variants.

15155

PHENOTYPIC TRANSITION FROM DANON DISEASE–RELATED HYPERTROPHIC CARDIOMYOPATHY TO BIVENTRICULAR ARRHYTHMOGENIC CARDIOMYOPATHY REQUIRING HEART TRANSPLANTATION

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(1) INCOR - INSTITUTO DO CORACAO DA UNIVERSIDADE DE SAO PAULO - SAO PAULO - SP - BRASIL; (2) HOSPITAL SIRIO-LIBANES - SÃO PAULO - SP - BRASIL;

Introduction: Danon disease is an X-linked lysosomal storage disorder caused by LAMP2 variants, classically associated with hypertrophic cardiomyopathy. In women, the phenotype is variable and often atypical. Arrhythmogenic cardiomyopathy (ACM) is characterized by fibrofatty myocardial replacement and ventricular arrhythmias. We report a case of genetically confirmed Danon disease with evolution to a phenotype consistent with ACM across clinical, imaging, and histopathological findings. Case Description: A 43-year-old woman with a hypertrophic phenotype at age 30 (short PR interval and preserved left ventricular function) showed progressive electrical and structural remodeling over 10 years, including low QRS voltages, ventricular arrhythmias, and severe biventricular dysfunction. Cardiac magnetic resonance demonstrated extensive ring-like mid-myocardial and subepicardial late gadolinium enhancement, fulfilling criteria for biventricular ACM. Genetic testing identified a pathogenic LAMP2 variant, confirming Danon disease. The patient progressed to advanced heart failure requiring inotropes, intra-aortic balloon pump support, and heart transplantation. Pathological examination of the explanted heart demonstrated extensive fibrofatty myocardial replacement, along with multiple foci of enlarged, vacuolated cardiomyocytes showing strong periodic acid–Schiff (PAS) positivity. Conclusions: This case demonstrates a rare phenotypic transition from hypertrophic cardiomyopathy to an arrhythmogenic phenotype in Danon disease. Multimodality evaluation and histopathology supported a genuine arrhythmogenic remodeling process, highlighting the importance of serial phenotypic reassessment in genetic cardiomyopathies

Figure 1: Electrocardiogram showing sinus rhythm, a short PR interval and repolarization abnormalities.

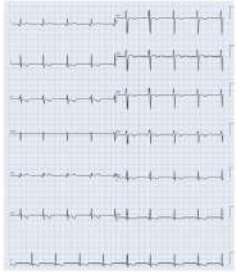


Figure 2: Echocardiogram showing mild ventricular thickening

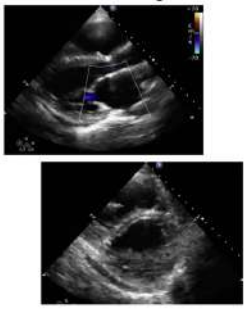


Figure 3: Pathological microscopy showing multiple foci of enlarged, vacuolated cardiomyocytes strongly stained by periodic acid-Schiff (PAS).

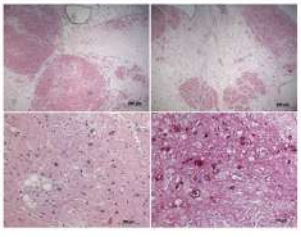
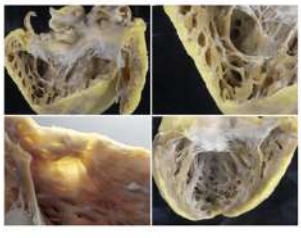


Figure 4: Pathological macroscopy showing multiple foci of fibrofatty myocardial replacement of subepicardial region of both ventricles



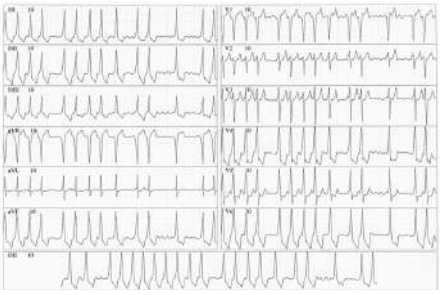
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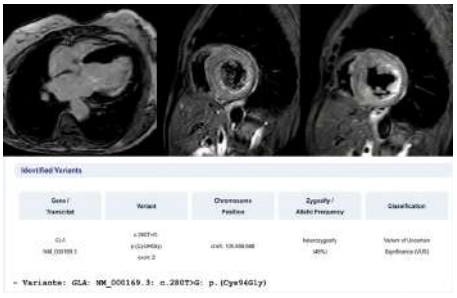
PRE-EXCITED ATRIAL FIBRILLATION AND LEFT VENTRICULAR HYPERTROPHY: FABRY DISEASE

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Introduction: Fabry Disease (FD) is an X-linked inborn error of metabolism causing lysosomal glycosphingolipid accumulation. Myocardial involvement often mimics Hypertrophic Cardiomyopathy (HCM). Integrating clinical reasoning and multimodal imaging is crucial for etiological distinction and the complex challenge of reclassifying Variants of Uncertain Significance (VUS) in the GLA gene. Case Description: A 62-year-old woman with a history of ischemic stroke at age 41 (mild facial sequela) and familial sudden death (brother at 25) reported dyspnea and palpitations since 2024. In July 2025, during external follow-up, she presented pre-excited atrial fibrillation with rapid ventricular response. Coronary angiography ruled out severe obstructive disease (40% LAD lesion). After stabilization, she was referred for accessory pathway ablation. Echocardiography showed biatrial enlargement and severe asymmetric left ventricular hypertrophy (LVH) (septum 19 mm). The clinical triad of LVH, accessory pathway, and premature stroke raised FD suspicion. Cardiovascular magnetic resonance (CMR) confirmed left chamber dilation, systolic dysfunction (LVEF 44%), asymmetric inferoseptal thickening (17 mm), and reduced native T1 mapping (846 ms). Subendocardial late gadolinium enhancement (LGE) and myocardial edema (T2 hyperintensity) in the mid-inferolateral and mid-anterolateral segments suggested inflammation and microvascular dysfunction—findings highly suggestive of FD. Genetic testing detected the heterozygous missense variant c.280T>G; p.(Cys94Gly) in GLA. Despite absence in gnomAD/literature, in silico deleterious predictors, and other pathogenic variants at the Cys94 residue, it was formally classified as VUS (ACMG criteria). Given the compatible phenotype, alpha-galactosidase A and Lyso-Gb3 levels were requested aiming to reclassify this “hot” VUS to pathogenic based on new robust evidence, confirming the definitive diagnosis. In Feb 2026, she underwent successful pathway ablation. Conclusions: Coexistence of LVH, anomalous atrioventricular conduction, and premature stroke mandates storage cardiomyopathy suspicion. CMR tissue mapping (native T1) provides a robust substrate to correlate phenotype to genotype, supporting future pathogenic reclassification of this VUS. This pheno-genotypic correlation warrants FD biochemical confirmation, enabling specific therapy, arrhythmia management, and cascade screening.





17132

REVERSIBLE LEFT VENTRICULAR DYSFUNCTION IN TYPE II MIXED CRYOGLOBULINEMIA: EVIDENCE OF INFLAMMATORY CARDIAC INVOLVEMENT

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Introduction: Cryoglobulinemia is a systemic immune complex–mediated vasculitis with heterogeneous organ involvement. Type II mixed cryoglobulinemia is frequently linked to previous hepatitis C virus infection or monoclonal B-cell expansion, promoting complement activation and vascular injury. Although extra-cardiac manifestations are well recognized, cardiac involvement is rare and may arise from inflammatory myocardial injury, coronary microvascular dysfunction, or systemic inflammatory burden. Case Description: An 86-year-old man with hypertension, former smoking history, arrhythmia, and previously treated hepatitis C presented with dyspnea, peripheral edema, and decompensated heart failure accompanied by renal impairment. Laboratory tests revealed significantly elevated NT-proBNP (9,595 pg/mL) and mild elevation of high-sensitivity troponin. Cardiac magnetic resonance imaging showed dilation of left-sided chambers and reduced left ventricular ejection fraction (LVEF) of 39%, without late gadolinium enhancement. During hospitalization, he developed acute kidney injury with proteinuria and hematuria; renal biopsy demonstrated immune complex–mediated membranoproliferative glomerulonephritis. Further workup identified IgM kappa monoclonal gammopathy, reduced complement levels, and monoclonal B-cell lymphocytosis without evidence of malignancy on PET-CT. These findings established the diagnosis of type II mixed cryoglobulinemia related to prior hepatitis C infection and B-cell clonal expansion. Treatment with corticosteroids and rituximab led to clinical improvement and recovery of LVEF to 56%. Conclusions: This report describes an uncommon presentation of type II mixed cryoglobulinemia with heart failure due to left ventricular systolic dysfunction in the absence of obstructive coronary disease or infiltrative cardiomyopathy. The absence of myocardial fibrosis and subsequent improvement in ventricular function suggest a predominantly inflammatory and reversible process, likely mediated by coronary microvascular involvement and immune complex deposition. Early recognition of this mechanism is crucial, particularly in patients with systemic vasculitis features, as targeted immunosuppressive therapy may significantly improve outcomes.

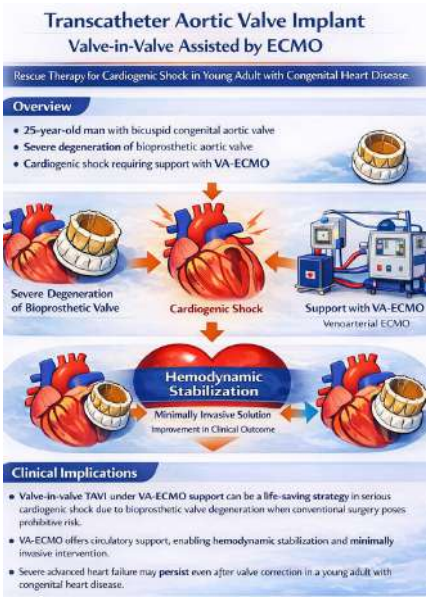
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VALVE-IN-VALVE TAVI UNDER VA-ECMO SUPPORT AS A BRIDGE-TO-DECISION IN REFRACTORY CARDIOGENIC SHOCK IN A YOUNG ADULT WITH CONGENITAL HEART DISEASE.

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(1) INSTITUTO NACIONAL DE CARDIOLOGIA - RIO DE JANEIRO - RJ - BRASIL; (2) HOSPITAL UNIVERSITARIO PEDRO ERNESTO - RIO DE JANEIRO - RJ - BRASIL;

Introduction: Early structural degeneration of bioprosthetic valves in adults with congenital heart disease is a major cause of clinical deterioration, potentially leading to advanced heart failure and cardiogenic shock. In this setting, redo surgery often carries prohibitive risk, particularly in the presence of severe ventricular dysfunction and hemodynamic instability. Valve-in-valve TAVI has emerged as a less invasive therapeutic alternative, while venoarterial extracorporeal membrane oxygenation (VA-ECMO) may provide hemodynamic stabilization and enable structural interventions in critically ill patients. Case Description: A 25-year-old male with bicuspid aortic valve and congenital stenosis, previously treated with three percutaneous valvuloplasties followed by surgical aortic valve replacement with a bioprosthesis. He developed complete atrioventricular block requiring permanent pacing, later upgraded to cardiac resynchronization therapy with defibrillator due to progression to advanced heart failure. Left ventricular ejection fraction was 12%, with severe functional tricuspid regurgitation and moderate mitral regurgitation. Echocardiography revealed severe structural degeneration of the bioprosthesis with critical stenosis (mean gradient 46 mmHg; peak velocity 4.3 m/s) and pulmonary hypertension (PASP 70 mmHg). Cardiopulmonary exercise testing showed marked functional impairment (peak VO□ 9 mL/kg/min; VE/VCO□ slope 48.3). The patient progressed to refractory cardiogenic shock and cardiorenal syndrome, requiring inotropic support, renal replacement therapy, and VA-ECMO. Under circulatory support, transfemoral valve-in-valve TAVI (Navitor Vision 27 mm) was successfully performed, with optimal positioning and immediate reduction of the transvalvular gradient to 10 mmHg. ECMO was weaned after 48 hours. Follow-up demonstrated a well-functioning prosthesis and improvement in LVEF to 20%. Conclusions: Valve-in-valve TAVI under VA-ECMO support represents an effective rescue strategy in hemodynamic collapse due to bioprosthetic degeneration, promoting immediate afterload reduction and clinical stabilization. In selected young patients with congenital heart disease and prohibitive surgical risk, it may serve as a bridge-to-decision, allowing reassessment for definitive therapies such as heart transplantation or durable mechanical circulatory support.



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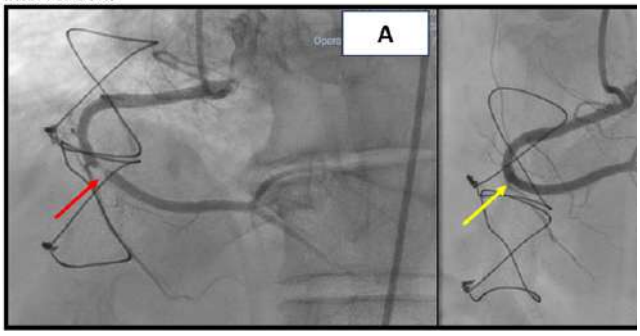
ANGINA AS A MARKER OF LATE CARDIAC REINNERVATION AFTER TRANSPLANTATION: A CASE REPORT WITH 24-YEAR SURVIVAL

PLÍNIO JOSÉ WHITAKER WOLF1; EDILEIDE DE BARROS CORREIA1; MARCOS OLIVEIRA VASCONCELLOS1; ANA CRISTINA MURTA1; YONA AFONSO FRANCISCO1; LARISSA VENTURA BRUSCKY1; SARA REGINA ALCALDE DOMINGOS1; EDUARDO MIKIO SASSAKI1; GABRIELA ESQUERDO1; THAIS GRECCA ANDRADE1; FERNANDA DE BRITO FORTUNA1; VICTOR BEMFICA1;

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Introdução: Heart transplantation (HTx) is the definitive, gold-standard therapy for patients with advanced, refractory heart failure, significantly improving survival, with a mean post-transplant survival of approximately 7–12 years. However, one of the main factors limiting long-term survival is cardiac allograft vasculopathy (CAV), which leads to ischemia, fibrosis, and ventricular dysfunction, often presenting with minimal or atypical symptoms due to post-transplant cardiac denervation. We describe a case of a transplant recipient with survival beyond the international average who developed symptomatic CAV. Descrição do Caso: A 68-year-old man, with a history of hypothyroidism prior to HTx, underwent bicaval orthotopic heart transplantation 24 years ago (donor aged 19 years) for advanced valvular heart disease, without perioperative complications. He had an uneventful post-transplant course, developing dyslipidemia but no major complications, including cellular or antibody-mediated rejection, malignancy, or cytomegalovirus infection. Over the past 10 years, he has been treated with simvastatin, levothyroxine, and aspirin, along with immunosuppressive therapy consisting of cyclosporine and mycophenolate sodium. During follow-up, the patient remained asymptomatic, with echocardiography demonstrating preserved biventricular function, and coronary CT angiography at 17 years post-transplant showing no obstructive coronary lesions. At 24 years post-HTx, the patient developed progressive, typical angina (CCS class III), associated with exertional dyspnea. Echocardiography showed a left ventricular ejection fraction of 67%, global longitudinal strain of 23%, normal chamber dimensions and contractility, and no valvular disease or pulmonary hypertension. Coronary angiography revealed a subocclusive lesion in the mid right coronary artery, which was successfully treated with percutaneous coronary intervention. The patient subsequently remained asymptomatic. Conclusões: Post-transplant survival is primarily limited by CAV. This case highlights that optimal control of comorbidities, appropriate immunosuppression, and favorable donor/graft characteristics may delay the onset of CAV, contributing to survival beyond the international average. Moreover, the presence of typical angina suggests cardiac reinnervation (particularly sympathetic), which may facilitate the clinical recognition of CAV and could be associated with the favorable prognosis observed in this patient.

Figure 1. Coronary angiography before (A) and after (B) percuta intervention.



Hypertension / Renal Denervation



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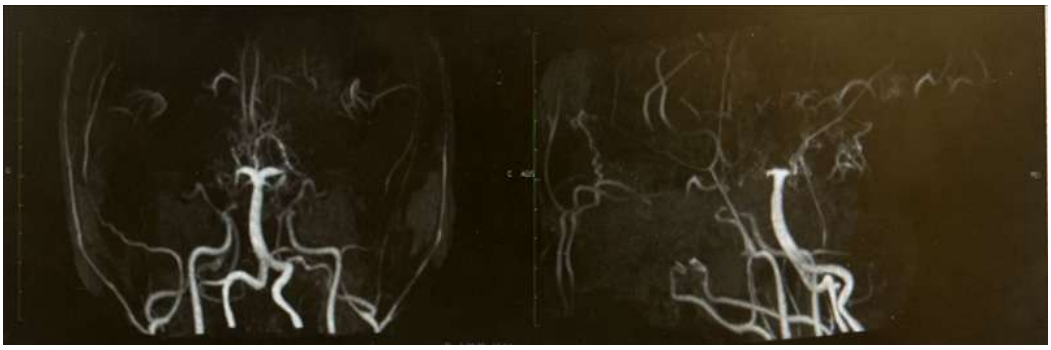
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CARDIOVASCULAR MANAGEMENT CHALLENGES IN MOYAMOYA DISEASE: A CASE REPORT

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Introduction: Moyamoya Disease (MMD) is a rare, chronic occlusive cerebrovascular disorder characterized by progressive stenosis of the terminal internal carotid arteries and their branches. While primarily a neurological entity, its frequent association with systemic vascular involvement—such as renal artery stenosis, severe hypertension, and coronary artery disease (Moyamoya Syndrome)—imposes significant challenges for the cardiologist, particularly regarding hemodynamic stability and stroke prevention. Case Description: A 34-year-old female presented with a history of refractory hypertension and recurrent transient ischemic attacks (TIAs). Diagnostic workup via digital subtraction angiography (DSA) revealed bilateral stenosis of the supraclinoid internal carotid arteries with the pathognomonic “puff of smoke” collateral network, confirming MMD. Cardiology was consulted for blood pressure (BP) optimization and preoperative risk assessment for encephaloduroarteriosynangiosis (EDAS). Echocardiography showed moderate concentric left ventricular hypertrophy (mass index 115 g/m2). Screening for secondary hypertension identified significant right proximal renal artery stenosis. Treatment was initiated with calcium channel blockers, cautiously avoiding rapid BP drops to preserve cerebral collateral perfusion. The patient achieved neurological stability and satisfactory BP control prior to successful revascularization surgery. Cardiovascular management in MMD is a delicate balancing act. Maintaining Mean Arterial Pressure (MAP) is critical; extreme hypertension risks hemorrhagic stroke from fragile collateral vessels, while hypotension triggers cerebral infarction due to hypoperfusion. Literature suggests that MMD can coexist with fibromuscular dysplasia and stenosis of medium-sized arteries (renal and coronary). The cardiologist’s role is vital in identifying these extracranial stenoses and tailoring antiplatelet therapy, weighing ischemic risks against the hemorrhagic potential of neovessels Conclusions: Moyamoya Disease requires a multidisciplinary approach where the cardiologist is essential for hemodynamic stabilization and screening for associated systemic vasculopathies. BP targets must be individualized to ensure adequate cerebral perfusion reserve, thereby reducing perioperative morbidity and mortality.

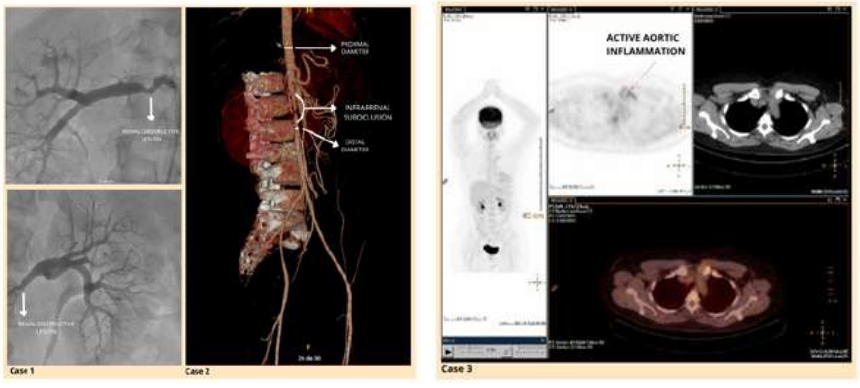


20834

HYPERTENSION IN TAKAYASU ARTERITIS: MULTIPLE FACETS AND CLINICAL CHALLENGES BEYOND RENAL ARTERY STENOSIS

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Introduction: Hypertension (HTN) is a multisystemic disease characterized by elevated blood pressure (BP) and complex pathophysiology. Genetic, environmental, and behavioral factors contribute to its development. Among the secondary causes, Takayasu arteritis (TAK) is a large-vessel vasculitis that involves the aorta and its major branches. HTN in TAK is commonly associated with renal artery stenosis or aortic coarctation-like physiology; however, mechanisms such as sympathetic activation and baroreceptor dysfunction may also contribute. This case series illustrates the spectrum of TAK presentation and the challenges in HTN management. Case Description: Case 1: AMS, female, 45 years old, diagnosed with TAK at 27 years old after systemic symptoms and upper-limb claudication. Pulses were absent in both arms. Imaging demonstrated inflammation of the aortic arch, sparing the descending aorta and renal arteries. BP could initially only be measured in the thighs when HTN was first identified. After immunosuppressive and antihypertensive therapy, pulses gradually returned and BP became measurable in both arms. Initial measurements were misleading, with systolic differences >80 mmHg between limbs. Despite restored flow, the patient remained hypertensive, requiring six antihypertensive drugs. Case 2: EGRL, male, 19 years old, referred without a previous TAK diagnosis despite multiple arterial revascularization procedures since early childhood. BP was controlled with two medications and renal function was preserved. He had reduced lower-limb pulses and pressure without symptoms. Investigation revealed bilateral renal artery and infrarenal aortic stenosis and established the diagnosis of TAK. Case 3: ERS, female, 49 years old, with HTN since pregnancy at 20 years old, was referred after developing heart failure. She complains of NYHA III dyspnea and lower-limb claudication. Investigation identified significant stenosis of the descending aorta and renal arteries, leading to TAK diagnosis and refractory HTN. Renal and aortic angioplasty resulted in symptom improvement and reduction of two antihypertensive drug classes. Conclusions: HTN is a major challenge in TAK. Aortic and subclavian disease may falsely lower BP values, delaying diagnosis and treatment. Inter-limb pressure differences can also limit ABPM. HTN in TAK is multifactorial and not solely related to renal artery stenosis, requiring multidisciplinary follow-up for better vascular and BP control.

21586

PICKERING SYNDROME: A RARE REVERSIBLE CAUSE OF REFRACTORY HYPERTENSION, FLASH PULMONARY EDEMA AND CARDIORENAL DYSFUNCTION

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Introduction: Pickering syndrome is a rare, underrecognized phenotype of renovascular disease, classically linking recurrent flash pulmonary edema, refractory hypertension, renal dysfunction and bilateral renal artery stenosis. Its recognition is decisive because it identifies a potentially reversible mechanism of cardiorenal collapse. Case Description: An 81-year-old woman with long-standing hypertension, type 2 diabetes, chronic kidney disease and reported atrial fibrillation was admitted with acute dyspnea, hypoxemia and severe hypertensive crisis, requiring noninvasive ventilation, intravenous vasodilators and loop diuretics. She initially improved, but blood pressure remained difficult to control despite escalation to amlodipine, carvedilol, losartan, spironolactone, hydralazine, isosorbide, clonidine and furosemide, with nitroprusside during decompensations. Echocardiography showed LVEF 44%, diffuse hypokinesia and grade II diastolic dysfunction. Renal Doppler and computed tomography angiography demonstrated critical bilateral ostial atherosclerotic renovascular lesions greater than 90%, with a reduced left kidney. During hospitalization, she developed recurrent episodes of flash pulmonary edema, repeatedly associated with systolic blood pressure over 200 mmHg and no evident infectious trigger, requiring intensive care, noninvasive ventilation, nitroprusside and furosemide. This recurrence despite intensive antihypertensive therapy, together with fluctuating renal dysfunction and bilateral critical renovascular disease, established Pickering syndrome. Bilateral renal angioplasty with stent implantation was performed. After revascularization, congestion resolved, nitroprusside was withdrawn, renal function recovered, with creatinine decreasing from 3.56 to 1.35 mg/dL, and antihypertensive therapy was markedly de-escalated. At follow-up, she remains on carvedilol and low-dose hydralazine only. Conclusions: This case highlights Pickering syndrome as a rare but actionable diagnosis. Although renal revascularization is not broadly beneficial in unselected atherosclerotic disease, recurrent flash pulmonary edema with refractory hypertension and renal dysfunction defines a high-risk phenotype in which intervention may restore cardiorenal stability and reduce antihypertensive burden.

Interventional Cardiology



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15041

COMBINED PERCUTANEOUS TREATMENT OF GIANT ARTERIOVENOUS MALFORMATION AND COMPLEX CORONARY LESIONS IN A HIGH-RISK SURGICAL PATIENT: A CASE REPORT.

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Introduction: Coronary artery fistulas (CAF) are congenital anomalies characterized by direct communications between one or more coronary arteries and cardiac chambers or adjacent great vessels. The prevalence is estimated to be between 0.2% and 0.4% of all congenital heart defects. The etiology is attributed to deviations in embryonic development. The clinical presentation is variable. Symptoms may include fatigue, dyspnea, palpitations, chest pain (resulting from the "coronary steal" phenomenon), and syncope. The diagnosis is established by imaging modalities. Coronary cineangiography is the gold standard for diagnostic confirmation and anatomical delineation of CAF. There are no standardized therapeutic guidelines for the management of CAF. The objective of this article is to report the case of a patient with complex obstructive coronary artery disease and multiple coronary fistulas to the pulmonary trunk treated with concomitant coronary angioplasty and fistula embolization. Case Description: A 66-year-old female with history of systemic arterial hypertension (SAH), insulin-dependent diabetes mellitus, dyslipidemia, stage IV chronic kidney disease (CKD), and pulmonary hypertension (PH). Initial evaluation with myocardial perfusion scintigraphy (MPS) revealed significant ischemia (approximately 21%), with hypoperfusion of the anterior, septal, and apical regions. She underwent cardiac catheterization (CATH), which demonstrated calcified lesions and critical obstructions in the following coronary segments: RCA: 90% proximal stenosis; LAD: 95% proximal stenosis and 90% mid-segment stenosis; left circumflex artery (LCx): 90% proximal stenosis; posterior descending artery (PDA): 80% stenosis in the mid segment. In addition, large high-flow fistulas originating from the proximal segments of the LAD and RCA draining into the pulmonary trunk (PT) were identified. Given the patient's high surgical risk, the heart team opted for percutaneous treatment with stent and fistula embolization. Conclusions: CAPF may be considered a differential diagnosis in patients presenting with acute or chronic coronary syndromes, primarily due to the phenomenon of coronary flow steal, especially when associated with significant atherosclerotic disease. Mastery of multiple percutaneous interventional techniques (used in endovascular surgery and neurointervention) allows, in selected cases, complete resolution of both the vascular malformation and the atherosclerotic disease, particularly in patients at high surgical risk.

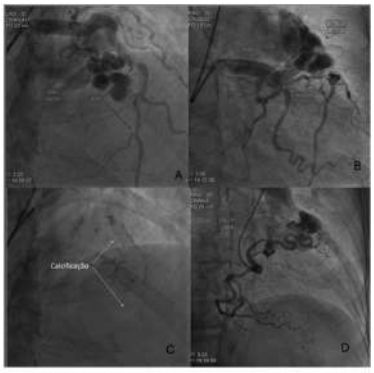


Figure 1. Angiographic images: 1A: Severe atherosclerotic coronary lesion in the left anterior descending artery. 1B: Fistula from the left anterior descending artery to the pulmonary artery trunk. 1C: Calcified atherosclerotic lesion in the left anterior descending artery. 1D: Fistula from the right coronary artery to the pulmonary artery trunk.

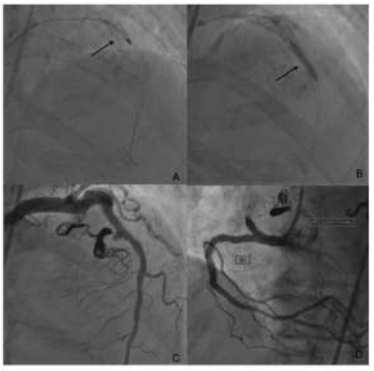


Figure 2. Angiographic images: 2A: Rotational atherectomy of an atherosclerotic lesion in the left anterior descending artery. 2B: *Cutting balloon* angioplasty in the left anterior descending artery. 2C: Final result of left anterior descending artery angioplasty and fistula occlusion. 2D: Final result of right coronary artery angioplasty and fistula occlusion.

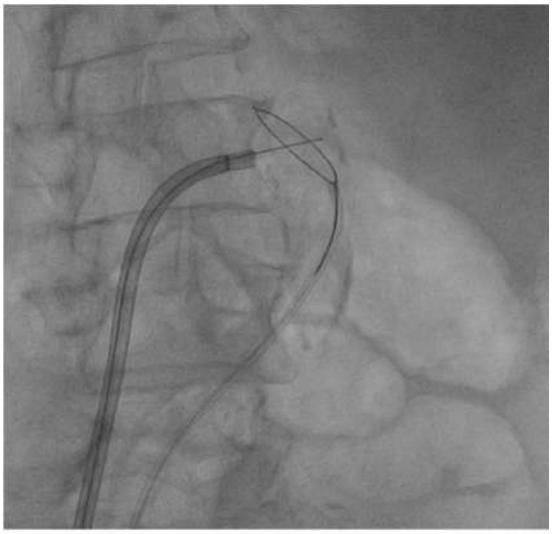
16854

COMBINED TRANSCAVAL ACCESS AND BASILICA TECHNIQUE IN TRANSCATHETER AORTIC VALVE REPLACEMENT (TAVR): A CASE REPORT

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Introduction: Transcatheter aortic valve replacement (TAVR) is a well-established minimally invasive alternative to surgical valve replacement for severe symptomatic aortic stenosis. The transfemoral route is the preferred access; however, it may be unfeasible in individuals with small or diseased iliofemoral arteries, increasing the risk of vascular complications. Alternative approaches, such as transapical or transaortic access, are more invasive and associated with higher morbidity. In this context, transcaval TAVR has emerged as a fully percutaneous option, enabling access to the abdominal aorta via the inferior vena cava, thereby avoiding diseased arterial pathways. Additionally, the BASILICA technique, which involves intentional leaflet laceration prior to valve deployment, has been developed to prevent iatrogenic coronary obstruction, a rare but potentially fatal complication of TAVR. Case Description: An 83-year-old woman with diabetes mellitus, coronary artery disease, and chronic obstructive pulmonary disease presented with progressive dyspnea, now at rest, requiring long-term oxygen therapy. Transthoracic echocardiography revealed severe low-flow, low-gradient aortic stenosis (area 0.9cm², mean gradient 27mmHg, stroke volume index 32mL/m², left ventricular ejection fraction 36%). The stress echocardiogram showed preserved contractile reserve with maintenance of the valve area. Computed tomography angiography showed a small aortic annulus (392mm²), low left coronary height (8mm) and narrow sinus of Valsalva (27mm), indicating high risk of coronary obstruction. Iliofemoral arteries were bilaterally small and diffusely atherosclerotic. Coronary angiography demonstrated moderate-to-severe lesions in the right and circumflex territories. The Society of Thoracic Surgeons score predicted mortality was 29.9%. Given the high surgical risk and unfavorable transfemoral access, a transcaval approach with BASILICA was performed under general anesthesia with transesophageal guidance. The procedure was successful, with no coronary obstruction or complications. Valve implantation was adequate and the aortic port was closed with a nitinol occluder. The patient was discharged on day 11 and remained stable at follow-up, no longer requiring oxygen therapy. Conclusions: This case demonstrates that combining transcaval access with the BASILICA technique is a feasible and effective fully percutaneous strategy for high-risk patients who are unsuitable for transfemoral TAVR and at increased risk of coronary obstruction.



Picture 1 – Successful crossing. The guidewire is advanced from the inferior vena cava into the aorta.

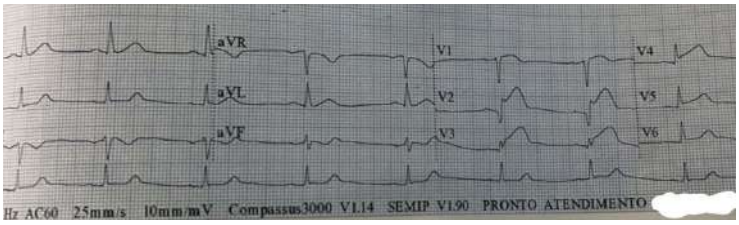
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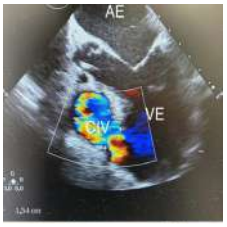
EARLY PERCUTANEOUS CLOSURE OF POST-INFARCTION VENTRICULAR SEPTAL DEFECT: A CASE FOR RETHINKING INTERVENTION TIMING

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(1) UFRN - NATAL - RN - BRASIL; (2) INSTITUTO ATENA - NATAL - RN - BRASIL;

Introduction: Post–myocardial infarction ventricular septal defect (VSD) is a rare but potentially fatal mechanical complication, even in the era of early reperfusion. Its incidence ranges from 0.17% to 0.31%, with mortality exceeding 80% in untreated cases. It results from septal rupture, creating a left-to-right shunt that leads to left ventricular volume overload, reduced cardiac output, and rapid hemodynamic deterioration, often progressing to acute heart failure or cardiogenic shock. Management is challenging and involves hemodynamic stabilization and individualized decision-making between surgical repair—the gold standard—and percutaneous closure, a viable alternative in selected patients. Case Description: A 59-year-old woman with no prior cardiovascular disease or traditional risk factors presented with typical chest pain at rest. She was diagnosed with ST-segment elevation myocardial infarction after 12 hours of symptoms and underwent thrombolysis with initial improvement. After 24 hours of hospitalization, she developed hypotension, tachycardia, and a new systolic murmur at the left sternal border. Echocardiography showed a left ventricular ejection fraction of 36%, extensive wall motion abnormalities, and a VSD with a left-to-right shunt of approximately 1.5 cm, along with pulmonary hypertension. The case was evaluated by the Heart Team. Given the initial hemodynamic instability, the size of the defect, and the acute phase context, an early percutaneous approach was chosen with device implantation, Amplatzer 16mm. The procedure was successfully performed, with immediate hemodynamic improvement. The patient stabilized and was discharged 48 hours later. At follow-up, she remained in NYHA class I–II on optimized therapy. Conclusions: This case challenges the paradigm of delaying intervention in post–myocardial infarction VSD, showing that, in selected cases, an early percutaneous approach may be not only feasible but decisive in halting hemodynamic deterioration. More than an alternative to surgery, it may become a leading strategy when time is the main prognostic determinant. This report highlights that decision-making guided by clinical dynamics and Heart Team assessment—rather than static recommendations—may redefine intervention thresholds, enabling a more assertive and potentially transformative approach to these catastrophic complications.







17759

ENDOVASCULAR APPROACH IN STANFORD TYPE A–EQUIVALENT AORTIC DISSECTION WITH COMPLEX ARTERIAL ANATOMY: CASE REPORT AND FAVORABLE AORTIC REMODELING

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Introduction: Acute Stanford type A aortic dissection is traditionally managed with emergent open surgery due to its high mortality. However, advances in endovascular techniques have expanded therapeutic possibilities in selected cases, particularly when the entry tear is not located in the ascending aorta. We report a case of a Stanford type A-equivalent dissection treated with a fully endovascular strategy, achieving favorable aortic remodeling. Case Description: ACS, a 65-year-old hypertensive woman, presented with mild chest pain and nausea. She had positive troponin and underwent coronary angiography, which revealed no obstructive lesions. Cardiac magnetic resonance imaging demonstrated an intramural hematoma in the ascending aorta. Computed tomography angiography showed a dissection with probable origin in an aberrant right subclavian artery, associated with retrograde intramural hematoma involving the ascending aorta, consistent with a Stanford type A–equivalent dissection. A bovine arch variant (left common carotid artery originating from the brachiocephalic trunk) and a retroesophageal right subclavian artery were identified, with extension of the dissection flap to the right external iliac artery. After hemodynamic stabilization with nitroprusside and esmolol, an endovascular strategy was chosen, with implantation of a thoracic endograft with a branch to the left subclavian artery and occlusion of the aberrant right subclavian artery. Follow-up computed tomography angiography demonstrated complete resolution of the intramural hematoma in the ascending aorta and arch, appropriate endograft positioning, and obliteration of the false lumen in the adjacent thoracic segment, with preserved flow in the left subclavian artery through a patent stent. The patient remains hemodynamically stable and asymptomatic. Conclusions: Endovascular treatment may be an effective alternative in selected cases of Stanford type A–equivalent dissection with a distal entry tear, particularly in complex anatomical settings. The favorable outcome and aortic remodeling highlight the importance of individualized, multidisciplinary decision-making in acute aortic disease.

14415

GIANT THROMBUS ON A LEFT ATRIAL APPENDAGE OCCLUSION DEVICE: WHEN PREVENTION BECOMES A NIGHTMARE

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Introduction: Left atrial appendage occlusion (LAAO) is an effective alternative to reduce the risk of stroke in patients with non-valvular atrial fibrillation (AF) who have contraindications to oral anticoagulation. However, device-related thrombosis (DRT), although uncommon, is associated with an increased risk of thromboembolic events. In oncologic patients, management is particularly challenging due to the prothrombotic state and higher bleeding risk, with limited data on the influence of active malignancy on DRT formation. Case Description: A 71-year-old male patient with permanent AF, CHA□DS□-VA score of 3 and HAS-BLED score of 2, previously on apixaban, developed recurrent hematuria of unknown origin, even after investigation and exclusion of glomerular and urological causes, leading to a functional contraindication to oral anticoagulation. He underwent percutaneous LAAO with implantation of a Watchman FLX® device, with adequate positioning and no residual leak. Despite a shortened antiplatelet strategy, hematuria persisted. Subsequent urological investigation revealed high-grade urothelial carcinoma of the bladder. During oncologic staging, a giant thrombus adherent to the atrial surface of the device was identified, extending to the Coumadin ridge, measuring approximately 5.6 × 1.5 cm (area of 6.77 cm²). The diagnosis was confirmed by transesophageal echocardiography and cardiac computed tomography angiography, with no significant peridevice leak. Given the high thromboembolic risk, full anticoagulation with warfarin was initiated regardless of the prior contraindication, considering that the thrombotic risk outweighed the bleeding risk at that time, resulting in progressive thrombus reduction. After surgical treatment of the bladder cancer, complete thrombus regression was observed after six months of anticoagulation. Warfarin was discontinued, and apixaban was reintroduced, with no recurrence of bleeding or new DRT. Conclusions: The interaction between AF, active malignancy with bladder bleeding, and thrombosis related to intracardiac devices can be highly challenging. LAAO does not eliminate thrombotic risk associated with hypercoagulable states. This case highlights the importance of late surveillance through multimodal assessment and the recognition of cancer as a risk factor for DRT. Thrombus regression following oncologic treatment and anticoagulation adjustment demonstrates that management should be continuous, individualized, and conducted in a multidisciplinary manner.



Figure 1: Cardiac computed tomography angiography (Fig. A) and 2D and 3D transesophageal echocardiography (Figs. B and C, respectively) 6 months after left atrial appendage occlusion. The occlusion device is visualized, well positioned, with a giant thrombus adherent to the atrial surface of the prosthesis.

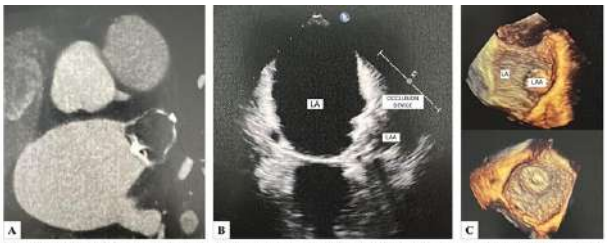


Figure 2: Cardiac computed tomography angiography (Fig. A) and 2D and 3D transesophageal echocardiography (Figs. B and C, respectively) after oncologic treatment and 6 months of full anticoagulation. The left atrium is visualized with a well-positioned occlusion device in the left atrial appendage, with complete thrombus regression.

16614

MITRAL VALVE-IN-VALVE: FROM GOOD HEMODYNAMIC RESULT TO HIDDEN EMBOLIC RISK

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(1) BENEFICENCIA PORTUGUESA - SAO PAULO - SP - BRASIL;

Introduction: Structural degeneration of mitral bioprostheses is a relevant late complication. In elderly patients at high surgical risk, transcatheter valve-in-valve (ViV) implantation has become a well-established alternative therapy. Despite favorable technical results, thromboembolic complications remain a concern, since in the presence of significant mitral regurgitation, the regurgitant jet may exert a “washing” effect on the left atrium, reducing local blood stasis. Therefore, its abrupt correction may significantly alter left atrial hemodynamics, favoring the appearance of spontaneous echo contrast and potential thrombus formation. Case Description: A 78-year-old woman with previous surgical mitral valve replacement with a bioprosthesis in 2013 evolved during follow-up with NYHA functional class III symptoms. Echocardiography showed structural degeneration of the bioprosthesis, with leaflet rupture and severe mitral regurgitation. Given the high surgical risk, the Heart Team indicated transcatheter mitral valve-in-valve implantation. After the procedure, transesophageal echocardiography showed a well-positioned prosthesis, with no paravalvular leak, satisfactory transmitral gradient, and no significant residual mitral regurgitation. However, intense spontaneous echo contrast was observed in the left atrium and left atrial appendage, not evident at baseline assessment. It was assumed that the abrupt interruption of the large regurgitant jet, previously responsible for a “washing” effect on the left atrium, associated with left atrial enlargement and possible transient reduction in cardiac output under anesthesia, favored blood stasis. Full anticoagulation was initiated, followed by transition to oral anticoagulation. The patient evolved without clinical embolic events, and follow-up echocardiography demonstrated complete disappearance of spontaneous echo contrast, absence of thrombi, and adequate function of the transcatheter prosthesis. Conclusions: Transcatheter mitral valve-in-valve implantation is an effective option for degenerated mitral bioprostheses in patients at high surgical risk. This case shows that, even with an excellent immediate hemodynamic result, abrupt correction of severe mitral regurgitation may favor left atrial stasis and increase thromboembolic risk. Early echocardiographic recognition and prompt anticoagulation were essential for a favorable outcome.

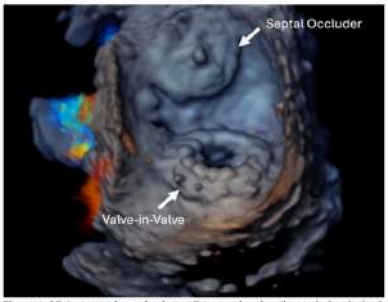


Figure 1: 3D transesophageal echocardiogram showing the occluder device in the interatrial septum and the prosthesis in mitral position (Valve-in-Valve).

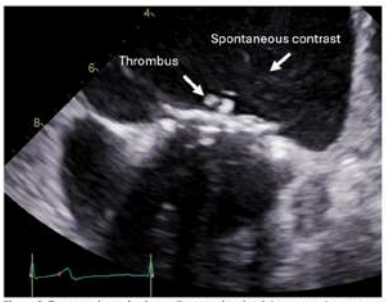


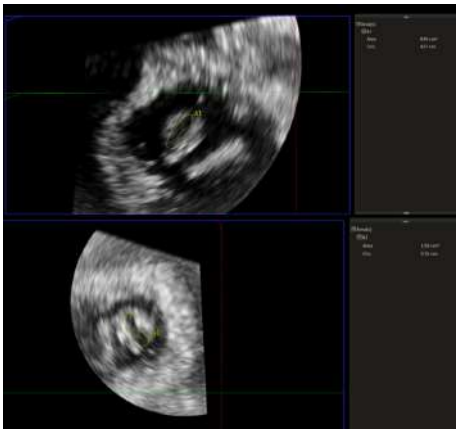
Figure 2: Transesophageal echocardiogram showing intense spontaneous contrast in the left atrium and a small thrombus on the left atrial surface of the occluder device in the interatrial septum.

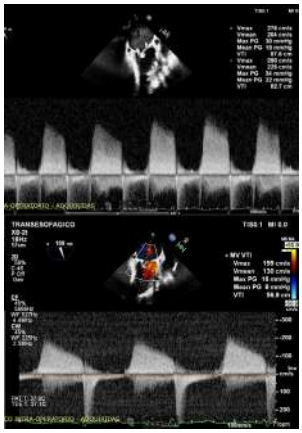
17863

MITRAL VALVULOPLASTY WITH BALLOON CATHETER IN A PREGNANT WOMAN WITH RHEUMATIC MITRAL STENOSIS AND CARPENTIER RING WITH UNFAVORABLE WILKINS SCORE.

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Introduction: The treatment of choice for rheumatic mitral stenosis is balloon mitral valvuloplasty (BMV) when the Wilkins score is favorable. However, this score has limited performance in the assessment of mitral valves previously repaired with a Carpentier ring, as it was developed for evaluation of the native valve. Valve-in-ring is a percutaneous treatment alternative, but it carries a risk of left ventricular outflow tract obstruction in some cases. Multidisciplinary Heart Team discussion with specialists is essential to define the therapeutic strategy in complex cases. Case Description: A 43-year-old female patient with severe rheumatic mixed mitral valve disease underwent mitral valve repair with a rigid Carpentier ring (size 30) and commissurotomy in 2015. She had an unplanned pregnancy requiring hospitalization during the first trimester due to dyspnea on minimal exertion. Transthoracic echocardiography showed commissural fusion, a mitral valve area of 0.9 cm² (planimetry), a mean left atrium–left ventricle gradient of 21 mmHg, a pulmonary artery systolic pressure of 89 mmHg, and a Wilkins–Block score of 10 points (subvalvular involvement: 3 points), unfavorable for BMV. The case was discussed with the interventional cardiology team to assess the feasibility of a valve-in-ring procedure. Cardiac computed tomography angiography demonstrated a high risk of left ventricular outflow tract obstruction (mitral annulus–septum distance of 16 mm and a predicted neo-LVOT area of 150 mm²). Given the complexity, the case was reviewed by the Heart Team, and BMV in the presence of the ring was considered. The procedure was performed in the operating room without complications, resulting in an increase in mitral valve area to 1.54 cm², with a reduction in the mean gradient to 8 mmHg and in pulmonary artery systolic pressure to 59 mmHg. Conclusions: BMV in the presence of a Carpentier ring is a practice rarely reported in the literature. The risks include possible ring dehiscence with acute mitral regurgitation and interference with balloon expansion, which may limit the gain in valve area. Another particular feature of this case is that the procedure was performed despite an unfavorable Wilkins score. This case highlights the importance of longitudinal follow-up, family counseling, and the role of the Heart Team. Performing BMV in the presence of a Carpentier ring with an unfavorable Wilkins score is uncommon, but it may represent a lower-morbidity alternative in high-risk situations.

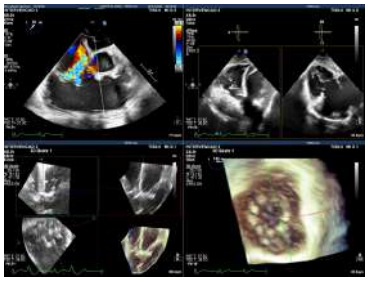
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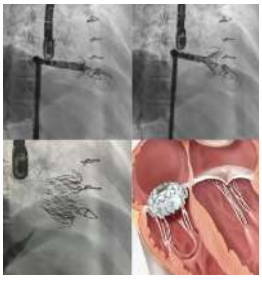
PERCUTANEOUS TRANSFEMORAL IMPLANTATION OF AN EVOQUE PROSTHESIS IN A PATIENT WITH SEVERE TRICUSPID REGURGITATION AFTER RESECTION OF A CARDIAC LIPOMA

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Introduction: The main indication for surgical intervention for tricuspid regurgitation (TR) is in the setting of correction of concomitant left-sided valve disease, but the surgical procedure is still associated with high morbidity and mortality. Transcatheter tricuspid valve replacement (TTVR) with the Evoque system has emerged as an effective treatment in this scenario. Multimodality imaging is essential for procedural planning and success. We describe a successful TTVR in a patient with severe TR after surgical resection of a cardiac lipoma. Case Description: We present a case of a previously healthy female patient, asymptomatic, with evidence of a cardiac tumor on a routine echocardiogram performed at age 43. The investigation was complemented with magnetic resonance imaging, which revealed a mass in the anterior and anteroseptal basal wall of the left ventricle (LV), measuring approximately 5.0 x 2.1 x 3.4 cm, not obstructing LV outflow tract but projecting towards the right ventricle (RV), suggestive of a lipoma. The patient remained asymptomatic but subsequent examination showed the mass was increasing. A surgical resection of the lesion was performed in the year of diagnosis. The procedure required detachment of the tricuspid valve to access the interventricular septum and opening of the pulmonary trunk to complete the dissection. The histopathological examination confirmed lipoma. In the postoperative period, torrential TR was evident, which over the years led to dilation of the right ventricle and congestive symptoms. Surgery was ruled out by the multidisciplinary team and transcatheter edge-to-edge repair was not possible due to anatomic characteristics. The correction was possible three years after diagnosis via percutaneous transfemoral implantation of an EVOQUE prosthesis. The procedure was uneventful. Post-procedure echocardiography showed a well-located tricuspid prosthesis with good leaflet mobility and minimal regurgitation, with a maximum right atrium-ventricular diastolic gradient of 9 mmHg and a mean gradient of 5 mmHg. The patient remained in the ICU for 24 hours for hemodynamic monitoring. She remained asymptomatic throughout the postoperative period and was discharged 4 days after the procedure for outpatient follow-up. Conclusions: A TTVR with the Evoque system was successfully performed in a patient who was not a candidate for surgical or transcatheter edge-to-edge repair of severe symptomatic TR. Despite its recent development, the procedure seems promising and effective.





Neglected Cardiovascular Diseases



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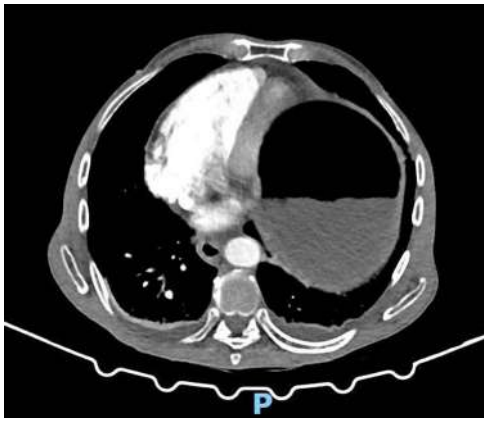
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GIANT CHAGASIC MEGACOLON AS A RARE CAUSE OF CARDIAC COMPRESSION DUE TO MEDIASTINAL SHIFT

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Introduction: Chagas disease is a chronic condition, often presenting with cardiac and gastrointestinal involvement. While Chagasic cardiomyopathy is a leading cause of heart failure in Latin America, the mechanical impact of a giant megacolon on the heart is a rare find, therefore frequently being overlooked. This anatomical distortion can cause significant mediastinal shift, leading to direct compression of cardiac chambers and impairment of venous return. In the context of simultaneous electrolyte imbalances and mechanical compression, the heart is subjected to a dual threat: impaired pumping mechanism and a high fatal arrhythmia risk. Case Description: An 81-year-old male with Chagas disease and metastatic prostate cancer presented with laboratory findings of a critical arrhythmogenic state: hypokalemia (1.90 mmol/L) and hypocalcemia (0.95 mmol/L), associated with severe prostration and hypoxemia (SpO2 88% on room air). Chronic use of laxatives was reported. Imaging studies demonstrated a massive gas-filled megacolon causing dramatic left-to-right mediastinal shift due to diaphragmatic compression, leading to displacement of the heart against the right thoracic wall, restricting cardiac filling and contraction, in addition to bilateral basal atelectasis. 12 lead electrocardiogram presented with right axis deviation. The patient was managed in the Intensive Care Unit with electrolyte replacement, introduction of a rectal tube and continuous cardiac monitoring. Electrolyte stabilization was achieved after 3 days of continuous intravenous replacement, and the colonic decompression led to improvement of respiratory parameters , mitigating the immediate risk of sudden cardiac death from either mechanical collapse or malignant arrhythmias. A colostomy was indicated due to high recurrence risk. Conclusions: This case reports a rare but critical cardiopulmonary complication of Chagasic megacolon. Severe anatomical displacement of the heart, when combined with metabolic disarray, significantly amplifies the risk of cardiovascular collapse. Physicians must maintain high suspicion for mechanical causes of mediastinal shift in Chagasic patients, as the synergy between cardiac compression, potential cardiomyopathy and electrolyte instability represents a high-risk scenario for lethal electrical and hemodynamic outcomes. The use of the patient's data and imaging studies was authorized by the patient and its family. The case was submitted for approval by the research ethics committee.

16300

REFRACTORY CARDIOGENIC SHOCK IN ACUTE CHAGASIC CARDIOMYOPATHY ASSOCIATED WITH SYSTEMIC LUPUS ERYTHEMATOSUS: A CASE REPORT FROM AN ENDEMIC REGION

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Introduction: Acute Chagas cardiomyopathy remains a severe manifestation of Trypanosoma cruzi infection and may progress rapidly to conduction abnormalities and advanced heart failure. The association with systemic autoimmune diseases requiring immunosuppression is rare and may worsen myocardial injury and clinical outcomes. Case Description: A 23-year-old woman was admitted to the intensive care unit with severe decompensated heart failure (left ventricular ejection fraction 32%) five months after treatment for acute Chagas disease. During outpatient investigation of serositis, systemic lupus erythematosus was diagnosed and hydroxychloroquine was initiated. Four days later, she developed complete atrioventricular block requiring permanent pacemaker implantation. Her clinical condition rapidly deteriorated with acute pulmonary edema and respiratory failure requiring invasive mechanical ventilation and vasopressor support. She was transferred to a tertiary care center presenting systemic congestion and acute kidney injury. After initial stabilization and withdrawal of vasopressors, pulse methylprednisolone therapy was repeated and mycophenolate mofetil was introduced due to lupus activity. Despite optimized heart failure therapy, progressive hemodynamic deterioration occurred and she was considered ineligible for heart transplantation. She subsequently developed recurrent cardiogenic shock characterized by metabolic acidosis, oliguria, and peripheral hypoperfusion requiring inotropic support. Despite maximal medical therapy, refractory shock persisted and the patient died 25 days after admission. Conclusions: Acute Chagas cardiomyopathy associated with systemic immunosuppression may lead to rapid progression to advanced heart failure, conduction system disease, and refractory cardiogenic shock even in young patients. Early cardiac monitoring is essential in patients with acure Chagas disease receiving immunosuppressive therapy in endemic regions

Pericardium / Endocardium / Valvular Heart Disease / Aortic Diseases



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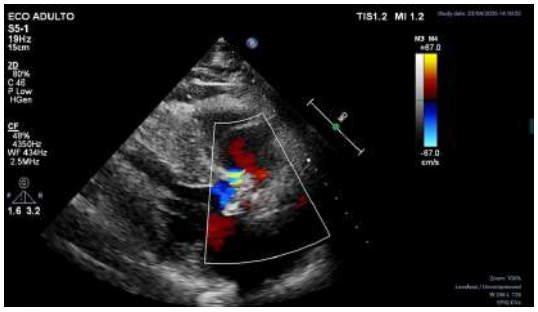
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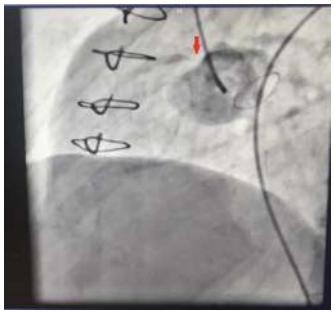
ACUTE MYOCARDIAL INFARCTION DUE TO EXTRINSIC COMPRESSION OF THE RIGHT CORONARY ARTERY SECONDARY TO SINUS OF VALSALVA PSEUDOANEURYSM IN PROSTHETIC VALVE ENDOCARDITIS

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Introduction: Prosthetic valve infective endocarditis may present with atypical manifestations and severe periannular complications, such as abscesses and pseudoaneurysms. The occurrence of acute coronary syndrome in this setting is rare and is usually related to embolic phenomena. Case Description: A 77-year-old female with a history of surgical aortic valve replacement with a bioprosthesis eleven years earlier due to severe aortic stenosis was initially admitted with a four-day history of fever of unknown origin. Given the suspicion of infective endocarditis, empirical antibiotic therapy was initiated, and the patient was transferred between different healthcare facilities. Serial transthoracic echocardiograms showed prosthetic valve dysfunction, with moderate regurgitation and severe stenosis (mean gradient of 45 mmHg and valve area of 0.9 cm²), without initial evidence of vegetations, abscesses, or other perivalvular complications. All blood cultures remained negative. The patient subsequently developed sudden chest pain associated with ST-segment elevation and elevated serum troponin levels. Coronary angiography revealed occlusion at the ostium of the right coronary artery, suggestive of extrinsic compression, with no possibility for percutaneous intervention. Computed tomography angiography of the thoracic aorta demonstrated a saccular aneurysmal dilation of the right coronary cusp of the sinus of Valsalva (4 × 3.6 cm), adjacent to the origin of the right coronary artery, causing extrinsic compression of the vessel. A repeat echocardiogram revealed vegetations on the prosthetic valve. After multidisciplinary discussion by the Heart Team, an initial conservative approach was chosen, with optimization of antibiotic therapy and planned reassessment with imaging after at least fourteen days, maintaining a strategy for subsequent surgical intervention. Conclusions: Prosthetic valve infective endocarditis may present with atypical manifestations and severe complications. This case illustrates a rare presentation of blood culture-negative prosthetic valve endocarditis complicated by sinus of Valsalva pseudoaneurysm and acute myocardial infarction due to extrinsic compression of the right coronary artery. It highlights the importance of clinical suspicion and the use of multimodality imaging in the diagnostic evaluation and therapeutic planning of such uncommon complications





16984

CATASTROPHIC PRESENTATION OF A MYCOTIC ABDOMINAL AORTIC ANEURYSM IN A PATIENT WITH MULTIMORBIDITY: A CASE STUDY

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Introduction: Infectious aortitis is a rare but life-threatening condition, often associated with significant morbidity and mortality. Among its etiologies, Salmonella species are notable pathogens, particularly in patients with underlying atherosclerosis or immunocompromising conditions. Its clinical presentation is frequently nonspecific, mimicking other inflammatory or autoimmune diseases, which can delay diagnosis. Early recognition and prompt multidisciplinary management are essential to improve outcomes. Case Description: A 55-year-old male was admitted to the Emergency Department presenting with acute, intense abdominal pain in the left hypochondrium, without irradiation, associated with nausea and vomiting. The patient's medical history was significant for severe cardiovascular disease: previous coronary artery disease with ischaemic heart failure (Left Ventricular Ejection Fraction of 36%). He also presented with systemic hypertension, insulin-dependent type 2 diabetes mellitus, dyslipidaemia, and obstructive peripheral arterial disease. He was a former smoker.Laboratory tests revealed a heightened inflammatory state, with an Erythrocyte Sedimentation Rate (ESR) of 110 mm/h. An abdominal Computed Tomography (CT) scan demonstrated aortitis with an ulcer in the distal abdominal aorta, near the bifurcation of the left iliac artery, accompanied by significant adjacent inflammation.A definitive diagnosis was established after blood cultures returned positive for Salmonella sp., at which point the antibiotic regimen was escalated to meropenem. A follow-up Doppler ultrasound revealed dissection of the abdominal aorta with true lumen thrombosis and ectasia. Conclusions: Mycotic aneurysms caused by Salmonella are associated with high morbidity and mortality rates. Rupture and dissection are catastrophic complications that carry a guarded prognosis, even with appropriate surgical and antibiotic treatment, particularly in patients with multiple cardiovascular comorbidities. The diagnostic challenge lies in the fact that infectious aortitis can mimic autoimmune diseases. Screening with blood cultures and early clinical suspicion are essential, especially in diabetic and atherosclerotic patients. A multidisciplinary approach is of paramount importance for a prompt and accurate diagnosis, thereby optimising effective patient treatment.

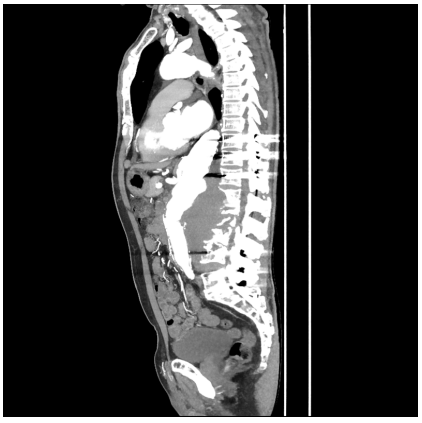
13209

CHRONIC CONTAINED RUPTURE OF THORACOABDOMINAL AORTIC ANEURYSM WITH ADJACENT INVASION: DIAGNOSTIC CHALLENGE AND COMPLEX ENDOVASCULAR MANAGEMENT

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Introduction: Chronic contained rupture of thoracoabdominal aortic aneurysm is a rare vascular condition. This presentation is estimated to account for only 2.7% to 4% of all ruptured abdominal aortic aneurysms, particularly when it manifests with extra-abdominal symptoms and an insidious course. The association with lumbar vertebral body erosion is even more uncommon: since the first reported case in 1962, fewer than 100 similar cases have been documented in the world literature. Case Description: Case Report: A 75-year-old male patient with hypertension, diabetes, and a smoking history, who had undergone open repair of an abdominal aortic aneurysm (AAA) in 1998 (bifurcated polyester graft), presented 27 years after the index procedure with late aneurysmal degeneration of the graft, chronic contained posterior rupture, and extensive vertebral body erosion. The clinical picture manifested as progressive low back pain over a six-year course, initially attributed to neoplastic and infectious etiologies; however, bone biopsies ruled out neoplasia, revealing only chronic inflammatory infiltrate. Hypotheses of spondylodiscitis and mycotic pseudoaneurysm led to prolonged courses of antibiotic therapy without success. In 2024, the patient developed incapacitating pain, lower limb weakness, and episodes of spontaneous scrotal hematomas (a sign of retroperitoneal hemorrhagic dissection). Computed tomography angiography (2025) revealed a 12.9 cm expansive lesion involving vertebral bodies T12 through L4, with marked bone destruction. Upon admission to a tertiary care center, active infectious etiology was excluded based on negative blood cultures and the absence of systemic signs of infection, establishing the diagnosis of late aneurysmal graft degeneration with chronic contained posterior rupture and secondary vertebral erosion. Due to surgical risk, endovascular treatment was chosen using a branched thoracoabdominal endograft with visceral revascularization using stents for the celiac trunk, superior mesenteric artery, and renal arteries, along with aorto-biiliac stent extension, aiming to exclude the rupture area and depressurize the compromised segment. Conclusions: This case is relevant not only for the rarity of the condition but also for illustrating an uncommon presentation of high diagnostic difficulty, and for reinforcing the importance of long-term surveillance after AAA repairs and the role of complex endovascular therapy as an alternative in high-risk patients with huge bone erosion.

15327

EOSINOPHILIC PERIMYOCARDITIS ASSOCIATED WITH EOSINOPHILIC GRANULOMATOSIS WITH POLYANGIITIS: A CASE REPORT FROM A REFERENCE HOSPITAL IN THE BRAZILIAN AMAZON

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Introduction: Eosinophilic Granulomatosis with Polyangiitis (EGPA) belongs to the group of ANCA-associated systemic vasculitides (antibody positive in 30-40% of the cases) that affect small to medium-sized vessels, characterized by granulomatous inflammation and vascular necrosis. Despite its low prevalence, the disease presents high morbidity and mortality and can be underdiagnosed, especially in atypical cardiac presentations. Given the rarity of its presentation and the relevance of the involvement, this work describes a case of perimyocarditis associated with EGPA, emphasizing its diagnostic and therapeutic challenges. Case Description: A 36-year-old woman, 30 weeks pregnant, was admitted with dyspnea, chest pain, headache, scotomas, and lower limb edema. She had a history of chronic rhinosinusitis. Upon examination, she was hypertensive, tachycardic, tachypneic, and presented with diffuse wheezing. Initially, the condition was managed in the ICU as an asthma exacerbation and HELLP syndrome, culminating in an emergency cesarean section. After clinical stabilization and transfer, the patient continued to have pleuritic chest pain. The echocardiogram revealed a large pericardial effusion (21 mm). Following the initial therapeutic failure for pericarditis with ibuprofen and colchicine, new exams detected an increase in the pericardial effusion (34 mm), leukocytosis with marked eosinophilia (5,343/mm3), and elevated troponin (3,363 ng/mL), indicating myocardial damage. Investigations for autoantibodies (including ANCA), viruses, parasites, and neoplasms were negative. The patient underwent a pericardial biopsy to investigate the effusion, which revealed fluid with a predominance of eosinophils. The histopathology showed an eosinophilic inflammatory infiltrate, granuloma formation, and necrosis in fibroadipose tissue, confirming the diagnosis of EGPA. Induction therapy with methylprednisolone and cyclophosphamide was instituted, resulting in significant clinical improvement and hospital discharge. However, the newborn from the emergency cesarean section passed away in the neonatal ICU due to pulmonary sepsis. Conclusions: Perimyocarditis associated with eosinophilia is a rare condition with grave potential, and early recognition of the condition is a major determinant for the patient's outcome. This case report has limitations, such as the absence of long-term follow-up for the patient, which makes it difficult to characterize possible chronic cardiac sequelae or the occurrence of relapses.

16890

INCIDENTALLY IDENTIFIED KOMMERELL DIVERTICULUM IN A PATIENT WITH ASYMMETRIC SEPTAL HYPERTROPHY: CONSERVATIVE MANAGEMENT IN AN ASYMPTOMATIC ADULT

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Introduction: Kommerell diverticulum (KD) is a rare congenital aortic arch anomaly, characterized by a saccular dilation at the origin of an aberrant subclavian artery, often associated with a right-sided aortic arch. It may remain asymptomatic and be detected incidentally, but it can also cause compressive symptoms, such as dysphagia, cough, and dyspnea, and may be associated with dissection or rupture when aneurysmal. In adults, management and intervention thresholds remain controversial, and small asymptomatic cases may be followed with serial imaging. Case Description: An adult woman was followed in the outpatient setting for asymmetric septal hypertrophy and was receiving disopyramide and diltiazem, with clinical improvement and reduction of the intraventricular gradient; beta-blockers were avoided due to a history of severe bronchospasm. During routine evaluation, chest imaging was requested because of pulmonary comorbidity and showed a mediastinal opacity, prompting further investigation. Computed tomography characterized an aortic arch anomaly with an aberrant subclavian artery and the presence of Kommerell diverticulum, without signs of dissection. The patient denied dysphagia, odynophagia, dyspnea, or chest pain, and there was no clinical evidence of compression of adjacent structures; therefore, conservative management was chosen. After one year of follow-up, repeat imaging showed no progressive changes. Given the anatomic stability and persistent absence of symptoms, conservative treatment with clinical and imaging surveillance was maintained. Conclusions: Kommerell diverticulum may mimic a mediastinal mass and be incidentally diagnosed on routine imaging studies. In asymptomatic adults, anatomic characterization by computed tomography is essential for diagnostic confirmation and management planning. In this case, the absence of compressive symptoms and stability during follow-up supported conservative management with imaging surveillance, reserving intervention for symptom development, progressive enlargement, or aneurysmal complications.

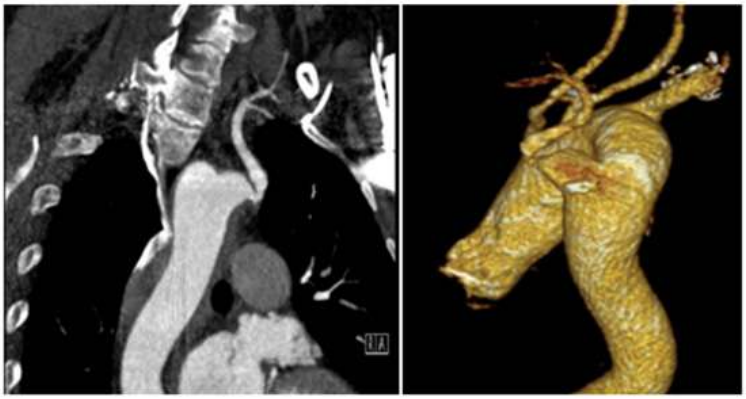


Figure 1. Aortic arch anomaly with an aberrant subclavian artery and presence of Kommerell diverticulum, with no signs of dissection.

17285

MITRAL ANNULAR DISJUNCTION AS AN OCCULT RISK FACTOR FOR SUDDEN CARDIAC DEATH IN ASYMPTOMATIC INDIVIDUALS: A CASE REPORT

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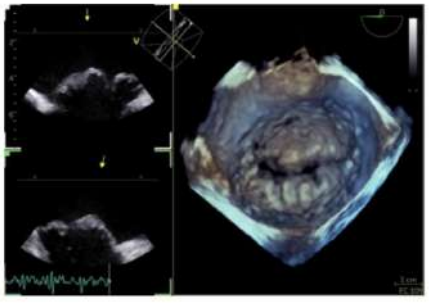
(1) PRONTO SOCORRO CARDIOLOGICO DE PERNAMBUCO - PROCAPE - RECIFE - PE - BRASIL;

Introduction: Mitral annular disjunction (MAD) is a structural abnormality associated with mitral valve prolapse (MVP) and ventricular arrhythmias, constituting an important substrate for sudden cardiac death (SCD). Case Description: A 32-year-old male patient previously assymptomatic suffered an out-of-hospital cardiopulmonary arrest (CPA) in a shockable rhythm, with 36 minutes of resuscitation. After the return of circulation, he suffered another CPA during transport. During the investigation, resting ECG revealed sinus rhythm, normal axis, and criteria for left ventricular hypertrophy (LVH). 24-hour Holter monitoring showed baseline sinus rhythm and low ventricular arrhythmia burden (31 isolated premature ventricular complexes, 14 in bigeminy, with no sustained or non-sustained ventricular tachycardia). Echocardiography, however, revealed severe mitral annulus disjunction (20 mm) associated with myxomatous prolapse and moderate regurgitation. The detailed transesophageal echocardiogram confirmed and characterized the valvular disease: thickened, redundant mitral leaflets with marked prolapse into the left atrium and mitral annular disjunction measuring 20 mm (Figure 1). Doppler study identified severe to moderate mitral regurgitation. Tissue Doppler imaging of the lateral mitral annulus showed a prominent S' wave (22.5 cm/s), consistent with the Pickelhaube sign, an echocardiographic marker of MAD. Three-dimensional echocardiographic image reconstruction also allowed morphological assessment of the valve, suggesting Barlow's disease as the etiology in this case (Figure 2). Cardiac magnetic resonance imaging could not be performed due to unavailability at the service. Material for genetic testing was collected, and the result is pending. After 60 days in the intensive care unit with severe complications (hypoxic-ischemic encephalopathy, status epilepticus, pulmonary infection, and renal dysfunction), the patient was stabilized. He received an implantable cardioverter-defibrillator (ICD) for secondary prevention and is awaiting mitral valve surgery for definitive correction. Conclusions: Mitral annulus disjunction is a high-risk anatomical marker for malignant arrhythmias and sudden cardiac death, especially when associated with mitral valve prolapse. Its diagnosis requires targeted echocardiographic investigation. Management should be multimodal, including ICD for secondary prevention and evaluation for surgical valve repair, essential to modify the prognosis of these patients.

Figure 1 – Transthoracic echocardiogram, parasternal long-axis view, revealing mitral annular disjunction of 20 mm.



Figure 2 - Three-dimensional reconstructed transesophageal echocardiographic image revealing myxomatous degeneration involving both valvular leaflets, associated with mitral annular disjunction.



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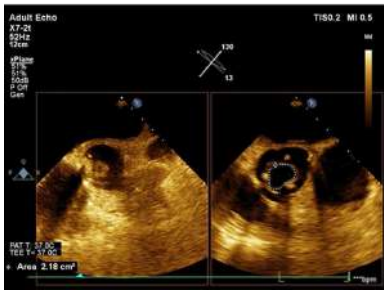
STRUCTURAL DEGENERATION OF AN AORTIC BIOPROSTHESIS VALVE AFTER 48 YEARS: A CASE REPORT

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Introduction: Aortic stenosis is the most prevalent valvular disease in Western countries, and aortic valve replacement is a common procedure. It is estimated that more than 400,000 aortic valve replacements are performed annually worldwide. Over the decades, the technological evolution of biological prostheses has represented significant advances in hemodynamics, tissue preservation techniques, and anticalcification treatments. Despite these advances, limited durability remains the main disadvantage of bioprostheses. The deterioration of bioprostheses within two decades of implantation is widely recognized, and data beyond that period are scarce and heterogeneous. Case Description: A 63-year-old male patient with a history of aortic valve disease and aortic coarctation, previously treated surgically with aortic valve replacement using a biological prosthesis in 1978, presented after 48 years of being asymptomatic and with well-controlled comorbidities. He developed dyspnea, and on physical examination, a holosystolic ejection murmur was detected in the aortic area, radiating to the mitral and tricuspid areas, suggestive of bioprosthesis dysfunction. A preoperative echocardiogram demonstrated a biological aortic prosthesis with fibrocalcific changes, an aortic valve area (AVA) of 0.7 cm², an estimated peak LV–Ao systolic gradient of 107 mmHg, and a mean gradient of 70 mmHg. Peak velocity was estimated at 5.2 m/s. The acceleration time (AT) was 140 ms. The patient underwent surgery, during which the old biological prosthesis was found to have a calcified and ruptured leaflet. It was replaced with a new biological prosthesis (N°. 23). The postoperative echocardiogram showed a normally functioning aortic bioprosthesis, without significant regurgitation on Doppler evaluation. The estimated peak LV–Ao systolic gradient was 16 mmHg, with a mean gradient of 8 mmHg. The effective orifice area was estimated at 2.1 cm² based on the continuity equation and planimetry. Following surgery, the patient had a favorable postoperative course and was discharged from the hospital 15 days after the procedure. Conclusions: Structural valve deterioration is an active, multifactorial process driven by calcification, inflammation, and mechanical stress, with freedom from degeneration of approximately 50% at 20 years. The continuous function of an aortic bioprosthesis over four decades, more than doubling the expected lifespan, represents one of the longest such reports in the literature.





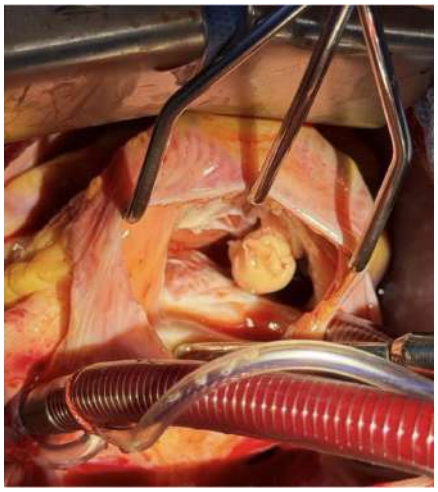
15105

TROPHOBLASTIC EMBOLIZATION OF THE TRICUSPID VALVE: A MIMIC OF CULTURE-NEGATIVE ENDOCARDITIS

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Introduction: Culture-negative endocarditis remains a major diagnostic challenge, traditionally attributed to fastidious pathogens or prior antimicrobial exposure. However, non-infectious mechanisms are increasingly recognized. In the postpartum setting, trophoblastic embolization represents an exceptionally rare and underrecognized entity capable of mimicking this condition. Case Description: A 19-year-old woman developed persistent fever, weight loss, and recurrent pulmonary embolic events following multiple uterine curettages for retained placental tissue after premature delivery. Transesophageal echocardiography revealed a progressively enlarging tricuspid vegetation, evolving to leaflet perforation and severe regurgitation. Despite prolonged broad-spectrum antimicrobial therapy, repeated blood cultures, serological, and molecular investigations remained negative. Multimodality imaging confirmed pulmonary embolism and persistent metabolic activity at the tricuspid valve. In the setting of progressive valvular destruction and ongoing embolization, surgical intervention was undertaken. Intraoperative findings confirmed a large vegetation (Figure 1), which was surgically excised (Figure 2), and valve repair was successfully achieved. Histopathological analysis demonstrated necrotic cellular aggregates consistent with degraded villous-trophoblastic material, with no evidence of infection. Conclusions: This case challenges the conventional infection-centered paradigm of endocarditis by highlighting trophoblastic embolization as a non-infectious substrate capable of mimicking culture-negative disease and driving progressive valvular injury. In postpartum patients with negative microbiological workup, alternative etiologies should be systematically considered. Histopathology is critical for diagnosis, and early surgical intervention may be required. Recognition of this mechanism has direct implications for clinical decision-making, particularly in distinguishing patients who may benefit from early surgical intervention rather than prolonged empirical antimicrobial therapy.





18875

WHEN CARDIAC MYXOMAS RECUR: A CASE OF CARNEY COMPLEX

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Introduction: Carney Complex is a rare autosomal dominant syndrome characterized by pigmented skin lesions, myxoid tumors, and endocrine abnormalities. Cardiac myxomas are the leading cause of mortality, typically presenting early in life, with multicentric involvement and a high recurrence rate. Pathogenic variants in PRKAR1A are central to diagnostic confirmation and disease characterization. Case Description: A 27-year-old woman presented with progressive dyspnea (now at minimal exertion), recurrent fever, and a 5kg weight loss over 5 months. She had undergone 3 prior cardiac surgeries for myxoma resection, involving distinct cardiac chambers over time: the left atrium at age 11, the right atrium 5 years later, and the right ventricle at age 21 (figure 1). Transthoracic echocardiography revealed a new right ventricular mass (figure 2) suggestive of tumor recurrence. She underwent surgical resection without complications, and histopathology confirmed a recurrent myxoma. Multidisciplinary evaluation identified extracardiac manifestations, including cutaneous lentiginosis and superficial angiomyxomas. Endocrine assessment demonstrated cyclic Cushing syndrome, hyperprolactinemia, and galactorrhea, refractory to medical therapy, leading to adrenalectomy. Pathology confirmed primary pigmented nodular adrenocortical disease (PPNAD). Whole-exome sequencing identified a pathogenic PRKAR1A variant (p.Glu11Glyfs*119), establishing the diagnosis of Carney Complex. The patient recovered uneventfully from the surgeries and is currently asymptomatic under outpatient follow-up. Conclusions: This case underscores the aggressive, multicentric, and recurrent nature of cardiac myxomas in Carney Complex. Early recognition is critical in young patients with recurrent tumors involving different cardiac chambers. A comprehensive multidisciplinary approach—including cardiology, endocrinology, genetics, dermatology, multimodality imaging, and pathology—is essential for accurate diagnosis, therapeutic planning, longitudinal long-term surveillance and family screening. The need for multiple cardiac surgeries throughout life represents a major challenge in these patients, given the increasing morbimortality associated with repeated procedures. To date, no therapies have been approved to reduce myxoma recurrence, and interventional management remains the only effective treatment strategy, either through surgical resection or, in selected cases, heart transplantation.





Sports Cardiology, Exercise, Ergometry and Cardiovascular Rehabilitation



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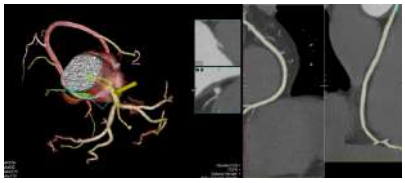
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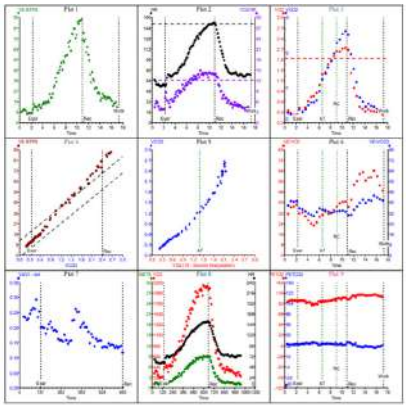
A HIGH-RISK CORONARY ANOMALY DIAGNOSED AFTER 35 MARATHONS: REDEFINING EXERCISE ELIGIBILITY IN A 70-YEAR-OLD ENDURANCE ATHLETE

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Introduction: Anomalous coronary arteries are classically associated with exercise-related sudden cardiac death in young athletes. However, some individuals may remain asymptomatic for decades despite high-risk anatomical features, raising important challenges regarding late diagnosis and sports eligibility. Case Description: A 70-year-old endurance athlete with a history of 35 completed marathons and ultramarathon participation underwent cardiovascular evaluation after incidental identification of a coronary artery anomaly. The patient had remained asymptomatic throughout decades of high-intensity physical activity. Coronary computed tomography angiography demonstrated anomalous origin of the right coronary artery from the left coronary sinus, with acute takeoff angle, elliptical proximal vessel morphology suggestive of dynamic compression, and an interarterial course between the aorta and pulmonary artery, consistent with high-risk anatomy. Despite the anatomical findings, multimodality evaluation demonstrated preserved cardiovascular performance. Transthoracic echocardiography and cardiac magnetic resonance imaging showed preserved biventricular systolic function, without myocardial fibrosis or late gadolinium enhancement. Functional ischemic assessment was negative. Cardiopulmonary exercise testing revealed excellent functional capacity, with peak VO2 of 34 mL/kg/min (124% of predicted) and physiological hemodynamic response to exercise. Only isolated and rare supraventricular and ventricular ectopy were observed during exertion and recovery. Current European sports cardiology guidelines acknowledge the paucity of evidence regarding exercise recommendations for patients older than 40 years with anomalous coronary arteries. Although restriction to moderate-intensity exercise was considered due to the recognized high-risk anatomical findings, the patient's high functional capacity, lifelong athletic performance, absence of symptoms, and lack of demonstrable ischemia made this decision particularly challenging. Conclusions: This case highlights the complexity of sports eligibility assessment in older athletes with anomalous coronary arteries. The dissociation between high-risk anatomical features and decades of uneventful endurance exercise emphasizes the limitations of current evidence and reinforces the need for individualized evaluation and shared decision-making in sports cardiology.





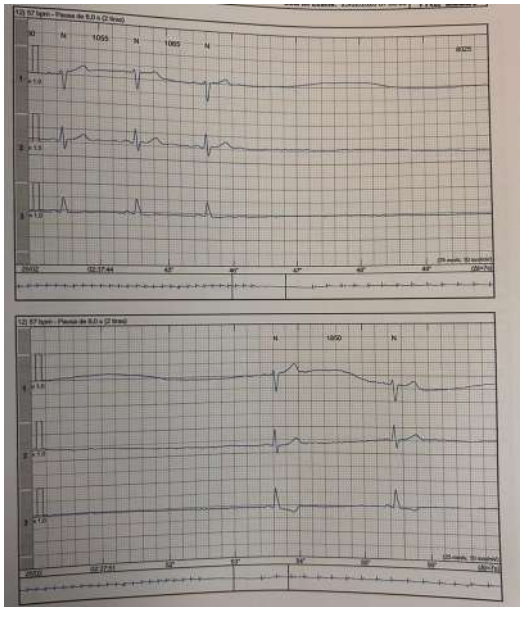
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EIGHT-SECOND SINUS PAUSE IN AN ELDERLY ULTRAMARATHON RUNNER: IS CARDIONEUROABLATION A THERAPEUTIC OPTION?

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Introduction: Prolonged sinus pauses are primarily caused by degenerative fibrosis in elderly individuals. But, they may also be associated with vagal hyperactivity. Factors that suggest this etiology are younger ages, an appropriate response to atropine testing, adequate chronotropic response, and the absence of structural heart disease. Case Description: A 77-year-old ultramarathon runner with no prior comorbidities or medication use and a baseline heart rate (HR) of 40 bpm, came for evaluation with 1.090 ventricular pauses, the longest one lasting 8 seconds, found on a routine 24-hour Holter monitor. Diagnostic investigation excluded hypothyroidism and electrolyte disturbances. Atropine testing showed a peak HR of 90 bpm. The electrocardiogram confirmed sinus bradycardia, atrial premature beats, and ventricular pauses. Exercise stress testing revealed appropriate hypertensive and chronotropic responses, and the patient reached 15.9 METs and remained asymptomatic. Transthoracic echocardiography showed preserved biventricular function with no segmental wall motion abnormalities. Coronary CT angiography showed no obstructive lesions (Calcium Score = 0). Cardiac MRI showed preserved biventricular function and no evidence of myocardial fibrosis. Polysomnography revealed moderate obstructive sleep apnea. A concurrent Holter monitor recorded frequent sinus pauses alternating with atrial or junctional escape rhythms. Findings were suggestive of enhanced vagal tone, and considering the severity of the ventricular pauses and age, therapeutic intervention was discussed. The patient declined pacemaker implantation. Therefore, cardioneuroablation (CNA) was performed without complications. The HR before the procedure was 33 bpm, and after CNA, it increased to 42 bpm. An atropine test further increased the HR to 53 bpm. Conclusions: This case highlights an etiology of prolonged sinus pause that, while uncommon at this age, must be considered. It is also crucial to define the mechanisms causing sinus node dysfunction. Management strategies may include discontinuation of medications, permanent pacemaker implantation, or cardioneuroablation. Cardioneuroablation may be considered, particularly if vagal hyperactivity is the main concern and there is a contraindication to pacemaker implantation.



15393

HEMODYNAMICALLY UNSTABLE VENTRICULAR TACHYCARDIA IN AN IRONMAN ATHLETE USING ANABOLIC STEROIDS AND LISDEXAMFETAMINE

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(1) UNIVERSIDADE VILA VELHA - VILA VELHA - ES - BRASIL;

Introduction: The use of anabolic steroids (AS) is common among high-performance athletes. The association with other performance-enhancing substances has become increasingly frequent, leading to a rise in cardiovascular abnormalities and greater predisposition to arrhythmias and sudden cardiac death (SCD). We report a case of hemodynamically unstable tachyarrhythmia in an AS user concomitantly using lisdexamfetamine. Case Description: A 27-year-old male high-performance athlete (Ironman competitor), on anabolic steroids (AS) for 24 months and lisdexamfetamine 70 mg once daily for the past 6 months, presented to the Emergency Department with palpitations and syncope following intense training. He was diagnosed with hemodynamically unstable ventricular tachycardia and promptly treated with electrical cardioversion at 100 J. Physical examination was unremarkable. Biochemical workup was normal after cardioversion, as was the post-cardioversion ECG, which was consistent with an athlete's ECG pattern (sinus bradycardia, early repolarization, left ventricular hypertrophy, incomplete right bundle branch block). The patient underwent echocardiography, cardiac magnetic resonance imaging (MRI), 24-hour Holter monitoring, cardiopulmonary exercise testing (CPET), and genetic testing. Cardiac MRI demonstrated only mild enlargement of the left ventricle and left atrium, with no late gadolinium enhancement and no signs of ischemia. Maximal CPET was unremarkable. Echocardiographic findings were consistent with cardiac MRI results, and 24-hour Holter monitoring was also normal. Genetic testing revealed no relevant pathogenic variants. Return to athletic activity was authorized 30 days after CPET completion and discontinuation of all substances. At 12-month follow-up, the patient remains asymptomatic. Conclusions: Prolonged AS use has been associated with dopamine store depletion, manifesting as reduced performance. Athletes may respond in three ways: 1) attributing decline to insufficient training, leading to overtraining; 2) increasing AS doses, heightening arrhythmic risk; or 3) seeking dopamine-replenishing agents — such as lisdexamfetamine — further increasing arrhythmic susceptibility. The third pathway is the most likely mechanism underlying the arrhythmia described in this case.

Women's Cardiology



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17082

CHRONIC TESTOSTERONE EXPOSURE AND DYSAUTONOMIA: A CASE OF PERSISTENT TACHYCARDIA FOLLOWING HORMONAL REDUCTION

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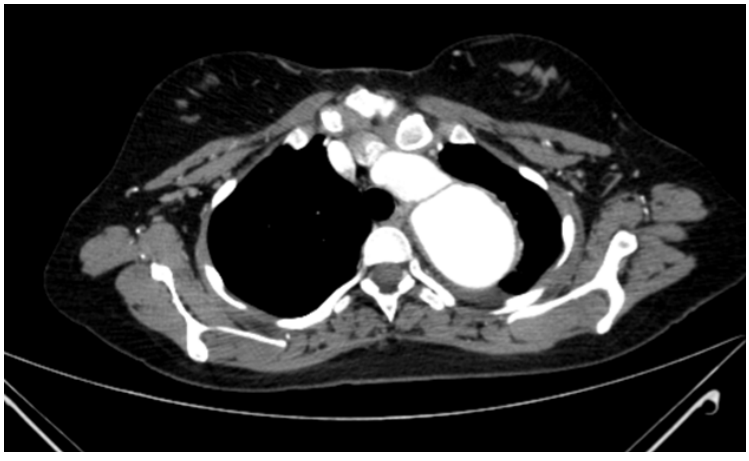
Introduction: Background: Supraphysiological testosterone therapy is increasingly prescribed off-label in postmenopausal women. Chronic exposure to male-range androgen concentrations may induce neuroendocrine adaptation. The cardiovascular consequences of relative androgen reduction in this context remain poorly described. Case Description: Case report: A 63-year-old woman presented with resting and exertional sinus tachycardia, orthostatic and heat-induced presyncope, progressive fatigue, subjective muscle weakness, insomnia, absent libido and nocturnal hot flushes. She had received combined oestrogen, progesterone and testosterone therapy for 14 years for aesthetic purposes. Serial measurements between 2015 and 2021 documented total testosterone persistently within the male reference range, with peak values of 519 ng/dL and 503 ng/dL. Approximately three years prior to presentation, testosterone dosage was reduced, coinciding with progressive onset of symptoms. At evaluation, total testosterone remained elevated for females (104 ng/dL; reference <63 ng/dL) and free testosterone 70.2 pg/mL (reference 2.4–37 pg/mL), though substantially lower than prior levels. Echocardiography was normal (LVEF 70%). Twenty-four-hour Holter monitoring demonstrated sinus tachycardia (69–160 bpm) with isolated ectopic beats and no complex arrhythmias. Exercise testing showed 7.22 METs without ischaemia. Thyroid and adrenal dysfunction were excluded. Background history included chronic hypotension (90/60 mmHg), recurrent syncope since adolescence, family history of dysautonomia, and prior iliac vein thrombosis treated with stenting. Concomitant medications were atomoxetine 10 mg daily and quetiapine 12.5 mg nightly. Conclusions: Excluding structural heart disease and endocrine causes, the clinical picture was interpreted as androgen withdrawal syndrome due to neuroadaptation following prolonged supraphysiological exposure. Maintaining male-range testosterone levels for over a decade meant subsequent reductions—even to levels above female physiological norms—functionally resembled androgen deficiency. Pre-existing constitutional dysautonomia and concomitant medications likely exacerbated the autonomic instability. Thus, a relative reduction in chronic testosterone exposure may be linked to persistent sinus tachycardia in postmenopausal women. Awareness of this presentation is crucial when evaluating unexplained autonomic symptoms in patients receiving long-term exogenous androgens.

17977

MANAGEMENT OF CHRONIC TYPE B AORTIC DISSECTION WITH ANEURYSMAL DEGENERATION DURING PREGNANCY: A STAGED HYBRID STRATEGY

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Introduction: Aortic dissection (AD) during pregnancy is a rare but potentially fatal condition, driven by hemodynamic and hormonal changes that increase aortic wall vulnerability, particularly in patients with underlying aortopathies. While most cases involve the ascending aorta, type B dissection with aneurysmal degeneration in pregnancy and genetic syndromes poses significant diagnostic and therapeutic challenges, requiring individualized management to balance maternal and fetal risks. Case Description: An 18-year-old woman at 12 weeks of pregnancy, with a history of bicuspid aortic valve and prior ascending aortic replacement with a Dacron graft and aortic valve repair at another institution (limited available data), was admitted after detection of a new cardiac murmur and reduced lower limb pulses, despite being asymptomatic. She had no prior diagnosis or phenotypic features suggestive of Marfan syndrome. Aortic CT angiography revealed a chronic descending thoracic aortic dissection (Stanford type B) with aneurysmal degeneration, measuring 7.5 cm in diameter and extending approximately 16 cm distal to the left subclavian artery. Given the high maternal risk, a staged strategy was proposed. However, delays in obtaining a customized endovascular graft, requiring legal authorization, and patient preference led to continuation of pregnancy. As the patient remained stable, a multidisciplinary team (cardiology and obstetrics) opted for close monitoring, aiming for fetal maturity. Cesarean delivery was performed at 32 weeks without complications. This was followed by supra-aortic trunk revascularization (carotid-carotid and left carotid-subclavian bypass) and thoracic endovascular aortic repair (TEVAR) with a custom graft. Control arteriography showed complete exclusion of the dissection and aneurysm, without endoleaks, and uneventful recovery. Genetic testing, obtained postoperatively during outpatient follow-up, identified a pathogenic mutation in the FBN1 gene, confirming Marfan syndrome. Conclusions: Pregnancy-associated AD with underlying genetic aortopathy and aneurysmal degeneration carries high risk and often requires intervention. This case demonstrates that a staged hybrid approach, integrating delayed delivery and endovascular repair within a multidisciplinary framework, is feasible and effective, even in complex clinical and logistical scenarios, with favorable maternal and fetal outcomes.

18781

METHYLDOPA-INDUCED ACUTE HEPATITIS: A DIAGNOSIS TO BE REMEMBERED

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(1) REDE MATER DEI DE SAUDE - BELO HORIZONTE - MG - BRASIL;

Introduction: Introduction: Methyldopa is considered a safe medication for the treatment of hypertension during pregnancy. Hepatitis secondary to its use is rare; however, it is a serious adverse effect that may be fatal. It is believed that hepatitis occurs due to abnormal metabolism by cytochrome P450 associated with an immune reaction to the resulting metabolite. Liver injury usually begins between 1 and 20 weeks after medication initiation, although cases have been reported up to 2 months postpartum. Case Description: Case description: A 35-year-old pregnant woman with asthma, previous history of preeclampsia (PE), and preterm delivery at 33 weeks was undergoing regular prenatal care and was using acetylsalicylic acid and calcium supplementation during the current pregnancy. At 15 weeks of gestation, she was referred for cardio-obstetric evaluation due to elevated blood pressure. Hypertension was confirmed, and methyldopa therapy was initiated.At 17 weeks, she developed a respiratory infection and was treated with amoxicillin/clavulanate. At 19 weeks, routine laboratory tests revealed a significant increase in liver transaminases, leading to hospital admission for further investigation. Viral hepatitis serologies and abdominal ultrasonography were normal. Drug-induced hepatitis secondary to amoxicillin/clavulanate was initially suspected, and close monitoring with serial laboratory testing was chosen. After stabilization of transaminase levels and in the absence of signs of liver failure, the patient was discharged for outpatient follow-up. However, liver enzymes increased again, accompanied by elevated bilirubin levels and jaundice, leading to readmission at 24 weeks of gestation. Autoimmune investigation and portal vein thrombosis screening were both negative. After discussion with the gastroenterology team, methyldopa was discontinued as a therapeutic test and replaced with nifedipine. Liver enzymes and bilirubin levels progressively decreased and subsequently normalized, supporting the diagnosis of probable methyldopa-induced acute hepatitis. The patient had a favorable clinical course, but developed preeclampsia and underwent cesarean delivery at 37 weeks. Conclusions: Conclusion: Although rare, methyldopa-induced acute hepatitis is a diagnosis that should be considered in patients presenting with compatible clinical findings and laboratory abnormalities. The treatment of gestational hypertension remains challenging, and cardiology follow-up is essential to achieve better outcomes.

Table 1. Laboratory Evolution During Pregnancy

Clinical Course	AST	ALT	ALP	GGT	TB	DB	IB	INR
1st hospitalization	289	458			0.52	0.1	0.42	
	456	749	57	35	0.64	0.01	0.63	1.0
	733	1118			0.65	0.11	0.54	1.0
2nd hospitalization	>1500	2118	176	83	1.9	1.4	0.5	1.0
	>1500	>2250			6.8	5.5	1.3	1.0
10 days after discontinua	>750	1767	138	71	0.6	0.3	0.3	1.0
1 month after discontinua	52	68	106	36	1.1	0.8	0.3	1.0

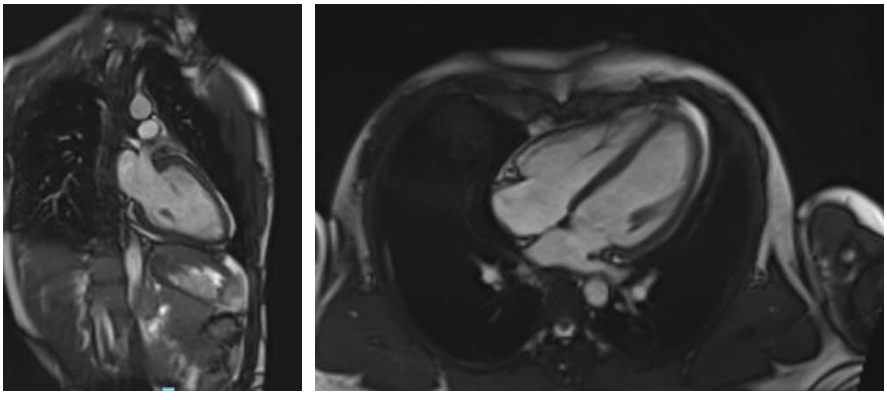
AST = aspartate aminotransferase; ALT = alanine aminotransferase; ALP = alkaline phosphatase; GGT = gamma-glutamyl transferase; TB = total bilirubin; DB = direct bilirubin; IB = indirect bilirubin; INR = international normalized ratio.

15924

Testosterone-Associated Myocarditis in a Female Patient: An Unusual Clinical Presentation

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(1) UNIPE - JOÃO PESSOA - PB - Brasil; (2) UNIVERSIDADE FEDERAL DA PARAIBA - JOÃO PESSOA - PB - Brasil;



Introduction: Myocarditis is an inflammatory disease of the myocardium with heterogeneous clinical presentation and multiple etiologies. Although infectious causes are the most common, drug-induced myocarditis remains underrecognized. Experimental and clinical data suggest that androgens may modulate immune response, promote myocardial inflammation, and contribute to adverse cardiovascular remodeling. However, its cardiovascular safety in women remains poorly defined, particularly in the context of off-label use. Case Description: A 24-year-old woman with endometriosis had been using exogenous testosterone for four months when she presented with acute, non-radiating chest pain lasting approximately five days, with progressive worsening, without hemodynamic instability. Laboratory tests revealed elevated C-reactive protein (26 mg/L) and an initial high-sensitivity troponin level of 684 ng/L, with a progressive increase during hospitalization, peaking above 5000 ng/L. Electrocardiogram showed sinus rhythm, left axis deviation, and an early repolarization pattern. Transthoracic echocardiography demonstrated preserved left ventricular ejection fraction (72%). Pulmonary embolism was excluded by tomography pulmonary angiography, and noninvasive coronary evaluation showed no evidence of atherosclerotic disease. Cardiac magnetic resonance imaging revealed subepicardial late gadolinium enhancement in the inferolateral wall, along with mild pericardial thickening and a small pericardial effusion, consistent with non-ischemic myocarditis. Viral serologies and autoimmune workup were negative. Total testosterone levels were above 800 ng/dL. The patient showed clinical improvement with nonsteroidal anti-inflammatory therapy, with a progressive decline in troponin levels to 50 ng/L at discharge and normalization (<1.5 ng/L) at one-week follow-up. N-terminal pro–B-type natriuretic peptide levels decreased from 726 pg/mL during hospitalization to 85 pg/mL on follow-up. Conclusions: This case suggests a possible association between exogenous testosterone use and myocarditis in a female patient. After extensive etiological investigation with negative results for infectious, autoimmune, and ischemic causes, androgen use emerged as the most likely underlying factor. Given the increasing off-label use and the limited data regarding cardiovascular safety in this population, this case highlights the need for caution and further investigation into the effects of androgen therapy in women.

SCIENTIFIC INITIATION POSTER – ORIGINAL RESEARCH



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Acute Cardiovascular Care / Cardiovascular Emergencies



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16969

ASSOCIATION BETWEEN LEFT ATRIAL ENLARGEMENT AND ACUTE ISCHEMIC STROKE SEVERITY: EVIDENCE FROM A BRAZILIAN REFERRAL CENTER

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Introdução/Fundamentos: Stroke remains one of the leading causes of death and disability worldwide, with ischemic stroke accounting for most cases. Left atrial enlargement (LAE) has emerged as an important marker of cardiovascular remodeling and has been associated with increased risk of ischemic stroke, even in the absence of atrial fibrillation. However, evidence regarding the relationship between LAE and stroke severity as well as functional outcomes remains limited. Objetivos: To investigate the impact of left atrial enlargement (LAE) on acute ischemic stroke severity. Métodos: Prospective cohort study conducted with patients with ischemic stroke admitted to a semi-intensive stroke care unit in Bahia, Brazil, between November 2017 and November 2025. Stroke severity was assessed at admission using the National Institutes of Health Stroke Scale (NIHSS). Left atrial enlargement was defined by transthoracic echocardiography primarily as a left atrial diameter >38 mm in women and >40 mm in men. For a supplementary analysis, left atrial volume index > 34 ml/m² was considered. Multiple linear regression models were used to assess the association between LAE and stroke severity, adjusting for relevant confounders. Resultados e Conclusões: A total of 1,009 patients were included in the severity analysis, of whom 322 (31.9%) had left atrial enlargement. LAE was independently associated with higher admission NIHSS scores (B = 1.118; 95% CI 0.300–1.936; p = 0.007). In the supplementary analysis restricted to patients with available indexed left atrial volume data, findings were consistent, with indexed left atrial volume also associated with greater stroke severity (n = 281, B = 2.377; 95% CI 0.911–3.843; p = 0.002). These findings suggest that atrial structural remodeling may influence the acute clinical expression of ischemic stroke, even in the absence of AF. Given that left atrial diameter is a simple and widely available echocardiographic parameter, it may serve as a practical marker to help identify patients at risk of more severe stroke presentations.

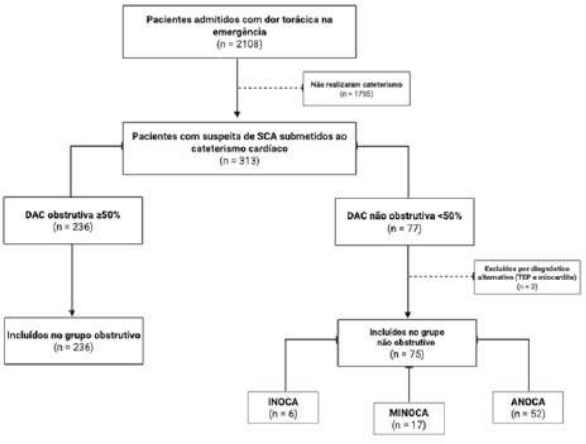
16811

CLINICAL PROFILE OF CHEST PAIN PRESENTATION IN PATIENTS WITH ACUTE CORONARY SYNDROME: COMPARISON BETWEEN OBSTRUCTIVE AND NON-OBSTRUCTIVE CORONARY ARTERY DISEASE IN A TERTIARY CENTER

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Introdução/Fundamentos: Chest pain characteristics in acute coronary syndrome (ACS) may overlap between patients with obstructive and non-obstructive coronary artery disease (CAD). Although typical pain is classically associated with obstructive CAD, non-obstructive presentations may also involve anginal symptoms, making initial clinical differentiation difficult. Objetivos: To compare the clinical profile of chest pain at admission between patients with ACS and obstructive versus non-obstructive CAD in a tertiary center. Métodos: Prospective cohort study including patients hospitalized with ACS in a tertiary hospital between 02/09/2024 and 01/09/2026 who underwent coronary angiography. Patients with a final diagnosis other than ACS, including endocarditis, myocarditis, and pulmonary thromboembolism, were excluded. Obstructive CAD was defined as stenosis ≥50% in at least one major epicardial coronary artery. Non-obstructive CAD was defined as atherosclerosis <50% and absence of plaque instability on intravascular ultrasound, when available. Demographic and clinical data were collected during hospitalization. Categorical variables were expressed as absolute values and percentages, and continuous variables as mean ± standard deviation. The chi-square test and Student's t-test were used. Statistical significance was set at p<0.05. Resultados e Conclusões: A total of 311 patients were evaluated. Of these, 236 (75.9%) had obstructive CAD and 75 (24.1%) comprised the non-obstructive ACS group, including 17 with MINOCA, 6 with INOCA, and 52 with ANOCA. Female sex: 81 (34.3%) vs. 44 (58.7%); p<0.001. Mean age: 67.83 ± 10.75 vs. 66.84 ± 10.77 years; p=0.490. Chest pain at admission: 170 (72.0%) vs. 53 (70.7%); p=0.819. Pain-type distribution differed between groups: type A chest pain, 77 (32.6%) vs. 12 (16.0%); type B, 107 (45.3%) vs. 34 (45.3%); type C, 37 (15.7%) vs. 20 (26.7%); anginal equivalent, 14 (5.9%) vs. 5 (6.7%); and unspecified record, 1 (0.4%) vs. 4 (5.3%); p=0.001, respectively for the obstructive and non-obstructive groups. In patients with ACS, the presence of chest pain at admission was similar between those with obstructive and non-obstructive CAD. Although type A pain was more frequent in obstructive CAD, the overlap in symptom presentation reinforces that pain characteristics alone cannot safely distinguish obstructive from non-obstructive coronary disease.



17079

COAGULOPATHY AND INFLAMMATORY PROFILE PREDICT INCIDENT ATRIAL FIBRILLATION IN HOSPITALIZED HEART FAILURE: A PHENOTYPIC AND PROGNOSTIC ANALYSIS

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Introdução/Fundamentos: Atrial fibrillation (AF) frequently complicates heart failure (HF), but the laboratory signature and prognostic relevance of AF newly detected during acute hospital presentation remain poorly characterized. Objetivos: To identify the phenotype and prognostic impact of incident AF in patients with HF admitted via the emergency department (ED). Métodos: Retrospective cohort from a publicly available text-enriched ED database. HF was defined by ICD-10 I50.x; incident AF as AF detected after admission and absent on the initial ECG, ascertained via validated regular expressions over clinical text. Patients with current or prior atrial flutter (ICD I48.3, I48.4, I48.92 or text mention) were excluded. Laboratories were z-scored after multicollinearity control (variance inflation factor below 5). Logistic regression was adjusted for age, sex and chronic kidney disease (CKD). HF-specificity was tested through lab-by-HF interaction against a non-HF cardiac control cohort. Prognostic incremental value was assessed by delta-AUC and likelihood-ratio (LR) tests over a base demographic model. Outcomes: in-hospital, 30-day and 1-year mortality and 30-day readmission. Resultados e Conclusões: After flutter exclusion, 1,884 HF patients (incident AF rate 28.4%) were compared with 1,580 non-HF cardiac controls (14.5%; OR for HF 2.34, 95%CI 1.97-2.78). Adjusted lab predictors per 1 standard deviation included prothrombin time (OR 1.83, 1.62-2.06), MCHC (0.80, 0.72-0.89), red cell distribution width (1.24, 1.12-1.37), albumin (0.81, 0.73-0.90) and neutrophils (1.26, 1.12-1.43). Prothrombin time, INR, neutrophils, lymphocytes, creatine kinase and partial thromboplastin time showed significant HF-specific interaction (all p<0.01); albumin, MCHC and RDW behaved as global frailty markers. Incident AF was independently associated with in-hospital (OR 1.98, 1.10-3.58), 30-day (1.90, 1.26-2.88) and 1-year mortality (1.76, 1.39-2.22). Adding incident AF to the demographic model improved discrimination (delta-AUC +0.020 at 30 days, +0.017 at 1 year; LR p<0.01). Readmission at 30 days did not differ. In hospitalized HF patients, incident AF presents a HF-specific signature dominated by coagulopathy and inflammation and carries independent prognostic value beyond age, sex and CKD. AF emerging during acute presentation represents a distinct phenotype warranting dedicated risk stratification.

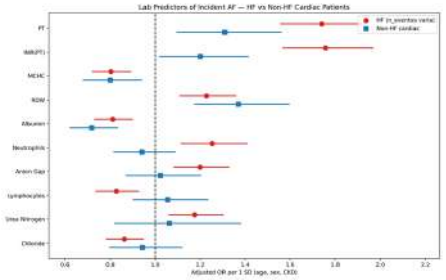


Figure 1. Forest plot of laboratory predictors of incident atrial fibrillation in heart failure (HF) versus non-HF cardiac controls. Adjusted odds ratios per 1 standard deviation. Coagulation markers (prothrombin time, INR, partial thromboplastin time), inflammatory cells (neutrophils, lymphocytes) and creatine kinase showed significant HF-specific interaction (all p<0.01); albumin, MCHC and red cell distribution width behaved as global frailty markers.

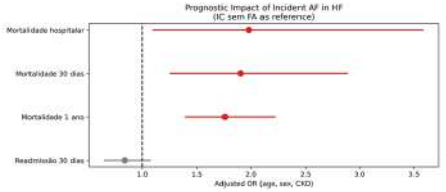


Figure 2. Independent prognostic value of incident atrial fibrillation in hospitalised heart failure patients. Adjusted odds ratios for in-hospital, 30-day and 1-year mortality, beyond age, sex and chronic kidney disease. Adding incident AF to the demographic model improved discrimination (delta-AUC +0.020 at 30 days, +0.017 at 1 year; LR p<0.01).

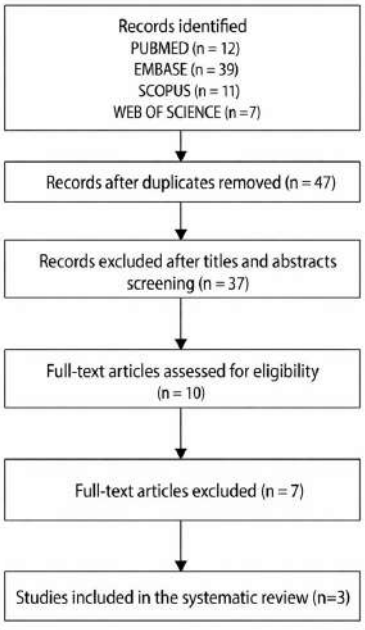
16269

COLCHICINE IN THE POST–ACUTE MYOCARDIAL INFARCTION SETTING: IMPACT ON THE REDUCTION OF MAJOR CARDIOVASCULAR EVENTS - A SYSTEMATIC REVIEW OF RANDOMIZED CLINICAL TRIALS

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Introdução/Fundamentos: Acute myocardial infarction (AMI) is characterized by myocyte necrosis resulting from reduced coronary arterial blood flow, leading to often irreversible injury and, in severe cases, death. In this context, as it represents the leading cause of death in Brazil, the implementation of effective therapeutic strategies in the post-AMI period is essential to reduce morbidity and mortality in this population. Objetivos: To evaluate the efficacy and safety of colchicine in reducing adverse cardiovascular events in post-AMI patients. Métodos: A systematic review conducted in accordance with PRISMA guidelines. Searches were performed in PubMed, EMBASE, and Web of Science, including placebo-controlled randomized clinical trials published between 2021 and 2026. The following MeSH/DeCS terms were used: (colchicine) AND (myocardial infarction) AND (clinical trial). Original studies assessing outcomes of colchicine administration in post-AMI patients were included. After screening, a total of 8 studies were deemed eligible for review. A qualitative synthesis of findings was performed without meta-analysis due to methodological heterogeneity among the included studies. Resultados e Conclusões: The included studies showed predominantly neutral results regarding the efficacy of colchicine in post-AMI patients. In a trial with 7,062 patients, the composite endpoint occurred in 9.1% of the colchicine group versus 9.3% in the placebo group (HR 0.99; 95% CI 0.85–1.16; p=0.93), with no reduction in major cardiovascular events. Consistently, no significant differences were observed in infarct size (26.0 g vs. 28.4 g; p=0.87), ejection fraction, ventricular remodeling, or CRP levels. Some findings suggest potential benefits, such as a trend toward reduced atrial fibrillation and decreased biomarkers (MMP-9, NOX2, and TGF-β) in subgroups without revascularization (p<0.05). On the other hand, there was a higher incidence of gastrointestinal adverse effects (up to 34.4% vs. 10.1%) and an early increase in left ventricular thrombus (22.2% vs. 7.4%; p=0.01). It is concluded that colchicine did not demonstrate consistent clinical benefit in improving adverse cardiovascular outcomes in post-AMI patients.



15760

COMPARATIVE EFFECTIVENESS AND SAFETY OF RIVAROXABAN VERSUS APIXABAN IN VENOUS THROMBOEMBOLISM: A SYSTEMATIC REVIEW AND META-ANALYSIS OF 248,579 PATIENTS

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Introdução/Fundamentos: Direct oral anticoagulants, particularly Rivaroxaban and Apixaban, are widely used for the treatment and secondary prevention of Venous Thromboembolism (VTE). However, direct comparative evidence regarding their effectiveness and safety remains limited. Objetivos: This study aims to evaluate the comparative effectiveness and safety of rivaroxaban versus apixaban in patients with VTE. Métodos: PubMed, Embase, and Web of Science were systematically searched from inception to March 2026. We included randomized controlled trials (RCTs) and cohort studies comparing apixaban and rivaroxaban in patients with VTE. The primary outcomes were VTE recurrency and major bleeding, defined according to the criteria of the International Society on Thrombosis and Haemostasis (ISTH). Secondary outcomes included intracranial (ICB) and gastrointestinal (GIB) bleeding, and all cause mortality. Risk ratios (RRs) with 95% confidence intervals (CIs) were pooled using a random-effects model. Statistical heterogeneity was assessed using the I^2 statistic, and publication bias was evaluated with funnel plots and Egger's test when applicable. Resultados e Conclusões: Twelve studies including 248,579 patients were analyzed (144,405 in the apixaban group and 104,174 in the rivaroxaban group). Apixaban was associated with an overall significantly lower risk of major bleeding (RR: 0.77; 95% CI 0.72–0.81) and VTE recurrence (RR: 0.91; 95% CI 0.85–0.95) compared with rivaroxaban. However, no significant differences were observed for either outcome at 3 months or 5 years, indicating that these differences were not sustained over time. There was no significant difference in the risk of ICB (RR: 0.99; 95% CI: 0.74–1.31), GIB (RR 0.82; 95% CI 0.63-1.06), and all-cause mortality (RR 0.96; 95% CI 0.85-1.08) between groups. Apixaban may provide a more favorable overall balance between efficacy and safety than rivaroxaban in patients with VTE, although this advantage appears less evident at very early and long-term follow-up. Further large-scale prospective studies are needed to confirm the durability of these findings.

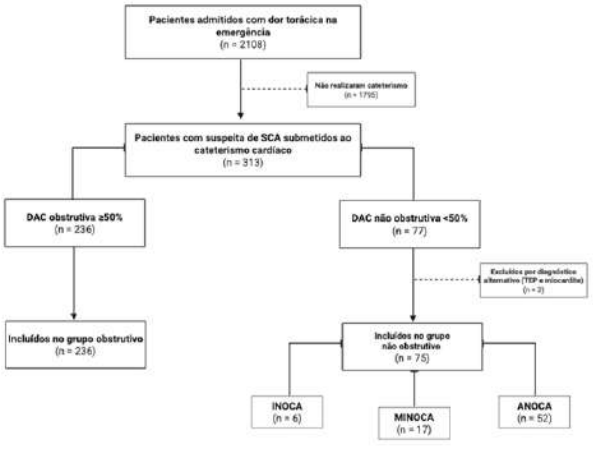
17117

COMPARISON OF THE GRACE SCORE IN PATIENTS WITH ACUTE CORONARY SYNDROME: OBSTRUCTIVE VERSUS NON-OBSTRUCTIVE CORONARY ARTERY DISEASE

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Introdução/Fundamentos: The GRACE score is widely used for prognostic stratification in patients with acute coronary syndrome (ACS). However, its application in patients with ACS without obstructive coronary artery disease (CAD) on catheterization remains less well defined, with limited evidence in this population. Objetivos: To compare GRACE score values between patients hospitalized with ACS and obstructive versus non-obstructive CAD in a tertiary center and to describe the demographic profile of the groups. Métodos: Prospective cohort study including patients hospitalized with ACS in a tertiary hospital between 02/09/2024 and 01/09/2026 who underwent coronary angiography. Patients with a final diagnosis other than ACS, including endocarditis, myocarditis, and pulmonary thromboembolism, were excluded. Demographic, clinical, and laboratory data were collected during hospitalization. Obstructive CAD was defined as stenosis ≥50% in at least one major epicardial coronary artery. Non-obstructive CAD was defined as atherosclerosis <50% and absence of plaque instability on intravascular ultrasound, when available. Categorical variables were expressed as absolute values and percentages, and continuous variables as mean ± standard deviation. The chi-square test and Student's t-test were used. Statistical significance was set at p<0.05. Resultados e Conclusões: During the study period, 2,108 patients were evaluated, of whom 313 had ACS and underwent coronary angiography. After exclusions, 311 patients comprised the final cohort. Of these, 236 (75.9%) had obstructive CAD and 75 (24.1%) comprised the non-obstructive ACS group. Female sex: 81 (34.3%) vs. 44 (58.7%); p<0.001. Mean age: 67.83 ± 10.75 vs. 66.84 ± 10.77 years; p=0.490. GRACE score did not differ between groups: 99.25 ± 28.90 vs. 92.59 ± 25.79; p=0.087. In patients with ACS undergoing coronary angiography, GRACE score values were similar between those with obstructive and non-obstructive CAD. In this cohort, non-obstructive ACS accounted for 24.1% of the sample, reinforcing the need for complementary methods beyond the clinical score for anatomical and functional evaluation, as well as for improved risk stratification and treatment personalization.



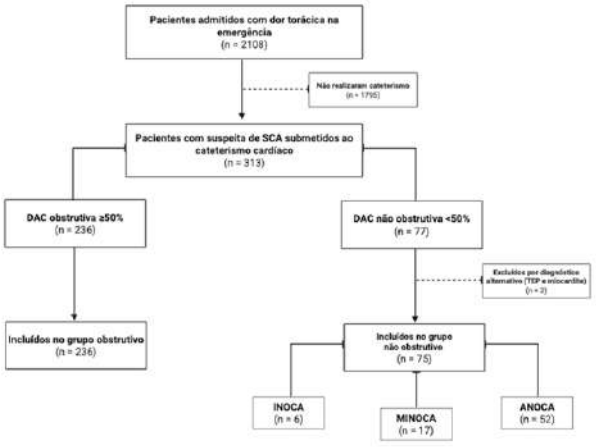
16781

COMPARISON OF THE HEART SCORE IN PATIENTS WITH ACUTE CORONARY SYNDROME: OBSTRUCTIVE VERSUS NON-OBSTRUCTIVE CORONARY ARTERY DISEASE

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Introdução/Fundamentos: The HEART score is widely used for risk stratification in patients with chest pain and suspected acute coronary syndrome (ACS). However, its application in patients with ACS without obstructive coronary artery disease (CAD) on catheterization remains less well defined regarding its ability to differentiate distinct anatomical phenotypes. Objetivos: To compare HEART score values between patients hospitalized with ACS and obstructive versus non-obstructive CAD in a tertiary center and to describe the demographic profile of the groups. Métodos: Prospective cohort study including patients hospitalized with ACS in a tertiary hospital between 02/09/2024 and 01/09/2026 who underwent coronary angiography. Patients with a final diagnosis other than ACS, including endocarditis, myocarditis, and pulmonary thromboembolism, were excluded. Demographic, clinical, and laboratory data were collected during hospitalization. Obstructive CAD was defined as stenosis ≥50% in at least one major epicardial coronary artery. Non-obstructive CAD was defined as atherosclerosis <50% and absence of plaque instability on intravascular ultrasound. Categorical variables were expressed as absolute values and percentages, and continuous variables as mean ± standard deviation. The chi-square test and Student's t-test were used. Statistical significance was set at p<0.05. Resultados e Conclusões: A total of 311 patients comprised the final cohort. Of these, 236 (75.9%) had obstructive CAD and 75 (24.1%) comprised the non-obstructive ACS group. Female sex was more frequent in the non-obstructive than in the obstructive CAD group: 44 (58.7%) vs. 81 (34.3%); p<0.001. Mean age was 67.83 ± 10.75 years in the obstructive CAD group and 66.84 ± 10.77 years in the non-obstructive ACS group; p=0.490. HEART score was 5.12 ± 1.24 in the obstructive CAD group and 4.78 ± 1.09 in the non-obstructive ACS group; p=0.094. In patients with ACS undergoing coronary angiography, HEART score values were similar between those with obstructive and non-obstructive CAD. In this cohort, initial assessment using the HEART score did not differentiate the anatomical CAD phenotypes, supporting the need for complementary approaches for better anatomical characterization.



21369

COST, LENGTH OF STAY, AND IN-HOSPITAL MORTALITY FROM ACUTE MYOCARDIAL INFARCTION ACROSS BRAZILIAN REGIONS: AN ECOLOGICAL ANALYSIS OF SIH/SUS DATA (2020–2024)

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Introdução/Fundamentos: Acute myocardial infarction (AMI) is one of the leading causes of in-hospital mortality in Brazil, representing 5,95% of the total deaths in the period. Regional disparities in healthcare access, density of specialized centers, and transportation infrastructure may directly influence clinical outcomes and care costs. The analysis of hospital indicators by region is a relevant tool for identifying inefficiencies and guiding cardiovascular health policies. Objetivos: To investigate whether Brazilian regions with higher mean cost per AMI hospitalization paradoxically present longer hospital stays and higher in-hospital mortality, testing the hypothesis that elevated costs reflect structural deficiencies rather than greater care resoluteness. Métodos: Cross-sectional, ecological, retrospective, and analytical study based on secondary data from the SIH/SUS, obtained through DATASUS, evaluating AMI hospitalizations by Brazilian region, mean hospital procedure cost per admission, mean length of stay (total inpatient days/number of admissions), and in-hospital mortality rate from 2020 to 2024. Resultados e Conclusões: The North region recorded the highest mean cost per AMI hospitalization (BRL 1,587.75) and the longest mean length of stay (8.14 days), while the South region presented the lowest values for both indicators (BRL 913.61 and 5.39 days, respectively). A direct and consistent association between cost and length of stay was observed across all regions. Regarding in-hospital mortality, the Northeast recorded the highest rate (10.20%), followed by the North (8.97%), Southeast (8.74%), South (8.20%), and Center-West (7.34%). The association between prolonged stays and higher costs suggests that longer hospitalizations in the North do not reflect greater care resoluteness, but rather late presentation with more severe clinical conditions, a hypothesis consistent with the region's geographical barriers, low density of hemodynamic services, and logistical challenges. Limitations include the ecological design, which precludes individual-level causal inference, and the inherent constraints of secondary administrative data. These findings reinforce the need for regionalized AMI care policies, prioritizing timely reperfusion access in the North and Northeast regions.

Data source: DATASUS / SIH-SUS · Period: 2020-2024 · Classification: Original Research

Region	Mean hospitalization cost (BRL)	Mean length of stay (days)	In-hospital mortality rate (%)
North	1,587.75	8.14	8.97
Southeast	1,407.53	7.03	8.74
Northeast	1,160.74	7.64	10.20
Central-West	1,096.56	6.17	7.34
South	913.61	5.39	8.20

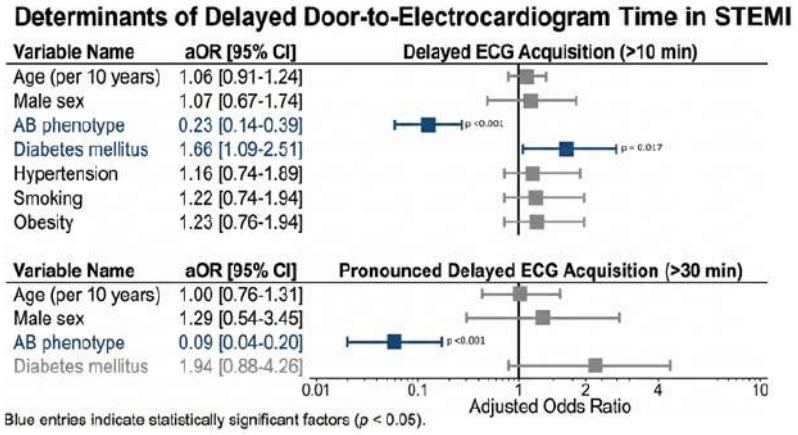
17553

DETERMINANTS OF DELAYED DOOR-TO-ECG TIME IN STEMI: A MULTICENTER STUDY

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Introdução/Fundamentos: Timely electrocardiogram (ECG) acquisition, ideally within 10 minutes of first medical contact, is essential for the early diagnosis and management of ST-segment elevation myocardial infarction (STEMI). However, delays in door-to-ECG time remain frequent and may reflect both patient-related factors and variability in initial clinical recognition. Objetivos: To identify clinical factors independently associated with delayed door-to-ECG time in patients with STEMI. Métodos: A multicenter study was conducted using a retrospective national registry with data from 14 Brazilian states between January 2020 and June 2024 from the largest private hospital network in the country. Multivariable logistic regression models were used to identify the factors independently associated with delayed door-to-ECG time (>10 min and >30 min) in the population with acute myocardial infarction with ST elevation. The data were analyzed using RStudio. Resultados e Conclusões: A total of 7,171 patients were included. In multivariable analysis, diabetes mellitus was independently associated with delayed ECG acquisition (>10 min) (aOR 1.66, 95% CI 1.09–2.51; p=0.017), while the AB phenotype (typical chest pain and highly probable coronary chest pain) was associated with a lower probability of delay (aOR 0.23, 95% CI 0.14–0.39; p<0.001). Age, sex, hypertension, smoking, and obesity were not independently associated with the outcome after adjustment for the other covariates. For more pronounced delays (>30 min), the AB phenotype remained the only significant factor (aOR 0.09, 95% CI 0.04–0.20; p<0.001). These findings suggest that diabetes may contribute to delayed recognition, potentially reflecting atypical presentations or lower initial clinical suspicion. In contrast, the association between the AB phenotype and shorter door-to-ECG time likely reflects differences in clinical presentation or triage prioritization. Targeted strategies focusing on high-risk groups, particularly those at risk for atypical presentation, may improve timely ECG acquisition and optimize STEMI care.



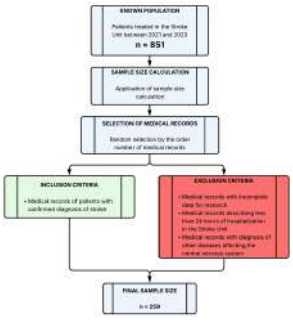
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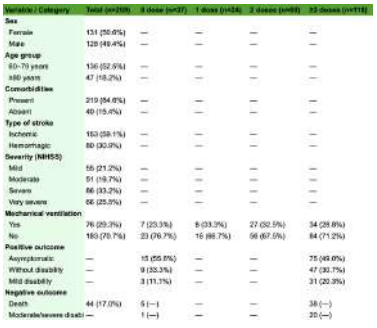
DETERMINANTS OF STROKE SEVERITY AND MORTALITY IN THE POST-COVID-19 ERA: A COHORT STUDY IN A REFERRAL UNIT

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Introdução/Fundamentos: Stroke is the leading cause of disability and death in Brazil. Acute complications can lead to respiratory failure and reduced level of consciousness, requiring invasive mechanical ventilation (IMV), a factor that drastically increases mortality. In the post-pandemic era, it is crucial to understand whether COVID-19 history and vaccination status have altered classic predictors of severity and the need for IMV. Objetivos: To evaluate clinical determinants and the influence of COVID-19 history and vaccination status on neurological severity, the need for invasive mechanical ventilation, and hospital mortality in stroke patients in the post-pandemic era. Métodos: This is a retrospective and ecological cohort study conducted in a regional hub in Northeastern Brazil. A random sample of 259 medical records of stroke patients (2021-2023) was analyzed. Clinical data, severity (NIHSS), functionality (mRS), and COVID-19/vaccination history were collected. Primary outcomes were death and invasive mechanical ventilation (IMV). Statistical analysis included multiple logistic and linear regression, as well as Joinpoint regression for temporal trends. A significance level of p < 0.05 and a 95% CI were adopted. The study was approved by the UFAL Ethics Committee (Opinion No. 81607524.0.0000.5013). Resultados e Conclusões: The sample (mean age 66.7 years; 50.6% women) showed a high prevalence of comorbidities (84.6%). Ischemic stroke predominated (59.1%), and 58.7% of patients presented with severe or very severe status (NIHSS > 10) upon admission. Although 68.7% reported prior COVID-19 infection and 85.7% were vaccinated, these factors were not associated with severity or death. The need for IMV (29.3%) was the strongest predictor of mortality (OR 24.43), followed by a diagnosis of hemorrhagic stroke (OR 3.58). Each additional point on the NIHSS increased the chance of IMV by 20%. Thrombolytic treatment (20.5% of cases) was associated with a 91% reduction in the risk of death. The NIHSS score and hemorrhagic stroke diagnosis are established as the main determinants of IMV and mortality, whereas COVID-19 history and vaccination status did not impact clinical outcomes. Optimizing early risk stratification and ensuring access to reperfusion therapy remain critical pillars for neurological survival in the post-pandemic era.





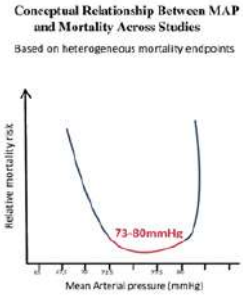
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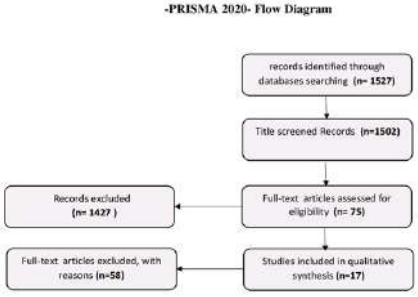
EARLY BLOOD PRESSURE VARIABILITY AS A PREDICTOR OF MORTALITY AND CARDIOVASCULAR COMPLICATIONS IN SEPSIS:A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Sepsis remains a major cause of mortality worldwide.Although hemodynamic management primarily targets mean arterial pressure (MAP),blood pressure variability (BPV) may better reflect early cardiovascular instability and autonomic dysregulation studies suggest that increased early BPV may predict adverse outcomes in sepsis,yet evidence has not been systematically synthesised Objetivos: To systematically evaluate the association between early blood pressure variability and mortality and cardiovascular adverse events in patients with sepsis and severe infections Métodos: A systematic review and meta-analysis were conducted according to PRISMA 2020 and registered on PROSPERO. PubMed, Scopus, Google Scholar, and SpringerLink were searched for studies published between 2015 and 2025.Adult studies reporting early BPV and clinical outcomes were included. Risk of bias was assessed using ROBINS-I and RoB 2 Resultados e Conclusões: Seventeen studies including over 100,000 patients were analyzed. Increased systolic BP variability was associated with higher 28–30-day mortality (OR 1.18, 95% CI 1.03–1.36; I^2 = 0%; n = 1,407), while MAP variability showed a stronger association with in-hospital mortality (OR 1.81, 95% CI 1.37–2.39; I^2 = 92%; n = 23,802). Overall, 14 of 17 studies demonstrated an independent association between elevated BPV and mortality, with diastolic variability frequently emerging as the strongest predictor. Absolute MAP demonstrated a U-shaped relationship with mortality, with increased risk at both low (<70 mmHg) and high values and an apparent optimal range between 73 and 80 mmHg Evidence linking BPV to specific cardiovascular complications remained limited but suggested associations with acute heart failure, arrhythmias, and cardiovascular stress. Patients with pre-existing hypertension appeared more vulnerable to adverse outcomes in the presence of elevated BPV. Intensive MAP strategies in elderly patients were also associated with increased ischemic and arrhythmic events Several studies used invasive arterial monitoring, providing high-resolution assessment of short-term BPV while contributing to methodological heterogeneity Early BPV is consistently associated with increased short-term mortality in sepsis and may represent a clinically relevant marker of cardiovascular stress and hemodynamic instability, warranting further prospective validation Overall, early BPV emerges as a simple, real-time, low-cost and clinically meaningful predictor that could enhance early risk stratification in sepsis





21838

HEART RATE CONTROL WITH ESMOLOL IN SEPTIC SHOCK: IMPACT ON CARDIOVASCULAR OUTCOMES — A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Septic shock is a severe clinical condition characterized by hemodynamic instability and high mortality, frequently associated with adrenergic hyperactivity and persistent tachycardia. In order to reduce myocardial oxygen consumption and optimize cardiovascular performance in these patients, different chronotropic control strategies have been investigated, particularly the use of Esmolol. Objetivos: This systematic review aims to evaluate data presented in clinical studies regarding the impact of heart rate control with esmolol on cardiovascular outcomes in patients with septic shock. Métodos: This systematic review evaluated the effects of heart rate control with esmolol in patients with septic shock. Searches were conducted in the PubMed/MEDLINE and BVS/LILACS databases between January 2020 and May 2026 using MeSH and DeCS descriptors related to septic shock, esmolol, beta-blockers, heart rate control, mortality, hemodynamics, and cardiovascular outcomes, combined with Boolean operators (AND/OR). Original studies involving adult patients with septic shock treated with esmolol and assessing cardiovascular or hemodynamic outcomes were included, while reviews, editorials, duplicates, and studies not meeting the eligibility criteria were excluded. Study selection followed PRISMA 2020 recommendations and was independently performed by two reviewers using the Rayyan platform. Of the 90 studies identified, 15 were included in the final analysis. Resultados e Conclusões: Fifteen studies involving 13,313 patients with sepsis and/or septic shock were included. Esmolol use was associated with significant heart rate reduction, with higher control rates within 24 hours (100% vs. 58.3%; p = 0.037) and reductions from 116.8 to 90.6 bpm (p < 0.001), supported by meta-analysis (SMD −1.83; 95% CI −2.95 to −0.70; p = 0.001). Improvements in hemodynamics and tissue perfusion were observed, including increased stroke volume index, lower lactate levels, and improved $ScvO_2$, without major circulatory instability. Esmolol was also associated with reduced 28-day mortality (RR 0.68–0.71) and 90-day mortality (HR 0.84), as well as decreased inflammatory and myocardial injury biomarkers. Overall, esmolol demonstrated a favorable safety profile and may represent a promising adjunctive strategy in septic shock, although further studies are still needed

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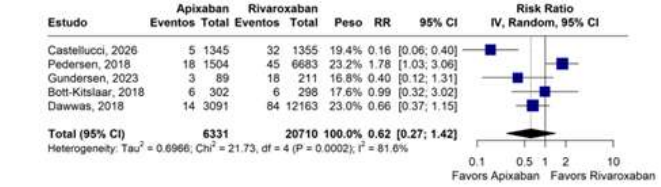
MAJOR BLEEDING AND RECURRENT VENOUS THROMBOEMBOLISM WITH APIXABAN VERSUS RIVAROXABAN: A SYSTEMATIC REVIEW AND META-ANALYSIS

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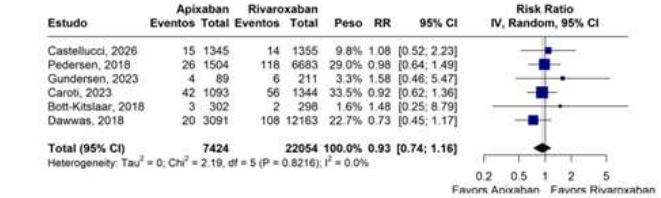
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Introdução/Fundamentos: Direct oral anticoagulants, including rivaroxaban and apixaban, are the most frequently prescribed treatments for acute venous thromboembolism. Despite their widespread use, head-to-head clinical trials directly comparing their safety and efficacy profiles have historically been lacking. This knowledge gap has led to uncertainty regarding the optimal choice between these agents in the acute setting. Objetivos: To compare the safety and efficacy of apixaban versus rivaroxaban in patients with acute venous thromboembolism, focusing on the risk of major bleeding and recurrent symptomatic VTE. Métodos: We conducted a systematic review and meta-analysis incorporating data from randomized controlled trials, such as the COBRRA trial, and real-world observational cohorts. The primary safety outcome was major bleeding, and the primary efficacy outcome was recurrent symptomatic VTE. Relative risks (RR) and 95% confidence intervals (CI) were pooled using a random-effects model. Resultados e Conclusões: Based on the pooled analysis, the risk of recurrent symptomatic VTE was comparable between apixaban and rivaroxaban (RR 0.93, 95% CI 0.74 to 1.16; I^2 = 0.0%). Regarding safety, there was a trend toward lower major bleeding with apixaban, although this did not reach statistical significance due to high heterogeneity (RR 0.62, 95% CI 0.27 to 1.42; I^2 = 81.6%). Notably, recent randomized evidence from the COBRRA trial demonstrated a significantly lower risk of major bleeding with apixaban. In conclusion, apixaban and rivaroxaban show comparable efficacy in preventing recurrent VTE, while apixaban may offer a more favorable safety profile. Further studies with standardized bleeding definitions are warranted.

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B)



16475

MANAGEMENT OF ACUTE PULMONARY THROMBOEMBOLISM IN RISK C PATIENTS ACCORDING TO THE NEW RISK STRATIFICATION: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Acute Pulmonary Embolism (PE) encompasses a broad spectrum of clinical severity, a fact that emphasizes the need for risk-informed therapy. However, according to the 2019 European Respiratory Society guideline classification, the management of PE has not been fully elucidated, particularly in intermediate-risk patients. Objetivos: Elucidate the correct clinical management of PE in risk C patients according to the new risk classification proposed by the AHA/ACC 2026. Métodos: Studies originally published in English and from 2016 onwards in the SciELO and PubMed databases were analyzed. Inclusion criteria were randomized controlled trials that examined the clinical management of PE in intermediate-risk or C-risk patients. Studies that were not related to the topic, with unclear or poorly described methods, were excluded. For the research, combinations of keywords related to Pulmonary Embolism, Intermediate risk, and Treatment obtained from MeSH were used. Two reviewers independently examined the records, and disagreements were resolved by a third reviewer. The PRISMA 2020 scale was used to systematize the reporting of this review. Resultados e Conclusões: A total of 15 studies were analyzed, and after applying the exclusion criteria, 8 articles remained for review (n=8). The analysis considered the outcome and the best administration conditions for each therapy according to the selected patients. In C2 patients, anticoagulant therapy as the basis of treatment has demonstrated benefit. Inhaled pulmonary vasodilators have likewise been beneficial in improving right ventricular afterload. Regarding catheter-directed thrombolysis (CDL), associated with anticoagulation, the results were inconclusive as to whether it provides benefits in patients in categories C2–C3 in preventing short-term clinical deterioration, reducing mortality, or improving functional capacity and quality of life. The choice of systemic thrombolysis instead of isolated anticoagulation is indicated from classification C3 onwards. The new classification proposed by AHA/ACC 2026 brings a new perspective to the management of PE cases, especially in level C patients. With this, the distribution of patients across the new classification parameters facilitates guidance in the management of PE. However, a scientific gap is still noted regarding the use of thrombolytics and the benefits of CDL in risk C patients.

17864

MAPSE AS A MARKER OF HEMODYNAMIC SUPPORT AND CLINICAL OUTCOMES IN PATIENTS ADMITTED TO THE INTENSIVE CARE UNIT

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Introdução/Fundamentos: Left ventricular systolic dysfunction is frequent in critically ill patients and can contribute to hemodynamic instability and the need for pharmacological support. Mitral annular plane systolic excursion (MAPSE) is a simple echocardiographic parameter that reflects the longitudinal function of the left ventricle and can be obtained rapidly at the bedside, even in scenarios of limited echocardiographic assessment. Despite its potential usefulness in clinical practice, there are still few studies evaluating the association between MAPSE values and clinical outcomes in patients admitted to intensive care units. Objetivos: To evaluate the association between MAPSE and the need for hemodynamic support in critically ill patients. Métodos: This was a prospective, single-center cohort study conducted in intensive care units of a tertiary hospital. Adult patients undergoing conventional echocardiography were included. MAPSE was measured and used to estimate left ventricular ejection fraction (EF = 4.8 × MAPSE + 5.8). Outcomes were obtained from electronic medical records and included the use of vasoactive, inotropic, and vasodilating drugs, hospital and 30-day mortality, and length of stay in the ICU. Associations were analyzed using Pearson correlation and Mann-Whitney test ($p < 0.05$). Resultados e Conclusões: 167 patients admitted to the intensive care unit were included. No significant association was observed between MAPSE values or estimated ejection fraction and length of stay in the ICU. A negative correlation was observed between MAPSE parameters and mortality, indicating a trend towards higher mortality among patients with lower values of the parameter; this association was statistically significant for lateral MAPSE, mean MAPSE, and estimated ejection fraction ($p < 0.05$). Furthermore, MAPSE showed a significant correlation with dobutamine use, suggesting that lower values reflect systolic dysfunction and a greater need for inotropic support. Among vasodilators, reduced MAPSE and estimated ejection fraction values were also associated with nitroglycerin use. Therefore, reduced MAPSE values were associated with the need for hemodynamic support and worse clinical outcomes.These findings reinforce the potential of MAPSE as a simple and rapid tool for assessing ventricular function in critically ill patients.

19070

NONINVASIVE VENTILATION IN ACUTE HEART FAILURE: IMPACT ON MORTALITY AND NEED FOR INTUBATION: A SYSTEMATIC REVIEW AND META-ANALYSIS

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(1) UNIVERSIDADE BRASIL - FERNANDÓPOLIS - SP - BRASIL; (2) UNIVERSIDADE BRASIL - FERNANDÓLIS - SP - BRASIL; (3) FACERES - SÃO JOSÉ DO RIO PRETO - SP - BRASIL;

Introdução/Fundamentos: Acute heart failure is one of the main causes of hospital admission, often associated with respiratory distress and acute pulmonary edema. Noninvasive ventilation (NIV), including CPAP and BiPAP, has been used as an initial strategy to improve oxygenation and reduce the work of breathing. However, the impact of this intervention on clinically relevant outcomes still requires consolidation. Objetivos: To evaluate the impact of noninvasive ventilation on mortality and the need for orotracheal intubation in patients with acute heart failure. Métodos: A systematic review was conducted according to PRISMA guidelines, with searches in PubMed, Embase, and Cochrane Library up to January 2026. Randomized clinical trials comparing noninvasive ventilation with conventional oxygen therapy in patients with acute heart failure were included. The outcomes analyzed were in-hospital mortality and need for intubation. The meta-analysis was performed using a random-effects model, with calculation of relative risk (RR) and 95% confidence intervals. Heterogeneity was assessed using the I^2 index. Resultados e Conclusões: Nine studies were included, totaling 3,684 patients. Noninvasive ventilation was associated with a significant reduction in the need for intubation (RR = 0.58; 95% CI: 0.46–0.73; $p < 0.001$) and a trend toward reduction in in-hospital mortality (RR = 0.88; 95% CI: 0.76–1.01; $p = 0.07$). Heterogeneity was low ($I^2 = 27\%$). Noninvasive ventilation significantly reduces the need for intubation in patients with acute heart failure, with a trend toward mortality reduction. These findings reinforce its early use as an essential strategy in the management of these patients in emergency settings.

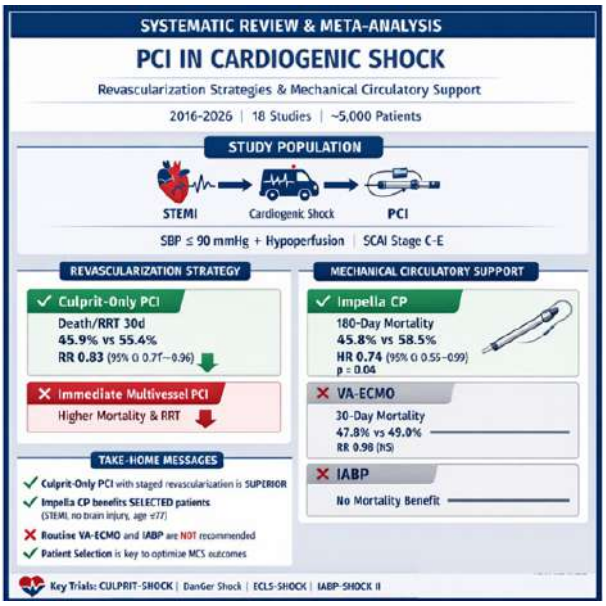
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PERCUTANEOUS CORONARY INTERVENTION IN CARDIOGENIC SHOCK FOLLOWING ACUTE MYOCARDIAL INFARCTION: SYSTEMATIC REVIEW AND META-ANALYSIS OF REVASCULARIZATION STRATEGIES AND MECHANICAL CIRCULATORY SUPPORT (2016-2026)

JADY BONARDI JOSE LIMA1; WAGNER ANTIDES RIBEIRO DE ALMEIDA PINA1; MARILIA DOS SANTOS ANDRADE1;

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Introdução/Fundamentos: Cardiogenic shock complicates 5-10% of acute myocardial infarctions with in-hospital mortality of 40-50%. Controversies persist regarding optimal revascularization strategy (culprit-only versus multivessel) and the role of mechanical circulatory support (MCS). Recent clinical trials including CULPRIT-SHOCK, DanGer Shock, and ECLS-SHOCK have provided new evidence requiring systematic synthesis. Objetivos: To evaluate the efficacy and safety of different PCI strategies and MCS use in patients with cardiogenic shock secondary to STEMI, analyzing mortality and composite clinical outcomes. Métodos: Systematic review following PRISMA 2020 guidelines. Criteria: adults with cardiogenic shock (SBP ≤90mmHg + hypoperfusion or SCAI C-E) secondary to STEMI undergoing PCI. Included RCTs and multicenter prospective cohorts (≥100 patients) from January/2016 to April/2026. Databases: PubMed, Embase, Cochrane CENTRAL, Web of Science. Primary outcome: 30-day mortality. Random-effects meta-analysis using modified HKSJ method. Resultados e Conclusões: Eighteen studies were included (8 RCTs, 10 prospective cohorts). For revascularization strategy, culprit-only PCI reduced the composite outcome of death or renal replacement therapy at 30 days compared to immediate multivessel PCI (45.9% vs 55.4%; RR 0.83; 95%CI 0.71-0.96; p=0.01). For MCS, Impella CP reduced 180-day mortality (45.8% vs 58.5%; HR 0.74; 95%CI 0.55-0.99; p=0.04), but with increased bleeding and limb ischemia. VA-ECMO showed no benefit (47.8% vs 49.0%; RR 0.98; 95%CI 0.80-1.19). IABP did not reduce mortality at 30 days or 6 years. Individual patient data meta-analysis identified MCS benefit in STEMI patients without hypoxic brain injury risk (HR 0.77; 95%CI 0.61-0.97). Culprit-only PCI with staged revascularization is superior to immediate multivessel PCI. Impella CP benefits selected patients (STEMI, no brain injury, age 77 years), while routine VA-ECMO and IABP are not recommended. Appropriate patient selection is essential to optimize MCS outcomes.



21154

PREHOSPITAL NONINVASIVE VENTILATION FOR ACUTE HEART FAILURE IN ELDERLY PATIENTS: IMPACT ON IN-HOSPITAL MORTALITY AND INTUBATION RATES

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(1) AFYA FACULDADE DE CIENCIAS MEDICAS DE PALMAS - PALMAS - TO - BRASIL;

Introdução/Fundamentos: Acute heart failure (AHF) is a frequent cause of emergency care admissions, especially among elderly patients, and is associated with high morbidity and mortality. Rapid clinical deterioration makes early intervention essential, highlighting the prehospital setting as a critical window for initial management. Although noninvasive ventilation (NIV) is strongly recommended by the Brazilian Society of Cardiology (SBC) and the European Society of Cardiology (ESC) guidelines for the in-hospital management of acute heart failure, evidence regarding its use in the prehospital setting remains heterogeneous, particularly in elderly patients. Objetivos: To evaluate the impact of prehospital NIV in elderly patients with acute heart failure, focusing on in-hospital mortality and endotracheal intubation rates. Métodos: A systematic review was conducted in accordance with PRISMA guidelines, with searches performed in PubMed, Embase, and the Cochrane Library (2005–2025), using the descriptors “Noninvasive Ventilation,” “Acute Heart Failure,” “Cardiogenic Pulmonary Edema,” “Prehospital Care,” and “Emergency Medical Services.” A total of 198 studies were identified, of which 164 remained after duplicate removal; 52 were assessed in full text and 11 were included. The analyzed outcomes were in-hospital mortality and the need for endotracheal intubation. Resultados e Conclusões: The 11 included studies, comprising 3,067 predominantly elderly patients, demonstrated an association between prehospital NIV and reduced rates of endotracheal intubation and in-hospital mortality (OR <1; p <0.05). CPAP was the most commonly used modality, while some studies also evaluated BiPAP/bilevel PAP. Compared with conventional oxygen therapy, NIV was associated with lower intubation rates (8.9% vs. 25.3%; p=0.003), lower in-hospital mortality (5.4% vs. 23.2%; p<0.001), and lower odds of intubation (OR 0.31; 95% CI 0.19–0.51) and death (OR 0.41; 95% CI 0.19–0.87). Prehospital NIV, especially through CPAP, was associated with reduced intubation rates and early clinical improvement in patients with acute heart failure. However, study heterogeneity limits definitive conclusions, reinforcing the need for protocol standardization and further studies.

14558

PROGNOSTIC PERFORMANCE OF THE OESIL AND EGSYS SCORES IN PATIENTS HOSPITALIZED FOR SYNCOPE: A RETROSPECTIVE COHORT STUDY

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Introdução/Fundamentos: Syncope is a transient loss of consciousness resulting from cerebral hypoperfusion, with the main causes being vasovagal, cardiac, and orthostatic. It's a common condition in emergency departments and, although generally benign, may be associated with serious outcomes such as sudden death and the need for interventions. Clinical scores such as OESIL and EGSYS are widely used for risk stratification. However, uncertainties remain regarding the comparative accuracy of these instruments, particularly in predicting clinically relevant outcomes. Objetivos: To evaluate the prognostic performance of the OESIL and EGSYS clinical scores in patients hospitalized for syncope, comparing their discriminative ability to predict clinical severity, defined by length of hospital stay. Métodos: Is single-center retrospective observational study based on electronic health record data from patients presenting with syncope in the emergency department of a high-complexity hospital. A total of 728 patients were included between August 2023 and June 2025. The comparative prognostic performance of the EGSYS and OESIL scores in predicting severity—defined by length of hospital stay (>5 days vs. ≤5 days)—was assessed using ROC curve analysis. Resultados e Conclusões: Results: A total of 728 patients with syncope were analyzed; 622 (85.4%) had complete data for both the OESIL and EGSYS scores, while 106 (14.6%) had missing data in the medical records. The mean length of hospital stay was 2.68 days. In the analysis of prolonged hospitalization (>5 days), ROC curve analysis showed that the OESIL score had an area under the curve (AUC) of 0.611 (95% CI: 0.542–0.680; p=0.003), indicating modest but statistically significant discriminative performance for predicting prolonged hospitalization. The EGSYS score had an AUC of 0.558 (95% CI: 0.490–0.627; p=0.112), showing no statistical significance. For hospital stays ≤5 days, both scores demonstrated good performance on ROC analysis. The OESIL score had an AUC of 0.881 (95% CI: 0.831–0.931; p<0.001), while the EGSYS score had an AUC of 0.801 (95% CI: 0.721–0.881; p<0.001), indicating adequate discriminative ability. Conclusion: The OESIL score demonstrated better discriminative performance compared to the EGSYS score, particularly in predicting shorter hospitalizations. For prolonged hospital stays, OESIL showed modest predictive ability, whereas EGSYS did not reach statistical significance. These findings highlight differences in the applicability of these scores for risk stratification.

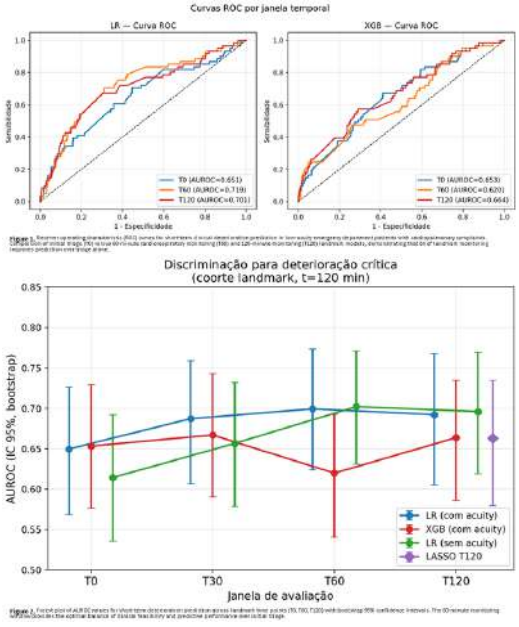
22095

SIXTY MINUTES OF CARDIORESPIRATORY MONITORING OUTPERFORMS INITIAL TRIAGE IN PREDICTING SHORT-TERM DETERIORATION IN LOW-ACUITY ED PATIENTS WITH CARDIOPULMONARY COMPLAINTS: A LANDMARK ANALYSIS

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Introdução/Fundamentos: Static initial triage may underestimate risk in low-acuity emergency department (ED) patients with cardiopulmonary complaints. Previously published dynamic prediction models are frequently confounded by immortal-time bias, which inflates apparent discrimination. Objetivos: To evaluate whether structured cardiorespiratory monitoring during the first 30, 60, and 120 minutes after ED arrival improves prediction of short-term critical deterioration over initial triage alone, using a landmark design that eliminates immortal-time bias. Métodos: Retrospective cohort using MIMIC-IV and the MIMICEL ED event log. Adults with cardiopulmonary chief complaints (chest pain, dyspnea, syncope, palpitations, dizziness, edema) were identified by NLP. A landmark cohort included only patients still in the ED at t=120 minutes. The primary outcome was a composite of ICU admission between 120 minutes and 12 hours, or in-hospital death. Logistic regression and XGBoost were trained on the same patients with progressive windows: T0 (triage), T30, T60, T120. AUROC with 95% CI (1,000 bootstrap replicates) was compared by DeLong's test. A parsimonious multivariable model identified independent predictors. Resultados e Conclusões: Of 2,832 eligible admissions, 184 were excluded by the landmark (final n=2,648); the composite outcome occurred in 339 (12.8%): 312 ICU admissions and 46 in-hospital deaths. Logistic regression AUROC rose from 0.650 (95% CI 0.569-0.726) at T0 to 0.699 (0.624-0.774) at T60 and plateaued at T120 (0.692). Only T60 outperformed T0 (Delta +0.068; DeLong p=0.009). In multivariable analysis (EPV 21.9), three independent predictors remained: ESI acuity (adjusted OR 0.73 per 1 SD; 95% CI 0.62-0.87; p<0.001), minimum systolic blood pressure (OR 0.77; 0.64-0.92; p=0.004), and maximum respiratory rate (OR 1.25; 1.03-1.51; p=0.025), all measured during the first 60 minutes. At 90% sensitivity, T60 yielded specificity 0.21 and NPV 0.94. Isotonic recalibration improved Brier from 0.219 to 0.094. Conclusions: sixty minutes of structured cardiorespiratory monitoring significantly improves deterioration prediction over triage alone, with no benefit from longer windows. Early hypotension and tachypnea were the dominant independent predictors, supporting a 60-minute reassessment paradigm.



21681

TIME TO DEFIBRILLATION AND SURVIVAL IN CARDIAC ARREST: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Cardiac arrest is one of the leading causes of sudden death, with high mortality. Early defibrillation is one of the most determining factors for survival, especially in shockable rhythms. However, the magnitude of the impact of time to defibrillation on clinical outcomes still requires consolidation through systematic analysis. Objetivos: To evaluate the association between time to defibrillation and survival in patients with cardiac arrest. Métodos: A systematic review conducted in accordance with PRISMA guidelines, with a structured search in PubMed, Embase, and Cochrane Library databases up to January 2026. Prospective and observational studies evaluating time to defibrillation in patients with cardiac arrest were included. The primary outcome was in-hospital survival. The meta-analysis was performed using a random-effects model, with calculation of relative risk (RR) and 95% confidence interval (95% CI). Heterogeneity was assessed using the I^2 statistic. Resultados e Conclusões: A total of 12 studies were included, comprising 54,328 patients. Shorter times to defibrillation were associated with higher survival (RR=1.62; 95% CI: 1.41–1.86; p<0.001). A progressive reduction in survival was observed with each minute of delay. Heterogeneity was moderate (I^2=38%). Early defibrillation is strongly associated with increased survival in cardiac arrest, reinforcing the importance of rapid interventions and well-organized emergency response systems.

21839

UNCERTAINTY IN NEUROLOGICAL PROGNOSTICATION AFTER CARDIAC ARREST: ETHICAL IMPLICATIONS FOR LIFE-SUSTAINING TREATMENT DECISIONS

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Introdução/Fundamentos: Neuroprognostication after cardiac arrest remains a major ethical challenge in intensive care medicine due to uncertainty regarding continuation or withdrawal of life-sustaining treatment in patients with severe neurological injury. Although guidelines recommend multimodal assessment 72 hours after return of spontaneous circulation, many patients still receive an indeterminate prognosis, complicating treatment decisions. In addition, differing expectations between healthcare teams and families may generate conflicts regarding care. Thus, post–cardiac arrest neuroprognostication involves not only technical limitations but also bioethical principles such as beneficence, non-maleficence, and autonomy. Objetivos: To evaluate how limitations in predicting neurological outcomes influence clinical and ethical decision-making in post–cardiac arrest patients. Métodos: A systematic literature review was conducted using the SciELO, PubMed, Cochrane Library, and VHL databases, including studies published up to the end of April 2026. Study selection was performed using the Rayyan platform, based on criteria defined by the PICO strategy. Studies published in Spanish, Portuguese, and English addressing the proposed topic were included. The study selection and eligibility process followed structured stages, including screening by titles, abstracts, and full-text reading. Resultados e Conclusões: The analyzed studies demonstrated persistent limitations in neuroprognostication after cardiac arrest despite multimodal assessment strategies. Bougouin et al. (2024) identified high specificity of ERC/ESICM recommendations for poor neurological outcome prediction; however, approximately 50% of patients remained in an indeterminate prognostic category. Sondag et al. (2017) showed that highly malignant EEG patterns were strongly associated with poor neurological outcomes, although sedatives, hypothermia, and metabolic disturbances may reduce predictive reliability. Wahlster et al. (2023) identified variability in early withdrawal of life-sustaining treatment among institutions, suggesting a possible self-fulfilling prophecy effect, while Rubenstein et al. (2023) observed treatment withdrawal even in patients without definitive predictors of irreversible neurological injury. Overall, prognostic uncertainty frequently generated ethical conflicts between healthcare teams and families, reinforcing the importance of cautious interpretation and shared decision-making in post–cardiac arrest care.

Cardiac Arrhythmias / Electrophysiology / Electrocardiography / Cardiac Pacing



81º CONGRESSO BRASILEIRO DE CARDIOLOGIA together with WORLD CONGRESS OF CARDIOLOGY





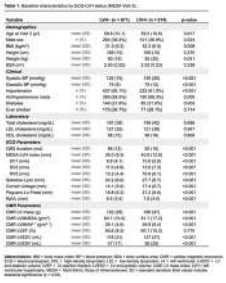
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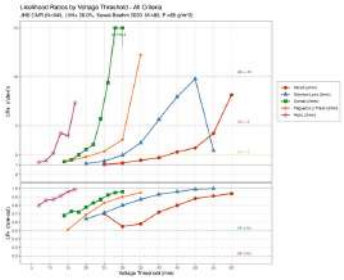
ACCURACY OF ELECTROCARDIOGRAPHIC CRITERIA FOR LEFT VENTRICULAR HYPERTROPHY AGAINST CARDIAC MAGNETIC RESONANCE AMONG AFRICAN-AMERICAN ADULTS: A JACKSON HEART STUDY ANALYSIS

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Introdução/Fundamentos: Electrocardiographic (ECG) criteria for left ventricular hypertrophy (LVH) are used as bedside surrogates of increases in left ventricular mass. However, they perform worse than commonly perceived by most clinicians when compared with cardiac magnetic resonance (CMR). We hypothesized that replacing dichotomous classification with a continuous spectrum-based approach could enhance their clinical utility. Objetivos: To evaluate the diagnostic accuracy of ECG-based LVH criteria using CMR as the reference standard in participants from the Jackson Heart Study (JHS). Métodos: We conducted a retrospective analysis of data from the JHS, a community-based cohort of African American participants of 21 to 94 years, recruited across the Jackson, Mississippi metropolitan area. The gold standard was CMR-LVH, which was defined using the Kawel-Boehm thresholds: left ventricular mass index indexed to body surface area greater than 83 g/m² in men and 65 g/m² in women. The index tests included most used ECG criteria (Cornell Voltage, Sokolow-Lyon, Peguero Lo-Presti, R wave in aVL) and the Multi-Ethnic Study of Atherosclerosis (MESA) LVH criteria that is defined as SV1 plus SV2 plus RV5. All ECG criteria were evaluated across a continuous spectrum increasing thresholds in 1mm increments evaluating sensitivity, specificity and likelihood ratios at each value. Resultados e Conclusões: A total of 945 participants were included, the prevalence of LVH, identified by the CMR, was 29%. Table 1 presented population baseline characteristics. Overall diagnostic performance of the evaluated ECG criteria remained limited, as illustrated in Figure 1. Among them, the Peguero–Lo Presti criterion demonstrated the highest area under the curve = 0.647, although its discriminative ability was still modest. MESA-LVH and Peguero Lo-Presti were the only criteria to demonstrate consistent diagnostic gradient behavior, exhibiting a steady rise in likelihood ratios as the index increased. In contrast, the remaining criteria showed abrupt and erratic increases, with isolated peaks at sparse thresholds, suggesting limited reliability of these estimates. In this African American cohort, ECG-based LVH criteria demonstrated a heterogeneous diagnostic accuracy when compared with CMR. These findings suggest that a spectrum-based interpretation may offer incremental value, but ECG criteria alone are insufficient for accurate LVH diagnosis





21521

ADJUNCTIVE LOW-VOLTAGE AREA ABLATION IN PERSISTENT ATRIAL FIBRILLATION: INCREMENTAL BENEFIT BEYOND PULMONARY VEIN ISOLATION? A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Pulmonary vein isolation (PVI) is the cornerstone of catheter ablation for atrial fibrillation (AF), yet recurrence rates in persistent AF exceed 40–50% at one year. Left atrial low-voltage areas (LVAs) bipolar voltage <0.5 mV are electrophysiological surrogates of atrial fibrosis and have been proposed as adjunctive ablation targets to improve outcomes beyond PVI. Objetivos: To systematically evaluate the efficacy and safety of adjunctive LVA ablation combined with PVI compared to PVI alone in patients with persistent or paroxysmal AF. Métodos: Systematic review following PRISMA guidelines. Three prospective studies were included: SUPPRESS-AF (RCT; n=341; 12-month follow-up), SCAR-AF (RCT; n=211; 18 months), and VOLCANO Extended Follow-up (prospective cohort; n=402; median 25 months). LVA was consistently defined as bipolar voltage <0.5 mV. Due to clinically significant heterogeneity in AF type, mapping timing, ablation technique, and follow-up duration, formal statistical pooling was not performed; evidence was synthesized narratively with individual effect estimates and absolute event numbers. Resultados e Conclusões: Across 954 patients, adjunctive LVA ablation did not significantly reduce AF/AT recurrence in any included study: SUPPRESS-AF (61% vs 50%; HR 0.781, 95%CI 0.564–1.083; P=0.127), SCAR-AF (73.1% vs 75.7%; P=0.45), VOLCANO (57% vs 59%; P=0.83). Recurrence after multiple ablations was numerically lower with LVA ablation but non-significant across studies. Iatrogenic organized atrial tachycardia (AT) was significantly more frequent in the LVA ablation arm in two of three studies: SUPPRESS-AF (~23 vs ~15 patients; 36% vs 18%; P=0.029); VOLCANO (~12 vs ~6; 71% vs 32%; P<0.0001), including six exclusive cases of biatrial reentrant tachycardia. SCAR-AF showed no significant difference in AT incidence. Procedure-related serious adverse events were rare and comparable between groups in all studies. Adjunctive LVA ablation does not consistently improve AF/AT-free survival beyond PVI and significantly increases the risk of iatrogenic organized AT. LVA functions primarily as a marker of atrial cardiomyopathy rather than a universally effective ablation target. Patient selection refinement particularly in patients aged ≥75 years, LA diameter ≥45 mm, or LVA ≥20 cm² and standardized trial methodology are required before routine adjunctive LVA ablation can be recommended.

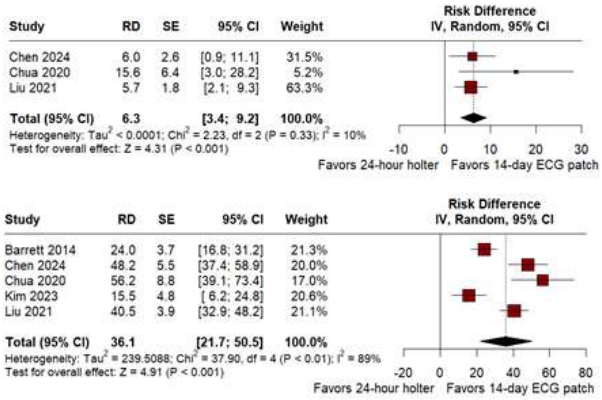
21587

ARRHYTHMIA DETECTION BY 24-HOUR HOLTER MONITORING VERSUS 14-DAY CONTINUOUS ELECTROCARDIOGRAM PATCH: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Arrhythmia detection is directly dependent on monitoring duration. The 24-hour Holter, despite widespread use, captures a narrow temporal window, limiting sensitivity for paroxysmal or infrequent events. Continuous 14-day electrocardiogram (ECG) patches extend the recording period with improved adherence, yet their comparative diagnostic yield remains insufficiently quantified. Objetivos: To compare the diagnostic yield of 24-hour Holter monitoring versus 14-day continuous ECG patches for arrhythmia detection in adults. Métodos: This systematic review and meta-analysis was conducted following PRISMA guidelines. PubMed, Embase, and Cochrane were searched for studies comparing 24-hour Holter monitoring with 14-day continuous ECG patches for arrhythmia detection in adults (>18 years), including atrial fibrillation, supraventricular and ventricular tachycardia, atrioventricular block, and pauses. Outcomes were expressed as risk difference (RD) or risk ratio (RR) with 95% confidence intervals (CI). Heterogeneity was assessed using the I-squared statistic. Resultados e Conclusões: Five studies were included, totaling 1,255 patients. The 14-day ECG patch was significantly superior for detection of any arrhythmia (RD 36.1; 95% CI 21.7–50.5; p<0.001). This superiority was consistent for atrial fibrillation and flutter (RD 6.3; 95% CI 3.4–9.2; p=0.001), supraventricular tachycardia (RD 38.1; 95% CI 19.7–56.5; p<0.01), and ventricular tachycardia (RR 3.49; 95% CI 1.88–6.47; p=0.01). The 14-day continuous ECG patch demonstrated significantly higher diagnostic yield than 24-hour Holter monitoring for atrial fibrillation, supraventricular tachycardia, and ventricular tachycardia. In clinical practice, adoption of prolonged monitoring may allow earlier detection of clinically relevant arrhythmias. However, substantial heterogeneity in overall arrhythmia detection suggests that diagnostic yield may vary according to patient profile, and further studies are needed to identify the subgroups that benefit most from this technology.



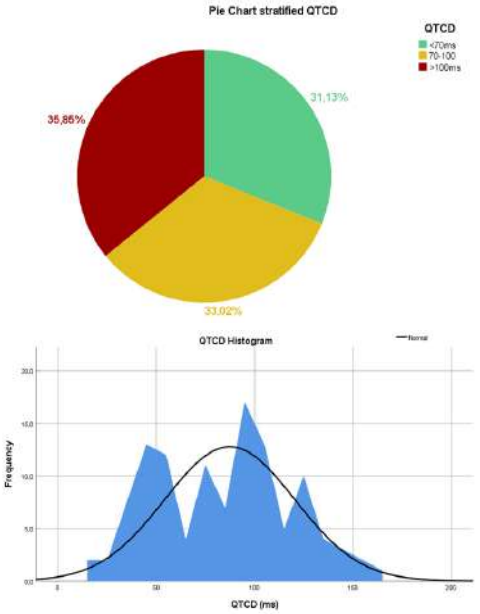
18171

ASSESSMENT OF CORRECTED QT INTERVAL (QTC) AND QTC DISPERSION (QTCD) IN PATIENTS WITH DUCHENNE MUSCULAR DYSTROPHY

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Introdução/Fundamentos: Early detection of cardiac abnormalities is vital for effective management of diseases such as Duchenne muscular dystrophy (DMD). In this context, established electrocardiographic findings, such as T-wave inversion and ST-segment changes, are associated with early cardiac involvement. Corrected QT interval (QTc) and QTc dispersion (QTcD) are indirect electrocardiographic measures of ventricular repolarization heterogeneity and have been positively associated with increased cardiovascular mortality in the general population. Objetivos: This study aims to assess the correlation between QTc and QTcD in patients with DMD, exploring their potential as early markers of cardiovascular involvement. Métodos: This retrospective cross-sectional study involved the review of electrocardiograms (ECGs) from patients with genetically confirmed DMD followed at the cardiology outpatient clinic of a university hospital. Patients with poor-quality ECGs or conditions that compromised analysis were excluded. The QT interval was defined as the distance from the onset of the Q wave to the point where the T wave returned to the baseline. QTc was calculated using the Bazett formula, based on the mean RR interval, and QTcD as the difference between the maximum and minimum QTc on a 12-lead ECG recorded at 25 mm/s. Excel and Software IBM SPSS were used for data analysis and statistical evaluation. Resultados e Conclusões: A total of 106 ECGs from male patients were analyzed, with a mean age of 12.17 ± 4.91 years. The ECGs were classified into 3 groups: 38 (36%) high-risk ECGs with values above 100 ms, 35 (33%) moderate-risk ECGs between 71 and 99 ms, and 33 (31%) low-risk ECGs between 10 and 70 ms. The mean QTcD was 86.54 ± 33.08 ms, and the mean QTc was 421.20 ± 33.62 ms. Despite discrepancies in the literature, values above 100 ms are associated with a higher risk of arrhythmias, while values between 71 and 100 ms are considered abnormal, but with a weaker association. In DMD, this finding may suggest progressive myocardial involvement related to fibrosis, electrical instability, and cardiac remodeling, increasing the risk of early arrhythmias.



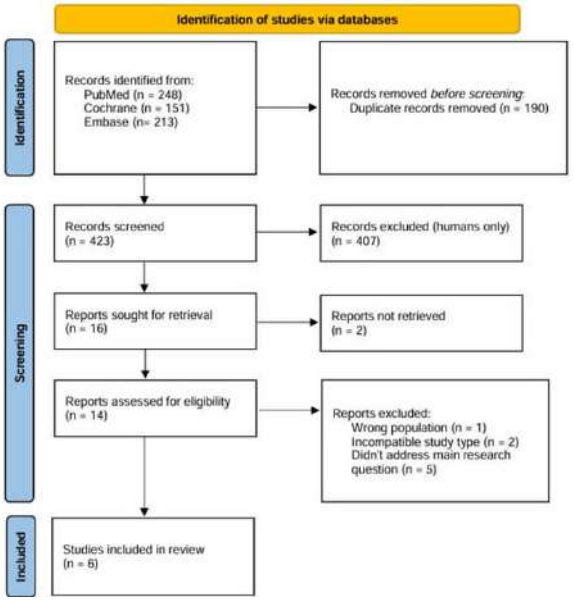
21302

ASSOCIATION BETWEEN DURATION OF SUBCLINICAL ATRIAL FIBRILLATION AND RISK OF THROMBOEMBOLIC EVENTS: A SYSTEMATIC REVIEW

GIOVANA SIEBRA DE OLIVEIRA1; GIOVANA PAZ LIMA1; JULIA SIEBRA DE OLIVEIRA1; CLARA SIMÕES NOBRE1; MARIA EDUARDA SANTOS DE OLIVEIRA1; CLARA CARVALHO DE MORAIS LEITE1; BEATRIZ BARSI CUNHA1; LETÍCIA LIMA FELIX MARINHO1; MARINA CALADO LIMA1; BÁRBARA MAIA FERNANDES LYRA1; ANE KAROLINE MEDINA NÉRI1;

(1) UNIVERSIDADE DE FORTALEZA - UNIFOR - FORTALEZA - CE - BRASIL;

Introdução/Fundamentos: Subclinical atrial fibrillation (SCAF) is defined as episodes of atrial tachyarrhythmia detected exclusively through continuous intracardiac monitoring using pacemakers, implantable cardioverter-defibrillators, and cardiac resynchronization devices, in the absence of clinical symptoms. In this context, the widespread adoption of cardiac monitoring devices has substantially contributed to early detection and the prevention of adverse events, since the first manifestation of SCAF can be a thromboembolic event. Given this scenario, there is a gap in risk stratification and clinical guidance, as there is no defined threshold for the duration of SCAF (burden) in predicting thromboembolic risk. Objetivos: The aim of this study is to assess whether the SCAF burden detected by implantable cardiac devices influences the thromboembolic risk in asymptomatic patients. Métodos: This systematic review was made according to PRISMA guidelines. This review evaluated the association between device-detected atrial high rate episodes (AHRE), focusing on its burden, and the risk of thromboembolic events, especially stroke and systemic embolism. A comprehensive literature search included studies published up to March 2026, performed across the Embase, PubMed and Cochrane Library databases. The study selection was undertaken independently by two reviewers, with any discrepancies resolved through a third reviewer. Resultados e Conclusões: Overall, six studies were included on this review, comprising a total of 11.320 patients with AHRE. Most studies consisted of retrospective cohort analyses and prospective randomized multicenter trials.The definition of arrhythmia burden varies across studies, ranging from 5 minutes to 24 hours. Regarding the risk of a thromboembolic event, results were heterogeneous and focused especially on stroke. Some studies reported that patients with episodes lasting at least 5-6 minutes were associated with higher risk of stroke. However other analyses found no significant association for episodes with less than 24 hours.In general, SCAF appears more as a marker of thromboembolic risk rather than a causal factor. These findings suggest that AHRE burden plays an important role in stratification, however current evidence remains insufficient to define exact values at which patients would benefit from therapy to prevent a stroke or a systemic embolism.



18294

ASSOCIATION BETWEEN GENETIC PROFILE AND CLINICAL FINDINGS IN PATIENTS WITH HYPERTROPHIC CARDIOMYOPATHY AT A TERTIARY CARDIOLOGY OUTPATIENT CLINIC IN SOUTHERN BRAZIL

JULIA CRESTANA RANGEL1; MAICO FURLANETTO2; JACQUELINE VAZ ALENCAR2; LUCAS TIBURSKI SOOMER2; BRUNA EIBEL2; ROBERTO TOFANI SANT'ANNA2; JULIANA TESSA2;

(1) PUCRS - PORTO ALEGRE - RS - BRASIL; (2) INSTITUTO DE CARDIOLOGIA / FUNDAÇÃO UNIVERSITARIA DE CARDIOLOGIA - PORTO ALEGRE - RS - BRASIL;

Introdução/Fundamentos: The genetic basis of hypertrophic cardiomyopathy (HCM) is poorly known in our setting, especially regarding its relationship with clinical presentation and the risk of sudden cardiac death. Objetivos: To evaluate the genetic profile of patients with HCM in southern Brazil and its association with clinical-morphological characteristics and indication for implantable cardioverter-defibrillator (ICD). Métodos: Cross-sectional study in a population aged ≥18 years with a diagnosis of HCM, followed at a tertiary hospital and submitted to genetic testing with a 19-gene panel. Resultados e Conclusões: A total of 157 patients were included, with a mean age of 53 years, of whom 61.1% were female. The predominant anatomical pattern was septal (79.6%), and the obstructive form was present in 39.5% of cases. Implantable cardioverter-defibrillator (ICD) was identified in 35% of patients. Genetic testing was abnormal in 71.3%, identifying 136 variants, of which 50.7% were pathogenic and 49.3% were of uncertain significance. The most frequently involved genes were MYH7 (46.4%), MYBPC3 (28%), and FLNC (11.1%). Patients with pathogenic variants were significantly younger (47.3 vs. 61.1 years; p<0.001) and showed a higher prevalence of septal hypertrophy. A significant association was observed between genetic test results and the presence of ICD (p<0.001), especially when considering the criterion of positive family history of sudden cardiac death (p=0.002). These findings demonstrate that, in a population from southern Brazil with hypertrophic cardiomyopathy, there was a predominance of variants in the MYH7 gene. Pathogenic variants were associated with earlier presentation, septal hypertrophy pattern, and greater indication for ICD. These findings provide novel data and reinforce the need for further research to refine disease management.

20982

BRAIN INJURY AND CARDIOVASCULAR RISK: DOSE–RESPONSE ASSOCIATION AND THE ROLE OF AUTONOMIC DYSFUNCTION – A SYSTEMATIC REVIEW OF OBSERVATIONAL STUDIES

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Introdução/Fundamentos: Patients with acute brain injury, including stroke and traumatic brain injury (TBI), have an increased risk of cardiovascular (CV) events even without prior heart disease. The brain–heart axis involves autonomic dysfunction characterized by sympathetic overactivity and reduced vagal modulation. However, the association between injury severity and subsequent CV risk has not been systematically synthesized. Objetivos: To evaluate the association between brain injury severity in stroke and TBI and adverse cardiovascular outcomes, and the potential role of autonomic dysfunction. Métodos: PRISMA-based review. PubMed was searched from 2011–2026. Cohort studies and meta-analyses including patients with stroke or TBI were eligible if they reported follow-up ≥1 year, adjusted risk estimates (HR, OR, RR), and cardiovascular outcomes including MACE, stroke, coronary artery disease, hypertension or cardiac mortality. Injury severity was assessed using NIHSS or TBI classification (mild, moderate–severe, penetrating). Data on heart rate variability, baroreflex sensitivity, and troponin were extracted. Only studies with adjusted analyses were included. Resultados e Conclusões: Eight studies involving >5.6 million participants were included. In TBI, a dose–response association was observed for composite CVD: mild (HR 1.62; 95% CI 1.58–1.66), moderate–severe (HR 2.63; 2.51–2.76), and penetrating injury (HR 4.60; 4.26–4.96). Stroke risk also increased progressively (HR 2.53, 5.32, and 12.15). A meta-analysis showed increased CVD risk (OR 1.78; 95% CI 1.39–2.29) and cardiac mortality (RR 3.07; 2.17–3.98). In stroke, elevated rates of major CV events and troponin elevation (30–60%) were reported. Neurological severity correlated with autonomic dysfunction (ρ 0.29–0.47). Right insular lesions were associated with higher mortality (HR 2.11) and new-onset atrial fibrillation (39%). Reduced heart rate variability and impaired baroreflex sensitivity were consistently observed. Beta-blocker use in TBI was associated with lower in-hospital mortality (OR 0.39; 0.30–0.51). There is a consistent dose–response association between brain injury severity and cardiovascular risk, possibly mediated by autonomic dysfunction. Patients with more severe injury and insular involvement represent a high-risk group. Findings regarding beta-blockers should be interpreted cautiously given the observational nature of the data. Limitations include study heterogeneity and lack of causal inference.

20251

CONDUCTION SYSTEM PACING VERSUS BIVENTRICULAR PACING FOR CARDIAC RESYNCHRONIZATION IN HEART FAILURE WITH REDUCED EJECTION FRACTION: AN UPDATED SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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Introdução/Fundamentos: Cardiac resynchronization therapy (CRT) is an established treatment for heart failure with reduced ejection fraction (HFrEF) and ventricular dyssynchrony. However, up to one-third of patients receiving conventional biventricular pacing (BiVP) fail to respond. Conduction system pacing (CSP), encompassing His bundle pacing (HBP) and left bundle branch area pacing (LBAP), directly engages the native His-Purkinje system, offering more physiologic resynchronization. Objetivos: To evaluate the efficacy and safety of CSP versus BiVP in patients with HFrEF. Métodos: PubMed, Embase, and Cochrane Library were searched from inception to April 2026. Eligible studies were RCTs comparing CSP (HBP or LBAP) versus BiVP in adults with HFrEF. Primary outcomes were changes in LVEF and NYHA functional class. Secondary outcomes were mortality, heart failure hospitalization, QRS duration (ms), pacing threshold, and procedural time (min). Continuous outcomes were analyzed as mean differences (MDs) and dichotomous outcomes as risk ratios (RRs), all with 95% confidence intervals (CIs). Heterogeneity was quantified by I². Prespecified subgroup analyses were performed by CSP modality (HBP vs. LBAP) and follow-up duration (≤12 vs. ≥12 months). The study was prospectively registered in PROSPERO. Resultados e Conclusões: We included eleven RCTs involving 1,003 patients. Baseline mean LVEF was 28.4% and mean NYHA functional class 2.5. CSP did not significantly improve LVEF compared to BiVP (MD +2.01%; 95% CI −0.80 to 4.82). CSP was associated with greater NYHA reduction (MD −0.18; 95% CI −0.36 to −0.01). Mortality and heart failure hospitalization were similar between groups; however, with follow-up ≥12 months, CSP was associated with significantly fewer heart failure hospitalizations (RR 0.37; 95% CI 0.15 to 0.91). CSP achieved greater QRS narrowing than BiVP (MD −9.68 ms; 95% CI −18.37 to −1.00). Regarding pacing threshold, LBAP demonstrated lower values than BiVP (MD −0.35 V; 95% CI −0.61 to −0.09), whereas HBP exhibited higher thresholds compared to BiVP. HBP required significantly longer procedural time than BiVP (MD +34.06 min; 95% CI 9.20 to 58.92), while LBAP was comparable. These findings suggest that CSP is associated with clinical and electrical benefits over BiVP, with LBAP emerging as the preferred modality given its superior QRS narrowing, lower pacing thresholds, and no added procedural burden, unlike HBP, which required significantly longer procedures. Confirmation in larger randomized trials is warranted.

Figure 1: Subgroup analysis of QRS duration reduction by CSP modality

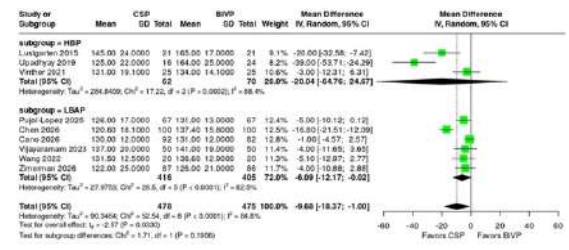


Figure 2 — Overall pooled analysis

Outcome	Studies (n)	Participants (n)	Favors	Effect estimate [95% CI]	I²	P-value
Primary outcomes						
LVEF (%)	9	944	NS	MD +2.01 [−0.80, 4.82]	80.2%	0.14
NYHA functional class*	4	424	CSP	**MD −0.18 [−0.36, −0.01]**	15.7%	**0.046**
Secondary outcomes						
Mortality	7	800	NS	RR 0.76 [0.31, 1.90]	27.1%	0.56
HF hospitalization	6	759	NS	RR 0.89 [0.36, 2.20]	68.0%	0.80
QRS duration (ms)*	9	953	CSP	**MD −9.68 [−18.37, −1.00]**	84.8%	**0.033**
Pacing threshold — LBAP (V)*	5	687	LBAP	**MD −0.35 [−0.61, −0.09]**	91.4%	**0.021**
Pacing threshold — HBP (V)	3	114	NS	MD +0.66 [−0.64, 1.97]	59.9%	0.16
Procedural time (min)	8	800	NS	MD +2.26 [−11.57, 16.10]	84.6%	0.71

CI, confidence interval; HBP, His bundle pacing; HF, heart failure; I², heterogeneity statistic; LBAP, left bundle branch area pacing; NS, not significant; LVEF, left ventricular ejection fraction; MD, mean difference; NYHA, New York Heart Association; RR, risk ratio. Highlighted values with an asterisk (*) indicate statistical significance (p < 0.05).

16625

CONGENITAL COMPLETE HEART BLOCK: THE ROLE OF EXERCISE STRESS TESTING IN PACEMAKER INDICATION.

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Introdução/Fundamentos: Congenital complete heart block (CCHB) is a rare condition, with estimated incidence: 1:15,000–20,000 live births, usually associated with maternal antibodies (anti-Ro/SSA). Although pacemaker implantation (MP) is well established in symptomatic patients, management of asymptomatic individuals remains challenging. Exercise stress testing is used for risk stratification in these patients, although its clinical utility is not well established. Objetivos: To evaluate the association between heart rate (HR) response and functional capacity during exercise stress testing and the need for pacemaker implantation in patients with CCHB. Métodos: Observational, retrospective study with analysis of medical records of patients with congenital complete heart block (CCHB) followed at a cardiology referral center. Individuals <50 years old who underwent exercise stress testing between 2015 and 2025, without prior pacemaker implantation (MP), were included. Patients were divided into two groups according to MP implantation: MP+ (with implantation) and MP- (without implantation). Clinical, echocardiographic, and exercise stress test variables were evaluated, including resting HR, peak HR, and HR response to exercise defined by achieving HR >100 bpm or doubling baseline HR, as well as achieving ≥10 METs. The outcome was the need for MP implantation within 12 months. Statistical analysis was performed using Fisher's exact test for categorical variables and unpaired Student's t-test for numerical variables (p<0.05). Resultados e Conclusões: A total of 35 patients were evaluated, with 17 in the MP+ group and 18 in the MP- group. No significant differences were observed between groups regarding age and echocardiographic parameters, including atrial volumes, ventricular volumes, and ejection fraction. The MP+ group showed, compared to the MP- group, lower resting HR (45.94±1.37 vs 53.78±1.96 bpm; p=0.0028), lower peak HR (94.41±5.27 vs 118.7±2.34 bpm; p=0.0001), and lower functional capacity (10.42±0.37 vs 12.27±0.35 METs; p=0.001). In categorical analysis, achieving HR >100 bpm was more frequent in the MP- group (18 vs 9; p=0.001), as well as doubling baseline HR (16 vs 8; p=0.0116) and achieving ≥10 METs (18 vs 12; p=0.0191). Heart rate response during exercise stress testing was associated with pacemaker implantation in CCHB. Lower peak HR, reduced functional capacity, and lower HR increment suggested a potential role for exercise testing in risk stratification.

	MP+	MP-	p-value
NUMBER OF PATIENTS	17	18	
AGE (YEARS)	19.82±2.91	19.83±2.46	NS
LEFT ATRIUM	31.88±1.71 mm	31.56±1.36 mm	NS
LV END-DIASTOLIC VOLUME	49.69±1.18 mm	49.75±1.25 mm	NS
LV END-SYSTOLIC VOLUME	30.94±0.99 mm	30.25±1.01 mm	NS
EJECTION FRACTION	0.68±0.048	0.67±0.048	NS
RESTING HR	45.94±1.37 bpm	53.78±1.96 bpm	0.0028
PEAK HR	94.41±5.27 bpm	118.7±2.34 bpm	0.0001
METs	10.42±0.37	12.27±0.35	0.001

Table 1: Comparison of clinical, echocardiographic and exercise data between MP+ and MP– groups.

	MP+	MP-	p-value
NUMBER OF PATIENTS	17	18	
HR >100 bpm	9	18	0.001
DOUBLING BASELINE HR	8	16	0.0116
≥10 METS	12	18	0.0191

Table 2: Exercise test variables associated with pacemaker implantation.

15804

EFFICACY AND SAFE OF CARDIAC RESYNCHRONIZATION THERAPY IN CHAGAS CARDIOMYOPATHY: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Chagas cardiomyopathy is a major cause of heart failure in Latin America. The effectiveness of cardiac resynchronization therapy (CRT) in this population remains uncertain. Objetivos: To systematically review the available evidence on the clinical outcomes of CRT in patients with Chagas cardiomyopathy. Métodos: Systematic review conducted according to PRISMA guidelines. Randomized and observational studies including patients with CRT and Chagas disease reporting clinical outcomes were included. A comprehensive search was performed in PubMed, Embase, Cochrane, and LILACS from inception to December 2025, without language or date restrictions. Study selection, data extraction, and quality assessment were conducted independently by two reviewers. Outcomes of interest included mortality (overall, cardiac, and non-cardiac), left ventricular function, and procedural complications. Methodological quality was assessed using the Risk of Bias in Non-randomized Studies of Interventions tool. Resultados e Conclusões: From 221 identified studies, 4 retrospective cohorts were included, comprising 250 patients with Chagas cardiomyopathy undergoing CRT. The mean age was 59 ± 12 years, 60% were male, and 87% were in NYHA class III/IV. Baseline characteristics included mean LVEF of 27% ± 7%, QRS duration of 154 ± 32 ms, atrial fibrillation in 28%, and ICD in 39%. Most patients were on guideline-directed medical therapy. Across studies, CRT was associated with improvement in functional status, with a consistent reduction in advanced NYHA classes. Echocardiographic outcomes were heterogeneous: some studies demonstrated significant improvement in LVEF and ventricular remodeling, while others showed no significant changes. Despite symptomatic and, in some cases, functional improvement, mortality remained high, predominantly due to cardiac causes, especially progressive heart failure. Non-cardiac deaths were less frequent. Cardiac resynchronization therapy is associated with improvement in functional status and, in some cases, ventricular function in patients with Chagas cardiomyopathy. However, the heterogeneity of echocardiographic responses and persistently high mortality—mainly driven by progressive heart failure—suggest a limited impact on long-term prognosis. These findings highlight the need for better patient selection and tailored therapeutic strategies in this high-risk population.

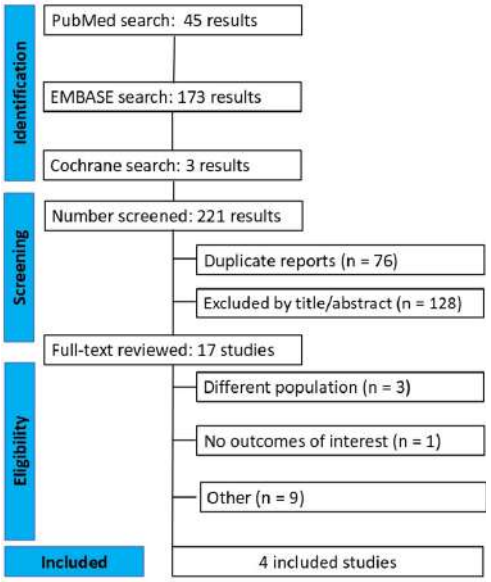


Figure 1. PRISMA flow diagram of study screening and selection

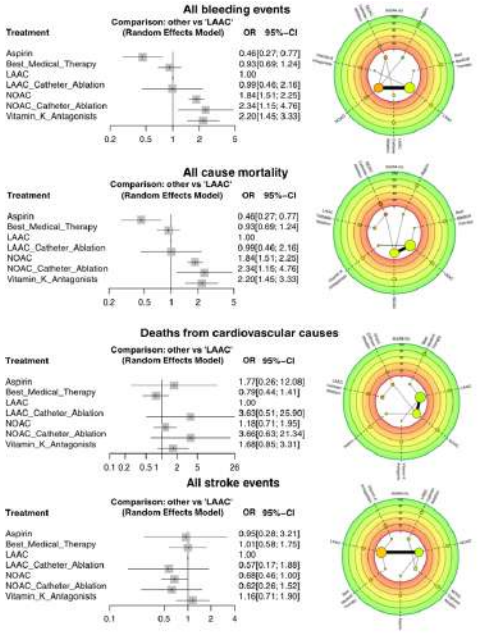
22094

EFFICACY AND SAFETY BETWEEN LEFT ATRIAL APPENDAGE CLOSURE AND ORAL ANTICOAGULATION FOR ATRIAL FIBRILLATION: A COMBINED FREQUENTIST AND BAYESIAN NETWORK META-ANALYSIS

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Introdução/Fundamentos: Atrial fibrillation (AF) is associated with an increased risk of stroke, death and other complications. Many therapeutic approaches have emerged, focusing on new procedures and anticoagulants for the management of this condition. Objetivos: To evaluate the comparative effectiveness of left atrial appendage closure (LAAC), new oral anticoagulation (NOAC) and other therapies for AF. Métodos: A systematic review and network meta-analysis was conducted following PRISMA guidelines. PubMed, Cochrane Library and Embase were searched for randomized controlled trials (RCTs) involving AF patients that underwent LAAC or NOAC therapies. The main outcomes of interest compromised all bleeding events (ABE), all-cause mortality (ACM), stroke, and death from cardiovascular causes (DCC). A combined frequentist and bayesian approach was employed to estimate odds ratios (OR) and 95% confidence/credible intervals (CI). Surface under the cumulative ranking curve (SUCRA) values were estimated and used to determine the probability a treatment is among the most effective for each endpoint of interest. Resultados e Conclusões: A total of 8 RCTs involving 8,532 patients were included, assessing distinct interventions: LAAC, NOAC, aspirin, best medical therapy (physician-directed) and vitamin K antagonists. The connected network comprised 21 possible pairwise comparisons, with 6 direct comparisons available. No studies presented zero-event arms, ensuring robust statistical estimation. In the network meta-analysis, LAAC demonstrated a statistically superior safety profile regarding bleeding and mortality. For ABE, LAAC significantly outperformed NOAC (OR 1.84; 95% CI 1.51–2.25) and vitamin K antagonists (OR 2.20; 95% CI 1.45–3.33). Bayesian SUCRA rankings placed Aspirin and LAAC as the safest interventions for bleeding. Regarding ACM, LAAC showed a protective trend compared to NOAC without statistical significance (OR 1.09; 95% CI 0.77–1.55) and vitamin K antagonists (OR 1.40; 95% CI 0.89–2.18). For stroke incidence, NOAC (OR 0.68; 95% CI 0.46–1.00) showed a trend toward higher efficacy, although not reaching statistical significance compared to LAAC alone. For DCC, best medical therapy and LAAC achieved the highest SUCRA positions. LAAC was associated with a reduction in bleeding events and proved to be comparable or superior to anticoagulation for the assessed efficacy outcomes, except for stroke, for which NOACs have stood out as the best treatment for its prevention.



15834

EFFICACY AND SAFETY OF CATHETER ABLATION IN PATIENTS WITH CONGENITAL HEART DISEASE: A 16-YEAR SINGLE-CENTER EXPERIENCE

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Introdução/Fundamentos: Catheter ablation is widely used to treat cardiac arrhythmias. However, accessing the arrhythmia substrate and creating reliable lesions can be challenging in patients with congenital heart disease (CHD). Objetivos: This study evaluated the feasibility, efficacy, and safety of catheter ablation in CHD patients. Métodos: Consecutive patients with CHD who underwent catheter ablation for arrhythmia were retrospectively included. Clinical, procedural, and follow-up data were collected. Patients were classified as having mild, moderate, or severe CHD based on disease complexity. Ablation efficacy was assessed over 12 months using device interrogation, ECG, or Holter monitoring. Acute success was defined as arrhythmia termination and non-inducibility at procedure completion, while long-term success was defined as freedom from clinical arrhythmia during follow-up. Resultados e Conclusões: The study included 224 patients (121 males) with a median age of 39 years (IQR, 29.1–51.5). CHD type and prior corrective procedures are shown in Figure 1. Atrial flutter was ablated in 98 procedures (43.8%), atrial tachycardia in 72 (32.1%), atrial fibrillation (AF) in 20 (8.9%), ventricular ectopy in 18 (8.0%), ventricular tachycardia (VT) in 10 (4.5%), and both AVNRT and accessory pathways in 15 procedures each (6.7%). AV junction ablation for permanent AF was performed in 2 patients (0.9%). Median procedural time was 110.0 minutes (IQR, 70.0–155.0) and was longer in patients with severe CHD (p < 0.001). The median radiation dose was 1.9 mGy·m² (IQR, 1.0–4.4). Acute arrhythmia termination was achieved in 96.0% of procedures. Procedure-related complications occurred in 11 cases (4.9%; Table 2), including one pharyngeal bleeding and one hematemesis, all managed conservatively without sequelae. Arrhythmia recurrence occurred in 47 patients (21.0%), most frequently in those with VT (40.0%) and AF (35.0%). Catheter ablation is a feasible and effective treatment for cardiac arrhythmias in patients with CHD, achieving a high 1-year success rate and a low recurrence rate. The overall safety profile is favorable, with complications being rare and manageable. These findings support the use of catheter ablation across a wide spectrum of arrhythmias and CHD severity.

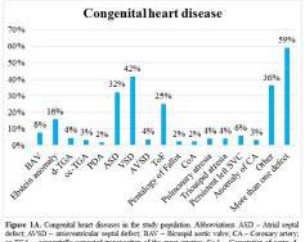


Figure 1A. Congenital heart diseases in the study population. Abbreviations: ASD – Atrial septal defect; AVSD – atrioventricular septal defect; BAV – Bicuspid aortic valve; CA – Coronary artery; cc-TGA – congenitally corrected transposition of the great arteries; CoA – Coarctation of aorta; d-TGA – dextro-transposition of the great arteries; PDA – Patent ductus arteriosus; SVC – superior vena cava; ToF – Tetralogy of Fallot; VSD – Ventricular septal defect.

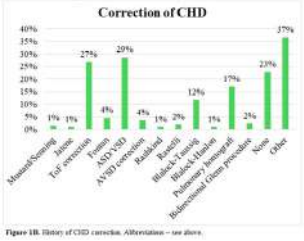


Figure 1B. History of CHD correction. Abbreviations – see above.

Parameter	Total (N = 224)	Mild CHD (N = 62)	Moderate CHD (N = 120)*	Severe CHD (N = 42)*	P-value
Male gender	121 (54.0%)	36 (30.0%)	66 (55.0%)	20 (47.7%)	0.733
Age [years]	39.8 (29.1–51.5)	48.2 (33.4–60.8)	38.9 (29.3–50.1)	31.9 (24.4–39.4)	0.012* <0.001** 0.032***
Heart failure	81 (36.2%)	26 (32.5%)	49 (40.8%)	19 (45.2%)	0.351
NYHA class: I	9 (4.0%)	1 (1.4%)	2 (1.7%)	6 (14.3%)	0.003
II	81 (37.2%)	33 (21.0%)	38 (31.7%)	10 (23.8%)	0.204
III	13 (5.7%)	8 (9.7%)	3 (4.7%)	1 (2.4%)	0.357
IV	3 (1.3%)	3 (5.0%)	1 (0.8%)	2 (4.8%)	0.154
Eisenmenger syndrome	7 (3.2%)	2 (2.2%)	3 (2.8%)	2 (2.4%)	0.599
Procedural time [min]	110.0 (70.0–155.0)	95.0 (60.1–128.0)	105.0 (70.0–147.5)	155.0 (110.0–245.0)	0.141* <0.001** <0.001***
Radiation dose [mGy·m²]	1.9 (1.0–4.4)	1.7 (0.8–2.8)	2.1 (1.1–4.6)	1.9 (1.2–4.3)	0.222* 0.592** 1.000***
Radiation time [min]	11.6 (7.0–21.0)	11.4 (7.9–21.8)	10.7 (6.7–20.7)	13.0 (7.7–20.4)	1.000* 0.881** 0.954***
Arrhythmia cessation during the procedure	215 (96.0%)	60 (96.8%)	115 (95.8%)	40 (95.2%)	1.000
No recurrence of clinical arrhythmia	177 (79.0%)	48 (79.0%)	91 (75.8%)	37 (88.1%)	0.241
Time to recurrence [months]	5.1 (0.8–7.1)	5.1 (1.0–5.1)	5.1 (2.0–7.1)	5.4 (0.5–8.1)	1.000* 1.000** 1.000***
Complications	11 (4.9%)	3 (4.8%)	5 (5.0%)	2 (4.8%)	1.000

* Median (Q1–Q3); N (%).
† Wilcoxon rank sum test (Kruskal–Wallis correction); Pearson's Chi-squared test (Fisher exact test for N < 5).

Table 1. General characteristics, procedural and follow-up data. Comparison between mild and moderate (*), mild and severe (**), moderate and severe (***) CHD. Abbreviations: CHD – congenital heart disease, NYHA – New York Heart Association.

Complication	Total (N = 224)	Mild CHD (N = 62)	Moderate CHD (N = 120)	Severe CHD (N = 42)
Hematemesis – iatrogenic damage to the esophagus	1 (0.4%)	0	0	1 (2.4%)
Lower limb edema	1 (0.4%)	0	1	0
Hemorrhagic filling in the pericardium	1 (0.4%)	0	1	0
Pharyngeal bleeding	1 (0.4%)	0	0	1 (2.4%)
Bleeding at the femoral access site	1 (0.4%)	0	1 (0.8%)	0
Pneumonia	1 (0.4%)	0	1 (0.8%)	0
intraventricular hematoma	1 (0.4%)	1 (1.6%)	0	0
Pulmonary circulatory insufficiency	1 (0.4%)	1 (1.6%)	0	0
Significant atrioventricular block	2 (0.9%)	1 (1.6%)	1 (0.8%)	0
Pericardial effusion	1 (0.4%)	0	1 (0.8%)	0
Total	11 (4.9%)	3 (4.8%)	5 (5.0%)	2 (4.8%)

Table 2. Periprocedural complications. Abbreviations: CHD – congenital heart disease.

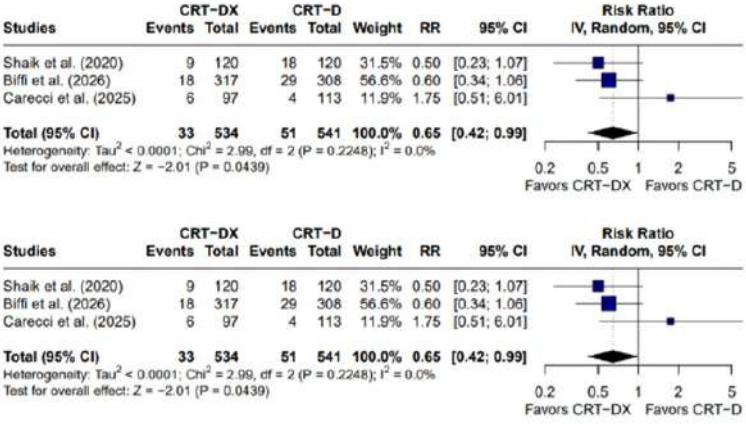
20542

EFFICACY AND SAFETY OF CRT-DX VERSUS CONVENTIONAL CRT-D IN PATIENTS WITHOUT AN INDICATION FOR PERMANENT ATRIAL PACING: A SYSTEMATIC REVIEW AND META-ANALYSIS.

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Introdução/Fundamentos: Cardiac resynchronization therapy with defibrillator (CRT-D) is an established treatment for patients with heart failure and electrical dyssynchrony. However, conventional three-lead systems carry a known risk of increased procedural complexity and device-related complications. By using a floating atrial dipole to eliminate the need for an atrial lead, the CRT-DX system offers a compelling alternative. Nevertheless, systematic data comparing its safety and efficacy directly to conventional CRT-D remains scarce. Objetivos: We aimed to compare the efficacy and safety of the CRT-DX system versus conventional CRT-D in patients lacking an indication for permanent atrial pacing. Métodos: We conducted a systematic review and meta-analysis of prospective and retrospective studies following Cochrane guidelines. A systematic search was performed in PubMed, Embase, and Cochrane databases to identify studies comparing CRT-DX versus conventional CRT-D in patients without an indication for permanent atrial pacing. Risk ratios (RR) were pooled using random-effects models for short-term outcomes (12-16 months), comparing CRT-DX with conventional CRT-D for all-cause mortality, heart failure hospitalization, and major lead-related complications. Resultados e Conclusões: A total of 1 randomized and 2 non-randomized studies were included, comprising 1,075 patients. Our meta-analysis demonstrated no significant difference between CRT-DX and conventional CRT-D in all-cause mortality (risk ratio [RR] 0.82; 95% confidence interval [CI] 0.40–1.65; p=0.57; I²=4.2%) or heart failure hospitalization (RR 0.92; 95% CI 0.51–1.65; p=0.78; I²=0.0%). However, CRT-DX was associated with a significant reduction in major lead-related complications (RR 0.65; 95% CI 0.42–0.99; p=0.04; I²=0.0%). Despite the absence of differences in clinical outcomes, the direction of effect consistently favored CRT-DX across most endpoints. These findings suggest that CRT-DX provides comparable efficacy to conventional CRT-D, with a lower burden of major lead-related complications, supporting its use as a less complex and potentially safer alternative in patients without an indication for permanent atrial pacing.



CRT-DX
CRT-D
Risk Ratio
Studies Events Total Events Total Weight RR 95% CI IV, Random, 95% CI
Shaik et al. (2020) 9 120 18 120 31.5% 0.50 [0.23; 1.07]
Biffi et al. (2026) 18 317 29 308 56.6% 0.60 [0.34; 1.06]
Carecci et al. (2025) 6 97 4 113 11.9% 1.75 [0.51; 6.01]
Total (95% CI) 33 534 51 541 100.0% 0.65 [0.42; 0.99]
Heterogeneity: Tau² < 0.0001; Chi² = 2.99, df = 2 (P = 0.2248); I² = 0.0%
Test for overall effect: Z = −2.01 (P = 0.0439)
0.2 0.5 1 2 5
Favors CRT-DX Favors CRT-D

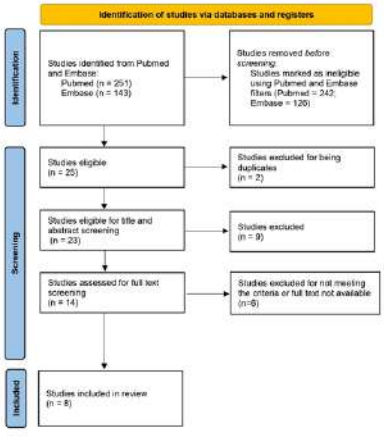
14990

EFFICACY AND SAFETY OF DIRECT ORAL ANTICOAGULANTS IN DEVICE-DETECTED SUBCLINICAL ATRIAL FIBRILLATION: A SYSTEMATIC REVIEW

DIEGO EVANGELISTA LABRUNA RODRIGUES1; BRUNA VICTORIA PIRES MACHADO1; GABRIELA MARIA VICENTE DE MELO1; CLARA BERGUETTE CHAVES1; LAURA CECHETTI GALLI BORGES1; LUCAS LEONARDO ALVES CARDOSO1; EDUARDA FRANCESCHET1; FELIPE DA SILVA PAULITSCH1;

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Introdução/Fundamentos: Atrial fibrillation is the most common sustained cardiac arrhythmia and is strongly associated with an increased risk of stroke and systemic embolism. The widespread use of implantable cardiac devices such as pacemakers and ICD has enabled detection of brief, asymptomatic episodes, termed device-detected subclinical atrial fibrillation. Although associated with increased thromboembolic risk, its absolute risk is lower than that of clinically overt atrial fibrillation, creating uncertainty regarding the net clinical benefit of anticoagulation, particularly given the bleeding risk associated with direct oral anticoagulants (DOACs). Objetivos: This study aims to evaluate the efficacy and safety of DOACs in patients with device-detected subclinical atrial fibrillation and to identify subgroups with the greatest net clinical benefit. Métodos: A systematic review was conducted in accordance with PRISMA guidelines. PubMed and Embase were searched in March 2026 using predefined descriptors and Boolean operators. Randomized controlled trials and cohort studies published within the last 10 years were included. Study selection was independently performed by three reviewers. Data were extracted in a standardized manner and synthesized qualitatively. Resultados e Conclusões: Eight studies were included. DOAC therapy, particularly apixaban, reduced stroke and systemic embolism by approximately 30–60%, depending on baseline risk. However, anticoagulation increased the risk of major bleeding (HR ≈1.8), with most events being gastrointestinal and rarely fatal. The net clinical benefit was strongly risk-dependent. Patients with CHA_2DS_2-VASc >4 demonstrated a favorable balance, with substantial absolute risk reduction and a number needed to treat of approximately 25 over 3.5 years. In contrast, patients with lower risk scores (CHA_2DS_2-VASc <4) derived limited benefit and experienced a relatively higher bleeding burden. Greater benefit was observed in individuals with prior stroke or transient ischemic attack, while atrial fibrillation burden did not consistently modify treatment effect. Based on these results we can conclude that DOACs reduce thromboembolic risk in device-detected subclinical atrial fibrillation but increase bleeding risk. Net clinical benefit is primarily observed in high-risk patients, supporting a personalized, risk-based approach to anticoagulation. Further studies are relevant to refine risk stratification and optimize patient selection





18110

EFFICACY OF BETA-BLOCKER DISCONTINUATION AFTER MYOCARDIAL INFARCTION WITH PRESERVED EJECTION FRACTION: A SYSTEMATIC REVIEW OF RANDOMIZED CONTROLLED TRIALS

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Introdução/Fundamentos: The use of beta-blockers after myocardial infarction (MI) is well established in clinical practice, particularly in patients with left ventricular dysfunction. However, in individuals with preserved left ventricular ejection fraction (LVEF), current recommendations are based on evidence derived from studies conducted prior to the widespread adoption of contemporary strategies, such as early coronary reperfusion and optimized pharmacological therapies. In this context, the true magnitude of benefit from prolonged use of this therapy remains uncertain. Objetivos: To critically evaluate the available evidence regarding the efficacy of beta-blocker discontinuation in post-MI patients with LVEF ≥40% without heart failure (HF). Métodos: This is a systematic review conducted in accordance with PRISMA recommendations. Randomized controlled trials (RCTs) comparing discontinuation versus continuation of beta-blocker therapy in post-MI patients with LVEF ≥40% without HF were included. The search was performed in PubMed, Cochrane, and BVS databases using controlled descriptors and free-text terms related to “Beta-blockers” and “Myocardial Infarction,” combined with Boolean operators. Study selection was carried out by two independent reviewers. Risk of bias was assessed using the RoB 2 tool. Studies with higher risk of bias were not automatically excluded but were considered in the interpretation of findings. Primary outcomes included all-cause mortality, recurrent MI, and stroke. Cardiovascular hospitalization was evaluated as a secondary outcome. Resultados e Conclusões: A total of 1,660 studies were identified, of which five eligible randomized clinical trials were included (n = 25,270). Significant heterogeneity was observed among the selected studies regarding the timing of intervention initiation and treatment duration. In trials assessing discontinuation strategies, results were inconsistent, precluding a robust determination of equivalence or non-inferiority, partly due to variability in confidence intervals and reported non-inferiority margins. In superiority analyses, continuation of therapy demonstrated statistically significant benefit in only one study (95% CI, 0.75–0.98; p = 0.03), while the others showed no significant differences between strategies. Therefore, current evidence remains inconclusive regarding the efficacy of discontinuation, highlighting the need for further trials with robust methodological design and well-defined outcomes to better inform evidence-based clinical practice.

Figure 1: Flowchart representing identification, screening, eligibility and inclusion and exclusion criteria of this systematic review.

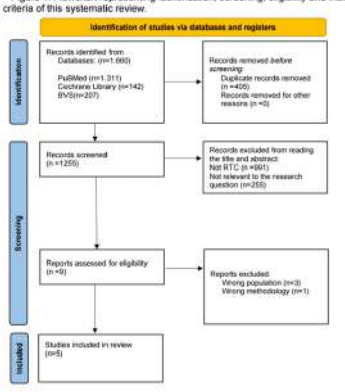


Figure 2. Risk of Bias tools analysis



18555

EFFICACY OF EARLY VERSUS DELAYED INITIATION OF DIRECT ORAL ANTICOAGULANTS AFTER ISCHEMIC STROKE IN ATRIAL FIBRILLATION: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Atrial fibrillation is one of the main cardioembolic causes, being responsible for increasing the risk of ischemic stroke, an important determinant of morbidity and mortality, characterized by high early recurrence and its influence on the occurrence of other vascular events. The use of anticoagulants after an acute stroke is recommended in clinical practice; however, there is controversy among guidelines regarding the optimal timing (≤4 days and ≥7 days), mainly due to the increased risk of intracranial hemorrhage. Objetivos: To evaluate the efficacy of early versus delayed initiation of direct oral anticoagulants after acute ischemic stroke associated with atrial fibrillation. Métodos: A systematic review was conducted in accordance with PRISMA guidelines and the Cochrane Handbook. Randomized controlled trials comparing early and delayed initiation of oral anticoagulants in patients with acute stroke associated with atrial fibrillation, published within the last 10 years and written in Portuguese or English were included. Studies with high risk of bias, unrelated topics, post hoc analyses, and derivative studies were excluded. The search was performed in PubMed, Cochrane, and BVS databases. Risk of bias was assessed using the RoB 2 tool. The descriptors “Ischemic Stroke,” “Anticoagulation,” and “Atrial Fibrillation,” along with their synonyms, were used. Primary outcomes included recurrence of ischemic stroke, intracranial hemorrhage, and mortality; secondary outcomes included other ischemic or hemorrhagic events. Resultados e Conclusões: A total of 3,821 studies were identified, of which four randomized controlled trials (n = 6,722) were included. Only one trial showed risk reduction with early initiation, suggesting a 41% probability that 3–4 days represents the optimal timing for initiation among four groups. On this group, no ischemic events and one hemorrhagic event were observed within 30 days. The remaining studies demonstrated non-inferiority of delayed initiation for the analyzed outcomes (95% CI, −5.31% to 1.74%; p = 0.004 and 95% CI, −1.1% to +1.2%; p = 0.0003), although they suggested a potential benefit of early initiation in prevention, without statistical significance, with lower recurrence of ischemic stroke and mortality. Therefore, this review suggest that there is no consistent evidence of superiority of early initiation compared with delayed oral anticoagulation, highlighting the need for further studies with appropriate methodological design and well-defined outcomes.

Figure 1. PRISMA 2020 flow diagram illustrating the study selection process, including identification, screening, eligibility and inclusion of studies.

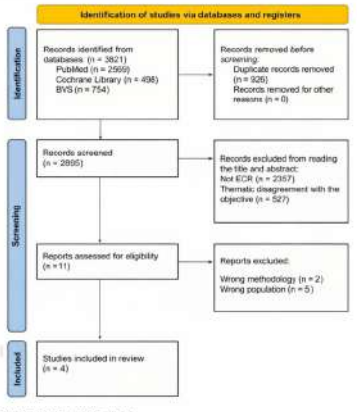


Figure 2. Risk of Bias tools 2 analysis



16679

EFFICACY OF PULSED FIELD ABLATION VERSUS CRYOBALLOON IN PAROXYSMAL ATRIAL FIBRILLATION: NETWORK META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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Introdução/Fundamentos: The current standard approach for paroxysmal atrial fibrillation (PAF) is the isolation of the pulmonary veins through catheter ablation. Thermal energy sources such as radiofrequency (RF) and cryoballoon (CRYO) are traditionally used in this manner. A novel energy delivery method, namely pulsed field ablation (PFA), has emerged as a potential alternative. Objetivos: To compare the efficacy of PFA and CRYO in patients with PAF. Métodos: A systematic review was conducted according to the PRISMA 2020 guidelines. PubMed, Embase, Cochrane Library and Web of Science databases were searched for randomized controlled trials (RCTs) that compared PFA, CRYO, and/or RF. The primary endpoint was treatment failure (recurrence of atrial fibrillation after 3 months in a follow-up of 12 months), expressed as odds ratio (OR) and 95% confidence intervals (95% CI), with RF as reference group. A random-effects network meta-analysis was performed in R software (version 4.5.2). Heterogeneity was assessed using I^2 statistic, with $I^2 > 50\%$ considered substantial. Treatment ranking was performed using P-scores. Global consistency test was assessed using Q decomposition. Risk of bias was evaluated with the RoB 2.0 tool. Resultados e Conclusões: A total of 6 RCTs and 2437 patients were included for the final analysis, comprising 8 pairwise comparisons. At 1-year follow-up, no statistically significant differences were observed in atrial fibrillation recurrence across interventions. Compared with RF, PFA showed a non-significant trend toward lower recurrence rate (OR = 0.855; 95% CI: 0.644 - 1.134; p = 0.813), while CRYO demonstrated similar outcomes (OR = 1.024; 95% CI: 0.84 - 1.25; p = 0.277). Indirect comparisons between PFA and CRYO also resulted in no statistical significance (OR 0.86; 95% CI: 0.64 - 1.13). Ranking analysis based on P-scores suggested PFA as the most favorable treatment (0.876), followed by RF (0.366) and CRYO (0.257). Heterogeneity was low ($I^2 = 0\%$) and no global (p = 0.71), within-design (p = 0.87) and between-design (p = 0.44) inconsistency was found. The findings indicate consistent yet non-significant differences across treatments, with a tendency favoring PFA in reducing atrial fibrillation recurrence in patients with PAF. This reinforces the need for more robust and long-term clinical trials to generate stronger evidence for clinical practice.

17629

EFFICACY OF THE ALDOSTERONE ANTAGONISTS IN REDUCING THE RISK OF POSTOPERATIVE ATRIAL FIBRILLATION IN PATIENTS UNDERGOING CARDIAC SURGERY: A META-ANALYSIS

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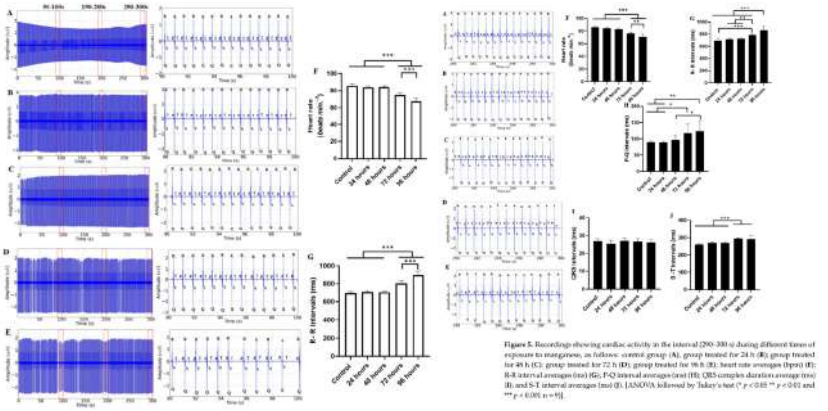
Introdução/Fundamentos: Background: Postoperative atrial fibrillation (PAOF) is a prevalent cardiac arrhythmia following heart surgeries, resulting in increased complications and prolonged hospital stays. Aldosterone antagonists (AA) demonstrate potential in managing PAF, but their effectiveness in significantly reducing the condition remains unclear in the existing literature. Objetivos: Purpose: We conducted a meta-analysis to evaluate the efficacy of the AA in reducing the risk of PAOF in patients undergoing cardiac surgery. Métodos: Methods: PubMed, Embase, and Cochrane database were analyzed. Outcome analyzed was PAOF. A random effects model was used to calculate the risk ratios (RRs) with 95% confidence intervals. Statistical analysis was performed using the R program (version 4.3.2). Heterogeneity was assessed with I2 statistics. Resultados e Conclusões: Results: We included 756 patients from 3 studies. Of those, 2 were derived from RCTs. Spironolactone was administered to 338 patients out of the 409 patients who received AA. The cardiac surgeries were: valvular surgery and coronary artery bypass graft (CABG). The remaining 71 patients received eplerenone as an intervention. The use of AA was associated with a significant reduction in the risk of PAOF compared to non-use (RR 0.73; 95% CI 0.58-0.92; P = 0.007; I2 = 47%). Conclusion: In this meta-analysis, AAs were associated with a lower risk of PAOF in patients undergoing cardiac surgery.

21411

ELECTROCARDIOGRAPHIC ALTERATIONS INDUCED BY MANGANESE EXPOSURE IN COLOSSOMA MACROPOMUM

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(1) UNIVERSIDADE FEDERAL DO PARA (UFPA) - BELÉM - PA - BRASIL;



Introdução/Fundamentos: Manganese is an essential metal whose function is primarily associated with its role as an enzymatic cofactor, being important in the activation of mitochondrial metabolism. Its absorption occurs mainly through enterocytes in the form of the divalent ion (Mn^{2+}). However, the excessive release of this element into the environment poses risks to human health, whose mechanisms are not yet fully understood. Among its toxic effects, the increased efflux of Mn^{2+} in cardiac mitochondria stands out, as these organelles possess a slow and energy-dependent transport system. This process impairs the extrusion of the metal into the extracellular environment, leading to the depletion of cellular energy reserves. Objetivos: evaluate manganese-induced cardiotoxicity through the analysis of electrocardiographic biomarkers, investigating its influence on cardiac homeostasis. Métodos: A total of 45 Colossoma macropomum were used and maintained under controlled conditions, with water quality monitoring and adherence to ethical principles. The fish were divided into five groups, including one control group and four groups exposed to manganese (4 mg/mL) for different periods (24, 48, 72, and 96 h). Electrocardiograms were performed with digital signal recording and analyzed using specific software. Finally, statistical analyses were conducted using ANOVA followed by Tukey's test, considering $p < 0.05$. Resultados e Conclusões: A significant reduction in heart rate was observed in the groups exposed for 72 h (74.67 ± 2.44 bpm) and 96 h (67.33 ± 3.74 bpm) compared to the control group. The RR interval increased during the same exposure periods (72 h: 805.4 ± 30.64 ms; 96 h: 893.4 ± 51.85 ms), indicating bradycardia. The PQ interval was also prolonged at 72 h (98.67 ± 5.47 ms) and 96 h (101.3 ± 9.16 ms), suggesting impairment of atrioventricular conduction. No significant changes were observed in QRS complex duration ($p = 0.344$). The ST interval showed a progressive increase, with higher values at 72 h (310.9 ± 18.00 ms) and 96 h (303.7 ± 15.44 ms), indicating alterations in ventricular repolarization. These findings suggest that manganese exposure promotes progressive cardiotoxicity, possibly associated with reduced cardiac electrical activity and blockade of L-type calcium channels. Despite the maintenance of sinus rhythm, the prolongation of the PQ interval and ST segment demonstrates impairment of cardiac electrical conduction and repolarization.

19889

ELECTROCARDIOGRAPHIC DIFFERENCES BETWEEN RACES IN BRAZILIAN COMPETITIVE ATHLETES: A TRANSVERSAL STUDY WITH UNDERREPRESENTED SPORT MODALITIES

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Introdução/Fundamentos: Electrocardiographic (ECG) patterns in athletes vary according to ethnicity, and distinguishing physiological adaptations from pathological findings is essential for cardiovascular screening and sudden cardiac death (SCD) prevention. However, data from ethnically diverse athletic populations in Brazil remain limited, especially in sports other than soccer. Objetivos: To compare the ECG findings in competitive athletes with different self-reported racial groups participating in multiple sports. Métodos: This is a cross-sectional study including competitive athletes with different auto-declared races, aged ≥12 years, from multiple sports institutions in Brazil. Participants self-reported race. Indigenous were excluded from this analysis due to the small sample size (n <10). Demographic data, sport modality and weekly training hours were obtained through a standardized questionnaire. Resting 12-lead ECG was performed in supine position and analyzed by a sports cardiologist following standardized criteria. Resultados e Conclusões: A total of 1095 athletes were included (median age 20 [interquartile range 16-28]), 65.1% men). Of these, 206 (18.8%) were black, 411 (37.5%) mixed-race, 467 (42.6%) white and 11 (1%) asian. Weekly training time differed significantly between groups ($p = 0.001$), with black and white athletes training more (median 15 hours/week) than mixed-race (13 hours/week) and Asian athletes (13.5 hours/week). ECG abnormalities associated with increased risk of sudden cardiac death did not differ significantly across racial groups. Physiological ECG patterns predominated in all groups. Sinus bradycardia was significantly more prevalent in black and white populations combined (9.5%) than in the others (4.3%; p=0.001). The black athlete repolarization variant was found to be more prevalent in black population (2.9%), but it was also seen in the other groups (mixed-race: 0.7%; white 0.4%; asian 0%; p=0.023). The most prevalent ECG alteration across all athletes was sinus arrhythmia (18.7%), with no statistically significant difference between groups. Early repolarization pattern also did not differ. These findings are consistent with benign, exercise-induced physiological adaptations, and the observed variations across ethnic groups align well with existing literature. Furthermore, the presence of ECG patterns of black athletes in all ethnic groups highlights the importance of interpretation criteria that take into account the admixture characteristic of the Brazilian population.

21384

ELECTROCARDIOGRAPHIC, CARDIORESPIRATORY, AND MYORELAXANT EFFECTS OF CAMPHOR IN NILE TILAPIA (OREOCHROMIS NILOTICUS): EXPERIMENTAL EVALUATION OF CARDIOTOXICITY

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Introdução/Fundamentos: Aquaculture uses anesthetics to reduce stress in fish, but synthetic agents can cause adverse effects and environmental impacts. Camphor (CPR), of plant origin, is an aromatic compound naturally present in the essential oil of Cinnamomum camphora and other plants, with widespread use in traditional medicine. CPR presents anesthetic potential through action on the central nervous system and has reported toxicity, including cardiotoxicity. Its effects on Oreochromis niloticus (Nile tilapia) remain poorly understood, warranting further investigation. Objetivos: To evaluate the safety and efficacy of camphor as an anesthetic in Oreochromis niloticus, analyzing behavioral, electromyographic (EMG), electrocardiographic (ECG), and respiratory responses, as well as its effects on muscular, cardiac, and ventilatory functions. Métodos: Ninety-nine juvenile tilapia acclimated under controlled conditions were exposed by immersion to camphor at 150, 200, 250, and 300 mg/L for 5 minutes. Evaluated parameters included: loss and recovery of postural reflex, muscular activity (EMG), cardiac parameters (ECG: heart rate, intervals, and amplitudes), and opercular beat frequency. Data were analyzed by ANOVA with Tukey's post-hoc test. Resultados e Conclusões: CPR induced postural reflex loss in all groups, with reduced latency time as concentration increased (150–300 mg/L) and longer recovery at higher doses. EMG showed decreased muscular activity during exposure, with irregular tracings and gradual post-exposure recovery. ECG analysis revealed dose-dependent bradycardia, with prolonged RR, PQ, QRS, and QT intervals, most pronounced at 250–300 mg/L, and reduced T-wave amplitude at the highest concentrations, suggesting impaired ventricular repolarization and arrhythmia risk. During recovery, groups at 150–250 mg/L showed increased heart rate, while 300 mg/L maintained reduced values. Respiratory activity decreased during exposure, with slower recovery at the highest dose. These findings indicate an anesthetic effect in Oreochromis niloticus associated with dose-dependent cardiorespiratory alterations and potential cardiotoxicity. Partial reversibility at intermediate doses suggests a limited safety margin, reinforcing the need for a defined therapeutic window and further physiological investigation in tilapia.

20752

EXTREME THERMAL EVENTS AND ADVERSE CARDIOVASCULAR OUTCOMES: A SYSTEMATIC REVIEW ON THE RELATIONSHIP BETWEEN HEAT AND ARRHYTHMIAS

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Introdução/Fundamentos: Climate change has increased the frequency of extreme thermal events worldwide. Intense heat triggers responses like profuse sweating and sympathetic hyperactivation, leading to dehydration, electrolyte imbalance, and hemodynamic instability. These are known triggers for cardiac arrhythmias in vulnerable populations. Updating clinical evidence on thermal stress and cardiac electrical stability is essential. Objetivos: To evaluate the association between extreme heat exposure and the risk of cardiac arrhythmias and out-of-hospital cardiac arrest (OHCA) in adults. Métodos: Systematic review conducted according to PRISMA guidelines. PubMed, Embase, Cochrane, Scopus, and LILACS were searched for observational studies assessing extreme heat exposure (e.g., heatwaves, high temperature percentiles, or WBGT >30°C) and cardiovascular outcomes. Study selection and data extraction were performed independently by two reviewers using Rayyan. Risk of bias was assessed using the Newcastle-Ottawa Scale, with most studies classified as low to moderate risk. Resultados e Conclusões: Of 169 records, 36 studies were included, comprising over 100 million individuals and 14 million cardiovascular events. Extreme heat exposure was consistently associated with increased risk of arrhythmias and OHCA, particularly in large population-based studies with low risk of bias. Time-series analyses showed acute effects, with higher risk between lag 0–4 days. Significant increases in atrial fibrillation-related emergency visits were observed during peak heat periods, with relative rises exceeding 200% in localized analyses. Large registries from Japan, China, and Europe demonstrated higher rates of OHCA and sudden cardiac death. Older adults (≥65 years) and individuals with cardiovascular disease were disproportionately affected. Extreme heat exposure is associated with increased risk of cardiac arrhythmias and OHCA, particularly in vulnerable populations. Findings are primarily supported by high-quality studies, reinforcing the need to integrate environmental risk into cardiovascular care and preventive strategies during heatwaves.

16819

FAILURE OF P-WAVE DURATION AS A SURROGATE MARKER FOR LEFT ATRIAL ENLARGEMENT IN AFRICAN AMERICANS: INSIGHTS FROM THE JACKSON HEART STUDY

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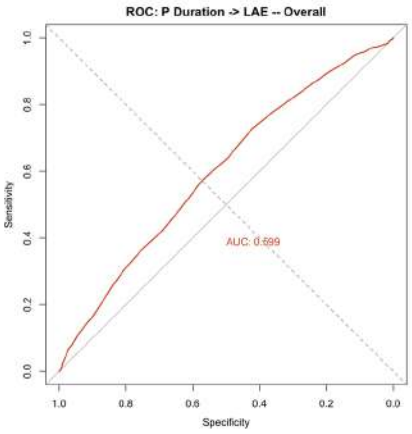


Table 1. Baseline Characteristics by P-Wave Duration

Characteristic	Overall (N=3,476)	P <120 ms (N=1,881)	P ≥120 ms (N=1,595)	p
Demographics				
Age, years	56 (13)	53 (13)	57 (12)	<0.001
Female sex	2,175 (63%)	1,389 (68%)	867 (55%)	<0.001
BMI, kg/m²	32 (7)	31 (7)	33 (7)	<0.001
Obesity (BMI ≥30)	1,871 (54%)	922 (49%)	949 (60%)	<0.001
Cardiovascular Risk Factors				
Hypertension	1,964 (57%)	931 (49%)	1,033 (65%)	<0.001
Antihypertensive meds	1,813 (53%)	854 (45%)	959 (61%)	<0.001
Diabetes mellitus	775 (22%)	391 (21%)	384 (24%)	0.013
Systolic BP, mmHg	127 (18)	126 (18)	129 (18)	<0.001
eGFR CKD-EPI, mL/min/1.73m²	96 (22)	97 (21)	92 (22)	<0.001
Prevalent CVD	331 (9.5%)	151 (8.0%)	180 (11%)	<0.001
ECG Parameters				
P-wave duration, ms	118 (13)	109 (7)	129 (9)	<0.001
PR interval, ms	173 (28)	163 (24)	186 (27)	<0.001
QRS duration, ms	94 (14)	91 (13)	98 (15)	<0.001
QTc, ms	426 (27)	426 (27)	427 (28)	0.3
Echocardiographic Parameters				
LA diameter, 2D, mm	35.0 (4.4)	34.3 (4.2)	35.9 (4.5)	<0.001
LA diameter, M-mode, mm	35.7 (4.3)	35.0 (4.2)	36.7 (4.2)	<0.001
LAE (ASE sex-specific)	607 (17%)	258 (14%)	349 (22%)	<0.001
LA enlargement (>40 mm)	372 (11%)	152 (8.0%)	220 (14%)	<0.001
LA dilation (qualitative)				<0.001
None	2,951 (85%)	1,679 (89%)	1,272 (81%)	
Mild	504 (15%)	202 (11%)	302 (19%)	
Moderate/Severe	9 (0.2%)	0 (0%)	9 (0.4%)	
LVEF, %	62 (7)	62 (7)	62 (8)	0.013
LV mass index, g/m²	75 (21)	72 (20)	77 (23)	<0.001
LVH (echo)	289 (8.3%)	128 (6.8%)	161 (10%)	<0.001

Continuous variables presented as mean (SD); categorical variables as n (%). BMI, body mass index; BP, blood pressure; CVD, cardiovascular disease; ECG, electrocardiogram; eGFR, estimated glomerular filtration rate; LA, left atrial; LAE, left atrial enlargement; LV, left ventricular; LVEF, LV ejection fraction; LVH, LV hypertrophy; ms, milliseconds

Introdução/Fundamentos: Electrocardiographic (ECG) criteria for left atrial enlargement (LAE) are often used as clinical surrogates for structural and hemodynamic left atrial (LA) overload. Their diagnostic performance compared to echocardiography remains suboptimal, and African American populations are consistently underrepresented in relevant diagnostic accuracy studies. Objetivos: To assess the diagnostic accuracy of P-wave duration across a continuous threshold spectrum for the detection of echocardiographic LAE in a large African American cohort. Métodos: We performed a retrospective analysis of the Jackson Heart Study, a community-based cohort of African American adults (aged 21–94 years). P-wave duration was evaluated as the index test across continuous thresholds using receiver operating characteristic (ROC) curve analysis and area under the curve (AUC) with 95% confidence intervals (95% CI). The reference standard was echocardiographic LAE defined by American Society of Echocardiography (ASE) sex-specific LA diameter thresholds (>40 mm in men; >38 mm in women). Diagnostic performance at the conventional ≥120 ms threshold was reported with sensitivity (Sn), specificity (Sp), positive and negative likelihood ratios (LR+ and LR−) with 95% CI. Exclusion criteria included unreadable and/or missing ECG, pacemaker rhythm, non-sinus rhythm, missing P-wave axis and/or duration, prevalent heart failure and lack of echocardiographic LA 2D diameter measure. Resultados e Conclusões: A total of 3,476 participants were included, of whom 607 (17.5%) met ASE diameter criteria for LAE. Baseline characteristics are summarized in Table 1. Overall discriminatory performance was poor (AUC 0.599; 95% CI 0.575–0.623), as shown in Figure 1. At the ≥120 ms threshold, Sn was 57.5% (95% CI 53.5–61.5%), Sp was 56.9% (95% CI 55.1–58.7%), LR+ was 1.34 (95% CI 1.23–1.45), and LR− was 0.75 (95% CI 0.68–0.82), reflecting limited capacity to rule in or rule out LAE. In this large African American cohort, P-wave duration demonstrated poor diagnostic accuracy for echocardiographically defined LAE. These findings highlight the inadequacy of this ECG criterion as a surrogate marker across a historically underrepresented population.

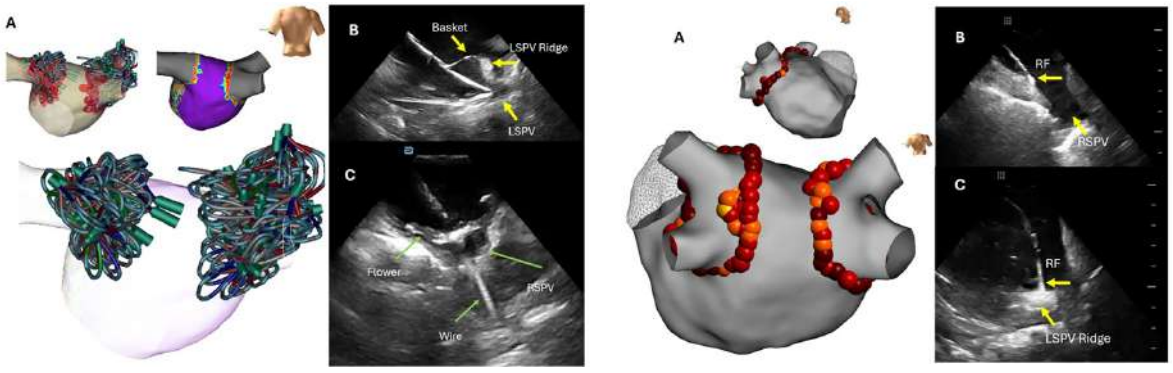
19615

FLUOROLESS HIGH-DENSITY PULSED FIELD VERSUS RADIOFREQUENCY ABLATION FOR ATRIAL FIBRILLATION GUIDED BY LEFT-ATRIAL INTRACARDIAC ECHOCARDIOGRAPHY: THE HALO PROTOCOL

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Introdução/Fundamentos: Pulsed field ablation (PFA) is a tissue-selective alternative energy source to radiofrequency ablation (RFA) for atrial fibrillation (AF) with favorable safety and efficiency; however, outcomes are highly dependent on technique, lesion density, and tissue-contact assessment. Objetivos: To compare outcomes of AF ablation using PFA versus RFA when performed in an identical, fluoroless workflow incorporating electroanatomic mapping (EAM) and intracardiac echocardiography (ICE) using the HALO (High-density Antral Left-atrial ICE-guided Overlapping) protocol. Métodos: We retrospectively analyzed 192 consecutive patients undergoing AF ablation with EAM-guided 4-mm lesion tags (50%–75% overlap) and LA ICE for contact assessment. PFA (n=62) employed high-density overlapping lesions extending beyond ostial PV isolation, while RFA (n=130) combined ICE tissue enhancement with contact-force guidance. Lesion delivery was guided by spatial density and contact quality. Resultados e Conclusões: Mean follow-up was 10.6 ± 4.3 months. Arrhythmia recurrence was lower with PFA (4.8%) than RFA (13.1%; p=0.082). In paroxysmal AF, recurrence was significantly lower with PFA (2.1%) versus RFA (16.7%; p=0.011). In persistent AF, recurrence rates were similar (p=0.569) despite a 3.5-fold higher proportion of redo procedures in the RFA group (p=0.001) and more frequent posterior wall (PW) isolation in the PFA group (46.8% vs 20.8%). Procedure duration was significantly shorter with PFA. No major complications occurred. In a standardized fluoroless HALO workflow, PFA achieved superior short-term rhythm control in paroxysmal AF and significantly shorter procedure times. In persistent AF, outcomes were comparable with RFA. Lesion strategy and quality are critical determinants of ablation success beyond energy source selection alone.



21128

IMPACT OF GLP-1 AGONISTS ON ATRIAL FIBRILLATION REDUCTION IN OBESE PATIENTS WITHOUT DIABETES: A SYSTEMATIC REVIEW OF RANDOMIZED CLINICAL TRIALS.

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Introdução/Fundamentos: Obesity is an important risk factor for atrial fibrillation (AF), being associated with cardiac remodeling, systemic inflammation, and worse cardiovascular prognosis. Recently, glucagon-like peptide-1 (GLP-1) receptor agonists, especially Semaglutide, have demonstrated relevant cardiovascular and metabolic benefits in obese patients, suggesting a potential role in reducing AF occurrence and progression. Objetivos: To evaluate the impact of GLP-1 agonists on atrial fibrillation reduction and related cardiovascular outcomes in obese patients without diabetes through a systematic review of randomized clinical trials. Métodos: This systematic review was conducted according to PRISMA recommendations. Searches were performed in the PubMed, SciELO, and EMBASE databases using the terms “GLP-1 receptor agonist”, “atrial fibrillation”, “obesity”, and “semaglutide”, combined with the Boolean operators AND and OR, applying filters for randomized clinical trials published between 2020 and 2026. Studies involving obese patients without diabetes treated with GLP-1 agonists compared with placebo were included, evaluating atrial fibrillation and cardiovascular outcomes. Review articles, editorials, observational studies, and duplicate studies were excluded. Study selection and data extraction were independently conducted by two reviewers. Risk of bias was assessed using the Cochrane RoB 2 tool. Resultados e Conclusões: The search strategy identified 43 studies, of which 8 randomized clinical trials met the eligibility criteria, totaling more than 10,000 participants. The studies demonstrated consistent benefits of GLP-1 agonists on parameters associated with atrial fibrillation and cardiac remodeling. In the STEP-HFpEF program, semaglutide promoted a significant reduction in left atrial remodeling compared with placebo (estimated mean difference -6.13 mL; 95% CI -9.85 to -2.41; p=0.0013), in addition to functional improvement and reduction of inflammatory markers. Patients with a history of AF showed greater improvement in heart failure-related symptoms (interaction p=0.001). Risk of bias assessment demonstrated low risk across most evaluated domains. Therefore, GLP-1 agonists demonstrated favorable effects on cardiac remodeling and AF-related outcomes in obese patients without diabetes, suggesting potential cardiovascular benefit in this population.

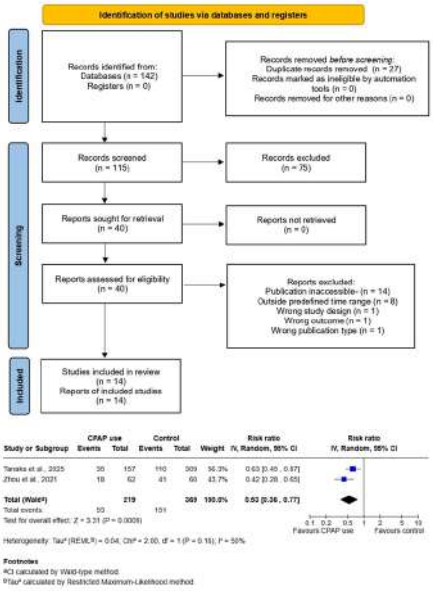
17180

IMPACT OF OBSTRUCTIVE SLEEP APNEA SYNDROME AND CPAP USE ON ATRIAL FIBRILLATION RECURRENCE

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Introdução/Fundamentos: Atrial fibrillation (AF) is the most prevalent sustained arrhythmia and is associated with high morbidity and mortality. Obstructive sleep apnea syndrome (OSAS) is a common comorbidity in these patients and contributes to pathophysiological changes that favor arrhythmia recurrence. Treatment with continuous positive airway pressure (CPAP) has been proposed as a strategy to reduce this risk, although the evidence remains heterogeneous. Objetivos: To analyze the relationship between OSAS and AF recurrence, as well as to evaluate the impact of CPAP use on reducing this clinical outcome. Métodos: This is a systematic review with meta-analysis conducted in accordance with PRISMA recommendations. The search was performed in PubMed, Embase, Cochrane, Web of Science, and LILACS, including studies published between 2016 and 2026. Studies involving adult patients with AF and OSAS were included, comparing CPAP use with no treatment. The primary outcome was clinical recurrence of AF. The effect measure adopted was relative risk, using a random-effects model. Resultados e Conclusões: Fourteen studies were included in the qualitative analysis, of which two were eligible for quantitative synthesis. In the meta-analysis, CPAP use was associated with a significant reduction in atrial fibrillation recurrence, with a relative risk (RR) of 0.53 (95% CI: 0.36–0.77), indicating an approximate 47% reduction in recurrence risk. A total of 53 events were observed among 219 patients in the CPAP group, compared to 151 events among 369 patients in the control group. Heterogeneity was moderate (I^2 = 50%), suggesting variability among studies, possibly related to methodological and clinical differences. The overall effect was statistically significant (p = 0.0009), reinforcing the robustness of the findings. Taken together, these results indicate that treatment of OSAS with CPAP may substantially reduce atrial fibrillation recurrence, particularly in post-intervention settings, although the limited number of studies included in the quantitative analysis underscores the need for further research to consolidate the evidence.



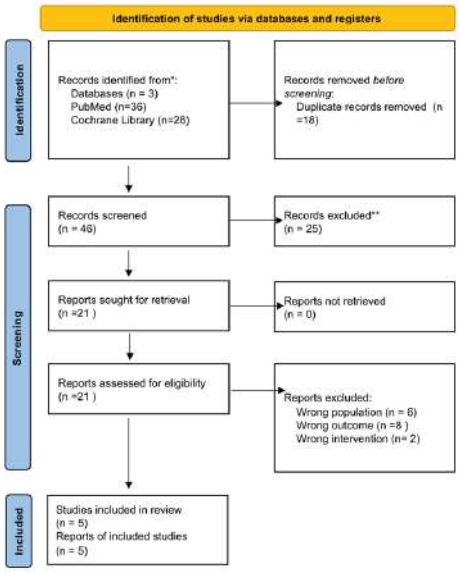
19047

IMPACT OF STRUCTURED PHYSICAL EXERCISE ON RECURRENCE AND BURDEN OF ATRIAL FIBRILLATION: A SYSTEMATIC REVIEW OF CLINICAL RANDOMIZED TRIALS

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Introdução/Fundamentos: Atrial fibrillation is the most prevalent sustained arrhythmia, associated with increased morbidity and mortality, recurrent hospitalizations, and reduced quality of life. Despite advances in pharmacological and interventional treatment, non-pharmacological strategies have been gaining relevance, particularly structured physical exercise. Evidence suggests that this intervention may influence pathophysiological mechanisms such as atrial remodeling, autonomic dysfunction, and inflammation. However, its effects on the recurrence and burden of atrial fibrillation remain inconsistent in the literature. Objetivos: To evaluate the impact of structured physical exercise on the recurrence and burden of atrial fibrillation, as well as its effects on secondary outcomes, including functional capacity and cardiovascular-related hospitalizations. Métodos: A systematic review was conducted in accordance with PRISMA 2020 guidelines. Searches were performed in the PubMed and Cochrane Library databases. Randomized controlled trials evaluating the impact of structured physical exercise interventions with outcomes related to atrial fibrillation recurrence and burden, arrhythmias, or functional capacity, in comparison with pharmacological treatment and absence of treatment, were included. Studies that did not address the research question, incomplete articles, or those without original data were excluded. Study selection was performed independently by three reviewers. Risk of bias was assessed using the RoB 2 tool. Due to heterogeneity, data synthesis was conducted qualitatively. Resultados e Conclusões: Of 64 studies identified in the databases, 5 were included in the final review. The studies demonstrated that structured physical exercise improves functional capacity and cardiovascular parameters in patients with atrial fibrillation. A trend toward reduction in arrhythmia recurrence and burden was observed, with significant results in some studies (HR=0.50; 95% CI 0.33–0.78; p<0.05) and reduction in episodes and symptoms. However, others did not demonstrate significance (RR=0.83; 95% CI 0.33–2.10; p>0.05), highlighting heterogeneity. Thus, the overall body of evidence suggests a trend toward a beneficial effect of exercise in the control of atrial fibrillation; however, further multicenter randomized clinical trials are needed to consolidate this association and define the optimal exercise protocol.



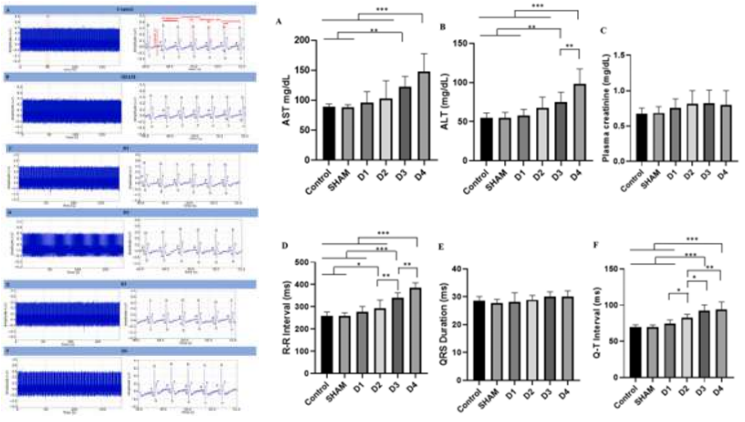
21263

INTOXICATION BY HIGH-DOSE HYDROXYCHLOROQUINE INDUCES CHANGES IN CARDIAC FUNCTION IN WISTAR RATS

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Introdução/Fundamentos: Interest in Hydroxycloriquine (HCQ)'s potential antiviral effects increased during research on SARS-CoV-2 throughout the year 2020, It was key towards the control of an epidemic caused by another type of covid virus in Egypt thus increasing such interest during the SARS-CoV-2 pandemic, but several studies have later shown that HCQ is ineffective against SARS-CoV-2. Consequently, research has shifted focus to investigate the potential effects of high-dose HCQ on organ systems due to the widespread misuse of HCQ by the population. In this context, the present study aims to evaluate the effects of high doses of hydroxychloroquine on the homeostasis of cardiac activity (ECG) in Wistar rats. Objetivos: Analyze the effects of potential intoxication by HCQ on the cardiac system by prolonged use or overdose on rats. Métodos: 53 Wistar rats were obtained from the Central Animal Facility of the Federal University of Pará. For the execution of this study, the following chemical substances were used: Ketamine Hydrochloride, Xylazine Hydrochloride, Lidocaine Hydrochloride, and Hydroxychloroquine. Electrodes were placed in the thoracic region for Electrocardiographic (ECG) recording, using lead D2. Electrocardiographic activity was recorded using lead DII. The reference electrode was placed under the right armpit (0.5 cm), and the recording electrode was fixed in the tenth intercostal space, 3.5 cm below the left armpit, in accordance with the recording vector. Each recording lasted for 3 minutes, and the analyzed data included: heart rate (BPM), amplitude (mV), R-R interval (ms), P-Q interval (ms), QRS duration (ms), and QT interval (ms). Resultados e Conclusões: Rats who'm were administred Hydroxycloriquine orally every 12 hours for a period of 96 hours had significant marked decrease in cardiac activity during 72 hours and 96 hours treatments, reflected in reduced heart rates and alterations in R-R and Q-T intervals, suggesting potential impacts on cardiac electrical activity. In this study, high doses (350 mg/kg PO) administered every 12 hours for 24, 48, 72, and 96 hours demonstrated that toxicity became more pronounced with increased duration of exposure. These results emphasize the necessity for thorough evaluation of cardiac function during HCQ treatment, particularly given that its use is linked to adverse cardiac reactions at therapeutic doses, thus ensuring safety and efficacy in treating medical conditions.



20166

INTRACARDIAC VERSUS TRANSESOPHAGEAL ECHOCARDIOGRAPHY IN PATIENTS UNDERGOING ATRIAL FIBRILLATION ABLATION: A SYSTEMATIC REVIEW AND META-ANALYSIS OF CLINICAL OUTCOMES

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Introdução/Fundamentos: Transesophageal echocardiography (TEE) is the gold standard to exclude left atrial and left atrial appendage (LAA) thrombus before atrial fibrillation (AF) ablation. Intracardiac echocardiography (ICE) has emerged as an alternative. ICE may have similar safety and additional procedural benefits. Objetivos: This meta-analysis aimed to compare clinical outcomes of ICE and TEE for patients undergoing AF ablation. Métodos: PubMed, Cochrane Library, and Embase databases were systematically searched for randomized and non-randomized trials comparing ICE and TEE in adult patients with AF undergoing ablation. The primary outcome was periprocedural thromboembolic events. Secondary outcomes were major bleeding, death, and procedure time. A random-effects model was used to calculate the odds ratios (ORs) and mean differences (MDs), with 95% confidence intervals (CIs). Resultados e Conclusões: Of 540 potential articles, five studies comprising 4,458 participants were included, of whom 2,423 were assigned to the ICE group. Paroxysmal AF was present in 53.1% of patients. CHA_2DS_2-VASc score ranged from 1.36 to 4.33 across the studies. Compared with TEE, ICE resulted in no difference in periprocedural thromboembolic events (OR 0.76; 95% CI 0.26, 2.25; p=0.62) and death (OR 1.41; 95% CI 0.17, 11.48; p=0.75). However, patients undergoing ICE had a 41% lower chance of major bleeding (OR 0.70; 95% CI 0.35, 1.42; p=0.33) and a trend toward shorter procedure time (MD -9.96 min; 95% CI -23.97, 4.06; p=0.16). In patients with AF undergoing ablation, ICE was associated with similar rates of periprocedural thromboembolic events and mortality compared to TEE, while demonstrating a trend toward reduced major bleeding and shorter procedure times. These findings suggest that ICE may be considered as an alternative to TEE for pre-ablation evaluation.

Figure 1

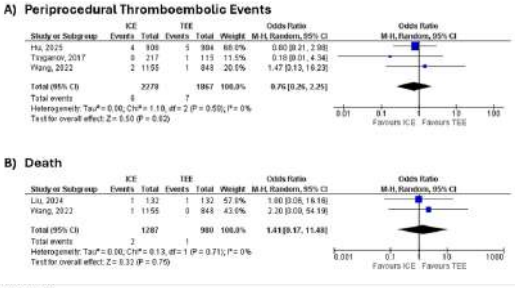
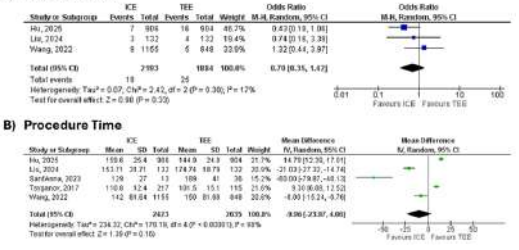


Figure 2



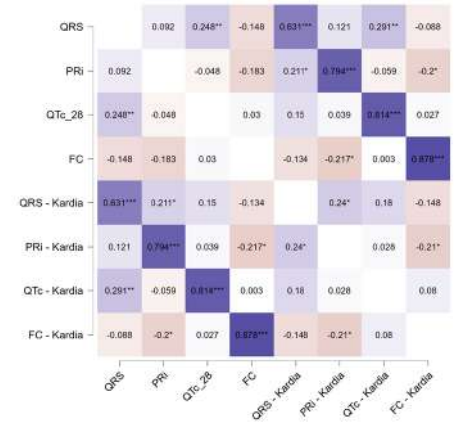
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KARDIAMOBILE VS 12-LEAD ECG IN OLDER ADULTS: DATA FROM A BRAZILIAN LONGITUDINAL COGNITIVE ASSESSMENT COHORT

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Introdução/Fundamentos: The 12-lead Electrocardiogram (ECG) is a valuable tool for cardiac evaluation. However, cost and need for trained professionals to perform the exam limit its availability for home monitoring. On the other hand, older adults might require close ECG monitoring, especially those exposed to polypharmacy because of the increased risk of cardiac side effects, while reduced mobility is common among this population. In this context mobile devices may represent a useful alternative, enabling the monitoring of essential ECG parameters without the need of dislocating to a healthcare facility. Objetivos: The aim of this study is to compare standard ECG with the Kardia Mobile (KM) by measuring heart rate, QRS duration, QTc, and PR interval in a Brazilian cognitive assessment cohort. The objective is to evaluate whether KM could be used to monitor such parameters with enough reliability to guide clinical decisions. Métodos: The baseline 12-lead ECG and KM were performed by medical students under supervision at a clinical research setting in the southeast region of Brazil. Measurements of heart rate, QT interval, PR interval and QRS interval in both devices were then analysed through a Spearman rho correlation to evaluate correlation, and through the Bland-Altman method to evaluate agreement between measurements. Resultados e Conclusões: 111 patients were included (mean age 76,82 (st. deviation 7.148), 73.87% female). The Spearman rho found a strong correlation between both devices in QRS interval (ρ= 0.631; p<0.001), a very strong correlation for Heart Rate (ρ = 0,878; p<0,001), QT interval (ρ = 0.814; p<0.001) and PR interval (ρ = 0.794; p<0.001). Bland–Altman analysis demonstrated a mean difference of −0.396 ms for QRS duration, with 95% limits of agreement ranging from −25.33 to +24.54 ms. For QTc, the mean difference was 3.568 ms (95% limits of agreement: −27.03 to +34.17 ms). Heart rate showed a mean difference of −2.640 bpm (95% limits of agreement: −12.23 to +6.95 bpm), while the PR interval demonstrated a mean difference of 6.757 ms (95% limits of agreement: −23.74 to +37.25 ms). These findings suggest that the KM demonstrates relatively small mean differences compared with the standard 12-lead ECG, indicating overall good agreement in this sample. However, the relatively wide limits of agreement may still be clinically relevant, particularly for parameters such as QTc and PR interval, potentially leading to missed or inaccurate identification of prolonged QT intervals or conduction abnormalities.



Standard QTc – Kardia QTc

Bias & Limits	Point Value
Mean difference + 1.96 SD	34.17
Mean difference	3.568
Mean difference - 1.96 SD	-27.03

Standard QRS – Kardia QRS

Bias & Limits	Point Value
Mean difference + 1.96 SD	24.54
Mean difference	-0.396
Mean difference - 1.96 SD	-25.33

Standard Heart rate – Kardia Heart rate

Bias & Limits	Point Value
Mean difference + 1.96 SD	6.947
Mean difference	-2.640
Mean difference - 1.96 SD	-12.23

Standard PRi – Kardia PRi

Bias & Limits	Point Value
Mean difference + 1.96 SD	37.25
Mean difference	6.757
Mean difference - 1.96 SD	-23.74

20235

LATE OUTCOME OF EPICARDIAL CATHETER ABLATION FOR VENTRICULAR TACHYCARDIA IN CHRONIC CHAGAS CARDIOMYOPATHY

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Introdução/Fundamentos: Epicardial ablation has become established as a technique for treating ventricular tachycardia (VT) in chronic chagas cardiomyopathy (CCC) patients, especially due to the peculiar location of the scar, frequently transmural, which can make the endocardial approach insufficient. Objetivos: To analyze the clinical profile and late outcomes of patients with VT and CCC who underwent catheter ablation using epicardial technique in a public university hospital. Métodos: A descriptive, observational, retrospective study, involving consecutive patients with CCC and recurrent sustained VT, refractory to amiodarone, who underwent catheter ablation between 2022 and 2026. Ablation technique applied was subxiphoid with a Tuohy needle, using radioscopy and/or electroanatomical mapping (EAM). Application site was determined by the presence of ventricular potentials during induced VT, or by determination of functional channels in sinus rhythm. Success criteria were the non-reinduction of clinical VT, or the elimination of reentry circuits. Resultados e Conclusões: 9 patients were analyzed, 7 (77.8%) were male, the mean age was 59.3±11.2 years. 8 (88.9%) had an implantable cardioverter-defibrillator (ICD) and 1 (11.1%) had a resynchronizer and ICD (CRT-D). Mean left ventricular (LV) ejection fraction was 32.7%±11.5% on echocardiography. Electrical storm was the indication for ablation in 8 patients (88.9%), 2 of whom had previously undergone stellate ganglion block, and 5 left thoracoscopic sympathectomy. Subxiphoid exclusively epicardial approach occurred in 6 patients (66.7%) and associated with endocardial in 3 (33.3%). EAM was used in 8 (88.9%), addressing the basal lateral (5), apical lateral (4) and basal inferior (3) LV regions. At the end of the ablation, 5 underwent ventricular stimulation without reinduction of VT. There was a complication in 1 patient due to right ventricular injury, without cardiac tamponade. And recurrence of VT in 5 (55.6%), after 9.1±12.9 months (n=4). None underwent reablation; 1 had successful heart transplantation. There were 2 deaths (22%) due to heart failure after 1 and 30 months of ablation. Most patients with CCC and ICD who underwent catheter ablation of VT had electrical storm and significant LV dysfunction. Epicardial technique was used in all patients without major complications, proving to be safe and effective in this setting, in experienced, high complexity service.

16948

POOR R-WAVE PROGRESSION AND LONG-TERM OUTCOMES IN THE MULTI-ETHNIC STUDY OF ATHEROSCLEROSIS

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Introdução/Fundamentos: Poor R-wave progression (PRWP) has been taught as a marker of anterior myocardial injury since the 1970s, but its temporal stability, substrate, and prognostic value in patients free of coronary artery disease (CAD) are uncertain. Objetivos: We assessed whether PRWP reflects a stable cardiac trait or a transient thoracic-geometric pattern, and whether it predicts cardiovascular events in a CAD-free population. Métodos: We studied 6,323 participants from MESA free of clinical cardiovascular disease, with standardized 12-lead ECGs at baseline and after a median of 10 years. PRWP was defined as R-wave amplitude ≤3 mm in V3 with RV3 > RV2. We evaluated 10-year test–retest stability (Cohen's κ), pulmonary/thoracic correlates, mechanistic substrate via cardiac magnetic resonance and biomarkers, and long-term outcomes (all-cause death, cardiovascular death, MACE) over median 14 years using Cox and Fine–Gray models. Resultados e Conclusões: PRWP prevalence was 3.2% at baseline and 6.2% at 10 years. Binary reproducibility was limited (κ = 0.344) despite good continuous R-V3 reliability (ICC = 0.73); only 52% of baseline PRWP persisted. Emphysema (OR 4.48; 95% CI 2.30–8.22) and current smoking (OR 1.77; 1.14–2.73) were the strongest predictors. PRWP showed no association with RV volumes, ejection fraction, or NT-proBNP. After adjustment for smoking and emphysema, PRWP was not associated with all-cause mortality (HR 1.19; 0.90–1.58), cardiovascular death (HR 1.02; 0.67–1.57), or MACE (HR 0.89; 0.54–1.47). Isolated PRWP in a CAD-free cohort is a poorly reproducible ECG pattern linked to pulmonary exposure and thoracic habitus, without independent cardiovascular prognostic value. Isolated PRWP should not prompt cardiac workup in the absence of other clinical evidence.

16997

PROGNOSTIC VALUE OF ELECTROCARDIOGRAPHIC LEFT VENTRICULAR HYPERTROPHY CRITERIA IN THE JACKSON HEART STUDY

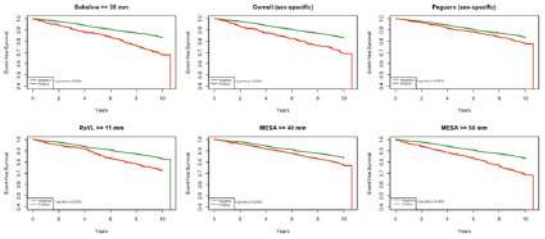
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Introdução/Fundamentos: Electrocardiographic criteria for left ventricular hypertrophy (LVH) demonstrate limited accuracy for detecting LVH when benchmarked against cardiac magnetic resonance (CMR). Despite diagnostic limitations, evidence from some cohorts suggests that these criteria could still carry prognostic significance for adverse outcomes, raising the question of whether they retain prognostic relevance even when failing to detect LVH. Objetivos: Assess the impact of the presence of electrocardiographic (ECG) LVH criteria in the mortality and major cardiovascular events (MACE) in participants from the Jackson Heart Study (JHS). Métodos: We retrospectively analyzed data from JHS, a community-based prospective cohort of African Americans aged 21-94 years from the Jackson Metropolitan Area. LVH was defined by echocardiogram as left ventricular mass indexed to height$^{2.7}$of ≥49 g/m$^{2.7}$ for men and ≥45 g/m$^{2.7}$ for women. 12-lead ECGs were analyzed for the presence of MESA (SV1 plus SV2 plus RV5), Cornell Voltage, Sokolow-Lyon, Peguero Lo-Presti, R wave in aVL criteria in different thresholds. Each criterion was evaluated as a binary variable. Co-primary outcomes were all-cause mortality and MACE, a composite outcome was also ascertained over the full follow-up period. Associations were examined using adjusted Cox proportional hazards regression models for LVH in ECO with 95% confidence interval (CI). Resultados e Conclusões: Among 1,923 participants followed for a median of 10 years, 536 outcomes were recorded. The population characteristics are shown in Table 1. In both Cox analyses, Cornell voltage and Peguero sex-specific were strong predictors of MACE, with a significant hazard ratio (HR) of 1.54 (CI 1.12–2.13) and 1.36 (CI 1.07–1.72) at traditional thresholds. MESA-LVH was the only criterion independently associated with all three endpoints across different cutoffs. At 40 mm it significantly predicted death but not MACE, although, at 50 mm, MACE prediction was statistically significant - HR of 1.42 (CI 1.03–1.94). Peguero also reached significance in composite endpoint. RaVL and Sokolow–Lyon did not demonstrate significant associations with any outcome. Kaplan Meier curves (Image 1) illustrate a higher cumulative event incidence among participants meeting ECG-LVH criteria. In this African American cohort, ECG-based LVH provided independent prognostic information for cardiovascular events and mortality, reinforcing their prognostic utility despite limited diagnostic accuracy for LVH.

Table 1. Baseline characteristics by echocardiographic LVH status

Characteristic	Echo-LVH(n = 224)	Echo-LVH− (n = 1,699)	p-value
Age (years)	59.0 ± 11.2	55.7 ± 12.4	<0.001
Male sex	43 (19.2%)	695 (39.6%)	<0.001
BMI (kg/m²)	34.1 ± 8.1	30.9 ± 8.5	<0.001
Height (cm)	164 ± 8	170 ± 9	<0.001
Weight (kg)	91 ± 23	89 ± 26	<0.001
Systolic BP (mmHg)	135 ± 16	124 ± 15	<0.001
Diastolic BP (mmHg)	77 ± 10	76 ± 9	0.170
Hypertension	177 (79.0%)	737 (43.4%)	<0.001
BP medications	162 (72.3%)	668 (39.3%)	<0.001
Diabetes	63 (28.1%)	239 (14.1%)	<0.001
Current smoker	28 (12.5%)	201 (11.8%)	0.830
HbA1c (%)	6.1 ± 1.2	5.7 ± 1.1	<0.001
LVMI/ht$^{2.7}$ (g/m$^{2.7}$)	52.7 ± 6.2	33.1 ± 8.2	<0.001
ECG voltages (mm)			
MESA (SV1+SV2+RV5)	63.6 ± 13.8	36.4 ± 10.8	<0.001
Sokolow-Lyon	38.8 ± 9.9	25.1 ± 7.3	<0.001
Cornell	19.2 ± 7.1	10.4 ± 5.7	<0.001
Peguero-Lo Presti	21.8 ± 9.4	10.7 ± 7.9	<0.001
RaVL	8.2 ± 3.8	5.1 ± 3.6	<0.001
ECG criteria positive			
Sokolow–Lyon ≥35 mm	47 (21.0%)	143 (8.6%)	<0.001
Cornell (sex-specific)	53 (23.7%)	101 (5.9%)	<0.001
Peguero (sex-specific)	104 (46.4%)	542 (31.9%)	<0.001
RaVL ≥11 mm	45 (20.5%)	143 (8.2%)	<0.001
MESA ≥40 mm	107 (47.8%)	563 (32.5%)	<0.001
MESA ≥50 mm	55 (24.8%)	193 (11.4%)	<0.001
Outcomes			
Death	38 (17.0%)	166 (9.4%)	<0.001
MACE	49 (21.9%)	174 (7.4%)	<0.001
Death or MACE	77 (34.4%)	313 (12.9%)	<0.001
Median follow-up, MACE (yr)	10	10	
Median follow-up, death (yr)	12	11.8	



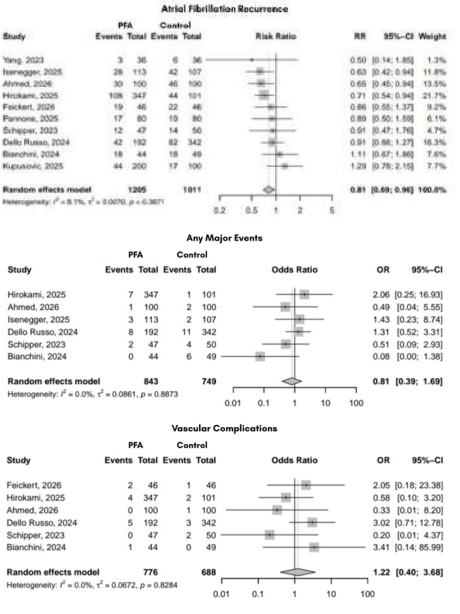
15644

PULSED FIELD ABLATION VERSUS CONVENTIONAL THERMAL ABLATION FOR PERSISTENT ATRIAL FIBRILLATION: A SYSTEMATIC REVIEW AND META-ANALYSIS OF EFFICACY AND SAFETY

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Introdução/Fundamentos: Persistent Atrial Fibrillation (AF) often requires extensive substrate modification beyond pulmonary vein isolation to achieve durable rhythm control. Conventional thermal ablation modalities, such as radiofrequency and cryoballoon energy, are limited by the risk of non-selective collateral damage to adjacent structures. Pulsed field ablation (PFA) is a non-thermal technology that utilizes high-intensity electrical fields to induce irreversible electroporation with high myocardial tissue-selectivity. However, the evidence regarding its clinical benefits and safety for persistent AF remains uncertain. Objetivos: This meta-analysis aims to evaluate the clinical outcomes and safety of PFA versus conventional thermal ablation modalities in patients with persistent AF. Métodos: The search was conducted in PubMed, Embase and Cochrane databases, through March 2026, according to PRISMA guidelines. Studies comparing clinical outcomes and complications of PFA (intervention) with radiofrequency and/or cryoballon ablation (control) for the treatment of patients with persistent AF (minimum follow-up of 6 months) were included. The primary outcome was AF recurrence and secondary outcomes included major adverse events and vascular complications. Two independent reviewers extracted data and assessed the risk of bias using the Cochrane Risk of Bias tool (RoB 2). Risk Ratios and Odds Ratios with 95% Confidence Intervals were calculated using a random-effects model. Resultados e Conclusões: Ten studies comprising 2,216 patients were included. In the pooled analysis, PFA was associated with a statistically significant reduction in atrial fibrillation recurrence compared with conventional thermal ablation (RR 0.81; 95% CI: 0.69–0.96; I² = 8.1%). Regarding safety outcomes, PFA demonstrated a comparable incidence of any major adverse events across 1,592 patients when compared to thermal modalities (OR 0.81; 95% CI: 0.39–1.69; I² = 0.0%). Similarly, there was no significant difference in the risk of vascular complications between the groups (OR 1.22; 95% CI: 0.40–3.68; I² = 0.0%). This meta-analysis demonstrates that PFA significantly reduces the risk of AF recurrence compared to thermal modalities while maintaining an equivalent safety profile. Clinically, the relative risk reduction translates into a meaningful improvement in single-procedure efficacy. The consistency of effect across studies reinforces the robustness of this finding, supporting PFA as an effective and safe ablation alternative for persistent AF.



18546

PULSED FIELD ABLATION VS CONVENTIONAL THERMAL ABLATION FOR PAROXYSMAL ATRIAL FIBRILLATION: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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Introdução/Fundamentos: Atrial Fibrillation is the most common sustained cardiac arrhythmia, conferring substantial risk of stroke, heart failure, and cardiovascular mortality. In patients with paroxysmal atrial fibrillation (PAF), catheter-based therapeutic approaches are increasingly preferred, particularly conventional thermal ablation (CTA) and, more recently, pulsed field ablation (PFA). However, consolidated data from randomized controlled trials comparing both modalities remain scarce. Objetivos: To compare the efficacy and safety between CTA and PFA in the treatment of PAF. Métodos: A systematic search of PubMed, Embase, and Scopus was conducted following the PRISMA guidelines to identify randomized controlled trials (RCTs) comparing efficacy and safety of PFA vs CTA in patients with PAF. Statistical analysis was performed using R 4.5.3 software with random-effects models. Risk of bias was assessed using the Cochrane RoB 2 tool. Resultados e Conclusões: Four RCTs were identified, including 1,393 patients (mean age 62.5 years, 35.9% female) of whom 697 (50%) underwent PFA, with a median follow-up of 1 year. PFA demonstrated significantly shorter procedure duration (MD -22.32 min, 95% CI -33.35; -11.28, p<0.001) and left atrial dwell time (MD -25.73 min, 95% CI -34.85; -16.61, p<0.001), with no significant difference in fluoroscopy time (MD 7.34 min, 95% CI -0.10; 14.79, p=0.053). After the 60-day blanking period, there were no differences in efficacy endpoints, such as atrial fibrillation recurrence (RR 1.00, 95% CI 0.56-1.78, p=0.990), any atrial arrhythmia recurrence (RR 0.92, 95% CI 0.74-1.13, p=0.411), or resumption of antiarrhythmic drugs (RR 0.87, 95% CI 0.64-1.17, p=0.347), and PFA was associated with higher need for repeat ablation (RR 1.65, 95% CI 1.02-2.69, p=0.043). No significant differences were observed in safety outcomes between PFA and CTA regarding overall complications (RR 0.63, 95% CI 0.26-1.53, p=0.303), stroke or transient ischemic attack (OR 1.21, 95% CI 0.29-4.94, p=0.758), and all-cause death (RR 2.99, 95% CI 0.31-28.54, p=0.342). In conclusion, PFA demonstrated greater procedural efficiency compared to CTA, with shorter procedure durations. Both interventions showed comparable arrhythmia recurrence and safety outcomes, though PFA required more repeat ablations. Although PFA is a viable option for the treatment of PAF, large-scale randomized controlled trials with longer follow-up periods are necessary to accurately define its long-term role.

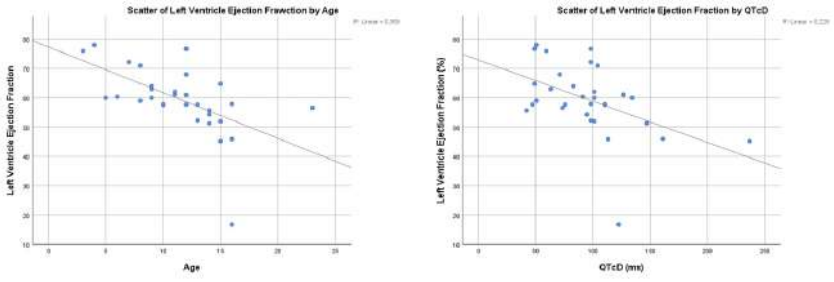
17969

RELATIONSHIP BETWEEN CORRECTED QT INTERVAL DISPERSION AND LEFT VENTRICULAR EJECTION FRACTION IN PATIENTS WITH DUCHENNE MUSCULAR DYSTROPHY

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Introdução/Fundamentos: Cardiomyopathy and arrhythmias, are important determinants of morbidity and mortality in patients with Duchenne muscular dystrophy (DMD). The assessment of electrocardiographic variables and their associations with ventricular function is a low-cost strategy that is valuable for the early identification of myocardial involvement and cardiovascular risk stratification. Corrected QT interval dispersion (QTcD) is an indirect measure of ventricular repolarization heterogeneity and has been associated with increased cardiovascular mortality in the general population. Objetivos: To evaluate the association between QTcD and age with myocardial function, estimated by left ventricular ejection fraction (LVEF), in patients with DMD. Métodos: Retrospective cross-sectional study based on the review of transthoracic echocardiograms (TTEs) and electrocardiograms (ECGs) of patients with genetically confirmed DMD followed at the cardiology outpatient clinic of a university hospital. Patients with poor-quality ECGs or conditions that prevented adequate measurement of QTcD were excluded. Statistical analyses were performed in Excel and Software IBM SPSS using simple linear regression, analyzing ECG and TTE data from the same patients, obtained within an interval of less than 1 year. QTcD was defined as the difference between the longest and shortest corrected QT interval on a 12-lead ECG, with manual measurement and Bazett correction. LVEF was estimated using the Teichholz method. Resultados e Conclusões: Thirty-two DMD patients were analyzed, with a mean age of 11.56 years ± 4.19, mean QTcD of 96.49 ± 39.95 and mean LVEF 59.34% ± 11.76. There was an inverse and moderate association between QTcD and LVEF (R=0.47; R^2=0.228; p<0.01), with a correlation coefficient (β=-0.14) showing a 0.14% reduction in LVEF for each increase of 1 unit in QTcD (95% CI -0.23 to -0.04). Age was inversely associated with LVEF (R=0.55; R^2=0.309; p<0.01), with a correlation coefficient (β = -1.54) with a 1.55% reduction in ventricular function per year (95%CI −2.41 to −0.68), indicating a relevant impact of age progression on ventricular function. The inverse association between QTcD and Age with LVEF suggests that the greater heterogeneity of ventricular repolarization is related to aging and worse ventricular systolic function in patients with DMD. These findings reinforce the potential of ECG and TTE, widely available and low-cost tests, as complementary tools for cardiovascular risk stratification in this population.



21657

RETROGRADE CATHETER-GUIDED DEEP SEPTAL PACING IN DILATED CARDIOMYOPATHY: FOCUS ON CHAGASIC ETIOLOGY IN NORTHEAST BRAZIL

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Introduction: Conventional right ventricular (RV) apical pacing induces ventricular dyssynchrony, exacerbating heart failure in patients with dilated cardiomyopathy (DCM). Physiological pacing techniques are essential to mitigate these deleterious effects and promote reverse remodeling. Objetivos: Objective: To evaluate the feasibility and initial outcomes of an innovative deep septal ventricular lead implantation technique, guided by left septal electroanatomical mapping via retrograde aortic catheter, in patients with DCM and ventricular dyssynchrony, focusing on Chagasic etiology. Métodos: Material and Methods: Between January and August 2025, ten consecutive DCM patients (mean age 61±7 years, 60% male, mean LVEF 30±5%) with LBBB and CRT indication underwent deep septal lead implantation. The procedure involved three left subclavian vein punctures for atrial, left ventricular (via coronary sinus), and deep septal RV lead implantation, guided by a retrograde electroanatomical mapping catheter in the left postero-septal region via the right femoral artery. Success was defined by a paced QRS duration ≤120 ms with modified LBBB morphology, and adequate sensing/pacing thresholds. Echocardiographic and clinical (NYHA) evaluations were performed pre-op and at 7 months. Resultados e Conclusões: Results: Deep septal implantation was successful in 8 (80%) patients. Mean native QRS was 178±18 ms (max 196 ms). Post-implantation, paced QRS significantly reduced to 96±8 ms ($p<0.001$), with 80% achieving QRS ≤120 ms. DCM etiologies: Chagasic (50%, n=5), ischemic (40%, n=4), and one dilated hypertrophic (10%, n=1). No major complications. At 7 months, 70% showed improved ejection fraction (mean LVEF 30% to 57%, $p<0.001$) and functional class (NYHA IV to II in 60%). Conclusion: Retrograde catheter-guided deep septal pacing in DCM patients with dyssynchrony—including the endemic Chagasic population of Northeast Brazil—is a promising and safe alternative to conventional pacing. Initial results suggest relevant clinical, electrocardiographic, and echocardiographic benefits, paving the way for larger studies to validate its long-term efficacy and CRT role.

21832

SURGICAL SITE INFECTION IN PATIENTS UNDERGOING IMPLANTABLE CARDIAC ELECTRONIC DEVICE PROCEDURES

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Introdução/Fundamentos: Surgical Site Infection (SSI) related to Implantable Cardiac Electronic Devices (CIEDs) is one of the major postoperative complications, leading to prolonged hospitalization, increased morbidity and mortality, and even right-sided infective endocarditis. Furthermore, previous studies have demonstrated that pacemaker procedures are associated with lower complication rates when compared with Implantable Cardioverter-Defibrillators (ICDs) and Cardiac Resynchronization Therapy (CRT). Objetivos: To analyze the incidence of SSI in patients undergoing CIED procedures at a public hospital in Alagoas, Brazil, between January 2022 and November 2025. Métodos: This was a retrospective observational comparative study conducted through the review of a database from a public hospital in Alagoas. Patients older than 18 years who underwent CIED implantation procedures, lead replacement, or generator replacement between January 2022 and November 2025 were included. SSI diagnosis was established according to the 2025 ANVISA criteria for Healthcare-Associated Infections, including local clinical signs, fever, and microbiological isolation. Temporary pacemaker procedures were excluded. The identified infection rates were subsequently compared with data from international studies published within the last five years. Resultados e Conclusões: During the study period, 609 CIED-related procedures were performed, including 554 permanent pacemakers, 49 Implantable Cardioverter-Defibrillators (ICDs), 78 generator replacements, and 20 lead replacement procedures. All patients received prophylactic Cefazolin 2 g 30–60 minutes before incision. Interrupted sutures were systematically performed in skin and subcutaneous tissue. Follow-up occurred at 30 days and every 6 months thereafter, enabling identification of late infections. Only two isolated SSI cases were identified, one in September 2022 and another in May 2023, resulting in an overall SSI incidence of 0.33%. No additional infection cases or deaths related to SSI were observed during subsequent years. Despite the increasing number of procedures over the years, SSI rates remained below 1%, consistent with and even lower than recent international reports ranging from 1–2%. These findings suggest that preventive strategies, including appropriate antibiotic prophylaxis, interrupted suturing, glycemic control, and shorter operative times, may contribute to reducing SSI rates in CIED procedures.

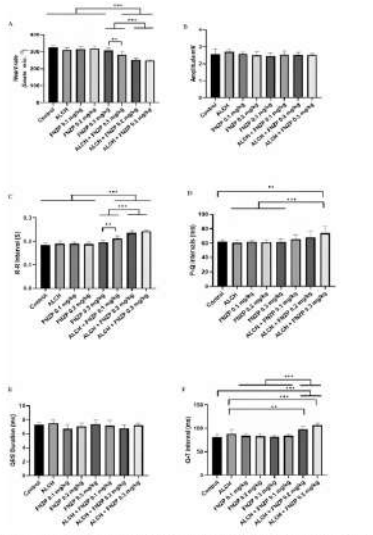
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SYNERGISTIC ELECTROPHYSIOLOGICAL AND CARDIORESPIRATORY DEPRESSION INDUCED BY ALCOHOL AND FLUNITRAZEPAM IN WISTAR RATS

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Introdução/Fundamentos: Alcohol is a widely consumed substance, while benzodiazepines, such as flunitrazepam, are frequently prescribed for sleep disorders and anxiety. The coadministration of these substances constitutes a public health concern due to the potential for synergistic depressant effects on the central nervous system, with possible cardiovascular and respiratory alterations. However, the integrated electrophysiological effects of this combination have not yet been fully elucidated. Objetivos: To investigate the effects of coadministration of alcohol and increasing doses of flunitrazepam on electrocorticographic, respiratory, and electrocardiographic parameters. Métodos: An experimental study with 72 Wistar rats divided into eight groups: control, alcohol (20%), flunitrazepam (0.1, 0.2, 0.3 mg/kg), and alcohol–flunitrazepam combinations at the same doses (CEUA protocol No. 6233270619). Electrocorticographic recordings, respiratory rate, and electrocardiographic parameters, including heart rate and P–Q, R–R, QRS, and Q–T intervals, were analyzed. Statistical analysis was performed using ANOVA followed by Tukey's test ($p < 0.05$). Resultados e Conclusões: The combination of alcohol and flunitrazepam led to a reduction in low-frequency brain oscillations (alpha and theta), intensification of central depressant effects, and a progressive, dose-dependent decrease in respiratory rate. In the cardiovascular system, heart rate decreased from 325.0 ± 11.7 bpm in the control group to 247.6 ± 6.3 bpm in the group receiving the highest dose of alcohol–flunitrazepam (0.3 mg/kg) ($p < 0.05$), indicating marked bradycardia and depression of autonomic control. In addition, Q–T interval prolongation was observed at higher doses, from 82.11 ± 5.061 ms (control) to 98.22 ± 5.783 ms (combination with 0.2 mg/kg) and 106.3 ± 4.873 ms (combination with 0.3 mg/kg), indicating a higher risk of electrical instability. Regarding the duration of the QRS complex, there were no significant changes, while a slight increase in P–Q and R–R intervals was observed, suggesting relative preservation of intraventricular conduction. These findings demonstrate a synergistic depressant effect, with impact on cerebral, respiratory, and cardiac activity. The study contributes to understanding the mechanisms involved in the combined toxicity of these substances, with implications for clinical practice in cardiovascular emergencies.



Graphics demonstrating the mean values of the cardiac activity records for the tested groups evaluating the following cardiac morphographic parameters: Heart rate (bpm) (A); QRS amplitude (mV) (B); R-R interval (ms) (C); P-Q interval (ms) (D); QRS complexduration (ms) (E); Q-T interval (ms) (F). After ANOVA and Tukey's test, (*) P<0.01; (**) P<0.001; (***) P<0.0001

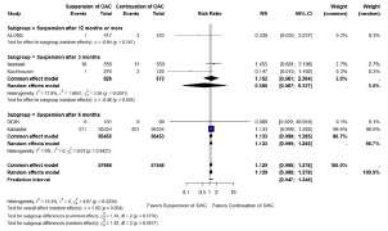
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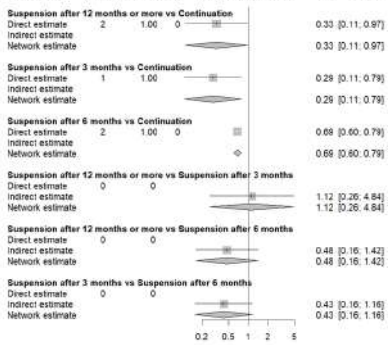
TIMING OF ORAL ANTICOAGULATION DISCONTINUATION AFTER ATRIAL FIBRILLATION ABLATION: A SYSTEMATIC REVIEW AND NETWORK META-ANALYSIS

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Introdução/Fundamentos: Whether oral anticoagulation (OAC) should be continued after atrial fibrillation ablation remains uncertain, as does the optimal timing for discontinuation. No prior network meta-analysis has directly compared continuation with specific post-ablation discontinuation timings. Objetivos: To compare the safety and efficacy of OAC continuation versus discontinuation after atrial fibrillation ablation and to evaluate the effect of discontinuation timing on clinical outcomes. Métodos: This systematic review and meta-analysis was conducted in accordance with PRISMA guidelines. PubMed, Embase, and Cochrane Library were systematically searched for randomized trials and propensity score–matched cohorts comparing OAC continuation with discontinuation after atrial fibrillation ablation. The primary outcome was thromboembolic events, and the secondary outcome was major bleeding. Direct comparisons were pooled using random-effects models, and a frequentist network meta-analysis compared different discontinuation timings. Analyses were performed using R software version 4.6.0. Resultados e Conclusões: Six studies were included, comprising a total of 116,530 patients, of whom 58,341 (50.1%) discontinued OAC. In the direct meta-analysis, discontinuation was not associated with a significant difference in thromboembolic events versus continuation (RR 1.13; 95% CI 0.99–1.28; p = 0.054; I^2 = 14.3%; Figure 1) but was associated with lower major bleeding (RR 0.49; 95% CI 0.28–0.87; I^2 = 14.3%). In the network meta-analysis, thromboembolic risk did not differ across strategies. Compared with continuation, discontinuation at 3 months (RR 0.29; 95% CI 0.11–0.79), 6 months (RR 0.69; 95% CI 0.60–0.79), and ≥12 months (RR 0.33; 95% CI 0.11–0.97) was associated with lower major bleeding, without significant differences among discontinuation timings (Figure 2). After atrial fibrillation ablation, OAC discontinuation was associated with lower major bleeding and no statistically significant increase in thromboembolic events, with comparable outcomes across discontinuation timing strategies.





21706

WEARABLE AND PORTABLE CARDIAC MONITORING FOR EXERCISE-RELATED ARRHYTHMIAS IN ATHLETES: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Monitoring physiological parameters in athletes aids in early identification of cardiovascular risk. Wearable devices enable continuous, non-invasive biometric data collection, while portable cardiac monitors allow electrophysiological recording outside clinical settings. Diagnostic accuracy in athletes is challenged by physiological adaptations of the “athlete’s heart” and by motion artifacts. Systematic reviews evaluating wearables have focused predominantly on general or elderly populations; athletes remain largely underrepresented, and available evidence is limited to small observational studies with heterogeneous methodologies. Objetivos: To evaluate the diagnostic accuracy and clinical utility of wearable and portable cardiac monitoring devices for arrhythmia detection in athletes, comparing them to gold-standard methods, and to identify technical and physiological limitations in high-intensity sports settings. Métodos: Systematic review following PRISMA 2020, registered in PROSPERO. PubMed/MEDLINE, Cochrane Library, LILACS/BVS, SPORTDiscus, and IEEE Xplore were searched for studies published in the last 10 years. Eligible studies included original human studies involving elite, competitive, or endurance athletes evaluated with wearable or portable cardiac monitoring devices for arrhythmia detection. Records were independently screened by two reviewers using Rayyan, with disagreements resolved by consensus. Risk of bias was assessed using ROBIS. Resultados e Conclusões: ECG-based wearables demonstrated high agreement with conventional electrocardiography (Pearson r=0.98–1.0). In marathon runners, abnormal ECG findings were observed in 16.8%, including 9.3% with non-sustained ventricular tachycardia. In contrast, non-ECG devices showed significant limitations: 45% of detected abnormal events were artifacts, and 15% of true arrhythmias were missed. Motion artifacts, sweating, and electrode displacement were the main sources of signal distortion. ECG-based technologies represent the most reliable option for rhythm assessment in athletes; however, their role remains complementary to standard diagnostic tools. Standardized validation protocols and studies specifically designed for athletic populations are warranted.

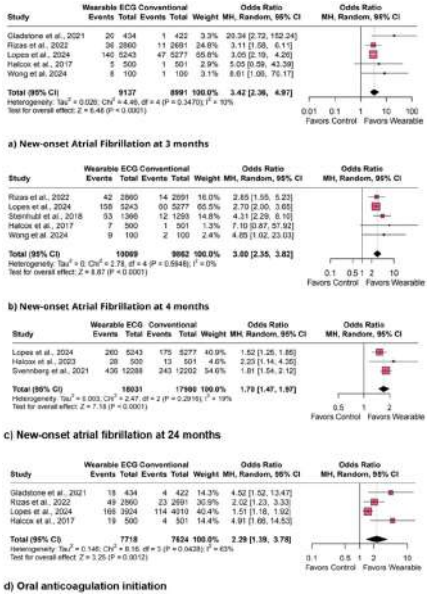
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WEARABLE ECG MONITORING FOR ATRIAL FIBRILLATION DETECTION IN OLDER ADULTS: A META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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Introdução/Fundamentos: Undiagnosed atrial fibrillation (AF) is a significant contributor to preventable stroke in older adults with cardiovascular risk factors. Although wearable electrocardiographic (ECG) monitors offer a scalable screening approach, the effectiveness of routine AF screening with wearables remains uncertain. Objetivos: We aimed to evaluate whether routine screening with wearable ECG devices increases the detection of new-onset AF compared to usual care in older adults at risk. Métodos: We conducted a meta-analysis of randomized controlled trials (RCTs) comparing wearable ECG screening versus usual care in older adults without known AF but with cardiovascular risk factors.Searches were performed in PubMed, Embase, and Cochrane CENTRAL through April 2026. Odds ratios (ORs) with 95% confidence intervals (CIs) were pooled using a random-effects model. Heterogeneity was assessed using the I² statistic. R software was used for statistical analysis Resultados e Conclusões: Eight RCTs comprising 78,378 participants (mean age 74.3 years; 47.7% men) were included. Routine screening with wearable ECGs significantly increased the detection of new-onset AF compared to usual care (OR 1.87; 95% CI 1.40-2.51; p < 0.0001). Subgroup analyses showed this effect was consistent at 3 months (OR 3.42; 95% CI 2.36-4.97; p < 0.0001), at 4 months (OR 3.00; 95% CI 2.35-3.82; p < 0.0001), and at 24 months (OR 1.70; 95% CI 1.47-1.97; p < 0.0001). Additionally, wearable-based screening was associated with significantly higher rates of oral anticoagulant initiation (OR 2.29; 95% CI 1.39–3.78; p = 0.0012). Routine screening with wearable ECG devices significantly increases the detection of atrial fibrillation and initiation of anticoagulation therapy in older adults at cardiovascular risk. These findings support the use of wearable AF screening as an effective preventive strategy in this population.



Cardio-Oncology

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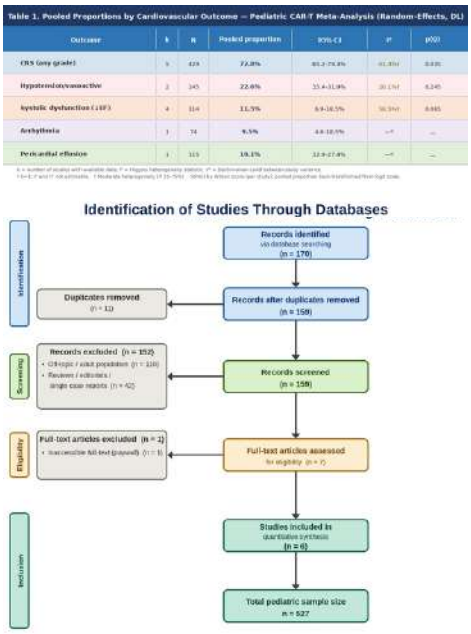
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ACUTE CARDIOVASCULAR TOXICITY FOLLOWING CAR-T CELL THERAPY IN PEDIATRIC PATIENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Chimeric antigen receptor T-cell therapy has revolutionized the treatment of refractory pediatric hematologic malignancies. However, cytokine release syndrome, its primary complication, can critically compromise myocardial function. Specific cardiovascular data in children remain scarce. Objetivos: To estimate the pooled incidence of acute cardiovascular toxicity in pediatric patients undergoing cellular immunotherapy via a systematic review and meta-analysis. Métodos: A search was conducted across the PubMed, Embase, Cochrane, LILACS, and Web of Science databases from 2018 to 2026 using the MeSH terms ''Chimeric Antigen Receptor'', ''Cardiotoxicity'', ''Heart Failure'', and ''Pediatrics''. Double-blind screening followed the PRISMA 2020 guidelines. Primary studies with quantitative cardiovascular data post-cellular infusion were included, excluding case reports, narrative reviews, and mixed samples. The risk of bias was assessed using the Joanna Briggs Institute (JBI) tools. For the meta-analysis, the DerSimonian-Laird random-effects model with logit transformation and a 95% confidence interval calculated by the Wilson score was adopted. Heterogeneity was evaluated using Cochran's Q test, the I² index, and the τ² variance. Resultados e Conclusões: Six studies with low to moderate risk of bias, comprising 527 pediatric patients, were included. Incidence of cytokine release syndrome was 72.8% (k=5, N=429, 95% CI 65.2–79.3%, I²=61.3%). Vasoactive support reached 22.6% (k=2, N=145, 95% CI 15.4–31.9%, I²=26.1%). Systolic dysfunction incidence was 11.5% (k=4, N=314, 95% CI 6.9–18.5%, I²=58.5%). Arrhythmias occurred in 9.5% (k=1, N=74, 95% CI 4.6–18.5%), 86% associated with cytokine release syndrome. Pericardial effusion occurred in 19.1% (k=1, N=115). Dysfunction was predominantly transient (resolution: 4 weeks–6 months). Global Longitudinal Strain reduction preceded ejection fraction decline by ≥1 week. Blast burden >25% (OR 15.5, p<0.001) and grade ≥3 cytokine release syndrome were the main predictors. Acute cardiotoxicity affects approximately 1 in every 9 children with systolic dysfunction and 1 in every 4 children with hemodynamic compromise, but is mostly reversible. The pediatric profile is distinguished by pericardial effusion and the predictive value of Global Longitudinal Strain. Standardized multicenter registries are needed.



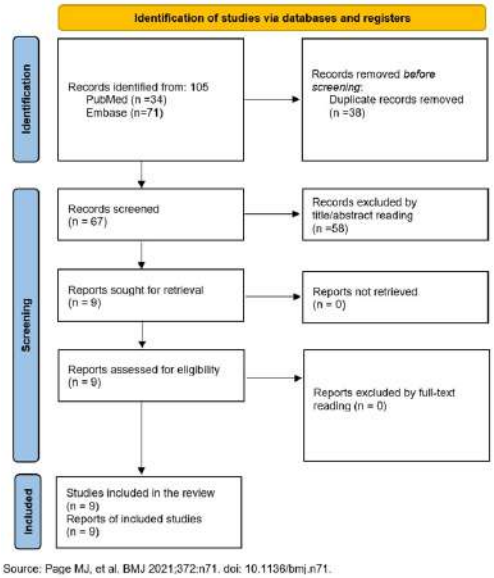
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BIOMARKER-GUIDED VERSUS UNIVERSAL PRIMARY PREVENTION FOR ANTHRACYCLINE-INDUCED CARDIOTOXICITY: A SYSTEMATIC REVIEW OF RANDOMIZED TRIALS

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Introdução/Fundamentos: Anthracyclines remain essential for treating breast cancer and lymphoma but are associated with a significant risk of cancer therapy-related cardiac dysfunction (CTRCD). Neurohormonal blockers such as ACE inhibitors (ACEi), ARBs, or beta-blockers (BB) are proposed for pharmacological prophylaxis; however, the optimal initiation strategy—universal versus biomarker-guided—remains clinically debated. Objetivos: To evaluate and compare the efficacy of biomarker-guided and universal prevention strategies in preventing CTRCD among adults receiving anthracycline-based chemotherapy. Métodos: A systematic review of randomized clinical trials (RCTs) published between 2021 and 2026 was conducted following PRISMA guidelines. Eligible studies included adults with breast cancer or lymphoma and preserved baseline left ventricular ejection fraction (LVEF). The primary outcome was CTRCD (LVEF reduction >10% or <50%); secondary outcomes included changes in global longitudinal strain (GLS) and cardiac biomarkers. Risk of bias was assessed using the Cochrane RoB 2 tool. Resultados e Conclusões: Trials demonstrated heterogeneous effects across strategies. In the Cardiac CARE trial, a biomarker-guided approach using troponin I to initiate candesartan and carvedilol did not significantly improve 6-month LVEF compared with standard care (mean difference -0.37%, p=0.82). Conversely, the SARAH trial showed that sacubitril/valsartan significantly reduced subclinical dysfunction (GLS decline >15%: 7% vs. 25%, p=0.015). Regarding universal prophylaxis, the PROACT trial found no significant reduction in myocardial injury with enalapril in high-dose anthracycline regimens. However, pooled evidence from randomized trials suggests that prophylactic ACEi are associated with a significantly smaller LVEF reduction (MD -5%, p<0.010), particularly in patients receiving concomitant trastuzumab (MD -3%, p<0.010). Overall, universal prevention provides modest but clinically relevant preservation of LVEF, especially in high-risk regimens. While biomarker-guided strategies effectively mitigate early subclinical myocardial injury (GLS), their impact on preventing overt cardiotoxicity requires further large-scale validation.



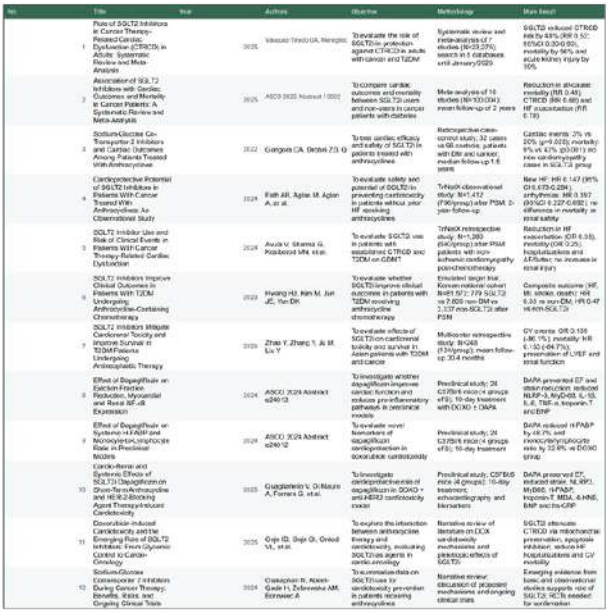
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CARDIOPROTECTIVE ROLE OF SGLT2 INHIBITORS IN CANCER PATIENTS RECEIVING ANTHRACYCLINES: A PRISMA SYSTEMATIC REVIEW

VINÍCIUS NASCIMENTO CAVALCANTE DA SILVA1; JULIANA FILGUEIRAS MEDEIROS1;

(1) UNIVERSIDADE SÃO JUDAS TADEU - CUBATÃO - SP - BRASIL;

Introdução/Fundamentos: Anthracyclines are essential in the treatment of hematologic malignancies and solid tumors, but their dose-dependent cardiotoxicity remains a major limitation. Cancer therapy–related cardiac dysfunction (CTRCD) affects 9–26% of exposed patients and is associated with increased morbidity and mortality. Sodium-glucose cotransporter-2 inhibitors (SGLT2i), recognized for their cardiovascular and renal benefits, have emerged as promising cardioprotective agents in cardio-oncology. Objetivos: To systematically evaluate the efficacy and safety of SGLT2 inhibitors in preventing and managing anthracycline-induced cardiotoxicity. Métodos: A PRISMA-guided systematic review was conducted including studies published between 2022–2026. Searches were performed in PubMed, Cochrane Library, Embase, Scopus, Web of Science, and major conference proceedings (ASCO/ESC), using the terms “SGLT2 Inhibitors” AND “Anthracycline” AND “Cardiotoxicity”. Twelve studies met inclusion criteria: 2 meta-analyses (n=123,279), 5 large observational cohorts, 3 mechanistic preclinical studies, and 2 narrative reviews. Due to dataset overlap and the absence of patient-level data, no formal meta-analysis was performed. Instead, a structured quantitative synthesis was undertaken, prioritizing meta-analytic populations for shared outcomes and individual cohorts for complementary endpoints. Effect estimates were derived using sample size–informed approximations. Resultados e Conclusões: All included studies showed a consistent direction of benefit, with improvement in at least one cardiorenal outcome. Quantitative synthesis found that SGLT2 inhibitors were associated with an approximately 35% reduction in CTRCD risk and a 50–55% reduction in all-cause mortality. Individual cohorts indicated an approximate 55% reduction in incident or worsening heart failure, representing the most pronounced clinical benefit. Renal outcomes were similarly favorable, with an estimated 55–65% reduction in adverse renal events and preservation of kidney function. Mechanistic studies were concordant, demonstrating attenuation of oxidative stress, suppression of inflammatory pathways (including NLRP3 inflammasome and NF-κB signaling), reduction of pro-inflammatory cytokines, and preservation of mitochondrial function. Safety outcomes were neutral overall, with no increase in severe adverse events and only a modest rise in genital infections. These findings support a clinically meaningful cardioprotective and renoprotective role of SGLT2 inhibitors in cardio-oncology.



No.	Title	Year	Authors	Objective	Methodology	Main Result
1	Role of SGLT2 Inhibitors in Cancer Therapy-Related Cardiac Dysfunction (CTRCD): in Adults: Systematic Review and Meta-Analysis	2025	Vilasco-Tinoco GA, Mengden	To evaluate the role of SGLT2i in protection against CTRCD in adults with cancer and T2DM	Systematic review and meta-analysis of 7 studies (N=23,276); search in 5 databases until January 2025	SGLT2i reduced CTRCD risk by 48% (RR 0.52; 95%CI 0.30-0.90), mortality by 56% and acute kidney injury by 16%
2	Association of SGLT2 Inhibitors with Cardiac Outcomes and Mortality in Cancer Patients: A Systematic Review and Meta-Analysis	2025	ASCO 2025 Abstract 10002	To compare cardiac outcomes and mortality between SGLT2i users and non-users in cancer patients with diabetes	Meta-analysis of 16 studies (N=100,004); mean follow-up of 2 years	Reduction in all-cause mortality (RR 0.48), CTRCD (RR 0.68) and HF hospitalization (RR 0.78)
3	Sodium-Glucose Co-Transporter 2 Inhibitors and Cardiac Outcomes Among Patients Treated With Anthracyclines	2022	Gongora CA, Drobni ZD, G	To test cardiac efficacy and safety of SGLT2i in patients treated with anthracyclines	Retrospective case-control study; 32 cases vs 66 controls; patients with DM and cancer; median follow-up 1.6 years	Cardiac events: 3% vs 20% (p=0.025); mortality: 9% vs 47% (p<0.01); no new cardiomyopathy cases in SGLT2i group
4	Cardioprotective Potential of SGLT2 Inhibitors in Patients With Cancer Treated With Anthracyclines: An Observational Study	2024	Fath AR, Aglan M, Aglan A, et al.	To evaluate safety and potential of SGLT2i in preventing cardiotoxicity in patients without prior HF receiving anthracyclines	TriNetX observational study; N=1,412 (706/group) after PSM; 2-year follow-up	New HF: HR 0.147 (95% CI 0.073-0.294); arrhythmias: HR 0.357 (95%CI 0.227-0.692); no differences in mortality or renal safety
5	SGLT2 Inhibitor Use and Risk of Clinical Events in Patients With Cancer Therapy-Related Cardiac Dysfunction	2024	Avula V, Sharma G, Pasbaksh MH, et al.	To evaluate SGLT2i use in patients with established CTRCD and T2DM on GDMT	TriNetX retrospective study; N=1,280 (640/group) after PSM; patients with non-ischemic cardiomyopathy post-chemotherapy	Reduction in HF exacerbation (OR 0.55), mortality (OR 0.25); hospitalizations and ER/Ambul. no increase in renal injury
6	SGLT2 Inhibitors Improve Clinical Outcomes in Patients With T2DM Undergoing Anthracycline-Containing Chemotherapy	2023	Hwang HJ, Kim M, Jun JE, Yun DK	To evaluate whether SGLT2i improve clinical outcomes in patients with T2DM receiving anthracycline chemotherapy	Emulated target trial; Korean national cohort; N=61,972; 779 SGLT2i vs 7,809 non-DM vs 2,337 non-SGLT2i after PSM	Composite outcome (HF, MI, stroke, death): HR 0.33 vs non-DM; HR 0.47 vs non-SGLT2i
7	SGLT2 Inhibitors Mitigate Cardiorenal Toxicity and Improve Survival in T2DM Patients Undergoing Antineoplastic Therapy	2025	Zhao Y, Zhang T, Ji M, Liu Y	To evaluate effects of SGLT2i on cardiorenal toxicity and survival in Asian patients with T2DM and cancer	Multicenter retrospective study; N=248 (134/group); mean follow-up: 20.4 months	CV events: OR 0.138 (-86.1%); mortality: HR 0.132 (-86.7%); preservation of LVEF and renal function
8	Effect of Dapagliflozin on Calcium-Handling Protection, Myocardial and Renal NF-κB Expression	2024	ASCO 2026 Abstract e24012	To investigate whether dapagliflozin improves cardiac function and reduces pro-inflammatory pathways in preclinical models	Preclinical study; 24 C57BL/6 mice (4 groups of 6); 10-day treatment with DOXO ± DAPA	DAPA preserved EF and strain; reduced NLRP-3, MyD-88, IL-1β, IL-6, TNF-α, troponin-T and BNP
9	Effect of Dapagliflozin on Systemic miRNA and Monocyte-Lymphocyte Ratio in Preclinical Models	2024	ASCO 2026 Abstract e24012	To evaluate novel biomarkers of dapagliflozin cardioprotection in doxorubicin cardiotoxicity	Preclinical study; 24 C57BL/6 mice (4 groups of 6); 10-day treatment	DAPA reduced miPAB-P by 48.7% and monocyte/lymphocyte ratio by 32.8% vs DOXO (p<0.05)
10	Cardio-Renal and Systemic Effects of SGLT2i Dapagliflozin on Short-Term Anthracycline and HER2-Blocking Agent Therapy-Induced Cardiotoxicity	2025	Guglielmini V, Di Mauro A, Ferrara G, et al.	To investigate cardioprotective role of dapagliflozin in DOXO + anti-HER2 cardiotoxicity model	Preclinical study; C57BL/6 mice (4 groups); 10-day treatment; echocardiography and biomarkers	DAPA preserved EF, reduced strain, NLRP3, MyD88, NFkBP, troponin-T, MDA, 4-HNE, BNP and hs-CRP
11	Doxorubicin-Induced Cardiotoxicity and the Emerging Role of SGLT2 Inhibitors: From Glycemic Control to Cardio-Oncology	2025	Goja ID, Goja G, Ondeck VL, et al.	To explore the interaction between anthracycline therapy and cardiotoxicity, evaluating SGLT2i as agents in cardio-oncology	Narrative review of literature on DOX cardiotoxicity mechanisms and pleiotropic effects of SGLT2i	SGLT2 attenuate CTRCD via mitochondrial preservation, apoptosis inhibition, reduce HF hospitalizations and CV mortality
12	Sodium-Glucose Cotransporter 2 Inhibitors During Cancer Therapy: Benefits, Risks, and Ongoing Clinical Trials	2024	Ganapathi R, Abdel-Qadir H, Zelkovska AM, Bonneau A	To summarize data on SGLT2i use to ameliorate cardiotoxicity prevention in patients receiving anthracyclines	Narrative review; discussion of proposed mechanisms and ongoing clinical trials	Emerging evidence from basic and observational studies supports role of SGLT2i; RCTs needed for confirmation

21723

CARDIOVASCULAR RISK RECLASSIFICATION IN PATIENTS WITH MULTIPLE MYELOMA: COMPARISON BETWEEN THE PREVENT SCORE AND A NOVEL PREDICTIVE MODEL

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Introdução/Fundamentos: Patients with multiple myeloma (MM) are at increased cardiovascular risk, particularly due to treatment-related cardiotoxicity. Although the PREVENT score is widely used to estimate cardiovascular risk in the general population, data regarding its ability to identify risk in MM patients remain limited. Given the growing survival of onco-hematologic patients and the increasing impact of cardiovascular complications on prognosis and quality of life, accurate cardiovascular risk stratification has become increasingly relevant in contemporary clinical practice. Objetivos: This study aimed to compare cardiovascular risk estimates obtained with the PREVENT score and a novel predictive model in patients with MM. Métodos: This retrospective observational study included 12 patients diagnosed with MM treated at a tertiary referral hospital in Bahia, Brazil. Cardiovascular risk was initially estimated using the PREVENT score and subsequently reassessed with a novel predictive model. Descriptive analyses and assessment of normality using the Shapiro-Wilk test were performed. As the data showed a non-parametric distribution, paired comparisons between models were conducted using the Wilcoxon signed-rank test, with $p < 0.05$ considered statistically significant. Resultados e Conclusões: A total of 12 patients were evaluated. An overall increase in estimated cardiovascular risk was observed after application of the novel model, with a mean score of 19.23 (± 23.74) for baseline PREVENT versus 30.78 (± 22.72) for the new score. Risk values ranged from 9.64 to 46.24 with baseline PREVENT and from 11.62 to 46.31 with the novel model, indicating a trend toward reclassification into higher-risk categories. An individual increase in estimated cardiovascular risk was observed in 83.3% of patients (n = 10). Shapiro-Wilk analysis confirmed non-parametric distribution ($p < 0.001$). Paired comparison demonstrated a trend toward higher cardiovascular risk estimates with the novel model, although without statistical significance ($z = -1.883$; $p = 0.064$). Patients with MM showed higher cardiovascular risk estimates with the novel predictive model compared with the PREVENT score, with individual risk increases observed in 83.3% of the sample. These findings suggest that the PREVENT score may underestimate treatment-related cardiovascular risk in this population and highlight the need for more specific cardiovascular risk stratification tools for onco-hematologic patients. Larger studies are needed to validate these findings.

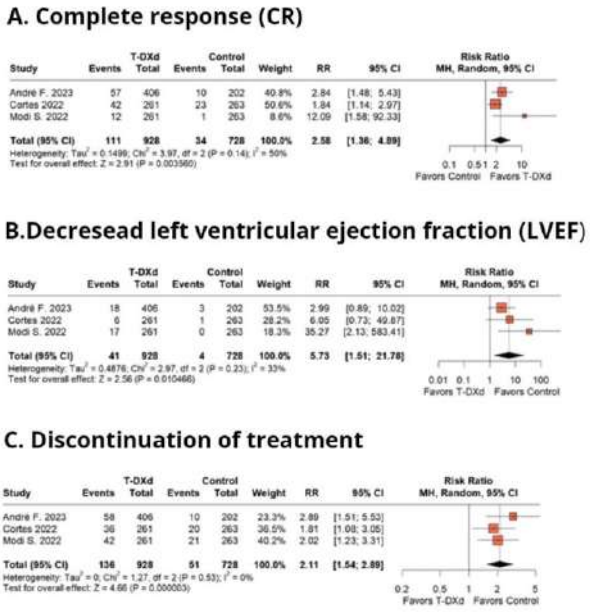
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CARDIOVASCULAR SAFETY AND TOLERABILITY OF TRASTUZUMAB DERUXTECAN IN HER2-POSITIVE BREAST CANCER: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Breast cancer (BC) remains one of the most prevalent malignancies among women, with the HER2-positive (HER2+) subtype requiring specific targeted therapies. Trastuzumab deruxtecan has emerged as a highly effective treatment for this population, significantly improving oncological outcomes. However, emerging clinical reports have raised concerns regarding its cardiovascular safety profile. Given the potential for treatment-induced cardiotoxicity, a comprehensive evaluation of its adverse effects on cardiac function and overall therapy tolerability is clinically imperative. Objetivos: To evaluate the cardiovascular safety and clinical tolerability of trastuzumab deruxtecan in patients with HER2-positive breast cancer, specifically focusing on the reduction of left ventricular ejection fraction (LVEF) and treatment discontinuation rates associated with adverse events. Métodos: A systematic review was conducted across Embase, PubMed, and Cochrane databases, adhering to PRISMA guidelines. We included randomized controlled trials (RCTs) comparing trastuzumab deruxtecan against standard-of-care treatments for HER2+ BC. Safety outcomes analyzed included LVEF reduction and therapy discontinuation due to adverse events. Effect sizes were expressed as Risk Ratios (RR) with 95% Confidence Intervals (CI), utilizing a random-effects model. Heterogeneity was assessed using the I^2 statistic. Resultados e Conclusões: Three randomized controlled trials were included, totaling 1,656 patients (928 in the trastuzumab deruxtecan group and 728 in the control group). Meta-analysis revealed a significantly higher incidence of LVEF reduction in the intervention group (RR: 5.73; 95% CI: 1.51-21.78; I2 = 33%). Additionally, a twofold increase in treatment discontinuation due to adverse events was observed (RR: 2.11; 95% CI: 1.54-2.89; I2 = 0%). While the efficacy of trastuzumab deruxtecan is well-documented, these results highlight a critical impact on treatment tolerability and cardiac safety. In conclusion, the use of this therapy is associated with a marked increase in cardiovascular adverse events. These findings underscore the necessity for rigorous cardiological monitoring and the implementation of standardized surveillance protocols during treatment to mitigate cardiotoxicity risks in clinical practice.



17487

CLINICAL PHENOTYPE OF WOMEN WITH BREAST CANCER UNDERGOING CHEMOTHERAPY: ANALYSIS OF THE PREVALENCE OF SYMPTOMS SUGGESTIVE OF HEART FAILURE IN A REFERRAL HOSPITAL

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Introdução/Fundamentos: Breast cancer is the leading cause of morbidity and mortality among women in Brazil, representing a major public health concern. In this context, complications associated with chemotherapy, particularly those related to cardiovascular health, significantly contribute to increased mortality rates in this population. Therefore, clinical monitoring and early detection of signs and symptoms may serve as essential tools for timely intervention and reduction of treatment-related complications. Objetivos: To evaluate the prevalence of symptoms suggestive of heart failure (HF) and their association with cardiovascular risk factors in women with breast cancer. Métodos: This is a cross-sectional, analytical, and descriptive study conducted with 39 women diagnosed with breast cancer and followed at a referral hospital in Paraíba, Brazil. Sociodemographic data, cardiovascular risk factors, and self-reported symptoms suggestive of HF (dyspnea, orthopnea, fatigue, and lower limb edema) were assessed through questionnaires, medical records, and interviews. A “clinical congestion phenotype” was defined as the presence of at least one congestive symptom. Descriptive and exploratory analyses were performed using SPSS. The study was approved by the Research Ethics Committee (CAAE: 92273025.4.0000.5178), and all participants provided informed consent. Resultados e Conclusões: A total of 39 women with breast cancer were evaluated, with a mean age of 52.6 years and a mean body mass index (BMI) of 29.3 kg/m². A high prevalence of cardiovascular risk factors was observed, including hypertension (41.0%; n = 16), dyslipidemia (40.0%; n = 12), and obesity (42.4%; n = 14). Smoking and alcohol consumption were reported by 30.8% of participants (n = 12), while 51.3% were physically inactive (n = 20). Regarding symptoms suggestive of heart failure, a high frequency of dyspnea (30.8%; n = 11), orthopnea (69.4%; n = 25), and lower limb edema (44.4%; n = 16) was observed, whereas fatigue was reported by 66.7% of patients (n = 26). Most participants presented at least one symptom, characterizing a clinical congestion phenotype. The high prevalence of symptoms suggestive of heart failure, combined with a substantial burden of cardiovascular risk factors, may indicate the presence of an underdiagnosed clinical congestion phenotype in women with breast cancer. These findings highlight the need for structured cardiovascular screening strategies within the context of cardio-oncology care.

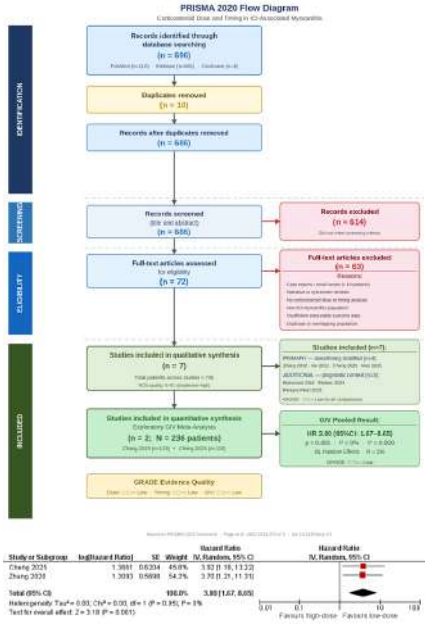
16027

CORTICOSTEROID DOSE AND TIMING IN IMMUNE CHECKPOINT INHIBITOR–ASSOCIATED MYOCARDITIS: A SYSTEMATIC REVIEW WITH STRUCTURED QUALITATIVE SYNTHESIS AND EXPLORATORY META-ANALYSIS

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Introdução/Fundamentos: Immune checkpoint inhibitor–associated myocarditis (ICI-M) has a case fatality rate of up to 50%. Corticosteroids are first-line therapy, yet optimal dose and timing remain undefined. Objetivos: To evaluate whether corticosteroid dose and timing are associated with major adverse cardiovascular events (MACE) and mortality in ICI-M patients, and to quantify this association when possible. Métodos: Systematic search in PubMed (n=110), Embase (n=581), and Cochrane (n=5). After duplicate removal (n=10) and two-stage screening, 7 studies were included. Risk of bias was assessed with the Newcastle–Ottawa Scale (NOS); evidence certainty with GRADE. An exploratory Generic Inverse Variance (GIV) meta-analysis pooled adjusted hazard ratios from comparable studies. Resultados e Conclusões: Seven predominantly retrospective studies (n≈735) were included. Three of four studies with dose data consistently favored high-dose corticosteroids: MACE rates were 22.0% vs. 61.9% (high vs. low dose; HR 0.27, 95%CI 0.09–0.84, p=0.024). Two studies reported timing data: in Zhang 2020 (n=126), MACE was 7.0% with corticosteroid initiation ≤24h vs. 85.1% when initiated >72h from admission (HR 0.03, 95%CI 0.004–0.23, p=0.001); Xie 2022 (n=46) confirmed the timing effect on overall survival (log-rank p=0.038). The exploratory GIV meta-analysis (n=236; 2 studies) yielded a pooled HR of 3.80 (95%CI 1.67–8.65, p=0.001) for low vs. high dose, with no heterogeneity (I^2=0%). GRADE certainty was Low for all comparisons. Together, available observational evidence consistently associates high-dose corticosteroids and early initiation (≤24h) with reduced MACE and mortality in ICI-M.



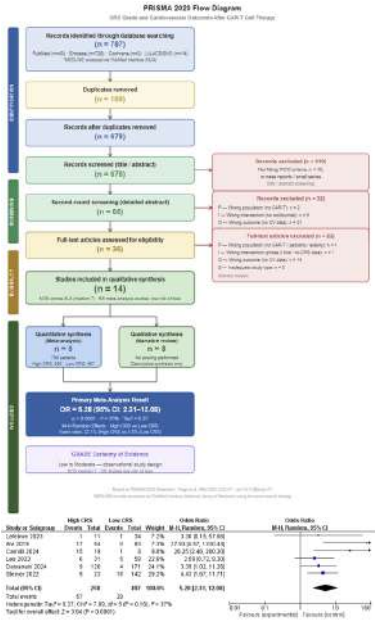
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CRS GRADE AS AN INDEPENDENT PREDICTOR OF CARDIOVASCULAR OUTCOMES AFTER CAR-T CELL THERAPY AND SUPPORTING EARLY TOCILIZUMAB AS A CARDIOPROTECTIVE STRATEGY: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: CAR-T cell therapy induces cytokine release syndrome (CRS), an IL-6-driven inflammatory response associated with myocardial injury and endothelial dysfunction. Tocilizumab is standard-of-care for CRS grade ≥2; however, the impact of CRS severity on cardiovascular outcomes and the cardioprotective role of tocilizumab timing remain incompletely explored Objetivos: To evaluate the association between CRS grade and cardiovascular adverse events in CAR-T recipients and to explore tocilizumab timing as a hypothesis-generating secondary endpoint Métodos: Systematic search across PubMed (n=43), Embase (n=728), Cochrane CENTRAL (n=2), and LILACS/BVS (n=14) totaling 787 records; 109 duplicates removed. After two-stage screening, 14 studies were included. Cardiovascular toxicity was defined as any clinically relevant adverse event, from strict MACE to broader composites (arrhythmia, HF decompensation, LVEF decline). High-grade CRS: grade ≥2; low-grade: grade 0–1 (Lee 2014/ASTCT 2019). Random-effects Mantel-Haenszel meta-analysis was performed on extractable comparative data; methodological quality by NOS; certainty of evidence per GRADE. Resultados e Conclusões: Of 14 included studies, 6 contributed to meta-analysis (n=755; high-grade CRS: n=258; low-grade: n=497). NOS scores: 6–8 (median 7); 5/6 studies with low risk of bias. High-grade CRS was associated with over 5 fold higher odds of cardiovascular toxicity (OR 5.28; 95% CI 2.31–12.08; p<0.0001; I^2=37%), with absolute event rates of 22.1% vs. 5.8%. Despite more frequent tocilizumab use in high-grade CRS, event rates remained markedly elevated, consistent with confounding by indication and suggesting that IL-6 blockade after CRS escalation may be insufficient to fully prevent myocardial injury, suggesting that earlier IL-6 blockade, before CRS escalation, may be needed. Troponin elevation emerged as a key early biomarker across qualitative synthesis. GRADE certainty was low-to-moderate, reflecting observational design. These findings support prospective trials evaluating earlier tocilizumab initiation as a cardioprotective strategy in high-risk CAR-T recipients.



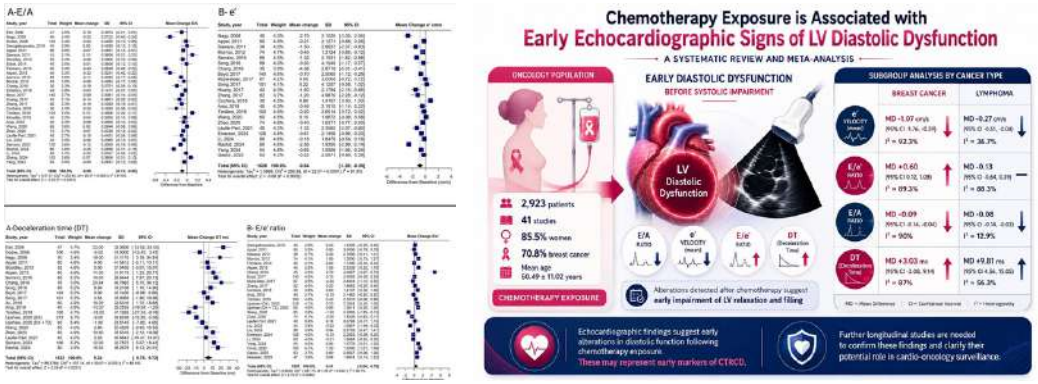
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ECHOCARDIOGRAPHIC ASSESSMENT OF CHEMOTHERAPY-INDUCED LEFT VENTRICULAR DIASTOLIC DYSFUNCTION - BEYOND EJECTION FRACTION: A SYSTEMATIC REVIEW AND META-ANALYSIS

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(1) UNIDAVI - CENTRO UNIVERSITARIO PARA O DESENVOLVIMENTO DO ALTO VALE DO ITAJAI - RIO DO SUL - SC - BRASIL;

Introdução/Fundamentos: With newer cancer therapies and improved survival, the incidence of cancer-therapy induced cardiotoxicity (CTRCD) is increasing. Systolic dysfunction is more frequently assessed than diastolic dysfunction, and while it is widely recognised that left ventricular (LV) systolic heart failure assessment is key in chemotherapic-treated patients, less is known about the relevance of LV diastolic functional impairment. Objetivos: We aimed to conduct a systematic review and meta-analysis evaluating diastolic parameters in CTRCD patients. Métodos: PubMed, Embase, and Cochrane databases were systematically searched for studies evaluating LV diastolic parameters before and after cancer treatment. The protocol was prospectively registered in PROSPERO (CRD420261288754). Analyses were conducted using R software. Pooled mean differences (MDs) were calculated using a random-effects model. Sensitivity analyses with correlation coefficients (r) of 0.3, 0.5, and 0.7 showed consistent results; therefore, r = 0.5 was adopted for the primary analysis. Heterogeneity was assessed using the I^2 statistic, and subgroup analyses were performed to explore possible sources. Resultados e Conclusões: A total of 41 studies including 2.923 patients were analyzed, of whom 85.5% were women and 70.8% were diagnosed with breast cancer, with a mean age of 50.49 ± 11.02 years. After chemotherapy, changes in diastolic parameters were significantly observed, including a decrease in E/A ratio (MD = -0.09 [95% CI: -0.13, -0.05]; p < 0.0001, e' mean velocity (MD = -0.84 cm/s [95% CI: -1.28, -0.39]; p < 0.0001, along with an increase in deceleration time (MD = 5.24 [95% CI: 0.75, 9.72]; p < 0.0001 and E/e' ratio (MD = 0.41 [95% CI: 0.04, 0.78]; p < 0.0001. Conclusion: Echocardiographic findings suggest early alterations in diastolic function after chemotherapy exposure. Further longitudinal studies are needed to confirm these findings and clarify their potential role as early markers of CTRCD.



19507

EFFECTS OF SACUBITRIL/VALSARTAN IN THE PREVENTION OF ANTHRACYCLINE CARDIOTOXICITY: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Anthracyclines are among the most widely used chemotherapeutic agents; however, they are associated with undesirable cardiotoxic effects, notably a reduction in left ventricular ejection fraction (LVEF) and heart failure (HF) onset. In a recent meta-analysis, sacubitril/valsartan (SV) was able to improve functional capacity in patients with cancer therapy-induced HF. Hence, new clinical trials were conducted to assess whether this drug could also prevent cardiotoxicity in patients undergoing anthracycline therapy (AT). Objetivos: To verify the effectiveness of SV in preventing cardiotoxicity in patients undergoing AT. Métodos: Randomized controlled clinical trials published in the last five years, in English, encompassing cancer patients who initiated AT, with no prior heart failure or cardiac dysfunction -- i.e., baseline LVEF ≥ 50%, assessed by cardiac magnetic resonance imaging (CMR) or echocardiography, or normal left ventricular global longitudinal strain (LVGLS), as well as no prior or current HF standard pharmacological treatment --, were included in the review. Studies not meeting these criteria were excluded. The outcomes analyzed were a decrease in LVEF ≥ 5%, assessed by CMR or echocardiography, and a decrease in LVGLS ≥ 15%. Initial research was conducted in MEDLINE using the entry terms "sacubitril/valsartan", "cardiotoxicity", and "anthracycline". The PRISMA 2020 checklist was used to systematize the review. Resultados e Conclusões: Three studies were included, comprising 352 patients, of whom 328 (93.2%) were women with breast cancer, and 151 (42.9%) were assigned to receive SV. The SARAH trial showed that a reduction in LVGLS ≥ 15% occurred in 7.1% of patients assigned to SV and in 25% of patients assigned to placebo (OR 0.23; 0.07–0.75, p = 0.015). A significant difference in LVEF decrease between the groups was observed when assessed by CMR (p = 0.011), but not by echocardiography. In the PRADA II trial, decrease in LVEF ≥ 5% assessed by CMR was not attenuated by SV when compared to placebo, but worsening in LVGLS was prevented by it (MD −0.9; −1.5 to −0.2). In another trial, 26.3% of patients in the control group showed a decline in LVGLS ≥ 15%, which did not occur in any patient in the SV group (p = 0.006). Therefore, in patients undergoing AT, SV attenuated the decrease in LVGLS, but such effect was not observed with respect to LVEF. More clinical trials are needed to confirm the potential cardioprotective effect of SV in these patients.



Figure 1. Flowchart of the study selection process

16215

EFFICACY OF SACUBITRIL-VALSARTAN ON CHEMOTHERAPY-INDUCED CARDIOTOXICITY IN ONCOLOGY PATIENTS: A SYSTEMATIC REVIEW AND BAYESIAN META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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Introdução/Fundamentos: Chemotherapy-induced cardiotoxicity represents a significant complication in the management of oncology patients, potentially leading to subclinical ventricular dysfunction and heart failure. In this context, sacubitril–valsartan, an angiotensin receptor–neprilysin inhibitor (ARNI), has emerged as a promising cardioprotective strategy, particularly for preserving myocardial function assessed by sensitive parameters such as Global Longitudinal Strain (GLS). Objetivos: To evaluate the efficacy of sacubitril–valsartan versus control in reducing cardiotoxic outcomes in cancer patients undergoing chemotherapy. Métodos: A systematic review was conducted in accordance with the PRISMA 2020 checklist. PubMed, Cochrane Library, Embase, and Web of Science databases were searched to identify full-text randomized controlled trials (RCTs) comparing sacubitril–valsartan versus control (placebo, standard care, or no treatment) in cancer patients receiving chemotherapy. The primary outcome was the change in baseline Global Longitudinal Strain. Statistical analysis was performed using R software (version 4.4.3), applying a Bayesian random-effects meta-analysis model to estimate mean difference (MD), with 95% credible intervals (CrI) and posterior probability of benefit (MD < 0), using weakly informative priors. Risk of bias was assessed using the RoB 2.0 tool. Resultados e Conclusões: Four RCTs were included, comprising 405 patients treated with sacubitril–valsartan and 231 controls. The ARNI significantly improved GLS, with a pooled MD of −0.94 (95% CrI: −1.61 to −0.26). The posterior probability of benefit (MD < 0) was 99.6%, indicating high confidence in the positive clinical effect of ARNI on myocardial strain. Between-study heterogeneity was negligible (I^2 = 0%; Tau^2 = 0; p = 0.88), suggesting a consistent effect across studies. Overall risk of bias was rated as low (n=2) to moderate (n=2). Sacubitril–valsartan demonstrated a significant benefit in preserving GLS in patients undergoing chemotherapy, with a high probability of positive effect and low heterogeneity across studies. These findings support its potential as a cardioprotective strategy in this setting, although additional RCTs are needed to further establish its clinical application.

19573

FRAILTY IN OLDER PATIENTS WITH HEMATOLOGIC MALIGNANCIES: PREVALENCE AND ITS ASSOCIATION WITH SYSTEMIC ARTERIAL HYPERTENSION

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(1) UNIVERSIDADE DO ESTADO DO PARA (UEPA) - BELÉM - PA - BRASIL;

Introdução/Fundamentos: The convergence of population aging, hematologic malignancies, and cardiovascular comorbidities represents one of the most challenging paradigms in contemporary medicine. Within this context, frailty has emerged not merely as a static marker of vulnerability, but as a dynamic determinant of clinical risk, with direct implications for treatment tolerance and outcomes. In cardio-onco-hematology, systemic arterial hypertension deserves particular attention due to its high prevalence and potential contribution to reduced functional reserve in older adults undergoing cancer care. Objetivos: To assess the prevalence of frailty in older adults with hematologic malignancies and to explore the association between systemic arterial hypertension and frailty in this population. Métodos: This was a single-center, cross-sectional, exploratory descriptive study conducted during routine outpatient care at a referral onco-hematology center in Belém, Pará, Brazil. Older adults with hematologic malignancies were evaluated using the FRAIL Scale and the Fried frailty phenotype. Clinical and treatment-related data were obtained from medical records. Frailty prevalence was compared between hypertensive and non-hypertensive patients using Fisher's exact test, with a significance level of 5%. Resultados e Conclusões: A total of 53 older patients with hematologic malignancies were included. Median age was 69 years (range 60–85), and 56.6% were male. The prevalence of systemic arterial hypertension was 62.9% (n=34). The most frequent hematologic diagnoses were lymphoma (32.1%), multiple myeloma (30.2%), and chronic lymphocytic leukemia (26.4%), followed by myelodysplastic syndrome (5.7%) and chronic leukemia (5.7%). Frailty prevalence was 30.2% according to the FRAIL Scale and 49.1% according to the Fried phenotype. Among hypertensive patients, frailty prevalence was 32.4% by FRAIL Scale and 47.1% by Fried criteria, compared with 26.3% and 47.4%, respectively, among non-hypertensive patients. No statistically significant association was observed between hypertension and frailty, either by FRAIL Scale (p=0.76) or Fried phenotype (p=1). Older adults with hematologic malignancies showed a high prevalence of frailty, especially by the Fried phenotype. Systemic arterial hypertension was not associated with increased frailty in this cohort. Findings are limited by small sample size but highlight the importance of routine frailty assessment.

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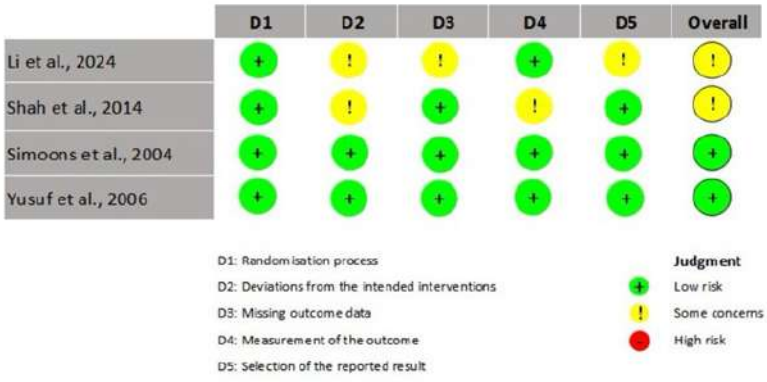
FROM CLINICAL TO SUBCLINICAL DYSFUNCTION: THE EVOLUTION OF TROPONIN-GUIDED CARDIOPROTECTION IN ANTHRACYCLINE TOXICITY

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Introdução/Fundamentos: Anthracyclines are fundamental in oncological treatment, but the risk of cardiotoxicity limits patient prognosis. Historically, troponin monitoring enabled prevention strategies focused on preserving the left ventricular ejection fraction (LVEF) during high-toxicity regimens. With the evolution toward contemporary reduced doses, the diagnostic focus has shifted to detecting subclinical myocardial damage, requiring a reevaluation of neurohormonal therapies against novel imaging modalities and high-sensitivity biomarkers. Objetivos: Analyze the historical evolution and efficacy of troponin-guided prophylactic cardioprotection strategies in preventing ventricular dysfunction (clinical and subclinical) in patients treated with anthracyclines. Métodos: A systematic review of randomized controlled trials (RCTs) was conducted according to the PRISMA protocol. The PICO strategy included patients using anthracyclines with troponin elevation undergoing preventive neurohormonal blockade versus control/placebo. Risk of bias was assessed using the Cochrane RoB 2 tool. Qualitative synthesis evaluated outcomes of clinical dysfunction (LVEF drop) and subclinical dysfunction (GLS drop >15%). Due to high clinical and methodological heterogeneity, a meta-analysis was not performed. Resultados e Conclusões: Three RCTs (n=403) were analyzed. The Cardinale study (2006; n=114) showed a high risk of bias (open-label) and demonstrated that enalapril prevented an LVEF drop >10% (0% vs. 43%; ARR=43%; p<0.001). In contemporary settings, the Cardiac CARE trial (2023; n=175) also presented high risk of bias (PROBE design, 31% discontinuation) and found no significant LVEF benefit (mean difference -0.37%; p=0.82). The SARAH trial (2025; n=114), with low risk of bias (double-blind), showed that sacubitril-valsartan significantly reduced GLS decline >15% (7.1% vs. 25%; OR 0.23; 95% CI 0.07–0.75; ARR=18%; p=0.015). Evidence demonstrates that cardioprotective efficacy has evolved alongside diagnostic refinement. While classical ACE inhibitor therapies in open-label studies prevented clinical dysfunction in high-toxicity settings, the methodological rigor of the SARAH trial proves that ARNI is effective in preserving subclinical function (GLS). This consolidates the need for early intervention and sensitive monitoring in contemporary cardio-oncology.

Figure 2. Assessment of the risk of bias in the included studies RoB 2.0.



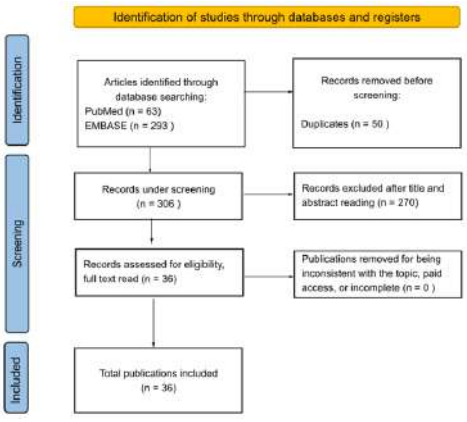
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GLOBAL LONGITUDINAL STRAIN VERSUS LEFT VENTRICULAR EJECTION FRACTION FOR EARLY DETECTION OF IMMUNE CHECKPOINT INHIBITOR-INDUCED CARDIOTOXICITY: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Immune checkpoint inhibitors (ICIs) are used to treat a variety of cancers, however cardiotoxicity, defined by a relative Global Longitudinal Strain (GLS) reduction of of ≥15% or asymptomatic decrease in Left ventricle Ejection Fraction (LVEF) of ≥10% to <55%, may occur during the treatment. In the spectrum of cardiovascular events that can happen, myocarditis is the most common. Using imaging methods to evaluate cardiotoxicity is essential for early assessment of dysfunction before significant reduction of the ejection fraction or major clinical events. To detect abnormalities in echocardiography, advanced options like GLS or conventional LVEF can be used. Objetivos: The objective of this study is to compare the temporal sensitivity of GLS and LVEF for the early detection of subclinical ICI-induced cardiotoxicity. Métodos: This is a systematic review conducted in accordance with PRISMA guidelines using PubMed and Embase. Studies (2021–2026) evaluating GLS and/or LVEF for early detection of cardiotoxicity in adult cancer patients treated with immune checkpoint inhibitors were included. The primary outcome was early detection of cardiotoxicity before LVEF reduction or major clinical events. Screening and data extraction were performed by three independent reviewers. Of 356 records, 36 studies were included. Resultados e Conclusões: GLS detects ICI-induced cardiotoxicity significantly earlier than LVEF. A relative GLS reduction of ≥15% occurred at a median of 14 days, whereas LVEF decline was a late finding, manifested at a median of 109 days. Notably, LVEF remained preserved during the subclinical phase (e.g., 66 ± 6% vs. 65 ± 5%, p=0.493). Conversely, GLS shows significant early reductions (e.g., -12.8 ± 3.2% vs. -16.6 ± 1.9%, p=0.028) despite normal LVEF, successfully identifying subclinical dysfunction. A strong negative correlation exists between GLS and LVEF (r = -0.64; p<0.002). Furthermore, GLS deterioration is an independent predictor for Major Adverse Cardiovascular Events (MACE). While biomarkers predict adverse outcomes, they frequently present asymptomatic elevations that cause diagnostic ambiguity. Consequently, GLS is demonstrably superior to LVEF for the early detection of subclinical myocardial injury. Integrating GLS with clinical screening and biomarkers maximizes diagnostic accuracy and risk stratification by combining biochemical alerts with mechanical sensitivity. Ultimately, this approach guides timely cardioprotective interventions long before LVEF declines.



17680

HIGH-SENSITIVITY TROPONIN I AS A PREDICTOR OF EARLY SUBCLINICAL MYOCARDIAL INJURY IN BREAST CANCER PATIENTS: A PROSPECTIVE STUDY

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Introdução/Fundamentos: Cardiotoxicity is a critical factor limiting the prognosis of breast cancer patients. While risk stratification typically relies on oncological staging and the type of chemotherapy, these conventional parameters often fail to identify subclinical myocardial injury in its earliest, most reversible stages. High-sensitivity cardiac Troponin I (hs-TnI) has emerged as a potential biomarker for detecting microscopic cardiac damage before the onset of functional changes. Objetivos: To investigate the longitudinal dynamics of hs-TnI during chemotherapy and evaluate whether conventional oncological risk factors (tumor stage and cardiotoxicity profile of the regimen) are associated with biomarker elevation. Métodos: We conducted a prospective cohort study of 48 women with histopathologically confirmed breast cancer (ICD-10 C50, stages I–III). Patients underwent serial biomarker assessment: at baseline (QT1) and after six chemotherapy cycles (QT6). Staging was categorized into early vs. locally advanced, and chemotherapy regimens were stratified by cardiotoxic potential (High-risk: anthracyclines/monoclonal antibodies vs. Lower-risk: taxanes/platinum). Statistical analysis employed the Wilcoxon signed-rank test for longitudinal changes and Fisher's exact/Mann-Whitney U tests for group comparisons (α=5%). Resultados e Conclusões: A significant longitudinal increase in hs-TnI levels was observed from QT1 to QT6 ($p < 0.001$). By the end of treatment (QT6), 12.5% (5/40) of the evaluable patients reached hs-TnI levels above the assay-specific threshold for myocardial injury. Crucially, this elevation was not associated with baseline tumor stage ($p = 0.845$) or the cardiotoxicity classification of the chemotherapy regimen ($p = 0.113$). No other clinical or sociodemographic variables analyzed in the baseline demonstrated a significant association with the development of subclinical injury. Conclusion: Chemotherapy induces significant subclinical myocardial injury that is independent of traditional oncological risk factors and drug classifications. These results suggest that current stratification models may underrepresent the risk of cardiac damage in certain patients. Our findings reinforce the need for universal, biomarker-based monitoring strategies in cardio-oncology to ensure early detection and personalized cardioprotective interventions.

Table 1: Clinical Profile and Distribution of Risk Factors (N=48)

Variable	Statistics (N=48)
Age (years), Mean ± SD	53.4 ± 11.6
Staging, n (%)	
Early Stages (I and II)	27 (56.25%)
Locally Advanced (Stage III)	21 (43.75%)
Cardiotoxicity Risk Profile, n (%)	
High Risk	41 (85.42%)
Low Risk	7 (14.58%)

Table 2: hs-TnI Evolution and Association Analysis (QT1 vs. QT6)

Biomarker Analysis	Pre-Chemo (QT1)	Post-6 Cycles (QT6)	p-value
hs-TnI Elevation, n (%)	0 (0%)	5 (12.5%)	< 0.001*
Associations with hs-TnI at QT6		**p-value**	
Tumor Stage (Early vs. Advanced)		0.845	
Cardiotoxicity Profile (High vs. Low)		0.113	

*Significant longitudinal change ($p < 0.05$). All data extracted from the study cohort and analyzed via R software.

19058

IMPACT OF TIME TO TOCILIZUMAB ADMINISTRATION ON CARDIOVASCULAR EVENTS ASSOCIATED WITH CYTOKINE RELEASE SYNDROME IN CAR-T CELL THERAPY: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: CAR-T cell therapy is associated with cytokine release syndrome (CRS), the primary mediator of cardiotoxicity, manifested as tachycardia, left ventricular dysfunction, arrhythmias, heart failure, and cardiovascular death. Tocilizumab, an IL-6 receptor antagonist approved for the management of severe CRS, has been investigated as a modulator of cardiovascular risk in this context. Objetivos: To systematically evaluate the relationship between time to tocilizumab administration following CRS onset and the occurrence of major adverse cardiovascular events (MACE) in patients undergoing CAR-T cell therapy. Métodos: An electronic search was conducted in the PubMed and Cochrane databases using Boolean operators (AND, OR, NOT) and the following descriptors: (CAR-T cells), (cytokine release syndrome), (cardiotoxicity), and (tocilizumab), encompassing publications from 2016 to 2026. Of the 243 records identified, duplicates, reviews, case reports, theses, and studies published in languages other than English were excluded. Following double-blind screening by title and abstract, succeeded by full-text review, 6 studies were prioritized for directly addressing predictive mechanisms and prevention strategies. Data were systematically extracted according to the PRISMA protocol and meticulously tabulated, categorizing: study design, protocols, patient populations, adverse events, and predictive factors. Resultados e Conclusões: CRS occurred in 59–93% of patients, with troponin elevation in 54% of tested cases and reduction in left ventricular ejection fraction (LVEF) in 28%. MACE were observed in 12–21% of patients, exclusively among those with grade ≥2 CRS. The risk of cardiovascular events increased 1.7-fold for every 12-hour delay in tocilizumab administration following CRS onset. Early administration protocols (grade 1 CRS persisting for >24 hours) were associated with 12-month MACE rates of 10%, compared with higher rates observed in late-intervention protocols. In 95% of cases involving MACE, prior troponin elevation was documented. Time to tocilizumab administration is a modifiable factor associated with cardiovascular risk in CAR-T cell therapy. Troponin is regarded as a sentinel biomarker for the early identification of high-risk patients. Institutional protocols for cardiac monitoring and early tocilizumab intervention are essential in contemporary cardio-oncology practice.

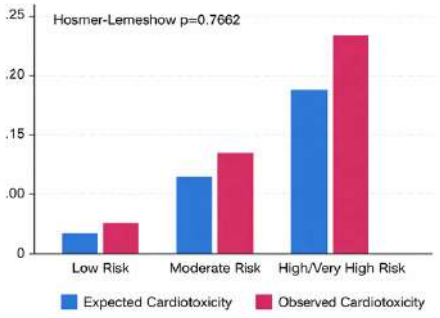
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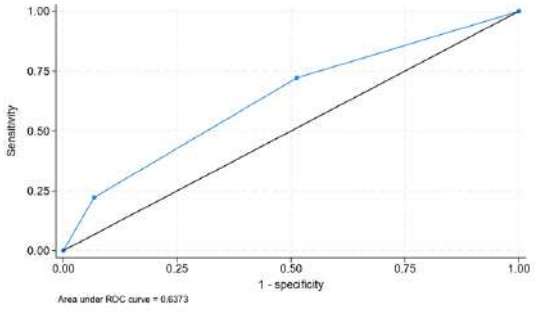
PERFORMANCE OF THE HFA-ICOS RISK SCORE FOR PREDICTING ANTHRACYCLINE-RELATED CARDIOTOXICITY IN A BRAZILIAN COHORT OF BREAST CANCER PATIENTS

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Introdução/Fundamentos: Anthracyclines are essential in breast cancer treatment but carry a risk of cardiotoxicity, leading to cardiac dysfunction and increased mortality. Early risk stratification is vital to minimize cardiovascular complications while optimizing cancer care. The HFA-ICOS risk score, proposed by the European Society of Cardiology (ESC), stratifies patients for cardiotoxicity risk, but its performance in non-European populations remains underexplored. Differences in cardiovascular risk profiles and healthcare infrastructure may influence its predictive accuracy, necessitating further validation in distinct populations. Objetivos: To evaluate the applicability, calibration, and accuracy of the HFA-ICOS risk score for predicting cardiotoxicity in a Brazilian cohort of breast cancer patients. The study also aims to compare cardiotoxicity incidence across risk groups and assess the association between clinical and oncological variables and cardiotoxicity risk. Métodos: This retrospective cohort study included 211 patients treated with anthracyclines from 2018 to 2023. Data were extracted from medical records. Patients were categorized into risk groups (low, moderate, high, very high) using the HFA-ICOS score. Cardiotoxicity was defined per ESC criteria, including symptomatic heart failure and asymptomatic ventricular dysfunction, assessed by left ventricular ejection fraction, global longitudinal strain, and cardiac biomarkers. Continuous variables were analyzed using ANOVA or Kruskal-Wallis tests, and categorical variables were compared using Fisher's exact test. Resultados e Conclusões: Out of 211 patients, 46.9% were low risk, 45.0% moderate, 7.1% high, and 0.9% very high risk. The overall cardiotoxicity rate was 8.5%, increasing across risk groups: 5.1% in low risk, 9.5% in moderate, and 23.5% in high/very high. The HFA-ICOS score showed good calibration (Hosmer-Lemeshow p = 0.7662) but limited discriminatory accuracy (AUC 0.6373, 95% CI 0.510–0.770). Cardiovascular factors, such as age, hypertension, and diabetes, were significantly associated with higher risk, while oncological variables showed no significant association. These findings highlight that while the HFA-ICOS score is useful for population-level risk estimation, its ability to predict individual cardiotoxicity risk in a Brazilian cohort is limited. The results underscore the need for region-specific predictive models to improve risk stratification and guide clinical decision-making in patients undergoing anthracycline therapy.





17468

QTC PROLONGATION AND ELECTROCARDIOGRAPHIC CHANGES DURING CHEMOTHERAPY IN BREAST CANCER PATIENTS

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Introdução/Fundamentos: Cardiotoxicity remains a leading cause of morbidity and mortality among women with breast cancer. Early electrophysiological changes often precede cardiac structural damage and are frequently missed by conventional imaging. The corrected QT interval (QTc) is a sensitive marker of electrical instability and increased risk of ventricular arrhythmias; however, prospective data on its dynamics during treatment are still limited. Objetivos: To evaluate and compare electrocardiographic changes, focusing on QTc prolongation, in women with breast cancer before (QT1) and after six chemotherapy cycles (QT6). Métodos: A prospective observational study was conducted with 48 women (≥18 years, stages I–III) at a High Complexity Oncology Center in Brazil. We excluded patients with pre-existing structural heart disease, uncontrolled arrhythmias, incomplete data, or palliative care. Chemotherapy regimens were stratified by cardiotoxic potential: (1) High (anthracyclines and/or monoclonal antibodies) and (2) Lower (taxanes and/or platinum-based, without anthracyclines/antibodies). 12-lead ECGs were performed at QT1 and QT6, analyzing rhythm, heart rate, QRS duration, and QTc (Bazett's formula). Statistical analysis was performed using R software (Shapiro-Wilk, Spearman correlation, and Stuart-Maxwell tests for paired comparisons), adopting a significance level of 5%. Resultados e Conclusões: Mean age was 53.4 ± 11.6 years, and 85.4% of patients were exposed to highly cardiotoxic regimens. A significant increase was observed in the proportion of patients with prolonged QTc, rising from 8.33% at QT1 to 25.0% at QT6 (p=0.039). A trend towards increased irregular heart rhythms was noted (2.08% vs. 12.50%; p=0.082), although not statistically significant. Notably, no association was observed between QTc prolongation and the cardiotoxicity class of the regimens (QT1: p=0.999; QT6: p=0.655), suggesting a generalized electrical effect. QRS duration, ST-segment changes, and T-wave inversion remained stable (p>0.05). Conclusions: Chemotherapy was associated with a significant increase in QTc prolongation, indicating subclinical electrical instability regardless of the traditional cardiotoxicity classification of the drugs. This reinforces the need for systematic ECG monitoring during treatment for early identification of arrhythmic risk and preventive cardio-oncology strategies.

Table 1: Clinical Characteristics and Chemotherapy Risk Stratification (N=48)

Variable	Statistics
Age (years), Mean ± SD	53.4 ± 11.6
Diagnosis, n (%)	
Breast Cancer (ICD-10 C50)	48 (100%)
Clinical Staging, n (%)	
Early Stages (I and II)	27 (56.25%)
Locally Advanced (Stage III)	21 (43.75%)
Chemotherapy Cardiotoxic Potential, n (%)	
High Cardiotoxicity (Anthracyclines/Antibodies)	41 (85.42%)
Lower Potential (Taxanes/Platinum)	7 (14.58%)

Table 2: Longitudinal ECG Evolution and Association Analysis (QT1 vs. QT6).

Electrocardiographic Variable	Pre-Chemo (QT1)	Post-6 Cycles (QT6)	p-value
Prolonged QTc Interval, n (%)	4 (8.33%)	12 (25.00%)	**0.039***
Irregular Heart Rhythm, n (%)	1 (2.08%)	6 (12.50%)	0.082
Wide QRS Complex (>120ms), n (%)	2 (4.17%)	3 (6.25%)	0.807
ST-Segment Changes, n (%)	3 (6.25%)	5 (10.42%)	0.655
T-Wave Inversion, n (%)	12 (25.00%)	11 (22.92%)	0.905
Association: QTc vs. Cardiotoxicity Class			
p-value (Fisher's Exact Test)	0.999	0.655	-

***Legend:** QTc: Corrected QT interval (Bazett); QT: Chemotherapy. *Significant p-value (<0.05). All data extracted from clinical records and analyzed via R software.*

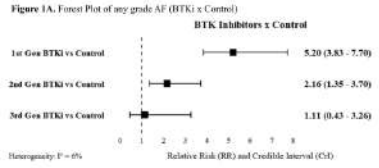
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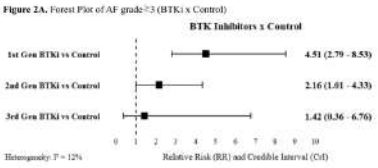
RISK OF ATRIAL FIBRILLATION IN PATIENTS TREATED WITH BRUTON'S TYROSINE KINASE INHIBITORS FOR ONCOHEMATOLOGICAL MALIGNANCIES: AN UPDATED SYSTEMATIC REVIEW AND BAYESIAN NETWORK META-ANALYSIS OF RANDOMIZED CLINICAL TRIALS

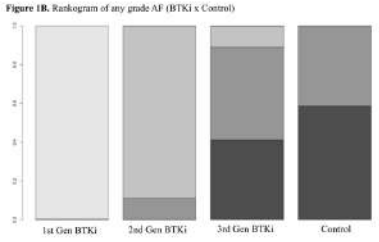
CAUÃ ARAUJO DE CARVALHO1; FELIPE GILDO VILELA MIRANDA SANTOS1; DAVI CHAVES ROCHA DE SOUZA1; JOÃO VITOR BENJAMIM PIRES1; JOÃO VICTOR TEIXEIRA COSTA1; PEDRO VITOR DE BRITO FERREIRA1; EDVAN DE QUEIROZ CRUSOE1;

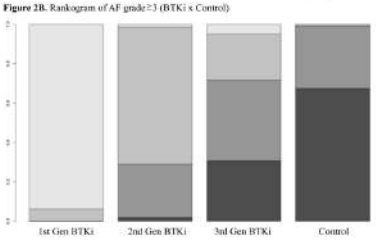
(1) UNIVERSIDADE FEDERAL DA BAHIA - SALVADOR - BA - BRASIL;

Introdução/Fundamentos: Bruton tyrosine kinase inhibitors (BTKi) revolutionized the treatment of patients with B-cell malignancies. However, these drugs have also been associated with a cardiovascular burden, notably atrial fibrillation (AF). New generations of BTKi were developed and have been associated with lower cardiotoxicity. Due to the relationship between BTKi and AF, a thorough review of their associated risk with each generation of BTKi was performed to provide insight into the management of these patients. Objetivos: To compare the risk of AF between patients treated with different BTKi generations for oncohematological malignancies. Métodos: PRISMA guidelines for network meta-analyses were applied. MEDLINE/PubMed, Cochrane and Embase were systematically searched on April 1st, 2026. Randomized clinical trials reporting AF in patients with oncohematological malignancies enrolled for treatment with BTKi were included. Risk of bias was assessed with Cochrane RoB 2 tool and findings were summarized with GRADE assessment. Data were extracted for statistical analysis using Excel and Rayyan software. Heterogeneity (I2), relative risks (RR) with 95% credible intervals (CrI) and surface under the cumulative ranking curve (SUCRA) were calculated in RStudio software. The primary outcome was any grade AF and secondary outcome was AF grade>/=3 Resultados e Conclusões: The systematic search yielded 4.830 studies, of which 32 met the inclusion criteria and were analyzed, including N=14.279 patients. Primary outcome analysis (I2=6%) showed increased risk of any grade AF with 1st generation (ibrutinib) (RR 5.20; 95% CrI 3.83-7.70; SUCRA 0.00) and 2nd generation BTKi (acalabrutinib/zanubrutinib) (RR 2.16; 95% CrI 1.35-3.70; SUCRA 0.37), with no statistically significant risk increase with 3rd generation BTKi (pirtobrutinib) (RR 1.11; 95% CrI 0.43-3.26; SUCRA 0.76) when compared with control (SUCRA 0.86). Secondary outcome assessment (I2=12%) showed increased risk of grade3 AF with 1st generation (RR 4.51; 95% CrI 2.79-8.53; SUCRA 0.02) and 2nd generation (RR 2.16; 95% CrI 1.01-4.33; SUCRA 0.43) BTKi, with no statistically significant risk increase with 3rd generation BTKi (RR 1.42; 95% CrI 0.36-6.76; SUCRA 0.65) when compared with control (SUCRA 0.88). These findings suggest that pirtobrutinib prevails as the lowest AF-risk BTKi, although it remains largely unavailable to most centers. Patients being treated with 1st or 2nd generation BTKi may benefit from regular electrocardiographic screening with a cardio-oncology follow-up team.









20653

SGLT2 INHIBITORS IN THE PREVENTION OF IMMUNE CHECKPOINT INHIBITOR-INDUCED CARDIOTOXICITY IN SOLID MALIGNANCIES: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Immune checkpoint inhibitor (ICI)-induced cardiotoxicity represents a serious complication, with mortality rates of up to 50% in cases of myocarditis. SGLT2 inhibitors (SGLT2i) possess anti-inflammatory and cardioprotective properties; however, their preventive role in this setting remains uncertain. Objetivos: To evaluate the efficacy of SGLT2i in the prevention of cardiotoxicity in patients with solid malignancies undergoing ICI therapy. Métodos: Systematic review and meta-analysis conducted in accordance with PRISMA 2020. Five databases were searched (PubMed, Embase, Cochrane, Scopus, Web of Science) through May 2026. Studies comparing SGLT2i versus standard of care in adults receiving ICIs (anti-PD-1/L1, anti-CTLA-4) were included. Risk of bias was assessed using ROBINS-I and certainty of evidence using the GRADE framework. Primary outcomes: MACE, cardiovascular mortality, and immune-related myocarditis. Secondary outcomes: HF hospitalization, atrial fibrillation (AF), and all-cause mortality. A random-effects model (DerSimonian-Laird) was applied; heterogeneity was assessed by I² and Cochran Q test. Resultados e Conclusões: Eight studies were included (N≈28,000), predominantly retrospective cohorts with propensity score matching (GRADE Low to Very Low). SGLT2i use was associated with a significant reduction in all-cause mortality [HR 0.55; 95%CI 0.45–0.67; p<0.001; I²=86%], with a marked decrease in heterogeneity in the sensitivity analysis restricted to ICI-specific studies [HR 0.65; 95%CI 0.58–0.72; I²=13%]. Significant reductions were also observed in HF hospitalizations [HR 0.60; 95%CI 0.40–0.91; p=0.016] and AF [OR 0.68; 95%CI 0.54–0.85; p<0.001], with moderate-to-high heterogeneity explored in subgroup analyses. The composite MACE endpoint did not reach statistical significance [HR 0.74; 95%CI 0.38–1.46; p=0.38], given the insufficient number of studies addressing this outcome. Immune-related myocarditis did not differ between groups (0 vs. 2 events, Perelman 2024; RR 1.001, Sabri 2025), with possible underreporting by electronic coding systems. SGLT2i were associated with significant reductions in mortality and cardiovascular complications in patients receiving ICIs. The consistency of the effect in ICI-specific studies supports the plausibility of benefit in this population. Randomized clinical trials are warranted to confirm these findings and establish the role of SGLT2i in cardioprotection in oncoimmunology.



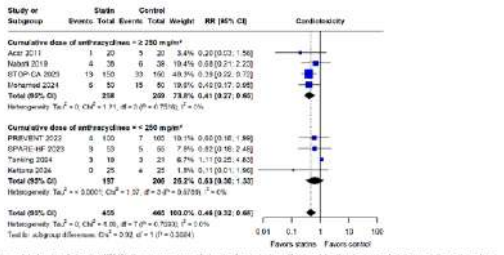
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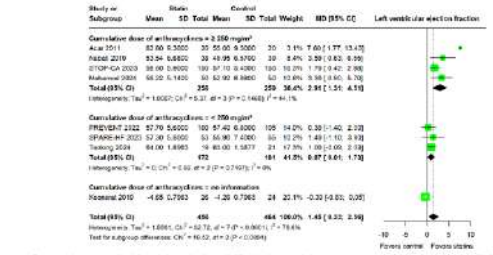
STATINS FOR PREVENTION OF CARDIOTOXICITY IN PATIENTS UNDERGOING ANTHRACYCLINE-BASED CHEMOTHERAPY: AN UPDATED SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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Introdução/Fundamentos: Anthracyclines remain a cornerstone of oncology but cause cancer therapy-related cardiac dysfunction (CTRCD) in up to 21% of patients. Statins have pleiotropic antioxidant, anti-inflammatory and endothelial effects that may attenuate this damage, supporting a class IIa recommendation in current cardio-oncology guidelines for high-risk patients. Recent randomized controlled trials (RCTs) yielded conflicting results, leaving the role of statins uncertain. Objetivos: To update a previously published meta-analysis (search through October 2023) by incorporating RCTs published thereafter and estimate the pooled effect of statins on CTRCD and left ventricular function in patients on anthracycline-based chemotherapy. Métodos: PRISMA-compliant systematic review. PubMed, Embase, Cochrane CENTRAL, Web of Science and ClinicalTrials.gov were searched from inception to May 2026. RCTs comparing any statin versus placebo or no intervention in adults with planned anthracycline therapy were eligible. Two reviewers screened, extracted data and assessed risk of bias with RoB-2. Random-effects models pooled risk ratios (RR) for binary outcomes and mean differences (MD) for continuous outcomes, with 95% confidence intervals (CI). A pre-specified subgroup analysis was performed by cumulative anthracycline dose (≥250 mg/m²). Resultados e Conclusões: Eleven RCTs were included; 920 patients (49% on statin) contributed to the primary outcome. Compared with controls, statin therapy significantly reduced CTRCD (RR 0.46; 95% CI 0.32–0.68; I-squared=0%; k=8). The benefit was consistent across cumulative anthracycline dose strata (interaction p=0.34). Post-anthracycline left ventricular ejection fraction was significantly higher with statins (MD +1.45%; 95% CI 0.33–2.56; p=0.011; k=8), and post-anthracycline left ventricular end-systolic volume was lower (MD −4.31 mL; 95% CI −6.57 to −2.04; p<0.001; I-squared=0%; k=5). Statins also reduced left ventricular end-diastolic volume (MD −4.20 mL; p=0.04). No cases of myositis or rhabdomyolysis attributable to statins were reported. In this updated meta-analysis, statin therapy reduced anthracycline-induced CTRCD by approximately 54% and produced consistent benefits on early markers of left ventricular dysfunction, with no apparent safety signal. These findings reinforce the consideration of statins as a cardio-protection strategy in patients with planned anthracycline-based chemotherapy.





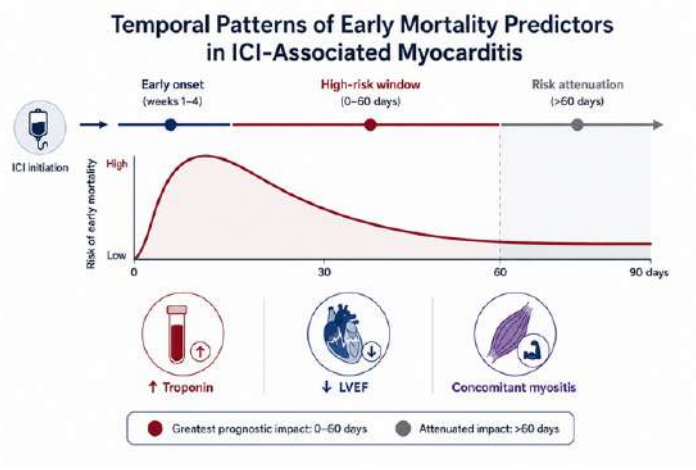
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TEMPORAL PATTERNS OF EARLY MORTALITY PREDICTORS IN IMMUNE CHECKPOINT INHIBITOR-ASSOCIATED MYOCARDITIS: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Immune checkpoint inhibitor (ICI)-associated myocarditis is a rare but potentially fatal immune-related adverse event. Although early mortality is substantial, predictors of adverse outcomes and their temporal prognostic behavior remain poorly characterized. Objetivos: To identify predictors of early mortality and evaluate their time-dependent prognostic significance in ICI-associated myocarditis. Métodos: A systematic review was conducted in accordance with PRISMA 2020 guidelines. PubMed, Embase, and the Cochrane Library were searched from January 2020 to April 2026 using terms including “immune checkpoint inhibitor”, “myocarditis”, “cardiotoxicity”, “predictors”, and “mortality”, combined with Boolean operators (AND). Two independent reviewers screened titles, abstracts, and full texts, with disagreements resolved by consensus. Eligible studies included observational cohort studies evaluating adults (≥18 years) with confirmed or suspected immune checkpoint inhibitor-associated myocarditis reporting predictors of early mortality (≤60 days) or major adverse cardiovascular events. Data extraction included time of onset, biomarker profiles, ventricular function, overlap syndromes, and clinical outcomes. Five studies comprising 549 patients met inclusion criteria. Due to methodological heterogeneity, findings were synthesized qualitatively. Risk of bias was assessed using the Newcastle-Ottawa Scale. Resultados e Conclusões: Incidence estimates ranged from 0.1% to 1.0%, with myocarditis typically occurring within 4 weeks of ICI initiation. Across included studies, markedly elevated troponin levels, reduced left ventricular ejection fraction (<50%), and concomitant myositis were recurrently associated with fulminant presentation and increased early mortality. Included multicenter cohorts identified reduced LVEF, elevated CK-MB, alanine aminotransferase, and overlap myositis as independent predictors of cardiotoxicity-related death. Landmark analyses showed that prognostic effects were strongest within the first 60 days and attenuated thereafter among survivors. Severe myocarditis was associated with increased 1-year cardiovascular mortality in a multicenter cohort (HR 6.52; 95% CI 2.2–19.6). These findings highlight the first 60 days as a critical therapeutic window for early recognition, biomarker-guided risk stratification, and risk-adapted management.



20611

TRANSCRIPTOMIC ANALYSIS OF HUMAN CARDIOMYOCYTES EXPOSED TO TYROSINE KINASE INHIBITORS REVEALS MOLECULAR SIGNATURES ASSOCIATED WITH CARDIOTOXICITY

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Introdução/Fundamentos: Cardiotoxicity associated with targeted therapies represents a challenge in cardio-oncology. Treatment with tyrosine kinase inhibitors (TKIs) - widely used in oncology - may induce myocardial dysfunction through mechanisms still incompletely understood. Therefore, the characterization of transcriptomic signatures associated with TKI exposure may help identify biological pathways and potential early biomarkers of risk of cardiotoxicity. Objetivos: To identify transcriptomic alterations due to exposure of human cardiomyocytes to TKIs. Métodos: A transcriptomic analysis was performed using RNA sequencing data from the dataset GSE146096 from the Gene Expression Omnibus. The dataset included gene expression profiles of human cardiomyocytes exposed to a panel of TKIs and controls. The analysis was conducted in R 4.4.3., with differential gene expression estimated using negative binomial regression. P-values were adjusted using the Benjamini-Hochberg method (padj<0.1 as significant), and the magnitude of expression change was estimated by log2 fold change (log2FC). Differentially expressed genes were subjected to functional enrichment analysis using Gene Ontology and KEGG pathways. Resultados e Conclusões: The initial matrix contained 38,478 genes (109 samples). A total of 1,717 differentially expressed genes were identified, including 1,006 upregulated and 711 downregulated genes. Among the most significantly downregulated genes were ACTG1 (log2FC=−1.57; padj=5.84×10-29), TPM1 (log2FC=−1.70; padj=6.32×10-13), TAGLN (log2FC=−2.48; padj=5.52×10-13), and LMO7 (log2FC=−2.38; padj=4.00×10-13), associated with cytoskeletal organization and myocardial contractility, while NAMPT (log2FC=2.61; padj=2.03×10-13), a regulator of cellular stress response, showed increased expression. Functional enrichment analysis revealed overrepresentation of genes related to actin filament organization, endoplasmic reticulum stress response, and cell-substrate adhesion. KEGG analysis indicated enrichment in pathways involving the muscular cytoskeleton, protein processing, and hypertrophic cardiomyopathy. Exposure of human cardiomyocytes to TKIs is associated with significant transcriptomic alterations involving genes related to cytoskeletal structure and cellular stress response. These transcriptomic signatures may contribute to the identification of molecular biomarkers with potential diagnostic and prognostic value for cardiotoxicity associated with targeted cancer therapies.

19530

TRANSCRIPTOMIC IDENTIFICATION OF PERIPHERAL BLOOD BIOMARKERS ASSOCIATED WITH ANTHRACYCLINE-RELATED CARDIOMYOPATHY

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Introdução/Fundamentos: Cardiomyopathy is characterized by structural changes in the myocardium, impairing cardiac function. Anthracyclines, widely used in chemotherapy, may induce cardiotoxicity by inhibiting topoisomerase IIβ in cardiomyocytes and triggering apoptotic pathways. In this context, peripheral blood transcriptomic biomarkers represent a promising non-invasive strategy. Objetivos: To identify transcriptomic biomarkers associated with anthracycline-induced cardiotoxicity. Métodos: This was a secondary bioinformatic analysis of RNA-seq data from the GSE218276 dataset, obtained from the Gene Expression Omnibus. The dataset included peripheral blood transcriptomic profiles from 104 childhood cancer survivors exposed to anthracyclines, including 40 with cardiomyopathy and 64 controls. Differential gene expression analysis was performed using DESeq2 in R 4.4.3, considering genes with adjusted p-value <0.05 and |log2 fold change| >1 as significant. Functional enrichment analyses were conducted using Gene Ontology and KEGG databases. LASSO regression and random forest were used to identify predictive genes; hub genes were the overlap between differentially expressed and machine learning-selected genes. Diagnostic performance was evaluated using ROC analysis. Resultados e Conclusões: The dataset included 58,101 genes across 104 samples. Differential expression analysis identified 187 significantly dysregulated genes between groups. Integration of differential expression and machine learning identified seven hub genes: HSPA8P1, TUBAP2, LOC644456, EEF1A1P14, KIF26A, TAF9BP2, and MTCO1P40. Enrichment analysis implicated mitochondrial metabolism, cellular stress response, and metabolic pathways in cardiac injury. A multigene logistic regression model based on these genes demonstrated moderate discriminative performance, with an area under the ROC curve (AUC) of 0.80 in the training dataset (72 samples) and 0.675 in the test dataset (32 samples). Overall, the study identified peripheral blood transcriptomic biomarkers potentially associated with anthracycline-related cardiomyopathy in childhood cancer survivors, suggesting involvement of genes and pathways related to mitochondrial function, cellular stress, and metabolic regulation. Despite its potential for risk stratification, the model showed moderate diagnostic performance, supporting validation in larger independent and broader cohorts before clinical application.

Cardiovascular Genetics



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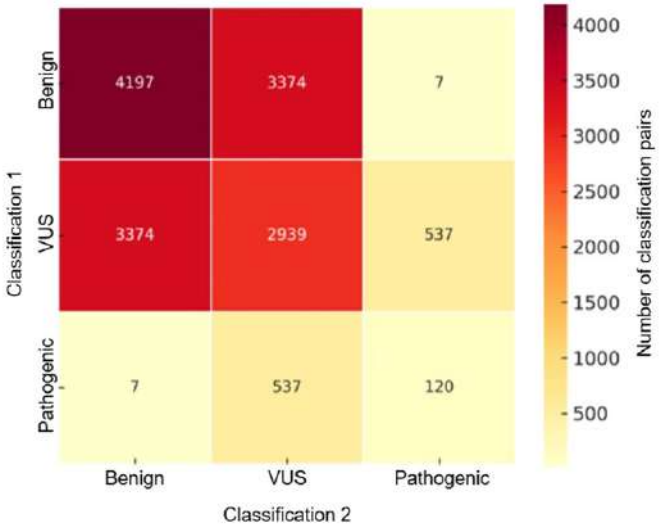
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CHALLENGES IN THE CLASSIFICATION OF VARIANTS IN THE FBN1 GENE: A CRITICAL ANALYSIS OF CONFLICTING DATA IN CLINVAR

MURILO KOSINSKI1; FELÍCIO FREITAS NETTO1;

(1) UNIVERSIDADE ESTADUAL DE PONTA GROSSA - PONTA GROSSA - PR - BRASIL;

Introdução/Fundamentos: The clinical interpretation of genetic variants remains a major challenge in genomic medicine due to variability in classification criteria across laboratories. The FBN1 gene, which encodes fibrillin-1, is classically associated with Marfan syndrome, an autosomal dominant multisystem disorder. Despite the establishment of the ACMG/AMP guidelines 2015 and additional specifications proposed by the Clinical Genome Resource (ClinGen), approximately 7% of FBN1 variants recorded in ClinVar show conflicting classifications, which may compromise diagnostic reproducibility. Objetivos: To analyze FBN1 variants deposited in ClinVar that present conflicting molecular interpretations. Métodos: A cross-sectional, analytical, and exploratory study was conducted using 629 FBN1 variants with conflicting interpretations retrieved from ClinVar. Only submissions from specialized institutions were included. Variants were categorized as benign, variants of uncertain significance (VUS), or pathogenic according to ACMG/AMP criteria. Descriptive analyses were performed to evaluate the distribution of variants by molecular type and year of submission. An interlaboratory discordance matrix was constructed and visualized as a heatmap. All analyses were performed using R (2025) and Python (v3.11). Resultados e Conclusões: Missense variants predominated (70.1%), followed by synonymous (14.9%) and intronic variants (11%). A marked increase in missense variants was observed after 2015, accompanied by growth in pathogenic classifications, whereas VUS remained the most frequent category throughout the study period. Some variants retained conflicting interpretations for up to 16 years. The discordance matrix demonstrated high intragroup concordance (4,197 benign pairs, 2,751 VUS pairs, and 802 pathogenic pairs), alongside notable divergences between benign and VUS classifications (3,374 pairs) and between VUS and pathogenic classifications (537 pairs). Direct conflicts between benign and pathogenic classifications were rare (7 cases). A high prevalence of missense variants with uncertain interpretation was observed in FBN1, frequently remaining classified as VUS for extended periods. This pattern may affect genetic counseling and clinical decision-making. Harmonization of variant interpretation based on ACMG/AMP guidelines and ClinGen recommendations is essential to improve diagnostic reliability.



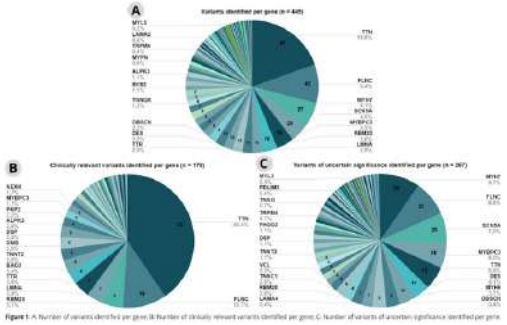
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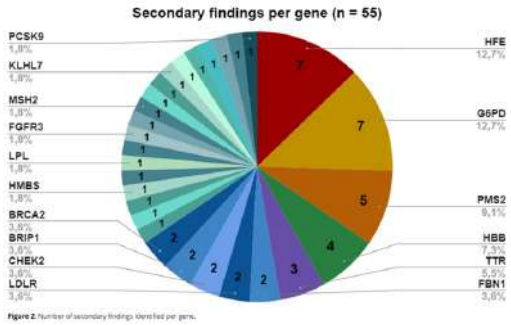
MUTATED GENES IDENTIFIED THROUGH GENETIC TESTING IN A BRAZILIAN COHORT WITH DILATED CARDIOMYOPATHY

LEONARDO CEDRO MACHADO1; EDUARDO KILIAN LUCENA1; EDIMAR ALCIDES BOCCHI1; FABIO FERNANDES1; EMANUELLE LEONILIA MARQUES1; SILAS RAMOS FURQUIM1; LUCAS VIEIRA LACERDA PIRES1; JOSÉ EDUARDO KRIEGER1;

(1) INCOR - INSTITUTO DO CORACAO DA UNIVERSIDADE DE SAO PAULO - SAO PAULO - SP - BRASIL;

Introdução/Fundamentos: Dilated cardiomyopathy (DCM) is associated with clinically relevant variants (CRVs) in up to 40% of cases. Current guidelines recommend genetic evaluation and counseling for individuals with DCM, in addition to cascade screening of first-degree relatives, providing an opportunity for early diagnosis and treatment. Furthermore, genetic testing enables the timely identification of mutations in genes not directly related to DCM. Objetivos: The objective of this study was to determine the prevalence of each mutated gene identified in genetic tests of a Brazilian cohort of patients with DCM, including primary findings (CRVs or variants of uncertain significance - VUS related to DCM) and secondary findings (genes not related to DCM). Métodos: This is an observational, retrospective, cross-sectional, multicenter study, based on the analysis of results from genetic tests previously performed in DCM patients participating in MAPA Genoma Brasil project. Eligible participants were adults (≥18 years) with a left ventricular ejection fraction <50% and a diagnosis of DCM established after the age of 14. Genes identified by genetic sequencing were quantified and classified as primary findings (CRVs and VUS) or as secondary findings (genes included in ACMG SF v3.3 list). Resultados e Conclusões: Genetic test results from 788 DCM patients were evaluated, of whom 462 (58.6%) were male. 785 exomes and 3 genomes were analyzed. A total of 445 variants in DCM-related genes were identified in 392 (49.7%) individuals, including 178 CRVs in 172 (21.8%) patients and 267 VUS in 239 (30.3%) patients. Among the 445 variants identified (Figure 1A), the most prevalent genes involved were TTN (19.6%), FLNC (9.4%), and MYH7 (6.1%). Within the subgroup of CRVs (Figure 1B), TTN predominated significantly (40.4%), followed by FLNC (10.7%). Conversely, VUS (Figure 1C) were most frequently located in MYH7 (9.7%) and FLNC (8.6%). Furthermore, 55 secondary findings (Figure 2) were identified in 52 (6.6%) individuals, with the most prevalent genes involved being HFE and G6PD (12.7%, n=7 each), followed by PMS2 (9.1%, n=5), HBB (7.3%, n=4), and TTR (5.5%, n=3). These findings reinforce the genomic consistency of DCM between Brazilian and predominantly European cohorts, as the prevalence of mutated genes is in line with that reported in the ESC guidelines. Moreover, the results underscore the importance of secondary findings to timely diagnosis of comorbid genetic disorders and broader counseling for patients and their relatives.





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15710

ALDOSTERONE SYNTHASE INHIBITORS IN PATIENTS WITH RESISTANT HYPERTENSION: A SYSTEMATIC REVIEW OF RANDOMIZED CLINICAL TRIALS.

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(1) UNIVERSIDADE DO ESTADO DO PARA (UEPA) - BELÉM - PA - BRASIL; (2) UNIVERSIDADE FEDERAL DO AMAPÁ (UNIFAP) - BELÉM - PA - BRASIL;

Introdução/Fundamentos: Resistant hypertension is associated with a 47% higher risk of cardiovascular events. Spironolactone, the drug of choice, is limited by hyperkalemia and reduced applicability in advanced kidney disease, while other treatments, such as renal denervation, alpha-blockers, and centrally acting agents, offer modest benefits or have notable side effects, highlighting aldosterone synthase inhibitors as a promising therapy. Objetivos: This review aims to evaluate the effect of aldosterone synthase inhibitors on blood pressure in patients with resistant hypertension. Métodos: A systematic search was conducted in PubMed, Embase, and The Cochrane Library databases, and the study included randomized clinical trials that had the following characteristics: a study population of patients with resistant hypertension; an intervention involving aldosterone synthase inhibitors; a comparison with placebo; and outcomes involving changes in systolic and diastolic blood pressure. Studies that did not provide a specific analysis for patients with resistant hypertension were excluded, including those that grouped individuals with uncontrolled and resistant hypertension without separately stratifying the results. Resultados e Conclusões: Four studies were included. LCI699 (osilodrostat), compared to placebo, did not result in statistically significant reductions in systolic and diastolic blood pressure in patients with resistant hypertension. Similarly, the 0.5 mg dose of Baxdrostat showed no significant effect in the trial conducted by Freeman et al. In contrast, at doses of 1 mg and 2 mg, baxdrostat produced clinically relevant and statistically significant reductions in blood pressure in all trials in which it was evaluated, with decreases in systolic blood pressure ranging from 8.1 mmHg to 11.0 mmHg and in diastolic blood pressure ranging from approximately 3.3 mmHg to 5.0 mmHg. Thus, aldosterone synthase inhibitors, particularly baxdrostat, represent a promising therapeutic strategy for the treatment of resistant hypertension. However, evidence remains limited, as only four randomized clinical trials have specifically evaluated this population, in addition to the short follow-up duration in most studies.

Table 1. Characteristics of Randomized Controlled Trials of Aldosterone Synthase Inhibitors in Resistant Hypertension

Study	Local	Study design	N (total)	Intervention (N)	Control (N)	Duration
Karns et al. (2013)	United States and Iceland	RCT, phase II	155	LCI699 in one of three regimens: 0.25 mg twice daily (n = 32); 1 mg once daily (n = 26); or 0.5 mg twice daily titrated to 1 mg twice daily after 4 weeks (n = 31)	Placebo (n = 33) or eplerenone 50 mg twice daily (n = 33)*	8 weeks
Freeman et al. (2023)	United States	RCT, phase II	275	Baxdrostat in one of three regimens: 0.5 mg once daily (n = 69); 1 mg once daily (n = 70); or 2 mg once daily (n = 67)	Placebo once daily (n = 69)	12 weeks
Flack et al. (2025)	North America, Europe and Oceania	RCT, phase III	794	Baxdrostat at either 1 mg (n = 264) or 2 mg (n = 266)	Placebo once daily (n = 264)	12 weeks
Azizi et al. (2026)	North America, South America, Europe, Asia, Oceania, and Africa	RCT, phase III	217	Baxdrostat 2 mg once daily (n = 108)	Placebo once daily (n = 109)	12 weeks

Notes: RCT: randomized controlled trial.
*In the study by Karns et al. (2013), eplerenone was used as an active control.

Table 2. Efficacy of Aldosterone Synthase Inhibitors on Blood Pressure in Resistant Hypertension: Placebo-Corrected Changes in SBP and DBP

Study	Drug / Dose	msSBP (Δ vs placebo, mmHg [95% CI])	msDBP (Δ vs placebo, mmHg [95% CI])	Significance
Karns et al. (2013)	LCI699 0.25 mg twice daily (n = 32)	−2.6	+0.3	NS
	LCI699 1 mg once daily (n = 26)	−4.3	−1.2	NS
	LCI699 0.5 mg twice daily titrated to 1 mg twice daily after 4 weeks (n = 31)	−3.7	−1.2	NS
Freeman et al. (2023)	Baxdrostat 0.5 mg once daily (n = 69)	NS	+0.6	NS
	Baxdrostat 1 mg once daily (n = 70)	−8.1 (−13.5 to −2.8)	−2.6	p=0.003
	Baxdrostat 2 mg once daily (n = 67)	−11.0 (−16.4 to −5.5)	−5.2 (−8.7 to −1.6)	p<0.001
Flack et al. (2025)	Baxdrostat 1 mg once daily (n = 264)	−9.1 (−12.6 to −5.7)	−3.3 (−5.2 to −1.4)	p<0.001
	Baxdrostat 2 mg once daily (n = 266)	−9.8 (−13.1 to −6.4)	−3.9 (−5.7 to −2.0)	p<0.001
Azizi et al. (2026)	Baxdrostat 2 mg once daily (n = 108)	−10.3 (−14.9 to −5.6)	−5.0 (−7.7 to −2.3)	p<0.001

Notes: Δ = placebo-corrected change; msSBP = mean seated systolic blood pressure; DBP = mean seated diastolic blood pressure; NS = not statistically significant.

18759

ARTERIAL STIFFNESS AND DIASTOLIC RESERVE DURING EXERCISE IN RESISTANT HYPERTENSION

GUILHERME GUILHERME VALLE1; MARCO ROGERIO DUARTE JUNIOR2; JOÃO VICTOR SOUTELLO FERREIRA2; RAÍSSA MARQUES DOS SANTOS2; LARYSSA FERNANDES FIGUEIRA RIBEIRO2; DÉBHORA TRINDADE PEIXOTO MARIANO2; MARIA EDUARDA SOARES CALAZANS2; GABRIEL RANGEL COSTA DA SILVA CARDOSO2; WILSON BRAZ CORRÊA FILHO2; SEBASTIANA BESSA PORTO2; FABIO DE SOUZA2;

(1) UNIRIO - RIO DE JANEIRO - DF - BRASIL; (2) UNIRIO - RIO DE JANEIRO - RJ - BRASIL;

Introdução/Fundamentos: Resistant hypertension (RH) is associated with increased cardiovascular risk, including heart failure, stroke, and mortality. Chronic pressure overload promotes accelerated vascular aging, assessed by pulse wave velocity (PWV), an independent predictor of adverse outcomes. Resting echocardiography may underestimate early diastolic dysfunction, a key mechanism in the development of heart failure. Objetivos: To assess arterial stiffness by comparing vascular and chronological age, describe the prevalence of diastolic dysfunction using stress echocardiography in RH, and explore variables associated with exercise-induced diastolic abnormalities. Métodos: Single-center cross-sectional study including patients with RH on ≥3 antihypertensive agents, including a thiazide diuretic, with adherence confirmed by the Morisky questionnaire. PWV was measured using an oscillometric method and compared with age- and sex-adjusted reference values. Diastolic function was evaluated by transthoracic echocardiography at rest and during supine bicycle exercise (25 W/3 min). The E/e' ratio estimated filling pressures and associations with demographic variables. Continuous variables are presented as mean ± SD or median [IQR]. The study was approved by the local ethics committee. Resultados e Conclusões: Thirty-two patients were included, 66% women, using a median of 5 [4–6] antihypertensive drugs, with mean office blood pressure of 159/97 ± 38/19 mmHg. Median BMI was 31.6 kg/m² [28.3–34.4]. Median PWV was 8.2 m/s [7.4–9.3], higher than expected, with vascular age of 60 vs. 54 years. At rest, 39% had normal diastolic function, 52% abnormal patterns, and 9% overt dysfunction; median E/e' was 9.5 [7.9–11.4]. During stress (n=15), normal findings decreased to 20%, abnormal patterns increased to 60%, and diastolic dysfunction was present in 20%. E/e' increased to 11.5 at peak exercise, suggesting elevated filling pressures. BMI was associated with E/e' during exercise (rho = -0.552, p = 0.041).Patients with RH may exhibit features consistent with early vascular aging and a possible reduction in diastolic reserve during exercise. Stress echocardiography suggested elevations in filling pressures not evident at rest, supporting a potential complementary role in detecting subclinical dysfunction. Obesity was associated with exercise-induced diastolic disfunction. Further studies are warranted to clarify the clinical implications and potential role of these measures in risk stratification.

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ASSOCIATION BETWEEN INTRACRANIAL COMPLIANCE DYNAMICS AND COGNITIVE PERFORMANCE: A MULTICENTER ANALYSIS

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Introdução/Fundamentos: Reduced intracranial compliance (IC) is emerging as a potential biomarker for cognitive impairment of vascular origin. The Mini-Mental State Examination (MMSE) is widely used for screening functional deficits, but its correlation with non-invasive cerebral hemodynamics remains poorly explored. Objetivos: To evaluate the association between the P2/P1 ratio (one of the markers of IC) and cognitive performance as measured by the MMSE, analyzing the moderating influence of age, sex, and cardiometabolic comorbidities. Métodos: This was a multicenter, cross-sectional observational study, following the STROBE guidelines. The sample consisted of 268 individuals (69.7% women), aged 21 to 84 years, with a mean BMI of 32.48 kg/m2. Intracranial compliance was assessed non-invasively (Brain4care device) for 7 minutes in the supine position; the mean P2/P1 ratio was calculated from the 5 minutes of central stability. Multivariable regression models associated the MMSE score with the P2/P1 ratio, age, sex, and comorbidities (arterial hypertension, dyslipidemia, and type 2 diabetes). Resultados e Conclusões: In the overall sample, the P2/P1 ratio was not independently associated with MMSE (p=0.344), with cognitive performance being predominantly predicted by advanced age (p=0.001) and the presence of arterial hypertension (p=0.035). However, a significant interaction by sex was observed. In the male group, the P2/P1 ratio was the only independent predictor of worse MMSE performance (p=0.010), outweighing the impact of age and comorbidities. In females, cognitive decline was exclusively associated with aging (p=0.006), with no influence from the P2/P1 ratio (p=0.580). An increase in the P2/P1 ratio may be associated with cognitive decline in males, independently of traditional risk factors. Although the MMSE is effective in global screening, non-invasive cerebral dynamics monitoring proves to be a promising clinical tool and sensitive for early identification of cognitive vulnerability, especially in men with a cardiometabolic risk profile.

19391

ASSOCIATION OF SYSTOLIC BLOOD PRESSURE STRATA AND TRAJECTORIES WITH ACUTE KIDNEY INJURY RISK IN HOSPITALIZED HEART FAILURE: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Acute kidney injury (AKI) is a frequent complication in heart failure (HF), affecting up to 30% of hospitalized patients and significantly worsening prognosis and mortality. Blood pressure (BP) management is essential for renal perfusion; however, optimal BP targets remain controversial because of the opposing risks of hypoperfusion and venous congestion. Objetivos: To analyze the association between different strata of systolic blood pressure (SBP) and the risk of development or progression of AKI in adults hospitalized with HF. Métodos: Systematic review conducted according to PRISMA guidelines via PubMed, Embase, and Cochrane. Studies from the last 5 years were included, with no language restriction and available in free full text, that evaluated SBP and mean arterial pressure (MAP) trajectories as exposure in adults with HF and AKI defined by KDIGO criteria. Risk of bias was assessed using ROBINS-I and RoB-2 tools. Screening and selection were performed by two independent reviewers, with disagreements resolved by discussion. Resultados e Conclusões: Five studies were selected, totaling 25,893 unique patients estimated after adjustment for sample overlap. The data reveal a non-linear U-shaped association between SBP and AKI risk, with the lowest predicted risk (nadir) at approximately 120 mmHg. Compared with the lenient stratum (SBP ≥140 mmHg), the standard (110–139 mmHg; aOR 0.77; 95% CI 0.69–0.86) and strict (<110 mmHg; aOR 0.74; 95% CI 0.67–0.82) strata were associated with lower odds of overall AKI. However, trajectories of rapid MAP decline were correlated with an increased risk of AKI (HR 1.284; 95% CI 1.085–1.521) compared with stable trajectories. Stable moderate MAP levels (85–91 mmHg) demonstrated a protective effect (HR 0.846; 95% CI 0.745–0.960). Strict management (<110 mmHg) was also associated with higher 28-day mortality (HR 1.162; 95% CI 1.012–1.334). Conclusions: SBP levels around 120 mmHg are associated with greater renoprotection. Although low values may reduce AKI through relief of congestion, abrupt declines and persistent levels <110 mmHg increase the risk of progression to severe stages and death, requiring dynamic monitoring of hemodynamic stability. This review is limited by the predominance of retrospective single-center studies, the presence of potential unmeasured confounders, and evaluation based on achieved pressures rather than randomized therapeutic targets.

18732

BEYOND BLOOD PRESSURE: CARDIOVASCULAR RISK FACTOR BURDEN AND CONTROL ACCORDING TO SEX IN A BRAZILIAN COHORT OF INDIVIDUALS WITH REFRACTORY HYPERTENSION

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Introdução/Fundamentos: Refractory hypertension (RefHTN) is an extreme phenotype of antihypertensive treatment failure associated with higher cardiovascular disease (CVD) risk. It is not well described to what extent risk factors other than hypertension (HTN) are controlled in patients with RefHTN, and whether there are sex differences in this aspect. Objetivos: We sought to evaluate the burden and control of CVD risk factors other than HTN by sex in patients with RefHTN. Métodos: This was a cross-sectional, single-center study conducted in a Brazilian cohort of patients attended by a public tertiary hypertension service between 2021 and 2025. We included participants with RefHTN, defined as office BP ≥140/90 mmHg and 24h ambulatory BP ≥130/80 mmHg despite the use of at least five classes of antihypertensive medications, in the absence of signs of poor treatment adherence. Patients with secondary hypertension were excluded. Cardiovascular risk factors assessed included LDL-c, HDL-c, non-HDL-c, triglycerides, diabetes mellitus (DM; uncontrolled DM defined as fasting glucose ≥130 mg/dL or HbA1c ≥7.0%), body mass index, and smoking status. LDL-c cutoff values and targets were defined according to current guideline recommendations. The 10-year atherosclerotic cardiovascular disease (ASCVD) risk was estimated using the PREVENT score, and patients were categorized according to the 2026 Dyslipidemia Guideline from the USA. Resultados e Conclusões: We analyzed 180 patients (76% female, 62.6 ± 11.4 years, mean office BP 167/93 mmHg, mean 24h ambulatory BP 149/90 mmHg). Median LDL-c was 88 (interquartile range: 69-106) mg/dL in individuals with ASCVD, 91 (75-125) mg/dL in those without ASCVD but with DM, and, in those with neither ASCVD nor DM, 120 (112-136) mg/dL, 142 (95-170) mg/dL, and 106 (96-129) mg/dL in high-, intermediate-, and borderline/low-risk patients, respectively (p=0.023, Kruskal–Wallis test). A low proportion of patients met recommended LDL-c targets, particularly among those with higher CVD risk (Tables 1 and 2). Table 2 shows a high burden of cardiometabolic risk factors and a low prevalence of current smoking in this population, without a significant difference between sexes. We observed a high prevalence of uncontrolled cardiovascular risk factors beyond HTN in both females and males with RfHTN that may potentiate the CVD risk. These findings highlight the urgent need for targeted strategies to improve risk factor control and reduce the burden of CVD.

Table 1. Prevalence of participants with LDL-c below selected cutoffs according to risk group

Condition	LDL-c cutoff (mg/dL)	Prevalence
ASCVD (n=53)	<55	3 (5.7%)
No ASCVD, with DM (n=59)	<70	8 (13.6%)
	<100	33 (55.9%)
No ASCVD, no DM		
High ASCVD risk (n=8)	<70	0
Intermediate ASCVD risk (n=8)	<100	3 (37.5%)
Low / Borderline ASCVD risk (n=15)	<100	5 (33.3%)
	<115	9 (60.0%)

Data expressed as number of observations (%).
The 10-year ASCVD risk was estimated using the PREVENT score for participants with available data within recommended ranges.
ASCVD: atherosclerotic cardiovascular disease; DM: diabetes mellitus, LDL-c: low-density lipoprotein cholesterol.

Table 2. Cardiovascular risk factor burden according to sex

Characteristic	Total (n=180)	Female (n=136)	Male (n=44)	p-value
LDL-c out of target*	120 (83.9%)	91 (83.5%)	29 (85.3%)	0.80
Non-HDL-c out of target**	71 (49.7%)	55 (50.5%)	16 (47.1%)	0.73
TG ≥150 mg/dL	76 (42.2%)	54 (39.7%)	22 (50.0%)	0.23
Low HDL-c***	103 (57.2%)	78 (57.4%)	25 (56.8%)	0.95
DM	93 (51.7%)	72 (52.9%)	21 (47.7%)	0.55
Uncontrolled DM	64 (68.8%)	48 (66.7%)	16 (76.2%)	0.41
BMI category				
Low / normal	21 (11.7%)	15 (11.1%)	6 (13.6%)	0.71
Overweight	59 (33.0%)	43 (31.9%)	16 (36.4%)	
Obesity	99 (55.3%)	77 (57.0%)	22 (50.0%)	
Current smoking	10 (5.6%)	9 (6.6%)	1 (2.3%)	0.46

Data expressed as number of observations (%).
* Target for participants with ASCVD: <55 mg/dL; target for participants without ASCVD and with DM: <70 mg/dL; targets for participants with neither ASCVD nor DM: <70 mg/dL (high risk), <100 mg/dL (intermediate risk), and <115 mg/dL (borderline/low risk).
** Non-HDL-c targets are 30 mg/dL above LDL-c targets.
*** <40 mg/dL in males and <50 mg/dL in females.
Statistical tests: chi-squared and Fisher's exact tests.
BMI: body mass index; DM: diabetes mellitus, HDL-c: high-density lipoprotein cholesterol; LDL-c: low-density lipoprotein cholesterol; TG: triglycerides

16202

BEYOND MEAN BLOOD PRESSURE: ADVANCED ABPM METRICS FOR CARDIOVASCULAR RISK STRATIFICATION

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Introdução/Fundamentos: Conventional ambulatory blood pressure monitoring (ABPM) parameters, particularly mean systolic and diastolic values, may underestimate the cumulative hemodynamic burden associated with cardiovascular risk. Advanced ABPM-derived metrics — such as time-weighted average (TWA), area under the curve (AUC), hemodynamic stress time (HST), and blood pressure variability — have emerged as tools for refined risk assessment. Objetivos: To evaluate the association and predictive value of advanced ABPM parameters in cardiovascular risk stratification compared to conventional mean blood pressure measurements. Métodos: A systematic review was conducted according to PRISMA 2020 guidelines. Studies published between 2015 and 2025 were identified in PubMed/MEDLINE, SciELO, and LILACS. Inclusion criteria comprised adult populations undergoing ABPM with analysis of advanced parameters (TWA, AUC, HST, or variability indices) and reporting cardiovascular outcomes or target organ damage. Study selection was performed by five independent reviewers. Methodological quality was assessed using the Newcastle – Ottawa Scale. Due to heterogeneity, a qualitative synthesis was performed. A total of 25 studies were identified. Resultados e Conclusões: Of 25 identified studies, 6 met inclusion criteria, comprising 437 patients in ABPM-focused cohorts. Advanced ABPM parameters showed consistent associations with target organ damage, particularly left ventricular hypertrophy and increased carotid intima-media thickness. Systolic BP variability demonstrated stronger correlations with structural vascular changes compared to mean BP ($p < 0.05$). TWA improved detection of cumulative hemodynamic burden and dynamic BP fluctuations. Integrated variability indices enhanced risk discrimination, especially in high-risk populations. Conventional ABPM parameters tended to underestimate cardiovascular risk. Advanced ABPM-derived parameters improve cardiovascular risk stratification and are more closely associated with target organ damage than conventional mean BP. These findings support a paradigm shift toward dynamic hemodynamic assessment in hypertension management.

18806

BLOOD PRESSURE VARIABILITY AND RISK OF MAJOR CARDIOVASCULAR EVENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Blood pressure variability has emerged as an important independent prognostic marker beyond absolute blood pressure levels. Blood pressure fluctuations may reflect hemodynamic instability and increased vascular risk. However, the magnitude of its association with major cardiovascular events still requires consolidation through systematic analysis. Objetivos: To evaluate the association between blood pressure variability and the risk of major cardiovascular events in adults. Métodos: A systematic review was conducted in accordance with PRISMA guidelines, with a structured search in PubMed, Embase, and the Cochrane Library up to January 2026. Prospective studies assessing blood pressure variability using different methods (office measurements, ambulatory blood pressure monitoring, or home monitoring) and its relationship with cardiovascular events were included. The primary outcome was major adverse cardiovascular events (MACE). Meta-analysis was performed using a random-effects model, with calculation of relative risk (RR) and 95% confidence intervals (95% CI). Heterogeneity was assessed using the I^2 statistic. Resultados e Conclusões: Eleven studies were included, totaling 89,462 participants. Higher blood pressure variability was associated with a significant increase in the risk of major cardiovascular events (RR = 1.53; 95% CI: 1.36–1.72; $p < 0.001$). Heterogeneity was moderate ($I^2 = 34\%$). Blood pressure variability is associated with a relevant increase in cardiovascular risk, reinforcing its importance as an additional marker in risk stratification and clinical management.

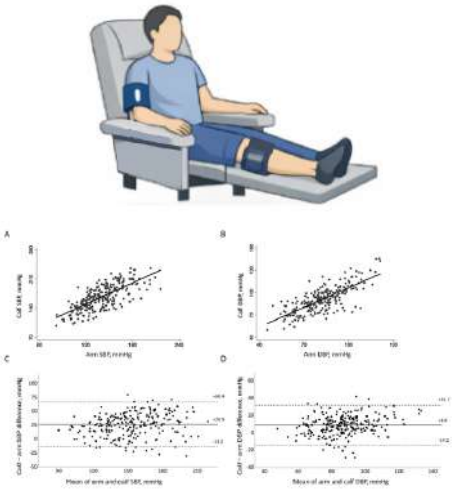
16166

CALF BLOOD PRESSURE THRESHOLDS FOR DETECTING ELEVATED ARM BLOOD PRESSURE IN HEMODIALYSIS PATIENTS

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Introdução/Fundamentos: Upper-arm blood pressure (BP) measurement may be limited in hemodialysis (HD) patients because of local vascular restrictions, making calf BP a relevant alternative. Objetivos: To assess the relationship between standardized calf and arm BP measurements in HD patients and to derive calf BP thresholds corresponding to elevated arm BP levels. Métodos: This cross-sectional study included 277 patients receiving thrice-weekly HD for ≥3 months at four Brazilian outpatient centers between January and August 2025. BP was measured immediately before the midweek dialysis session using an automated oscillometric device (Omron HEM-7320) with appropriately sized cuffs. After a 5-min rest, participants remained seated with the back supported at 90° and legs fully extended and supported parallel to the floor, reflecting their usual posture during dialysis (Figure 1). Simultaneous measurements were obtained in the non-arteriovenous fistula arm (or right arm when no fistula was present) and the ipsilateral calf. Three readings were taken at 1-minute intervals, and the mean of the second and third was used for analysis. Associations between arm and calf BP were assessed by Pearson correlation and linear regression. Calf BP thresholds corresponding to elevated arm BP (≥140/90 and ≥130/80mmHg) were estimated from regression models. Diagnostic performance was evaluated by receiver operating characteristic curve analysis, and agreement by Bland-Altman analysis. The study was approved by the Ethics Committee. Resultados e Conclusões: Mean age was 55±14 years, 64% were male, median dialysis vintage was 759[286-1708] days, and 82% were receiving antihypertensive therapy. Mean arm and calf BP were 140±24/83±14 and 167±29/92±17mmHg, respectively, with correlations for systolic and diastolic BP of r=0.72 and r=0.74. Calf BP values of 167/98 and 158/89mmHg corresponded to arm BP thresholds of 140/90 and 130/80mmHg (Figure 2-A/B), yielding AUCs of 0.755 and 0.804, sensitivities of 82% and 88%, and specificities of 69% and 73%, respectively. Bland-Altman analysis showed higher calf than arm BP, with mean systolic and diastolic biases of 26.7 and 8.8mmHg and wide but expected limits of agreement (Figure 2-C/D). In conclusion, when upper-arm BP measurement is not feasible in HD patients, calf BP thresholds of approximately 165/100 and 160/90mmHg may help identify arm BP levels of 140/90 and 130/80mmHg, respectively, supporting more accurate BP assessment in this setting.



21497

CARDIOMETABOLIC INDEX AND EARLY RENAL DYSFUNCTION IN YOUNG ADULTS: A POPULATION-BASED STUDY

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Introdução/Fundamentos: Hypertension is the leading cause of mortality and disability-adjusted life years worldwide. Individuals with hypertension have a higher risk of metabolic syndrome and early target-organ damage. The cardiometabolic index (CMI) has emerged as a simple marker for screening diabetes mellitus, stroke, and renal dysfunction. However, its association with early cardiovascular and renal alterations in young adults remains unclear. Objetivos: To investigate the association between the cardiometabolic index (CMI) and renal function in young adults. Métodos: This study included 543 adults (60% female gender; mean age 37,9 ± 8,9 years old) aged 20–50 years from a population-based cohort in Rio de Janeiro, Brazil. Sociodemographic, anthropometric, and cardiovascular risk factor data were collected. All participants underwent laboratory testing to assess metabolic profile and renal function, office blood pressure measurement, and home blood pressure monitoring (HBPM; 7-day protocol). The cardiometabolic index (CMI) was calculated as (waist circumference/height) × (triglycerides/HDL-cholesterol) and categorized according to the median value (1.12). Resultados e Conclusões: Individuals with higher CMI were older (40.3 ± 8.3 vs. 35.6 ± 8.8 years, p<0.001), had higher obesity prevalence (40.2% vs. 14.9%, p<0.001), were more frequently smokers (15.2% vs. 9.2%, p=0.024), and exhibited a worse glycemic and lipid metabolic profile. Estimated glomerular filtration rate was lower in individuals with higher CMI (102 vs. 111 mL/min/1.73m², p=0.001), indicating an association with reduced renal function even in a relatively young population. Consistently, individuals with lower eGFR presented higher CMI values (p<0.001) and a worse metabolic profile, including higher prevalence of diabetes, glucose intolerance, and metabolic syndrome. No significant differences were observed in albuminuria, indicating that early renal alterations associated with CMI may occur independently of albuminuria. In conclusion, CMI was associated with lower eGFR in young adults, suggesting its potential role as a simple and cost-effective biomarker of early subclinical renal dysfunction and risk stratification.

18844

CARDIOMETABOLIC INDEX AND HYPERTENSION IN YOUNG ADULTS: A POPULATION-BASED STUDY

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Introdução/Fundamentos: Hypertension is the leading cause of mortality and disability-adjusted life years worldwide. Individuals with hypertension have a higher risk of metabolic syndrome. The cardiometabolic index (CMI) is an emerging metabolic marker for screening diabetes mellitus, stroke, and renal dysfunction. However, the association between CMI and hypertension in young adults remains unclear. Objetivos: To investigate the association between CMI and hypertension in young adults. Métodos: This study included 543 adults (60% female gender; mean age 37,9 ± 8,9 years old) aged 20–50 years from a population-based cohort in Rio de Janeiro, Brazil. Sociodemographic, anthropometric, and cardiovascular risk factor data were collected. All participants underwent laboratory testing to assess metabolic profile and renal function, office blood pressure measurement, and home blood pressure monitoring (HBPM; 7-day protocol). Participants were classified as normotensive (n=232), prehypertensive (n=215), or hypertensive (n=96). The cardiometabolic index (CMI) was calculated as (waist circumference/height) × (triglycerides/HDL-cholesterol) and categorized according to the median value (1.12). Resultados e Conclusões: Individuals with higher CMI were older (40 ± 8 vs. 35 ± 8 years, p<0.001), had higher obesity prevalence (40.4% vs. 14.8%, p<0.001), were more frequently smokers (15.1% vs. 9.2%, p=0.025), and exhibited a worse glycemic and lipid metabolic profile, as well as a lower ankle–brachial index. Blood pressure levels were higher both in office and HBPM measurements, and the prevalence of prehypertension (43.4% vs. 35.8%, p=0.043) and hypertension (21.3% vs. 14.0%, p=0.017) was significantly greater. A progressive increase in CMI was observed according to hypertension severity (normotension: 1.19 ± 0.81; prehypertension: 1.46 ± 0.88; hypertension: 1.74 ± 1.69), suggesting that CMI may serve as an early risk marker even in the prehypertensive stage. In conclusion, CMI showed a positive association with hypertension in young adults, indicating that it may represent a simple and cost-effective biomarker for early cardiovascular risk stratification.

18103

CARDIOMETABOLIC INDEX IS ASSOCIATED WITH OBSTRUCTIVE SLEEP APNEA IN YOUNG ADULTS: A POPULATION-BASED STUDY

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Introdução/Fundamentos: Obstructive sleep apnea (OSA) is strongly associated with cardiometabolic abnormalities. However, the role of composite indices integrating multiple metabolic parameters in OSA risk assessment remains poorly defined. Objetivos: To investigate the association between the cardiometabolic index (CMI) and OSA in a cohort of young adults. Métodos: This study included 85 adults (57.6% women; mean age 37.9 ± 8.9 years) aged 20–50 years from a population-based cohort in Rio de Janeiro, Brazil. Sociodemographic, anthropometric, and cardiovascular risk factor data were collected. All participants underwent laboratory evaluation of metabolic profile and renal function, office blood pressure measurement, and 7-day home blood pressure monitoring (HBPM). Domiciliary polysomnography (ApneaLink Air, ResMed) was performed in all individuals, and OSA was defined as an apnea–hypopnea index (AHI) >5 events/hour. The cardiometabolic index (CMI) was calculated as (waist circumference/height) × (triglycerides/HDL-cholesterol) and categorized according to the median value (1.25). Resultados e Conclusões: Individuals with OSA were more frequently male (60% vs. 33%, p=0.014), had a higher prevalence of central obesity (57% vs. 36%, p=0.04), and increased neck circumference (33% vs. 13%, p=0.025). They also showed a higher prevalence of hypertension (77% vs. 31%, p<0.001) and dyslipidemia (80% vs. 47%, p=0.003). CMI was significantly higher in patients with OSA (1.67 ± 0.61 vs. 1.17 ± 0.45, p<0.001). Moreover, individuals with higher CMI (above the median) exhibited a worse polysomnographic profile, with a higher prevalence of moderate-to-severe OSA (16.3% vs. 2.4%, p=0.031), higher AHI (4.8 vs. 2.0 events/hour, p=0.013), and greater oxygen desaturation indices. In conclusion, CMI is significantly associated with both the presence and severity of OSA in young adults. These findings suggest that CMI may serve as a simple, low-cost, and clinically useful biomarker for early identification and risk stratification of OSA in this population.

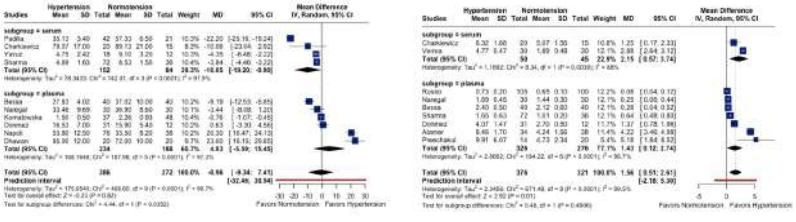
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CIRCULATING NITRIC OXIDE AND MALONDIALDEHYDE LEVELS IN HYPERTENSIVE VERSUS NORMOTENSIVE ADULTS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Arterial hypertension affects approximately 40% of adults worldwide and contributes substantially to cardiovascular mortality. Oxidative stress is central to hypertension pathophysiology, with reduced nitric oxide (NO) bioavailability and increased lipid peroxidation, reflected by malondialdehyde (MDA) levels. Objetivos: To quantitatively compare circulating NO and MDA levels between hypertensive and normotensive adults. Métodos: A systematic search of PubMed, Embase, and Cochrane Library identified randomized controlled trials and observational studies comparing circulating NO and MDA levels in hypertensive versus normotensive adults. The study was conducted in accordance with the PRISMA guidelines. Primary outcomes were serum and plasma NO and MDA levels. Subgroup analyses were performed by biological sample type and MDA assay method. Mean differences (MD) with 95% confidence intervals (CI) were pooled using a random-effects model. Resultados e Conclusões: Fourteen studies (3 randomized and 11 observational), comprising 1,029 participants, were included. For NO, the overall analysis (10 studies; 386 hypertensive and 272 normotensive participants) showed no significant difference between groups (MD -0.96, 95% CI -9.34 to 7.41; I²=99.7%). However, subgroup analysis by sample type revealed that serum NO levels were significantly lower in hypertensive individuals (MD -10.05, 95% CI -19.20 to -0.90), whereas plasma NO did not differ significantly (MD 4.93, 95% CI -5.59 to 15.45). Regarding MDA (9 studies; 376 hypertensive and 321 normotensive participants), hypertension was associated with higher overall levels (MD 1.56, 95% CI 0.51 to 2.61; I²=99.5%). Subgroup analysis confirmed this trend in both serum (MD 2.15, 95% CI 0.57 to 3.74) and plasma (MD 1.43, 95% CI 0.12 to 2.74). Additionally, the assay method influenced MDA estimates, with larger effects observed in TBARS and ELISA studies compared to HPLC analyses. Conclusions: Hypertension is associated with increased circulating MDA levels, supporting enhanced lipid peroxidation in this condition. Although NO levels were not significantly different overall, lower serum NO suggests impaired NO bioavailability in hypertensive adults. The marked heterogeneity indicates that sample type and assay methodology substantially affect biomarker estimates, underscoring the need for standardized measurement strategies in future studies.



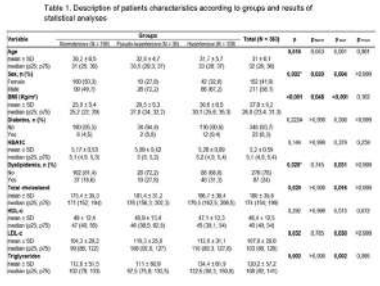
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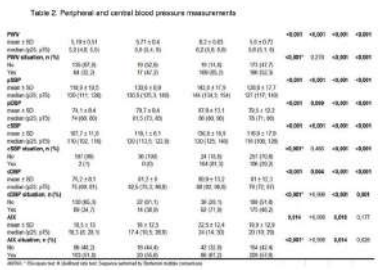
CLINICAL AND CENTRAL HEMODYNAMIC PROFILES OF SPURIOUS AND SUSTAINED HYPERTENSION IN YOUNG ADULTS: A PHENOTYPE-BASED ANALYSIS

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Introdução/Fundamentos: Isolated systolic hypertension in young adults is a heterogeneous condition including true hypertension related to increased arterial stiffness and spurious systolic hypertension driven by peripheral pulse pressure amplification. Differentiating these phenotypes is essential due to distinct prognostic and therapeutic implications, yet remains underrecognized. Objetivos: To compare the clinical, metabolic, and central hemodynamic characteristics of young adults classified as normotensive, spurious systolic hypertensive, or sustained hypertensive. Métodos: This retrospective cross-sectional study included 363 individuals aged 18–40 years evaluated between 2018 and 2022. Clinical, metabolic, peripheral blood pressure, and central hemodynamic data were obtained from medical records. Participants were classified into normotensive, spurious systolic hypertensive, or sustained hypertensive groups based on peripheral and central blood pressure. Isolated systolic hypertension was defined as systolic blood pressure ≥140 mmHg and diastolic blood pressure <90 mmHg. Ambulatory blood pressure monitoring confirmed systolic hypertension and excluded white-coat effect. Central systolic blood pressure ≥120 mmHg defined elevated central pressure. Central hemodynamic parameters, including central blood pressure, pulse wave velocity, and augmentation index, were assessed using a validated noninvasive device (Complior system). Comparisons were performed using ANOVA and chi-square tests, with post hoc analyses when appropriate. A p-value <0.05 was considered significant. The study was approved by the Human Research Ethics Committee (number 5.779.058.). Resultados e Conclusões: Of 363 individuals, 199 were normotensive, 36 had spurious systolic hypertension, and 128 had sustained hypertension. Sustained hypertensive individuals showed higher body mass index, greater prevalence of dyslipidemia, and higher peripheral and central blood pressure. Pulse wave velocity and augmentation index were increased, indicating greater arterial stiffness. In contrast, spurious systolic hypertension showed elevated systolic blood pressure without differences in arterial stiffness, with preserved central hemodynamics. Sustained hypertension is associated with increased arterial stiffness and elevated central blood pressure. Spurious systolic hypertension reflects a functional phenotype driven by peripheral amplification, without structural vascular damage, supporting phenotype-based evaluation.





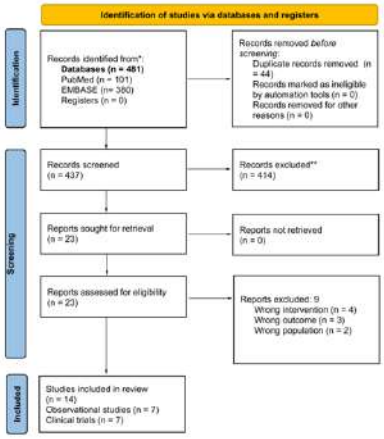
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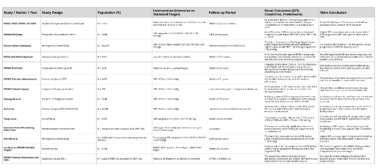
EFFECTS OF NEW INTENSIVE BLOOD PRESSURE TARGETS ON THE PROGRESSION OF CHRONIC KIDNEY DISEASE IN PATIENTS WITH PRE-EXISTING NEPHROPATHY: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Intensive blood pressure (BP) control reduces cardiovascular events, but its direct impact on pre-existing Chronic Kidney Disease (CKD) progression remains debated. Clinical observations of acute Glomerular Filtration Rate (GFR) declines following strict targets raise renal safety concerns, demanding an in-depth analysis of long-term risks and benefits. Objetivos: To evaluate the effect of intensive BP targets (systolic <120 mmHg) versus standard control on CKD progression risk, incidence of end-stage renal disease (ESRD), and GFR decline. Métodos: Following Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, a systematic review was conducted in PubMed and EMBASE (last 10 years). Inclusion criteria used the PICOT strategy, encompassing trials and observational studies comparing intensive versus standard BP targets on renal progression in adults with pre-existing CKD. Initially, 481 records were identified. Double-blind, independent screening was performed by two reviewers, with disagreements resolved by a third. After duplicate removal and screening, 23 full texts were reviewed. Nine were excluded, resulting in 14 studies. Methodological quality and risk of bias were assessed using appropriate tools. Resultados e Conclusões: Analysis of 14 studies shows that higher systolic BP (>120 mmHg) accelerates GFR decline and increases End-Stage Renal Disease (ESRD) risk. Intensive SBP targets (<120 mmHg), aligning with KDIGO 2021 guidelines, significantly reduce long-term progression to kidney failure across diverse cohorts. While intensive control frequently causes acute GFR declines (>15% to >30%), longitudinal biomarker analyses confirm this reflects a reversible hemodynamic response, not intrinsic tubular damage. Notably, this GFR drop occurs primarily during the active intervention, without sustained progressive risk post-trial. Benefits remain consistent regardless of baseline albuminuria, and intensive control attenuates the impact of baseline tubular dysfunction. In subgroups like IgA nephropathy, optimal targets lie between 110-119 mmHg due to a U-shaped risk curve. In conclusion, implementing strict SBP targets (<120 mmHg) in pre-existing CKD safely and effectively mitigates long-term ESRD risk. The initial GFR decline is an adaptive response. Continuous monitoring is essential to individualize treatment and prevent hypotension.





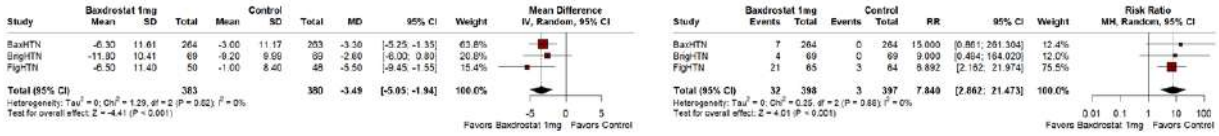
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EFFICACY AND SAFETY OF BAXDROSTAT IN RESISTANT AND UNCONTROLLED HYPERTENSION: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CLINICAL TRIALS

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Introdução/Fundamentos: Resistant hypertension poses a high cardiovascular risk, frequently driven by aldosterone dysregulation. Baxdrostat, a selective aldosterone synthase inhibitor, directly targets the pathophysiology of sodium-water retention and arterial stiffness. Objetivos: To evaluate the antihypertensive efficacy and safety profile of baxdrostat compared with placebo in patients with resistant or uncontrolled hypertension. Métodos: This systematic review and meta-analysis was conducted following PRISMA guidelines. PubMed, Embase, and Web of Science were searched for randomized controlled trials comparing baxdrostat (1–2 mg) versus placebo for at least 12 weeks in adults with resistant or uncontrolled hypertension. Pooled estimates were calculated using a random-effects model. Heterogeneity was assessed with the I-squared statistic. Effects were reported as mean difference (MD) for systolic (SBP) and diastolic blood pressure (DBP), and risk ratio (RR) for safety outcomes, both with 95% confidence intervals (CI). Resultados e Conclusões: Three randomized controlled trials were included, totaling 1,260 patients (863 baxdrostat; 397 placebo). The 1 mg dose reduced SBP by 8.33 mmHg (MD −8.33; 95% CI −10.67 to −5.99) and DBP by 3.49 mmHg (MD −3.49; 95% CI −5.05 to −1.94). The 2 mg dose yielded greater reductions in SBP (MD −9.89; 95% CI −12.21 to −7.56) and DBP (MD −4.11; 95% CI −5.57 to −2.65). Hyperkalemia incidence was higher with baxdrostat (RR 7.84 for 1 mg; RR 11.88 for 2 mg). Discontinuation due to adverse events was significantly increased only with the 2 mg dose (RR 2.31; 95% CI 1.19–4.48), with no significant difference for the 1 mg dose versus placebo. Baxdrostat produced consistent, dose-dependent blood pressure reductions in patients with resistant or uncontrolled hypertension. Although hyperkalemia risk was increased, particularly at higher doses, discontinuation rates were significantly elevated only with the 2 mg dose. These findings support baxdrostat as a potential therapeutic option for this difficult-to-treat population, pending further long-term safety dat



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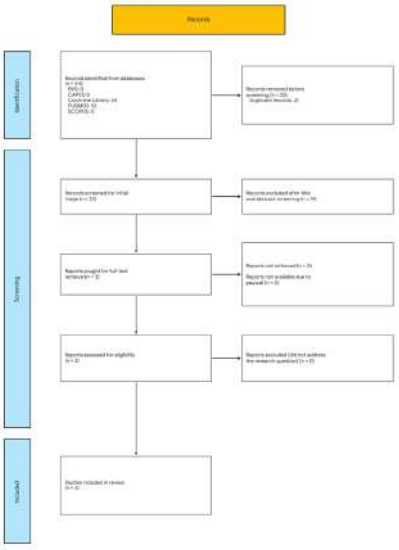
EFFICACY AND SAFETY OF SACUBITRIL/VALSARTAN COMPARED TO CONVENTIONAL THERAPY IN THE MANAGEMENT OF SYSTEMIC ARTERIAL HYPERTENSION: A SYSTEMATIC REVIEW.

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Introdução/Fundamentos: Hypertension is a chronic condition that compromises the integrity of the cardiovascular system. Despite being established, traditional therapy presents limitations and side effects, highlighting the need for other pharmacological managements Objetivos: To evaluate the efficacy and safety of Sacubitril/Valsartan on the control of essential or resistant hypertension when compared to conventional therapy Métodos: Systematic review according to PRISMA guidelines. Research conducted in PubMed, BVS (VHL), Cochrane Library, SciELO, and EMBASE databases, including studies published between 2021 and 2026. DeCS/MeSH descriptors related to Sacubitril/Valsartan and Systemic Arterial Hypertension were used, combined by the Boolean operator “AND”. Identified studies were independently evaluated by two reviewers on the Rayyan platform. Randomized controlled trials (RCT) were included, featuring adult patients with essential or resistant hypertension as the population, regardless of treatment duration, with previous use of ACE inhibitors or ARBs. Studies that did not answer the research question or those involving specific populations with associated comorbidities, such as diabetes or chronic kidney disease, were excluded. The risk of bias was assessed using the RoB 2.0 tool Resultados e Conclusões: 22 studies were found, but only 3 RCTs were included, with a total sample of approximately 1,784 patients. Regarding essential hypertension, the ZHANG study demonstrated a greater reduction in SBP with sacubitril/valsartan (200mg) vs. olmesartan (20mg) ($p < 0.001$), and RAKUGI evidenced superiority in SBP/DBP ($p < 0.001$) vs. olmesartan, with a dose-dependent effect (200-400mg). Regarding resistant hypertension, BITAR reported blood pressure control (<140/90mmHg) of 94.9% vs. 69.2% in the standard therapy group (ACEi/ARB) ($p = 0.03$) and SBP reduction of -26.71 vs. -12.34 mmHg, with an advantage in pulse pressure in the intervention group ($p = 0.008$). Reported adverse events were: dizziness (21.3% vs. 16.4%), hypotension (17.9% vs. 10.3%; $p = 0.517$), and hyperkalemia (2.6% vs. 7.7%). The included studies suggest that Sacubitril/Valsartan presents benefits in the control of essential hypertension compared to conventional therapies. Furthermore, it indicates a reduction in systolic pressure and a similar safety profile, highlighting the potential of Sacubitril/Valsartan as an alternative to traditional pharmacological therapy





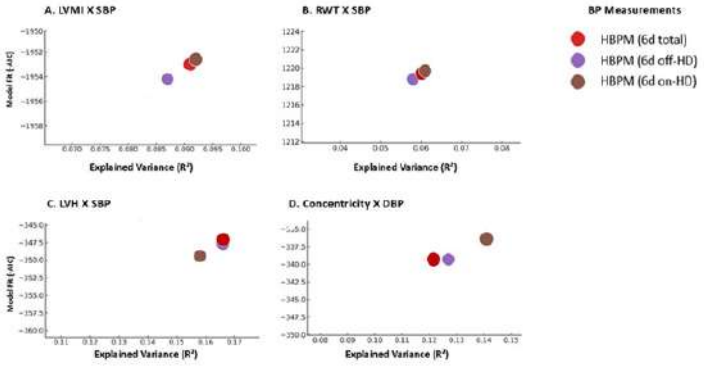
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HOME BLOOD PRESSURE MONITORING PROTOCOLS AND LEFT VENTRICULAR REMODELING IN HEMODIALYSIS: A MULTICENTER STUDY

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Introdução/Fundamentos: In hemodialysis (HD), blood pressure (BP) measured outside the dialysis unit predicts cardiovascular outcomes better than peridialytic BP. Home BP monitoring (HBPM) is a practical alternative to ambulatory BP monitoring, but the protocol that best reflects cardiac target-organ damage remains uncertain. Objetivos: To compare three HBPM protocols and their associations with echocardiographic markers of left ventricular (LV) remodeling in HD patients. Métodos: This cross-sectional study included 265 adults on thrice-weekly HD for ≥3 months at three Brazilian centers between August 2023 and January 2025. HBPM was performed with validated oscillometric devices (Omron HEM-7320), with three morning and three evening readings obtained after 3 minutes of rest for 6 days. HBPM was analyzed as three protocols: 6-day total (all days), 6-day off-dialysis (non-dialysis days), and 6-day on-dialysis (dialysis days). Echocardiograms performed within 12 months of HBPM were used to assess LV mass index (LVMI), relative wall thickness (RWT), LV hypertrophy (LVH), and LV concentricity. Associations between BP and LV remodeling were evaluated using multivariable linear and logistic regression. The study was approved by the Ethics Committee. Resultados e Conclusões: Mean age was 57±16 years, 69% were male, and median dialysis vintage was 922 [336-2110] days. Mean HBPM was 132±22/79±12mmHg for 6-day total, 132±23/78±13mmHg for off-HD, and 132±23/80±12mmHg for on-HD. LVH and LV concentricity were present in 47.8% and 37.8%, respectively. Patients with LVH had higher 6-day total HBPM than those without LVH (138±23/82±13 vs 126±20/76±11mmHg; both p<0.001), and similar differences were observed for LV concentricity (138±23/82±12 vs 128±21/77±12mmHg; p<0.001 and p=0.001). In multivariable linear models, systolic HBPM 6-day on-HD showed the strongest association with LVMI (β=0.234, p<0.001, R^2=0.092) and RWT (β=0.179, p=0.007, R^2=0.061). In logistic models, systolic HBPM 6-day total was most strongly associated with LVH (OR 1.026, 95% CI 1.012-1.039; p<0.001, pseudo-R^2=0.166), whereas diastolic HBPM 6-day on-HD was most strongly associated with LV concentricity (OR 1.045, 95% CI 1.018-1.074; p=0.001, pseudo-R^2=0.141). In conclusion, HBPM protocols that include dialysis-day readings showed the strongest associations with echocardiographic markers of LV remodeling, supporting their inclusion in BP assessment in HD patients.



15698

ISOMETRIC HANDGRIP TRAINING AND OFFICE/RESTING SYSTOLIC BLOOD PRESSURE IN ADULTS WITH ELEVATED BLOOD PRESSURE OR HYPERTENSION: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED TRIALS

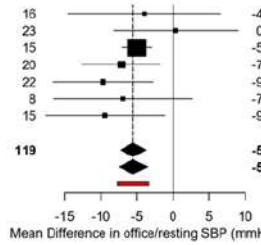
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Introdução/Fundamentos: Hypertension remains one of the leading modifiable cardiovascular risk factors worldwide. According to the 2025 Brazilian Guidelines of Hypertension, non-pharmacological interventions are a cornerstone of both prevention and management of hypertension. Isometric handgrip training has emerged as a simple, low-cost, and feasible non-pharmacological strategy, although randomized evidence remains scattered. Objetivos: To quantify the effect of isometric handgrip training on office/resting systolic blood pressure in adults with elevated blood pressure or hypertension. Métodos: This systematic review and meta-analysis was conducted according to PRISMA guidelines. Randomized controlled trials were identified through systematic searches of PubMed, Scopus, and LILACS up to March 2026. Studies including adults with elevated blood pressure or hypertension undergoing isometric handgrip training versus control or usual care were eligible. Risk of bias was assessed using the Cochrane RoB 2 tool, evaluating bias arising from the randomization process, deviations from intended interventions, missing outcome data, measurement of the outcome, and selection of the reported result. The primary outcome was post-intervention office/resting systolic blood pressure. Pooled estimates were calculated as mean difference (MD) using a random-effects model (REML) with Hartung–Knapp adjustment. Heterogeneity was assessed using the I^2 statistic. All statistical analyses were performed using R version 4.5.3. Resultados e Conclusões: Results: Seven randomized controlled trials were included, totaling 249 participants. Risk of bias assessment showed that one trial was judged as low risk, five raised some concerns, and one was classified as high risk of bias. Isometric handgrip training was associated with a significant reduction in office/resting systolic blood pressure compared with control (MD −5.53 mmHg; 95% CI −7.48 to −3.58; p < 0.001), with no statistical heterogeneity (I^2 = 0%; τ^2 = 0; p = 0.571). Results were highly consistent across studies, and the prediction interval remained entirely below zero, supporting the robustness of the pooled effect. Conclusion: Isometric handgrip training was associated with a clinically meaningful reduction in office/resting systolic blood pressure in adults with elevated blood pressure or hypertension, supporting its role as a simple, accessible, and potentially useful adjunctive strategy in the non-pharmacological management of hypertension.

Forest plot - isometric handgrip training and systolic blood pressure

Study	IHG	Control	MD	95% CI	Weight (common)	Weight (random)
Fecchio 2023	15	16	-4.00	[-14.57; 6.57]	2.7%	2.7%
Pinto 2025	27	23	0.40	[-8.20; 9.00]	4.1%	4.1%
Palmeira 2021	16	15	-5.00	[-7.11; -2.89]	68.7%	68.7%
Punia 2020	20	20	-7.16	[-12.56; -1.76]	10.5%	10.5%
Cohen 2023	28	22	-9.70	[-16.71; -2.69]	6.2%	6.2%
Taylor 2003	9	8	-7.00	[-16.63; 2.63]	3.3%	3.3%
Champaiboon 2026	15	15	-9.40	[-17.66; -1.14]	4.5%	4.5%
Common-effect model	**130**	**119**	**-5.53**	**[-7.28; -3.78]**	**100.0%**	.
Random-effects model (REML + Hartung-Knapp)			**-5.53**	**[-7.48; -3.58]**	.	**100.0%**
Prediction interval				**[-7.71; -3.35]**		



Heterogeneity: Q = 4.79, df = 6, p = 0.571; I^2 = 0%; τ^2 = 0

Test for overall effect: p = 0.000444

17892

PREVALENCE OF PRIMARY ALDOSTERONISM IN SYSTEMATICALLY SCREENED HYPERTENSIVE PATIENTS AT FIRST CLINICAL EVALUATION

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Introdução/Fundamentos: Primary aldosteronism is increasingly recognized as a frequent and underdiagnosed cause of hypertension, characterized by autonomous aldosterone secretion and increased cardiovascular risk beyond blood pressure levels. Contemporary data suggest a prevalence of 5–10% in general hypertensive populations and higher rates in selected groups. However, the impact of systematic screening at first clinical evaluation remains insufficiently explored. Objetivos: To determine the prevalence and clinical characteristics of primary aldosteronism in hypertensive patients undergoing systematic screening at their first outpatient evaluation. Métodos: This retrospective cross-sectional study included 745 consecutive patients evaluated at their first hypertension consultation between October 2024 and January 2026. All patients underwent screening with the aldosterone-to-renin ratio (ARR). A positive screening test was defined as ARR ≥30, in the presence of plasma aldosterone concentration ≥15 ng/dL and suppressed renin levels. Confirmatory testing was performed using a saline infusion test. Adrenal computed tomography was obtained in all confirmed cases. The study was approved by the Human Research Ethics Committee (number: 81761324.7.0000.0104). Resultados e Conclusões: Among 745 patients, 56 (7.5%) had a positive ARR. Primary aldosteronism was confirmed in 24 patients, corresponding to a prevalence of 3.2% in the overall cohort and 42.9% among those with positive screening. Among confirmed cases, mean age was 45 years, and most patients were male (66.7%). Resistant hypertension was present in 33.3% of cases. Hypokalemia was observed in 30% of patients, with a mean serum potassium level of 3.3 mmol/L among affected individuals. Adrenal imaging identified unilateral adenoma in 6 patients (25%) and bilateral disease in 18 (75%). The observed prevalence was lower than that reported in contemporary literature, which describes primary aldosteronism in approximately 5–10% of hypertensive populations and higher rates in selected cohorts. This difference may be explained by the inclusion of an unselected population at first clinical evaluation, the absence of enrichment for high-risk phenotypes, and the use of strict diagnostic criteria, which likely reduced false-positive results. Primary aldosteronism prevalence was lower than expected. However, high confirmation rates and heterogeneous presentation, without universal hypokalemia and with predominance of bilateral disease, support systematic screening and careful phenotyping.

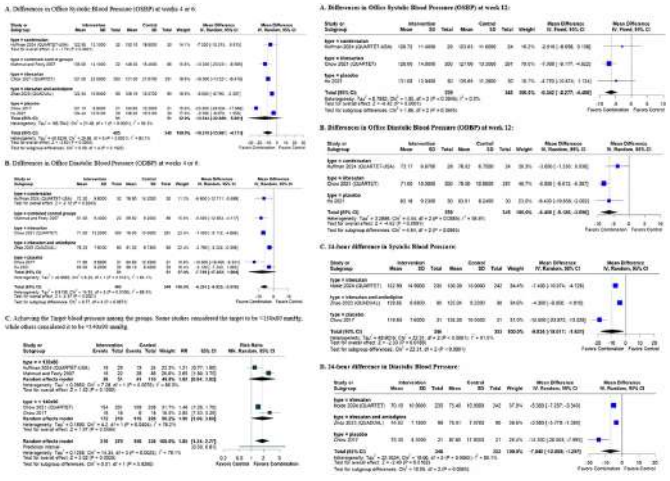
15819

SINGLE-PILL QUADRUPLE COMBINATION OF ANTIHYPERTENSIVE AGENTS VERSUS STANDARD THERAPY OR PLACEBO FOR BLOOD PRESSURE REDUCTION AND TARGET ACHIEVEMENT: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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Introdução/Fundamentos: Arterial hypertension (AH) is a chronic, non-communicable disease characterized by persistent elevation of systolic blood pressure (SBP) and/or diastolic blood pressure (DBP). The combination of four low-dose antihypertensive drugs, in a single pill, may represent an innovative and potentially more effective therapeutic strategy in controlling blood pressure. Objetivos: To evaluate, through meta-analysis (MA), the efficacy of quadruple therapy in a single pill compared to standard therapy or placebo in adults with AH. Métodos: This MA followed the PRISMA 2020 guidelines and was registered in PROSPERO. The Cochrane Library, Embase, PubMed, Scopus, and Web of Science databases were searched to identify randomized controlled trials (RCTs) comparing quadruple single-pill therapy versus placebo or usual medication. Outcomes included reduction in office SBP and DBP, 24-hour ambulatory blood pressure, and achievement of target blood pressure. Analyses were performed using the R software (v4.4.1), using fixed or random effects models according to heterogeneity. The results were expressed as mean difference (MD) or relative risk (RR), with 95% confidence intervals (95% CI). Heterogeneity was assessed using Cochran's Q test and I², and risk of bias was assessed using the RoB 2.0 tool. Resultados e Conclusões: Six RCTs were included (932 patients). Quadruple therapy significantly reduced office SBP and DBP at weeks 4-6 (SBP: MD -10.37, 95% CI -15.98 to -4.77; DBP: MD -6.25, 95% CI -8.93 to -3.57; p<0.001; figure 1), with maintenance of effect until week 12 (SBP: MD -6.34, 95% CI -8.27 to -4.40; DBP: MD -6.41, 95% CI -9.12 to -3.69; p<0.001; figure 2). In 24-hour assessment, the intervention was superior to the control, with a sustained reduction. There was a significantly higher probability of achieving the target blood pressure in the intervention group (RR 1.85; 95% CI 1.24-2.77; p<0.05; figure 1). Heterogeneity ranged from low to high, and one of the studies was classified as having a high risk of bias. This MA showed that low-dose quadruple therapy demonstrated superiority in lowering blood pressure over standard therapy, promoting early and sustained blood pressure control. It also increased the likelihood of reaching target blood pressure, with the potential to reduce therapeutic complexity and clinical inertia. This may be a promising strategy for optimizing hypertension control. Further studies with long-term outcomes should be conducted to confirm these results.



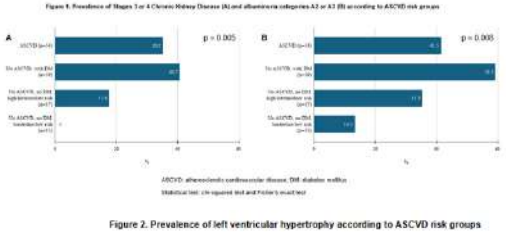
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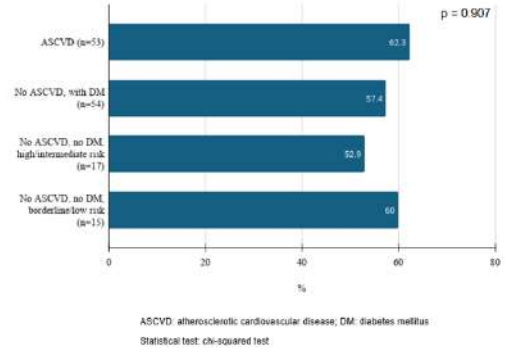
TARGET ORGAN DAMAGE ACCORDING TO ASCVD RISK CATEGORIES IN A BRAZILIAN COHORT OF INDIVIDUALS WITH REFRACTORY HYPERTENSION

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Introdução/Fundamentos: Guidelines recommend atherosclerotic cardiovascular disease (ASCVD) risk stratification based on the identification of high-risk groups (e.g., individuals with ASCVD or diabetes mellitus [DM]) and risk estimation by scores. Hypertension (HT) associated left ventricular hypertrophy (LVH), chronic kidney disease (CKD), and albuminuria are independently related to ASCVD events, and refractory HT (RefHT) is a high-risk phenotype. It is not known how the presence of target organ damage aligns with traditional ASCVD risk stratification in patients with RefHT. Objetivos: To determine the prevalence of target organ damage (CKD, albuminuria, and LVH) according to ASCVD risk categories in patients with RefHT. Métodos: This was a single-center, cross-sectional study conducted in a tertiary hypertension outpatient clinic from the public Unified Health System in Brazil. We included patients who attended the service from 2021 to 2025 and met criteria for RefHT, meaning office BP ≥ 140/90 mmHg and 24-hour ambulatory BP ≥ 130/80 mmHg despite the use of at least five classes of antihypertensive medications, with no evidence of poor treatment adherence. Patients with secondary hypertension or Stage 5 CKD were excluded. Participants were categorized into risk groups according to the presence or absence of ASCVD and DM, and, for those with neither ASCVD nor DM, the 10-year ASCVD risk was estimated by the PREVENT score. CKD and albuminuria were defined according to KDIGO guideline criteria. LVH was defined as a left ventricular mass index >115 g/m² in men and >95 g/m² in women. Resultados e Conclusões: We analyzed 180 patients (76% female, 62.6 ± 11.4 years, mean office systolic BP 167 ± 23 mmHg, mean 24h systolic BP 149 ± 16 mmHg). Prevalence rates of Stages 3a, 3b, and 4 CKD were 28 (15.6%), 18 (10.0%), and 6 (3.3%), respectively. Frequencies of albuminuria categories A2 and A3 were 54 (30.9%) and 22 (12.6%), respectively. Prevalences of CKD and albuminuria increased across higher ASCVD risk categories, with the highest frequencies observed in patients with DM (Figure 1). In contrast, LVH prevalence did not differ significantly across ASCVD risk strata (Figure 2). In this sample of patients with RefHT, we found a graded association between traditional ASCVD risk categories and kidney disease, but not LVH. The prevalence of LVH was high even in the lowest-risk groups determined by the PREVENT score. These results highlight the limitations of risk scores in specific populations, such as those with RefHT.





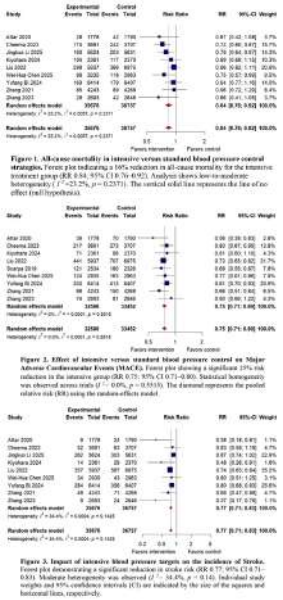
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THE CLINICAL IMPACT OF INTENSIVE VERSUS STANDARD BLOOD PRESSURE TARGETS IN ELDERLY HYPERTENSIVE PATIENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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Introdução/Fundamentos: The optimal systolic blood pressure (SBP) target for elderly patients remains a subject of intense discussion, balancing cardiovascular protection against potential adverse events. While guidelines move toward tighter control, evidence regarding all-cause mortality and clinical consistency in the elderly requires updated synthesis. This study aimed to investigate the clinical impact of intensive (SBP <120 – 130 mmHg) versus standard (SBP <140 – 150 mmHg) strategies in this specific population. Objetivos: This study aimed to evaluate the clinical impact of intensive blood pressure targets (SBP <120 – 130 mmHg) compared to standard control (SBP <140 – 150 mmHg) in elderly hypertensive patients. The primary goal was to determine the effect of these strategies on all-cause mortality, major adverse cardiovascular events (MACE), and the incidence of stroke. Métodos: We performed a systematic review and meta-analysis of randomized controlled trials (RCTs) identified via PubMed, Embase, and Cochrane databases up to May 2026. From an initial pool of 136 articles, 61 remained after de-duplication. Following rigorous screening and quality assessment, 10 studies met the inclusion criteria. Primary outcomes were all-cause mortality, major adverse cardiovascular events (MACE), and stroke. Random-effects models (DerSimonian-Laird) were used, and sensitivity analyses were performed to address population overlap and outliers. Resultados e Conclusões: Results: A total of 10 RCTs comprising 72,433 patients were included. Intensive BP control was associated with a significant 16% reduction in all-cause mortality (RR 0.84; 95% CI 0.76–0.92; I 2 = 23.2%). For MACE, the intensive strategy showed a 25% risk reduction (RR 0.75; 95% CI 0.71–0.80) with exceptional consistency across trials (I2 = 0.0%). Stroke risk was also significantly reduced by 23% (RR 0.77; 95% CI 0.71– 0.83; I2 = 34.4%). Sensitivity analyses excluding small-scale outliers and redundant cohorts (overlapping populations) confirmed the robustness of these findings. Conclusion: The clinical impact of intensive blood pressure targets (SBP <130 mmHg) is superior to standard care in elderly hypertensive patients, providing significant protection not only against MACE and stroke but, crucially, reducing all-cause mortality. The high consistency of these results supports the implementation of more stringent BP targets in the elderly, provided that individual frailty and safety profiles are considered, aligning with the most recent international cardiology guidelines.



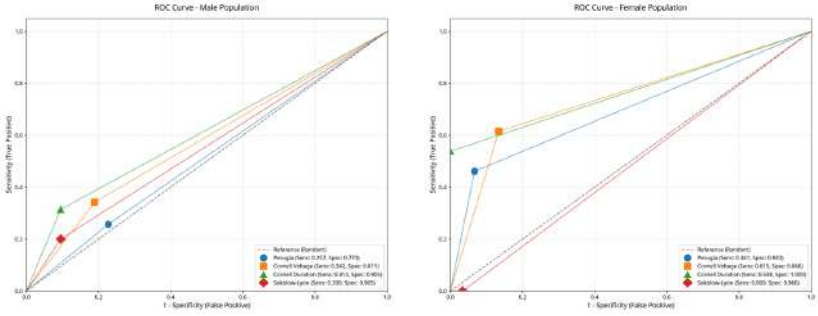
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USE OF ELECTROCARDIOGRAPHY FOR LEFT VENTRICULAR HYPERTROPHY DIAGNOSIS: A COMPARATIVE ANALYSIS OF ECG CRITERIA

GUSTAVO GUSTAVO FUKUOKA1; BRUNA GUSTAVO OVIEDO DE OLIVEIRA1; GUSTAVO JOSÉ MODESTO2; MIGUEL ANTÔNIO MORETTI1; ADRIANO GUSTAVO MENEGHINI1; ANTÔNIO CARLOS PALANDRI CHAGAS1;

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Introdução/Fundamentos: Left Ventricular Hypertrophy (LVH) is the most prevalent manifestation of target-organ damage in Systemic Arterial Hypertension (SAH) and a strong predictor of adverse outcomes, including heart failure, arrhythmias, and thromboembolic events. With nearly 38 million hypertensive individuals in Brazil, early and accurate detection of LVH is a major clinical priority. Although echocardiography is the gold standard for LVH diagnosis, its high cost and limited availability significantly restrict its use, particularly in resource-limited settings. Consequently, electrocardiography (ECG) remains the most accessible tool for large-scale screening. However, the diagnostic performance of ECG is highly variable, with most criteria demonstrating low sensitivity and no clear consensus on the optimal method. This limitation directly impacts clinical decision-making and risk stratification. In this context, identifying the most accurate ECG criterion is essential to improve early detection and optimize patient care Objetivos: To identify the most accurate electrocardiographic criterion for detecting LVH, using echocardiography as the reference standard. Métodos: Cross-sectional study based on retrospective analysis of medical records from a tertiary cardiology outpatient clinic. LVH was assessed using ECG criteria (Perugia, Cornell Voltage, Cornell Duration, and Sokolow-Lyon), selected for their widespread use and diagnostic performance. Echocardiography was used as the reference standard. ECG criteria were compared to assess diagnostic performance across subgroups by age, sex, and ethnicity (White, Black or Mixed [Pardo], Indigenous, and Asian).Inclusion criteria: patients aged 18–60 years. Exclusion criteria: valvular disease, chronic arterial disease, arrhythmias, and bundle branch blocks. Resultados e Conclusões: The sample was predominantly male (N=88) and White (N=48). Among men with LVH (N=35), Black, Mixed, or Indigenous individuals predominated (N=18), while women (N=73) were mainly White (N=38). Cornell Duration demonstrated the highest diagnostic accuracy, especially in women, whereas Sokolow-Lyon showed no sensitivity in females. Significant differences were observed in LVH prevalence between sexes (p=0.0042) and in Cornell Duration performance (p=0.0003), higher in women. Cornell Duration was the most accurate ECG criterion for LVH in both sexes, supporting its use as a reliable and accessible screening tool in resource-limited settings.



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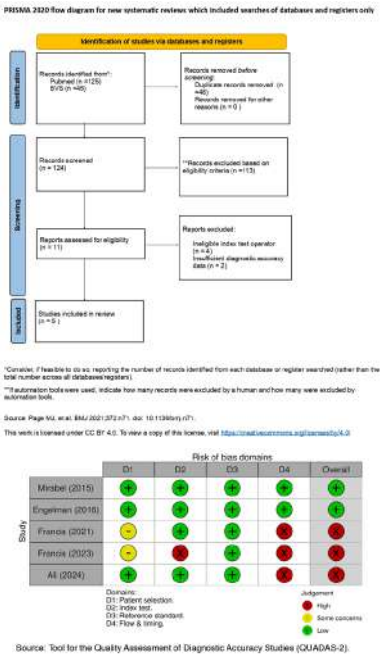
20193

DIAGNOSTIC ACCURACY OF HANDHELD POINT-OF-CARE ULTRASOUND (POCUS) BY NON-EXPERTS FOR DETECTION OF RHEUMATIC CARDITIS IN ENDEMIC REGIONS: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: The 2015 revision of the AHA Jones criteria marked a paradigm shift by incorporating echocardiography-detected subclinical carditis as a new major diagnostic criterion for acute rheumatic fever (ARF). This update made echocardiographic assessment indispensable, however, standard transthoracic echocardiography (TTE) remains largely unfeasible in high-prevalence, resource-limited regions due to high costs and specialist scarcity. Meanwhile, handheld point-of-care ultrasound (POCUS) emerges as a transformative low-cost option, but its accuracy when operated by non-experts requires systematic validation. Objetivos: To systematically evaluate the diagnostic accuracy of cardiac POCUS performed by non-specialist clinicians for detecting clinical and subclinical rheumatic carditis (mitral/aortic regurgitation) in patients with suspected ARF or asymptomatic individuals in endemic regions, using standard TTE as the reference standard. Métodos: Following PRISMA guidelines, a systematic search was conducted across PubMed, SciELO, MEDLINE, and LILACS for studies published between January 2015 and December 2025, and blindly screened by two independent reviewers. Eligible studies met strict PICO criteria: populations in endemic areas undergoing ARF diagnosis or rheumatic heart disease (RHD) screening, assessed via handheld POCUS by non-experts (focusing strictly on Doppler-detected valvular regurgitation), compared to standard TTE performed by certified experts using WHF 2012/2023 or Jones 2015 criteria. Methodological quality and risk of bias were assessed using QUADAS-2. Resultados e Conclusões: Out of 170 records, 5 studies (n=9,200) were included. QUADAS-2 indicated high bias risk in 3 studies due to partial verification, but universally high applicability. For RHD screening (n=9,123), sensitivity ranged from 70.4% to 86.5% and specificity from 61.4% to 92.0%, with offsite expert review significantly improving specificity. In acute settings (n=77), POCUS achieved 88.0% sensitivity and specificity for subclinical carditis. Diagnostic heterogeneity was strongly linked to operator training intensity. In conclusion, while not replacing standard TTE, POCUS by non-specialists yields acceptable accuracy for initial screening. These findings suggest that task-shifting (delegating echocardiography to non-experts) is a viable strategy for endemic regions. However, its safe implementation requires rigorous standardized training (≥100 supervised exams) and remote expert review to mitigate false positives.



Source: Tool for the Quality Assessment of Diagnostic Accuracy Studies (QUADAS-2).

21851

DISTRIBUTION OF GLOBAL LONGITUDINAL STRAIN AND ITS RELATIONSHIP WITH CARDIOVASCULAR RISK FACTORS IN PATIENTS UNDERGOING STRESS ECHOCARDIOGRAPHY

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Introdução/Fundamentos: Global longitudinal strain (GLS) is a sensitive marker of subclinical systolic dysfunction, allowing for the identification of early changes in myocardial mechanics before a reduction in left ventricular ejection fraction. Changes in GLS have been associated with the presence of cardiovascular risk factors and may contribute to the early detection of subclinical myocardial dysfunction. Objetivos: To describe the global longitudinal strain profile in patients undergoing stress echocardiography and to explore its relationship with cardiovascular risk factors. Métodos: This observational, retrospective, and exploratory study was conducted at a tertiary care hospital in Paraná, Brazil. Clinical and echocardiographic data from patients undergoing stress echocardiography were analyzed, including GLS values at rest and during stress. GLS abnormalities were evaluated according to the presence of hypertension, dyslipidemia, type 2 diabetes mellitus, obesity, and smoking, as well as their relationship with myocardial contractile reserve assessed by ΔGLS. Resultados e Conclusões: A total of 69 patients were included, with a mean age of 70.26 ± 14.16 years, and 78.26% were female. Hypertension was present in 72.46% of the sample, dyslipidemia in 63.77%, and type 2 diabetes mellitus in 30.43%. Alterations in resting GLS were observed in 33.33% of patients, with 21.74% in the gray zone and 11.59% in the pathological zone. Among patients with one cardiovascular risk factor, 38.46% presented abnormal resting GLS. Reduced myocardial contractile reserve assessed by ΔGLS was observed in 57.14% of patients with two cardiovascular risk factors and in 46.15% of those with three or more risk factors. No significant association was found between overall cardiovascular risk burden and ΔGLS (p=0.223). However, in multivariate analysis, hypertension was the only factor independently associated with impaired myocardial contractile reserve assessed by ΔGLS (β=−2.12; p=0.030). A significant prevalence of GLS abnormalities was observed in patients undergoing stress echocardiography, including abnormalities at rest and reduced myocardial contractile reserve. Although the overall burden of risk factors was not significantly associated with ΔGLS, hypertension was independently associated with poorer myocardial contractile reserve. These findings reinforce the potential of GLS for the early identification of subclinical myocardial changes.

19883

ECHOCARDIOGRAPHY IN ADVANCED HFREF ON DOBUTAMINE: VENTRICULAR REMODELING IN CHAGAS CARDIOMYOPATHY AND PARAMETERS ASSOCIATED WITH IN-HOSPITAL MORTALITY

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Introdução/Fundamentos: Advanced heart failure with reduced ejection fraction (HFrEF) is associated with high in-hospital mortality. Patients receiving dobutamine represent a high-risk group, often related to Chagasic cardiomyopathy, still prevalent in Brazil's Central-West region. In this setting, the discriminatory value of left ventricular ejection fraction (LVEF) may be limited due to the near-universal presence of severe systolic dysfunction, highlighting the importance of additional parameters such as right ventricular function and functional valvular regurgitation. Objetivos: To describe the echocardiographic profile of patients with HFrEF receiving dobutamine; compare parameters according to etiology; and identify variables associated with in-hospital mortality. Métodos: This was a retrospective, single-center observational study including 67 patients. The following variables were analyzed: LVEF, left ventricular diameters, left atrial volume, tricuspid annular plane systolic excursion (TAPSE), pulmonary artery systolic pressure (PASP), and severity of mitral and tricuspid regurgitation. Comparisons were performed using the Mann–Whitney U test and Fisher's exact test, and correlations using Spearman's coefficient, with a significance level of 5%. Resultados e Conclusões: Median LVEF was 26%, with 62.7% of patients <30%. Among 67 patients, 61.2% had Chagasic etiology. These patients showed greater ventricular remodeling: larger LV end-diastolic diameter (68 vs. 60 mm; p=0.001), lower LVEF (25% vs. 32%; p=0.023), and higher frequency of severe dilation (61% vs. 19%; p=0.028) (Figure 1). LVEF did not differ between death and discharge (24.5% vs. 27.0%; p=0.268). Right ventricular dysfunction (TAPSE <17 mm) was more frequent in deaths (80% vs. 48%; p=0.035). Higher grades of mitral (p=0.013) and tricuspid (p=0.017) regurgitation were associated with in-hospital mortality (Figure 2). In advanced HFrEF receiving dobutamine, LVEF has limited prognostic value, whereas right ventricular dysfunction and functional regurgitation are more strongly associated with in-hospital mortality. Chagasic etiology correlates with more pronounced ventricular remodeling, reinforcing the importance of etiological stratification.

17511

IMPACT OF PRIMARY ALDOSTERONISM ON CARDIAC REMODELING: A SYSTEMATIC REVIEW AND META-ANALYSIS OF STRUCTURAL AND FUNCTIONAL DATA

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(1) UNIVERSIDADE DE PASSO FUNDO - UPF - PASSO FUNDO - RS - BRASIL; (2) ATITUS EDUCACAO - PASSO FUNDO - RS - BRASIL; (3) UNIVERSIDADE DE PASSO FUNDO - PASSO FUNDO - RS - BRASIL; (4) UNIVERSIDADE FEDERAL DA FRONTEIRA SUL - PASSO FUNDO - RS - BRASIL;

Introdução/Fundamentos: Primary aldosteronism (PA) confers a greater cardiovascular risk than essential hypertension (EH) due to the direct cardiotoxicity of aldosterone, which induces adverse myocardial remodeling in addition to pressure overload. This study systematizes echocardiographic evidence to quantify the magnitude of this structural and functional damage to the heart. Objetivos: To quantify the impact of PA on cardiac remodeling, evaluating differences in structural and functional echocardiographic parameters compared to patients with HE. Métodos: A systematic review and meta-analysis was conducted according to PRISMA guidelines. The PubMed, EMBASE, Scopus, and Web of Science databases were searched from their creation until 2025. Observational studies (cross-sectional, case-control, cohort) comparing echocardiographic parameters between adult patients with PA and controls with EH were included. The primary outcome was Left Ventricular Mass Index (LVMI). Secondary outcomes included the incidence of left ventricular hypertrophy (LVH) and GLS. Mean differences (MD) and odds ratios (OR) were calculated using random-effects models, and heterogeneity was assessed using Higgins' I^2. Resultados e Conclusões: After screening 2752 articles, 19 studies were selected for final analysis. It was found that patients with PA had significantly higher LVMI compared to controls with EH (MD: 15.58 g/m²; 95% CI: 12.36-18.80; p<0.001), however, there was heterogeneity (I^2=76%) reflecting methodological, population, and clinical variations in PA. In this context, the direction of the effect was consistent across studies; Subgroup analyses using indexing methods explored these sources of variability, supporting the robustness of the findings. Furthermore, the incidence of left ventricular hypertrophy was approximately 150% higher in the PA group (OR: 2.47; 95% CI: 1.93-3.18; p<0.001). GLS analysis demonstrated subclinical systolic dysfunction in the PA group, with significantly reduced absolute GLS values (MD: 2.98%; 95% CI: 2.65-3.32; p<0.001), indicating compromised longitudinal myocardial deformation. It is concluded that PA induces a more severe phenotype of structural and functional myocardial injury than HE. The increase in ventricular mass with worsening subclinical systolic function (GLS) supports the direct cardiotoxicity of aldosterone. These findings reinforce its myocardial impact and highlight the importance of early diagnosis and management to reduce cardiovascular risk.

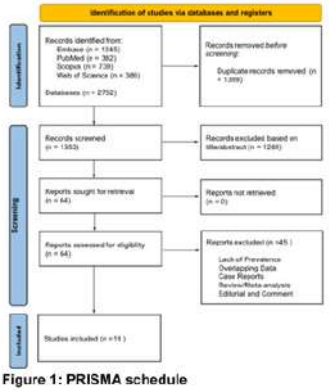


Figure 1: PRISMA schedule

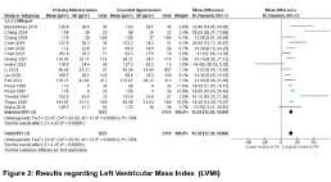


Figure 2: Results regarding Left Ventricular Mass Index (LVMI)

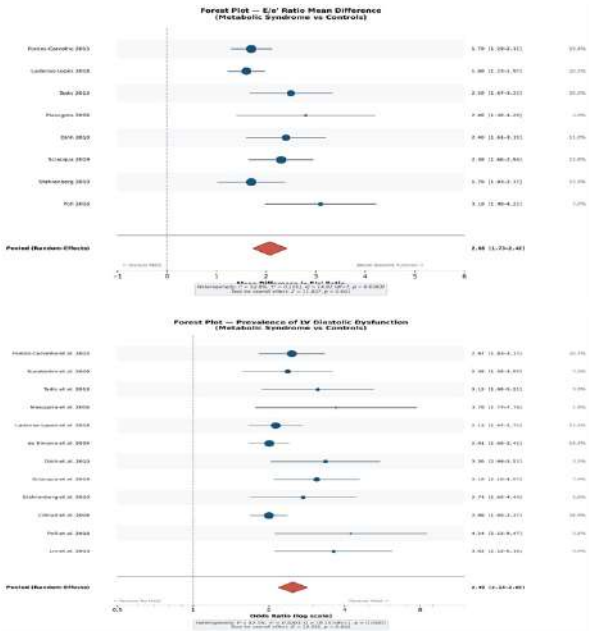
18603

LEFT VENTRICULAR DIASTOLIC DYSFUNCTION IN METABOLIC SYNDROME: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Metabolic syndrome (MetS) is an increasingly prevalent cardiovascular risk condition associated with adverse cardiac remodeling. Left ventricular diastolic dysfunction (LVDD) represents a common subclinical manifestation and an independent predictor of heart failure with preserved ejection fraction (HFpEF). However, the magnitude of this association has not yet been fully established in the literature. Objetivos: To systematically evaluate the association between MetS and LVDD through a systematic review and meta-analysis, estimating the prevalence of LVDD and the difference in E/e' ratio between individuals with and without MetS. Métodos: A systematic review was conducted in accordance with PRISMA 2020 guidelines and submitted to PROSPERO (under review). PubMed/MEDLINE, Cochrane Library, Embase, and LILACS databases were searched (January 2000 to December 2025). Observational studies comparing echocardiographic diastolic parameters between adults with MetS (defined by NCEP-ATP III, IDF, or harmonized criteria) and controls were included. Outcomes were LVDD prevalence (odds ratio, OR) and E/e' ratio (mean difference, MD). A random-effects model using the DerSimonian-Laird method was applied. Heterogeneity was assessed using I^2 and Cochran's Q test, and publication bias was evaluated by funnel plot and Egger's test. Resultados e Conclusões: A total of 12 studies (n = 12,629) were included in the prevalence analysis and 8 studies in the E/e' analysis. MetS was associated with a higher prevalence of LVDD (OR = 2.49; 95% CI 2.18–2.85; p < 0.001; I^2 = 42.5%). The E/e' ratio was significantly higher in individuals with MetS (MD = 2.08; 95% CI 1.73–2.42; p < 0.001; I^2 = 52.8%). Sensitivity analyses (leave-one-out) confirmed the robustness of the findings, with no significant influence of individual studies on pooled estimates. Metabolic syndrome is associated with a significantly increased prevalence of left ventricular diastolic dysfunction and higher E/e' ratio. These findings highlight the relevance of diastolic impairment as an early manifestation of cardiovascular damage in MetS and suggest a potential role for echocardiographic assessment in risk stratification of these patients.



15646

LEFT VENTRICULAR REMODELING IN PATIENTS WITH ACROMEGALY RECEIVING LONG-TERM CABERGOLINE THERAPY: A 10-YEAR LONGITUDINAL ECHOCARDIOGRAPHIC STUDY

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Introdução/Fundamentos: Acromegaly is associated with structural and functional cardiac alterations, including ventricular remodeling, increased cardiac dimensions, and diastolic dysfunction, which together comprise the spectrum of acromegalic cardiomyopathy. Although cabergoline is widely used as an adjuvant therapy in the treatment of acromegaly, its long-term effects on cardiac function remain poorly characterized in longitudinal echocardiographic studies. Objetivos: To evaluate changes in cardiac dimensions and left ventricular systolic and diastolic function in patients with acromegaly undergoing long-term cabergoline therapy. Métodos: A historical prospective cohort study conducted at a university referral center. Twenty-one patients with acromegaly receiving cabergoline therapy were included and underwent two serial echocardiographic evaluations performed in 2013 and 2025, corresponding to approximately 10 years of follow-up. Structural and functional cardiac parameters were analyzed, including left ventricular end-diastolic diameter (LVEDD), left ventricular end-diastolic volume (LVEDV), left atrial (LA) volume, left ventricular ejection fraction (LVEF), and the presence of diastolic dysfunction. Resultados e Conclusões: No significant differences were observed in left atrial volume (30 ± 8 mL vs. 34 ± 7 mL; p = 0.068) or left ventricular end-diastolic diameter (49.2 ± 5.4 mm vs. 47.6 ± 5.6 mm; p = 0.085). A significant reduction in left ventricular end-diastolic volume was observed over the follow-up period (114 ± 32 mL vs. 86 ± 29 mL; p < 0.001), accompanied by an increase in left ventricular ejection fraction (64.7 ± 4.7% vs. 68.5 ± 6.4%; p = 0.026). The prevalence of diastolic dysfunction increased numerically from 25% to 55% of patients, although this change was not statistically significant (p = 0.221). In patients with acromegaly receiving long-term cabergoline therapy, a significant reduction in left ventricular end-diastolic volume along with an increase in ejection fraction was observed, suggesting favorable ventricular remodeling over follow-up. Global cardiac dimensions remained stable, and diastolic dysfunction showed a numerical increase without statistical significance. These findings indicate that prolonged cabergoline therapy is not associated with deterioration of cardiac function, with preservation of left ventricular systolic performance during long-term follow-up.

TABLE 1. Echocardiographic variables evolution between evaluations of 21 patients receiving cabergoline therapy

	First Evaluation 2013	Second Evaluation 2025	P value
LVEDD (mm)	49,2 ± 5,4	47,6 ± 5,6	0,085
LVEDV (mL)	114 ± 32	86 ± 29	**<0,001**
LA volume (mL/m²)	30 ± 8 (30)	34 ± 7 (32)	0,068
LVEF (%)	64,7 ± 4,7	68,5 ± 6,4	**0,026**

1 Mean ± sd, (median). **LVEDD** - Left Ventricular End-Diastolic Dimension, **LVEDL** - Left Ventricular End-Diastolic Volume, **LA** - Left Atrium, **LVEF** - Left Ventricular Ejection Fraction.

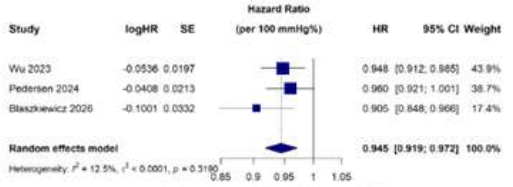
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PROGNOSTIC VALUE OF LEFT VENTRICULAR MYOCARDIAL WORK INDICES IN SEVERE AORTIC STENOSIS UNDERGOING TRANSCATHETER AORTIC VALVE REPLACEMENT: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Left ventricular myocardial work (LVMW) indices from noninvasive pressure-strain loop analysis provide afterload-corrected assessment of systolic function, overcoming limitations of ejection fraction (EF) and global longitudinal strain (GLS) in aortic stenosis. Individual studies suggest prognostic value in transcatheter aortic valve replacement (TAVR) patients, but no systematic synthesis exists. Objetivos: To evaluate the prognostic value of LVMW indices — global work index (GWI), constructive work (GCW), wasted work (GWW), and work efficiency (GWE) — for mortality in severe aortic stenosis patients undergoing TAVR. Métodos: A PRISMA-compliant systematic review was performed across PubMed, Embase, Cochrane CENTRAL, Scopus, and LILACS through April 2026. Cohort studies reporting hazard ratios (HR) for LVMW indices and clinical outcomes in TAVR patients (minimum 3-month follow-up) were included. Risk of bias was assessed using QUIPS. Adjusted HRs (with study-specific covariate sets) were harmonized to a common scale (per 100 mmHg% GWI increase) via dose-response conversion and pooled using DerSimonian-Laird random-effects inverse-variance meta-analysis; a Hartung-Knapp sensitivity adjustment was applied given small k. Resultados e Conclusões: Seven studies from six countries (1,196 unique patients across 7 cohort-analyses; follow-up 12–60 months) were included, with all-cause mortality (n=5), cardiovascular mortality (n=1), or composite endpoints (n=2). Pre-TAVR GWI independently predicted all-cause mortality in 6/7 studies with incremental value over EF and GLS; GWW showed no prognostic association. Pooled analysis of three studies with harmonizable pre-TAVR GWI (n=854; 297 deaths) demonstrated that each 100 mmHg% increase reduced mortality risk by 5.5% (HR 0.945; 95% CI 0.919–0.972; p<0.001; I²=12.5%); Hartung-Knapp adjustment yielded HR 0.945 (95% CI 0.887–1.006). Sensitivity analyses confirmed robustness of the point estimate (HR range 0.937–0.949). Two post-TAVR studies were not pooled due to heterogeneous endpoints and unverified HR scales. Proposed GWI cut-offs ranged 1234–2323 mmHg%. One study identified GWE as the strongest post-TAVR predictor, linked to ventricular dyssynchrony. Higher pre-TAVR GWI is consistently associated with lower all-cause mortality with low heterogeneity. LVMW provides incremental prognostic value beyond EF and GLS, potentially improving risk stratification and timing of intervention in TAVR candidates.



Legend: Forest plot of pre-TAVR global work index (GWI) and all-cause mortality. Squares represent study-level hazard ratios (HR) per 100 mmHg% increase in GWI, sized by inverse-variance weight; horizontal lines show 95% CI. The diamond indicates the pooled estimate from a DerSimonian-Laird random-effects model (HR 0.945; 95% CI 0.919–0.972; p < 0.001; I² = 12.5%). Values left of HR = 1.0 favor higher GWI.

Table 1. Characteristics of the included studies

Study	Country	Design	N / Events (%)	Age (years)	Male (%)	LVEF (%)	AV Mean Gradient (mmHg)	GWI (pre-TAVR)	Echo Timing	FU (mo)	Primary Outcome	Overall RoB (QUIPS)
Wu et al., 2023 §	Netherlands	Retro. cohort	286 / 64 (22)	82 (78–85)	52	59 (47–63)	40 (40–56)	1685 (1532–2150)	Pre-TAVR	52	All-cause mortality	Moderate (SL 3M)
Pedersen et al., 2024	Denmark	Retro. cohort	472 / 204 (43)	80 ± 7	48	†	†	1896 (1671–2616)	Pre-TAVR	60	All-cause mortality	Low (SL 1M)
Blaszkiewicz et al., 2026	Poland	Retro. cohort	100 / 29 (29)	76.4 ± 7.1	39	60 (54–65)	49 (39–58)	1574 (1115–2080)	Pre-TAVR	46	All-cause mortality	Moderate (SL 3M)
Moya et al., 2024	Belgium	Prosp. cohort	113 / 59 (26)	82 ± 6	54†	52 ± 10	50 ± 24	2581 ± 748	Pre-TAVR	17	Death + HF hosp.	Low (SL 1M)
Wu et al., 2024 §	Netherlands	Retro. cohort	256 / 125 (51)	82 (77–85)	53	59 (50–67)	50†	1304 (1003–2004)	Post-TAVR	59	All-cause mortality	Low-Mod. (SL 1M)
Aemer et al., 2024	Switzerland	Prosp. cohort	104 / 30 (41)	80 (78–86)	54	56 (52–64)	50†	1325 † (1010–1641)	Post-TAVR	11	CV mortality	Mod.–High (1L 4M 1M)
Rosti et al., 2024	Italy	Retro. (registry)	80 / 35 (18)	76.9 ± 6.6	40	58.2 ± 9.5	49.3 ± 12.6	2450 ± 947	Post-TAVR	12	Composite ‡	Moderate (SL 3M 1m)

Abbreviations: AV: aortic valve; CV: cardiovascular; FU: follow-up; GWI: global work index; HF: heart failure; LVEF: left ventricular ejection fraction; NR: not reported; RoB: risk of bias; TAVR: transcatheter aortic valve replacement. Data are presented as mean ± SD or median (IQR). Risk of bias was assessed using the QUIPS tool (Quality in Prognosis Studies) across 6 domains; each domain rated Low (L), Moderate (M), or High (H). The overall judgment reflects the predominant rating across domains.

* Pedersen 2024 reported LVEF and hemodynamic data classified by AR subtype and EF category; no single global value was available.

† Aemer 2024: MW was measured post-TAVR (within 2 weeks after the procedure), not at baseline.

‡ Composite endpoint: all-cause death, worsening of dyspnea (NYHA class ≥ 3), or rehospitalization for cardiovascular events at 1 year.

§ Wu 2023 and Wu 2024 represent partially overlapping pre- and post-TAVR analyses of the same Leiden cohort (2013–2020; ~854 unique patients). Wu 2023 contributed to the pre-TAVR meta-analysis; Wu 2024 was described narratively.

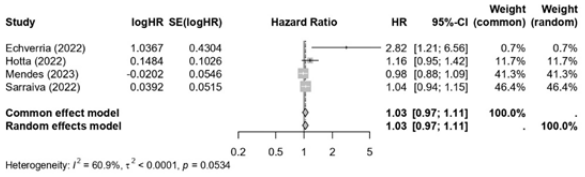
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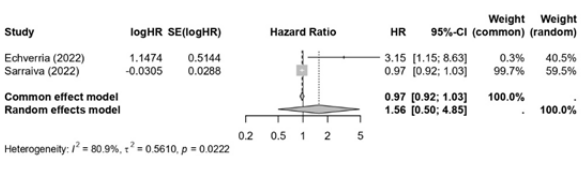
PROGNOSTIC VALUE OF MYOCARDIAL STRAIN AND CONVENTIONAL ECHOCARDIOGRAPHIC PARAMETERS IN CHRONIC CHAGAS CARDIOMYOPATHY: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Chagas Disease remains a major cause of cardiomyopathy in endemic regions. Chagas Cardiomyopathy (CC) is associated with progressive myocardial damage and adverse outcomes. While left ventricular ejection fraction (LVEF) is widely used for risk stratification, myocardial strain imaging has emerged as a more sensitive tool for detecting subclinical dysfunction. Objetivos: To evaluate the prognostic value of myocardial strain parameters and compare their performance with conventional echocardiographic measures in patients with chronic CC. Métodos: A systematic review was conducted following PRISMA guidelines, we searched in PubMed, Embase, Web of Science, and Cochrane Library using descriptors and their variations for the terms: Chagas Cardiomyopathy; Echocardiography; Prognosis. Study selection was performed independently by two reviewers using the Rayyan platform. Studies that evaluated strain and conventional echocardiographic parameters were included. Hazard ratios (HRs) were standardized to ensure consistency in the direction of effect. Statistical analysis was performed at RStudio. A random-effects meta-analysis was conducted based on log(HR) and standard errors. Resultados e Conclusões: A total of 4 studies were included, with 704 participants. In univariate analyses, global longitudinal strain (GLS) (HR 1.25; 95% CI 1.21–1.30) and LVEF (HR 0.93; 95% CI 0.92–0.94; I² = 0%) showed strong and consistent associations with adverse outcomes. However, in multivariable analyses, GLS (HR 1.03; 95% CI 0.97–1.11; I² = 60.9%) and LVEF (HR 1.56; 95% CI 0.50–4.85; I² = 80.9%) were not significantly associated with outcomes. Circumferential strain remained significantly associated in both univariate (HR 1.26; 95% CI 1.20–1.31) and multivariable analyses (HR 1.10; 95% CI 1.04–1.16; I² = 47.8%). Radial strain showed a modest association in multivariable analysis (HR 0.98; 95% CI 0.96–1.00; I² = 34.1%), but not in univariate analysis. The E/e' ratio was significantly associated with outcomes (HR 1.12; 95% CI 1.05–1.19). Myocardial strain parameters provide incremental and complementary prognostic information in chronic CC. Circumferential strain demonstrated the most consistent and independent association with adverse outcomes, whereas global longitudinal strain and left ventricular ejection fraction primarily reflected overall disease severity without consistent independent prognostic value. These results support a multiparametric approach integrating myocardial deformation analysis to improve risk stratification.





17343

SUBCLINICAL MYOCARDIAL DYSFUNCTION IN ADULT PATIENTS WITH SYSTEMIC LUPUS ERYTHEMATOSUS: A SYSTEMATIC REVIEW AND META-ANALYSIS OF GLOBAL LONGITUDINAL STRAIN PARAMETERS

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Introdução/Fundamentos: Cardiovascular disease is a leading cause of mortality in Systemic Lupus Erythematosus (SLE). Myocardial involvement often progresses silently, driven by inflammation, autoantibodies, and secondary metabolic insults. Left Ventricular Ejection Fraction (LVEF) is notoriously insensitive to this early-stage damage, frequently leading to a false sense of security in SLE patients with “normal” conventional echocardiograms. Conversely, Global Longitudinal Strain (GLS) by 2D-speckle-tracking has emerged as a highly sensitive “biological sensor,” capable of detecting subclinical myocardial failure long before LVEF declines. Objetivos: To assess the magnitude of the difference in Global Longitudinal Strain (GLS) between patients with SLE and healthy controls in order to quantify subclinical systolic dysfunction and analyze its correlation with disease activity (SLEDAI). Métodos: A systematic review and meta-analysis were conducted in accordance with the PRISMA 2020 guidelines. A search of the PubMed/MEDLINE, Embase, and Cochrane databases identified the initial records. After rigorous selection and full-text review, 9 observational studies were included in the final analysis. The studies compared GLS in adult patients with SLE and preserved LVEF (≥50%) with healthy controls. Methodological quality was assessed using the Newcastle-Ottawa Scale (NOS), and data were synthesized using random-effects models. Resultados e Conclusões: A total of 9 studies comprising 634 SLE patients and 451 healthy controls were included. The population consisted predominantly of young females with preserved LVEF. Pooled analysis using a random-effects model demonstrated a significantly impaired GLS in SLE patients compared to controls (Mean Difference [MD]: 2.15%; 95% CI: 1.49 to 2.82; p < 0.0001). Significant heterogeneity was observed across studies (I^2 = 81.9%, p < 0.0001). Furthermore, qualitative synthesis indicated a consistent correlation between higher disease activity, measured by SLEDAI scores, and a greater magnitude of GLS impairment. This meta-analysis confirms the presence of subclinical systolic dysfunction in young women with SLE, a high-risk demographic group often overlooked by conventional echocardiography. The correlation between reduced GLS and elevated SLEDAI scores highlights the direct cardiotoxic impact of inflammatory flares. Ultimately, these findings support the routine integration of GLS into cardiovascular monitoring of SLE to enable early risk reclassification and cardioprotective interventions.

Table 1: Characteristics of the included studies

Study (Author, Year)	Design / Country	N (SLE / Control)	Mean Age (SLE)	Female (%)	SLEDAI (Activity)	LVEF (%) [SLE/Control]	GLS (%) [SLE vs Control]	Quality (Score)
Taha et al., 2019	Prospective Cohort	63 / 50	26 ±7.4	89	11±3	63 / 60	-19.9 / -22.7	★★★★★★★☆ ☆ (7)
Kadoglou et al., 2024	Cross-sectional	102 / 51	51 ±15	90	NR	65 / 66	-19.84 / -21.35	★★★★★★★★ ★ (9)
Farag et al., 2020	Case-control	50 / 50	30.8 ±7.6	NR	NR	67.3 / 67.9	-18.95 / -21.4	★★★★★★★★ ☆ (8)
Gegenava et al., 2020	Prospective Cohort	102 / 50	43 ±14	88	9±8	51 / 62	-15 / -19	★★★★★★★★ ☆ (8)
Nikdoust et al., 2018	Cross-sectional	33 / 35	25.45 ±NR	100	NR	61.84 / 62.31	-19.29 / -20.29	★★★★★★★☆ ☆ (7)
Pazoki et al., 2022	Prospective Case-control	53 / 53	41.5 ±14.09	96	NR	55.92 / 56.98	-18.39 / - 21.07	★★★★★★★☆ ☆ (7)
Li et al., 2021	Case-control	87 / 59	41.8 ±7.56	100	6.18 ±4.39	63.39 / 64.46	-19.53 / -20.7	★★★★★★★★ ☆ (8)
Guyets et al., 2016	Cross-sectional	75 / 73	43.2 ±12.5	89.3	NR	61.3 / 62.5	-18.4 / -19.3	★★★★★★★★ ☆ (8)
Zheng et al., 2022	Cross-sectional	69 / 30	38.78±11.27	85.5	5.46 ± 3.91	67.2 / 69.4	-18.8 / -21.1	★★★★★★★★ ☆ (8)

Legend: SLE: Systemic Lupus Erythematosus; **LVEF:** Left Ventricular Ejection Fraction; **GLS:** Global Longitudinal Strain; **SLEDAI:** Systemic Lupus Erythematosus Disease Activity Index; **NR:** Not Reported. Numeric data are presented as Mean ± Standard Deviation (SD). The quality score was assessed using the Newcastle-Ottawa Scale (NOS), where higher scores indicate a lower risk of bias.

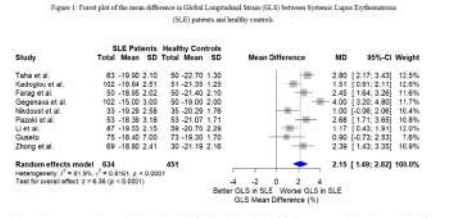


Figure 1. Forest plot of the mean difference in Global Longitudinal Strain (GLS) between Systemic Lupus Erythematosus (SLE) patients and healthy controls.

Legend: Squares represent the mean difference (MD) of GLS for each individual study, with the size proportional to the study's statistical weight. Horizontal lines indicate the 95% Confidence Intervals (95% CI). The blue diamond represents the pooled overall effect (MD = 2.15%, 95% CI: 1.49 to 2.82; p < 0.0001) using a random-effects model. Since normal GLS is a negative value, effect sizes to the right of the line of no effect (zero) indicate less negative values, thereby reflecting **worse subclinical myocardial function** in the SLE group compared to controls.

18193

THREE-DIMENSIONAL SPECKLE TRACKING ECHOCARDIOGRAPHY IN MEASURING LEFT VENTRICULAR MYOCARDIAL FUNCTION IN ADULT DIABETIC PATIENTS WITH OR WITHOUT OTHER COMMORBIDITIES: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Diabetes mellitus (DM) is associated with structural and functional myocardial alterations that may lead to diabetic cardiomyopathy and subclinical left ventricular (LV) dysfunction. Conventional echocardiographic parameters, particularly LV ejection fraction (LVEF), often remain preserved in early stages, limiting early detection.Three dimensional speckle-tracking echocardiography (3D-STE) enables comprehensive assessment of LV mechanics through multidirectional myocardial strain analysis. However, evidence regarding its diagnostic performance in diabetic populations remains heterogeneous. Objetivos: To evaluate the use of 3D-STE in assessing LV myocardial function in adults with DM and determine the impact of other commorbidities on these parameters. Métodos: A systematic review and meta-analysis was conducted following PRISMA guidelines. PubMed, Web of Science, and Embase were searched for observational studies evaluating 3D-STE in adults with DM. Primary outcomes included LVEF and myocardial strain parameters: global longitudinal strain (GLS), global circumferential strain (GCS), global radial strain (GRS), and global area strain (GAS). Pooled mean differences (MD) with 95% confidence intervals (CI) were calculated using random-effects models. Subgroup analyses evaluated glycemic control, obesity, and hypertension. Resultados e Conclusões: Twenty-eight studies including 1,182 diabetic patients and 1,269 healthy controls were analyzed. Compared with controls, diabetic patients showed significant impairment in all strain parameters: GLS (MD −2.73%; 95% CI −3.27 to −2.18; p<0.001), GCS (MD −1.65%; 95% CI −2.15 to −1.15; p<0.001), GAS (MD −2.61%; 95% CI −3.42 to −1.81; p<0.001), and GRS (MD −5.06%; 95% CI −6.59 to −3.52; p<0.001). Heterogeneity was moderate to high. In contrast, LVEF showed only a modest reduction (MD −1.04%; 95% CI −1.68 to −0.39; p=0.002; I^2=61.9%). Poor glycemic control (HbA1c ≥7%) was associated with greater impairment in GLS (MD −3.43%) and GAS (MD −5.07%). Obese diabetic patients (BMI ≥25 kg/m²) showed pronounced reductions in LVEF (MD −3.78%) and GLS (MD −4.64%), while hypertensive diabetics exhibited greater GLS impairment than normotensive patients (−2.83% vs −1.54%). Conclusion: 3D-STE consistently detects early subclinical LV dysfunction in adults with DM, evidenced by significant impairment across multiple strain parameters, while myocardial dysfunction is exacerbated by poor glycemic control, obesity, and hypertension.

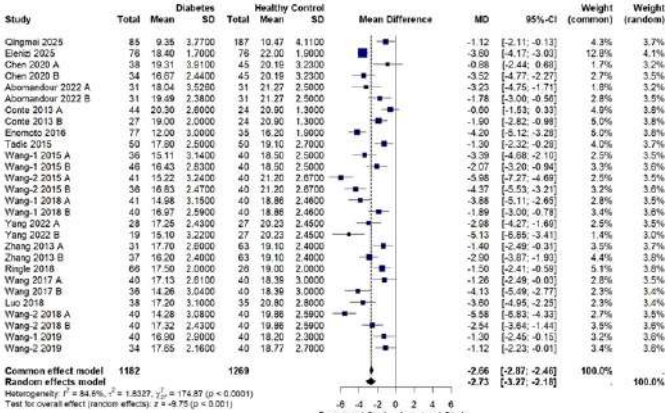


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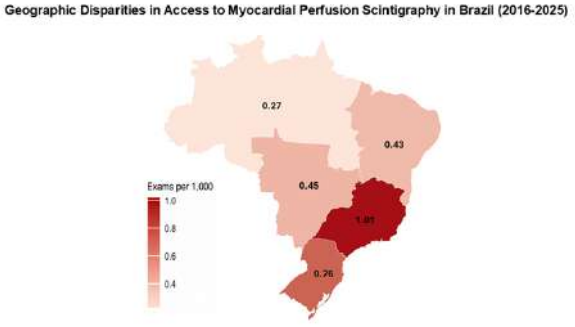
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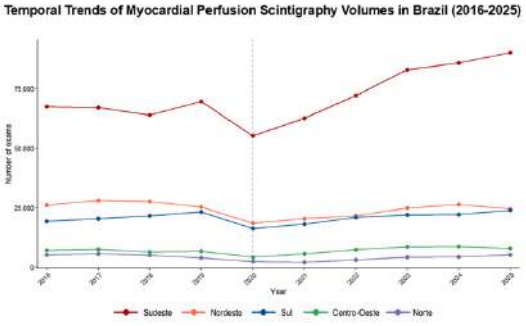
A DECADE OF MYOCARDIAL PERFUSION SCINTIGRAPHY REVEALS PERSISTENT REGIONAL INEQUALITIES IN CARDIAC IMAGING ACROSS BRAZIL

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Introdução/Fundamentos: Access to cardiovascular imaging remains uneven in middle-income countries. Myocardial perfusion scintigraphy (MPS) is a guideline-recommended test for Coronary Artery Disease, which represents a significant global public health problem. Early and accurate detection of myocardial ischemia is essential for proper risk assessment, therapeutic decision-making, and optimization of clinical outcomes; however, its distribution within public health systems is still poorly understood. Objetivos: To evaluate temporal trends, regional disparities, and costs of MPS in Brazil's Unified Health System from 2016 to 2025. Métodos: Time-series study using DATASUS outpatient data and IBGE population estimates. Outcomes included procedure volume and public expenditure for stress and rest MPS by region. Statistical analyses included Mann-Kendall trend test, ANOVA for regional comparisons, and compound annual growth rate. Rates were adjusted per capita. Resultados e Conclusões: Over the decade (2016-2025), national MPS volume showed an overall upward trend (stress exams: 124,760 to 151,031), despite a sharp COVID-19 disruption in 2020, followed by a robust recovery (CAGR +9.1%). Regional disparities, evaluated using population-adjusted rates, remained extreme. In 2025, the Southeast concentrated the highest volume (90,034 stress exams; 1.01/1,000 inhabitants), starkly contrasting with the South (0.76/1,000), Midwest (0.45/1,000), Northeast (0.43/1,000), and North (0.27/1,000) (p<0.001). Total investment exceeded R$ 521 million. Stress and rest volumes remained proportional (≈1:1). Limitations inherent to administrative databases, including underreporting, should be considered; however, the comprehensive decade-long national dataset and robust population-adjusted statistics strengthen these findings. In conclusion, despite general procedural growth, extreme geographic inequalities in MPS volumes persist, with the Southeast performing 3.7 times more per capita exams than the North. These findings highlight structural disparities that demand targeted health policy strategies.



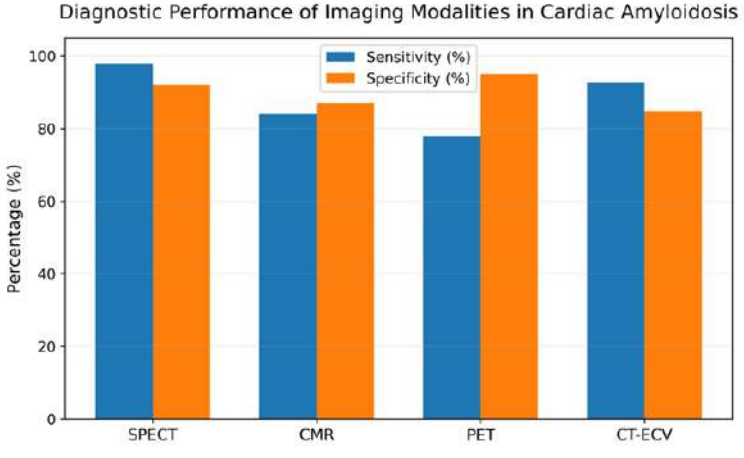


17501

CARDIAC AMYLOIDOSIS: ADVANCES IN DIAGNOSTIC METHODS AND PROGNOSTIC IMPLICATIONS

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Introdução/Fundamentos: Cardiac amyloidosis is a progressive and often underdiagnosed infiltrative cardiomyopathy, resulting from the extracellular deposition of protein fibrils in the myocardium. Clinical nonspecificity and overlap with other causes of left ventricular hypertrophy contribute to diagnostic delay and worse prognosis. Objetivos: To evaluate the main diagnostic methods used in the identification of cardiac amyloidosis, analyzing their accuracy, clinical applicability, and prognostic impact. Métodos: Systematic review conducted according to the PRISMA protocol, with searches in the PubMed and LILACS databases. A total of 50 studies published between 2021 and 2026 were identified, of which 15 met the eligibility criteria after methodological screening. Resultados e Conclusões: Myocardial scintigraphy by SPECT showed the best diagnostic performance among noninvasive imaging methods, with sensitivity of 98%, specificity of 92%, and AUC of 0.99, outperforming cardiac magnetic resonance imaging (84%, 87%, and 0.92) and PET (78%, 95%, and 0.95), consolidating itself as the main diagnostic tool for ATTR-CM. Computed tomography with myocardial extracellular volume fraction demonstrated sensitivity of 92.8%, specificity of 84.8%, and AUC of 0.94, proving to be a promising alternative, especially in patients with contraindications to magnetic resonance imaging. In the prognostic field, cardiac magnetic resonance imaging showed relevant stratification value, as higher extracellular volume values were associated with increased mortality (HR 2.90; 95% CI 1.68–5.01), reinforcing its utility beyond structural diagnosis. Artificial intelligence tools also demonstrated high diagnostic accuracy, with AUC up to 0.999, sensitivity of 98.9%, and specificity of 99.5%, highlighting their potential in optimizing early screening. Furthermore, patients diagnosed at early stages showed a 57% reduction in mortality when early disease-modifying therapy was initiated, reinforcing the direct prognostic impact of early recognition. Noninvasive diagnostic methods play a central role in the identification and prognostic stratification of cardiac amyloidosis. The integration of multimodal diagnostic strategies and early recognition of the disease favor greater diagnostic accuracy, better risk stratification, and higher therapeutic effectiveness, directly impacting clinical outcomes.

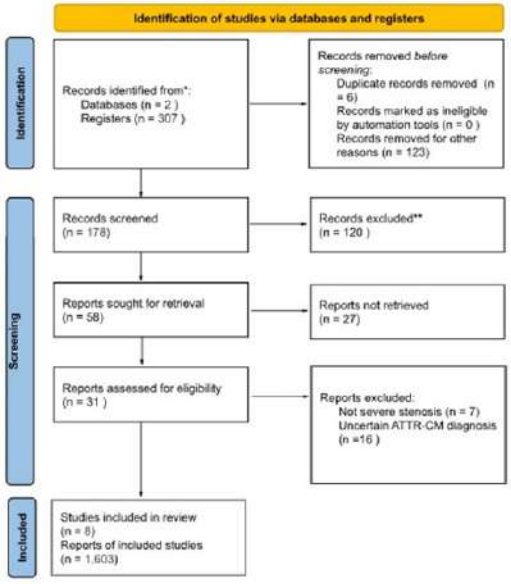
19318

DIAGNOSTIC ACCURACY OF IMAGING MODALITIES FOR ATTR CARDIAC AMYLOIDOSIS DETECTION IN CANDIDATES FOR TRANSCATHETER AORTIC VALVE IMPLANTATION WITH SEVERE AORTIC STENOSIS: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: TTR cardiac amyloidosis (ATTR-CM) and severe aortic stenosis (AS) frequently coexist in elderly patients, with concomitant disease associated with one-year mortality exceeding 50% versus 20% in isolated AS. ATTR-CM remains underdiagnosed in TAVI candidates due to the lack of a standardized imaging-based screening strategy. Objetivos: To systematically review and compare the diagnostic accuracy of imaging modalities — echocardiography, CMR, CT, bone scintigraphy, and PET/MRI — for ATTR-CM detection in severe AS patients evaluated for TAVI. Métodos: Systematic review following PRISMA guidelines. Searches were performed in PubMed and EMBASE. Of 307 records identified, 178 were screened by title, 58 by abstract, and 31 by full text; 8 studies (n=1,603 patients) met eligibility criteria. Diagnostic accuracy metrics (sensitivity, specificity, AUC) were synthesized. Heterogeneity in reference standards (bone scintigraphy grade ≥2, endomyocardial biopsy, or ESC criteria) precluded formal statistical pooling. Resultados e Conclusões: The prevalence of ATTR-CM among TAVI candidates ranged from 3.5% to 22% across studies, highlighting relevant underdiagnosis in routine practice. Diagnostic performance varied substantially by modality. ^{18}F-fluoride PET/MRI achieved perfect discrimination in LGE regions (sensitivity and specificity 100%; AUC 1.00), though its widespread applicability remains limited. CT-derived ECV demonstrated excellent accuracy. CMR-ECV was significantly elevated in ATTR-CM patients; however, typical transmural LGE was absent in up to 64% of confirmed cases, underscoring its limited sensitivity as a standalone criterion. Echocardiographic indices demonstrated moderate accuracy with high negative predictive value (up to 96%), supporting their role as first-line screening tools. In conclusion, no single imaging modality combines optimal accuracy, availability, and feasibility for universal ATTR-CM screening in TAVI candidates. The evidence supports a stepwise strategy incorporating echocardiographic strain indices as initial screening for tracking ATTR.



19219

FDG PET/CT VERSUS CARDIAC MAGNETIC RESONANCE IMAGING IN THE DIAGNOSIS OF CARDIAC SARCOIDOSIS WITHOUT PRIOR SYSTEMIC DIAGNOSIS: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Cardiac sarcoidosis (CS) is a significant cause of ventricular arrhythmia, advanced atrioventricular block, and sudden cardiac death. In patients without an established systemic diagnosis, the choice between fluorodeoxyglucose positron emission tomography/computed tomography (FDG PET/CT) and cardiac magnetic resonance imaging (CMR) as the initial diagnostic modality remains controversial, hindering early diagnosis and appropriate clinical management. Objetivos: To compare the diagnostic accuracy of FDG PET/CT and CMR in patients with suspected CS in the absence of a previously established systemic diagnosis. Métodos: A systematic electronic search was conducted in the PubMed and Cochrane databases. Original studies evaluating the diagnostic performance of FDG PET/CT and/or CMR in adults with suspected or confirmed CS were included, provided they reported accuracy measures and were published between 2016 and 2026. Of the 59 records identified, duplicates, review articles, case reports, theses, and studies published in languages other than English were excluded. Additional exclusion criteria comprised narrative reviews, therapeutic monitoring studies, and populations in which active systemic sarcoidosis with prior documentation was a mandatory inclusion criterion. Following double-blind title and abstract screening and full-text review, four studies were prioritized based on their direct focus on predictive mechanisms and prevention strategies. Data were systematically extracted according to the PRISMA protocol and methodically tabulated. Resultados e Conclusões: Four studies were included, encompassing a total of 176 patients. The findings demonstrated that CMR with late gadolinium enhancement (LGE) yielded superior standalone diagnostic accuracy (sensitivity 82%, specificity 78%, AUC 0.80) compared to standalone cardiac FDG PET/CT (sensitivity 60%, specificity 56%, AUC 0.58). The PET/CMR fusion approach maximized sensitivity (94%), albeit with a reduction in specificity (44%). Furthermore, significant evidence of diagnostic reclassification was observed in 22% of cases when CMR was added to standalone FDG PET/CT, reinforcing the complementary nature of both modalities. The available evidence suggests that CMR with LGE demonstrates superior standalone diagnostic accuracy for CS relative to FDG PET/CT, whereas the combination of both modalities maximizes sensitivity at the expense of specificity.

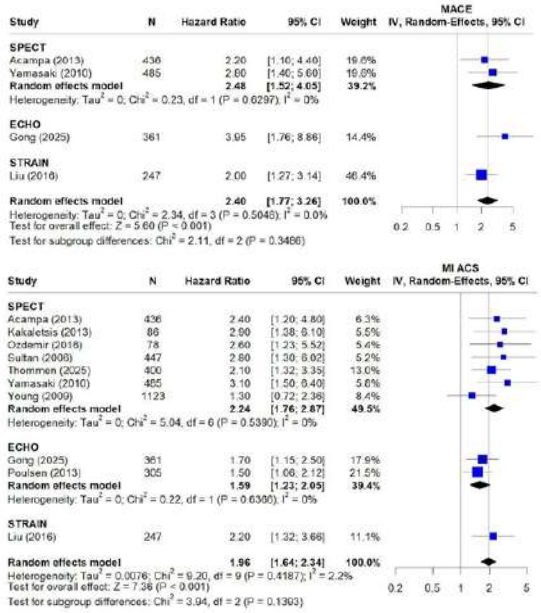
16078

IMAGING-DEFINED CARDIOVASCULAR RISK IN ASYMPTOMATIC TYPE 2 DIABETES: A META-ANALYSIS COMPARING SPECT AND MYOCARDIAL STRAIN

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(1) FACULDADE DE MEDICINA DA UNIVERSIDADE DE SAO PAULO - SÃO PAULO - SP - BRASIL; (2) HOSPITAL DAS CLINICAS USP - SÃO PAULO - SP - BRASIL;

Introdução/Fundamentos: Adults with type 2 diabetes mellitus (T2DM) are at increased cardiovascular risk even without symptoms. Non-invasive cardiovascular imaging may improve risk stratification, but the prognostic value of myocardial perfusion imaging with single-photon emission computed tomography (SPECT) and strain-based echocardiography remains uncertain. Objetivos: To evaluate the prognostic value of abnormal non-invasive cardiovascular imaging findings and compare imaging modalities in asymptomatic adults with T2DM. Métodos: We conducted a systematic review and meta-analysis of longitudinal studies (prospective cohorts and randomized trial follow-up analyses) assessing the association between abnormal imaging findings and cardiovascular outcomes, including major adverse cardiovascular events (MACE) and myocardial infarction/acute coronary syndrome (MI/ACS). PubMed/MEDLINE, Embase, and Cochrane Library were searched from inception to January 4, 2026. Random-effects models pooled hazard ratios (HRs) with 95% confidence intervals (CIs). Subgroup analyses and meta-regression were performed by imaging modality, allowing indirect comparisons. Resultados e Conclusões: Twelve studies were included in the qualitative synthesis and nine in the meta-analysis, comprising 5,181 patients. Mean age was 60.6 years, 57.4% male, mean HbA1c 8.13%, and diabetes duration 10.8 years. Follow-up varied across studies. Abnormal imaging findings were associated with increased risk of MACE (HR 2.40, 95% CI 1.77–3.26; I^2 = 0%) and MI/ACS (HR 1.96, 95% CI 1.64–2.34; I^2 = 2.2%). SPECT showed consistent associations for MI/ACS (HR 2.24, 95% CI 1.76–2.87) and MACE (HR 2.48, 95% CI 1.52–4.05). Echocardiographic and strain parameters also showed relevant associations, particularly for MACE (HR 3.95 and 2.00), though based on fewer studies. Meta-regression showed no significant effect modification. In asymptomatic adults with T2DM, abnormal non-invasive cardiovascular imaging findings are associated with increased risk of adverse cardiovascular events. These associations were observed across different imaging approaches, supporting the concept of a shared high-risk phenotype rather than modality-specific effects. These findings support imaging-based risk stratification and highlight the need for prospective head-to-head studies to define the role of each modality.



17056

MYOCARDIAL FLOW RESERVE IDENTIFIES LOWER-RISK PHENOTYPES ACROSS CORONARY CALCIUM BURDEN: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Introduction: Coronary artery calcium (CAC) reflects atherosclerotic burden but not functional significance. Myocardial flow reserve (MFR), derived from positron emission tomography (PET), integrates epicardial and microvascular function. Their combined prognostic value remains unclear. We evaluated the joint prognostic role of CAC and MFR and whether preserved MFR identifies lower-risk phenotypes across CAC strata. Objetivos: Objective: To evaluate the combined prognostic value of coronary artery calcium (CAC) and positron emission tomography (PET)–derived myocardial flow reserve (MFR), and to determine whether preserved MFR identifies lower-risk phenotypes across different CAC strata. Métodos: Methods: A systematic review and meta-analysis were conducted according to PRISMA and MOOSE guidelines. PubMed, Embase, and Cochrane databases were searched in March 2026 for observational studies reporting CAC categories and PET-derived MFR. Impaired MFR was defined as <2, and CAC as 0, 1–399, and ≥400. The primary outcome was major adverse cardiovascular events (MACE). Random-effects models estimated pooled risk ratios (RRs) and prevalence with 95% confidence intervals (CIs). Resultados e Conclusões: Results: Four studies (N = 10,971; mean age 65.2 ± 11.1 years; 53.9% female) were included. Overall, 49.5% had impaired MFR. Its prevalence increased with CAC (40% in CAC=0, 49% in CAC 1–399, 53% in CAC ≥400). Preserved MFR (≥2) was associated with a 66% lower risk of MACE (RR 0.34, 95% CI 0.26–0.44; p<0.001; I^2=47.3%). This association was consistent across CAC strata: CAC=0 (RR 0.27; I^2=0%), CAC 1–399 (RR 0.32; I^2=58%), and CAC ≥400 (RR 0.46; I^2=0%). Conclusion: Preserved MFR identifies a lower-risk phenotype across all CAC categories. Despite increasing impairment with higher CAC, MFR provides complementary prognostic information, supporting its integration with CAC for improved risk stratification.

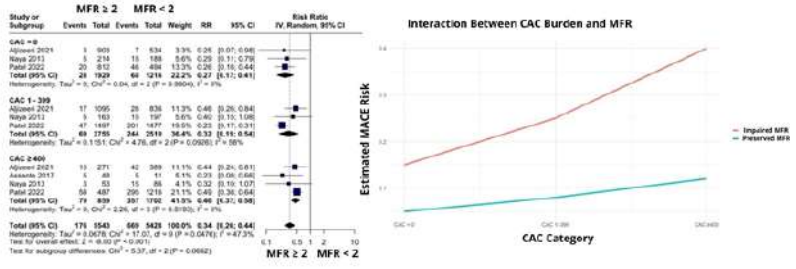


Figure. Association of myocardial flow reserve (MFR) and coronary artery calcium (CAC) with MACE. Preserved MFR (≥2) is associated with lower risk across all CAC strata, despite increasing risk with higher CAC burden.

16354

TEMPORAL TRENDS IN MYOCARDIAL PERFUSION IMAGING: A LONGITUDINAL ANALYSIS OF ABNORMAL SPECT RESULTS

RAFAEL DE LORENZO LIMA1; RONALDO DE SOUZA LEÃO LIMA2; PAULA FAVIERI DE MELO SILVA3; ANDRÉ LUIZ BEZERRA4; ANDREA DE LORENZO3;

(1) UNIVERSIDADE FEDERAL DO ESTADO DO RIO DE JANEIRO - RIO DE JANEIRO - RJ - BRASIL; (2) DASA - RIO DE JANEIRO - RJ - BRASIL; (3) INSTITUTO NACIONAL DE CARDIOLOGIA - RIO DE JANEIRO - RJ - BRASIL; (4) UNIVERSIDADE FEDERAL DO RIO DE JANEIRO - RIO DE JANEIRO - RJ - BRASIL;

Introdução/Fundamentos: Myocardial Perfusion Imaging (MPI) remains a cornerstone in the diagnostic workup of patients with suspected coronary artery disease (CAD). Over the past decade, there have been substantial shifts in cardiovascular care, characterized by more aggressive management of cardiac risk factors as well as evolving criteria for imaging referrals. Despite these advancements, gender-based disparities in the presentation, diagnosis, and outcomes of CAD continue to be a subject of intense clinical scrutiny. Objetivos: This study aimed to evaluate longitudinal trends in the prevalence of abnormal results in MPI and to identify potential disparities based on patient gender. Métodos: Institutional records of a network of Brazilian, private, Nuclear Cardiology laboratories, were analyzed to determine the diagnostic yield of MPI over a 15-year period (2009–2024). MPI studies were read by 2 experienced observers, and abnormal results were considered as the presence of either myocardial ischemia or infarction. A value of $p<0.05$ when comparing frequencies was considered statistically significant. Resultados e Conclusões: In the overall period, 96,009 studies were performed, among which 18.2% were abnormal. From 2009 to 2024, there was a reduction in the frequency of abnormal MPI studies, from 31.5% to 16.2% ($p<0.001$). In contrast to the general trend, the percentage of abnormal MPI results within the female subgroup increased, from 50.4% to a maximum of 56.4% in 2020 ($p<0.001$), stabilizing at 54% in the final 2 years of the analyzed period. In conclusion, in this cohort, along 15 years there was an overall decline in abnormal MPI results, which may suggest a shift towards the indication of the test for lower-risk individuals, or even improvements in primary cardiovascular prevention and earlier medical intervention in the general patient population. However, there was a paradoxical increase of the frequency of abnormal scans in women, which might reflect either an increase in the burden of CAD in women, driven by multiple (including sex-specific) biologic and social risk factors, or an increased awareness regarding the atypical presentation of CAD in women, leading to more appropriate patient selection for imaging. The rising trend among women highlights a significant shift in the diagnostic landscape, from a male to a female predominance.

Imagem Cardiovascular – RM e TOMO

81º CONGRESSO BRASILEIRO DE CARDIOLOGIA together with WORLD CONGRESS OF CARDIOLOGY

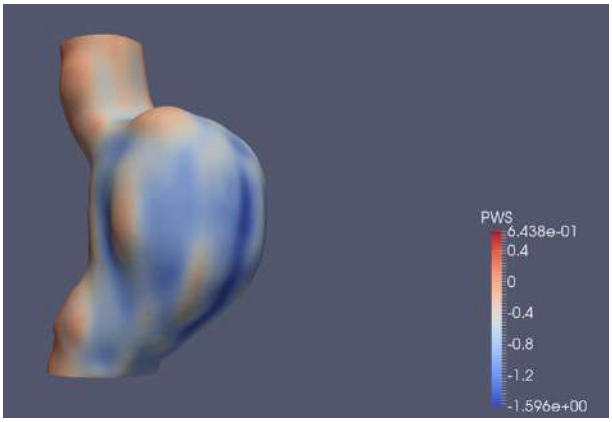
17021

ABDOMINAL AORTIC ANEURYSM BIOMECHANICAL EVALUATION: IN SILICO EVALUATION

LEONARDO CAMPOS JUNQUEIRA1; DANIEL CAMPOS SILVA1; MARCONE LIMA SOBREIRA1;

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Introdução/Fundamentos: Abdominal aortic Aneurysm (AAA) is defined as a local dilatation of the aorta with diameter exceeding 30 mm. This condition affects 35.12 million people between the ages of 30 and 79 worldwide and, although manly asymptomatic, the dilatation of the aortic wall weakness the vessel structure and eventually leads to its rupture. With the advance of technology, biomechanical analysis is being developed to better evaluate AAA behavior and rupture risk. Therefore, Peak wall stress (PWS), the highest tension exerted on the AAA wall, Peak wall rupture index (PWRI), the ratio between the local stress and the wall resistance, and Regional aortic weakness (RAW), an estimate of the local weakness of the aortic wall, are posted as promising index for better understanding the AAA. Objetivos: The aim of this study was to evaluate the biomechanical indexes behaviors in large AAA, utilizing finite element analysis (FEA) on computed generated 3D-model. Métodos: Computed tomography (CT) scan images were collected from patients with AAA larger than 55 mm in men and 50 mm in women. Patients with low-quality CT scans were excluded. For each image a 3D model of the aorta was produced, and FEA was used to divide the geometry into a mesh with several smaller elements, from which the pressure distribution was calculated. Based on these results, PWS, PWRI and RAW were obtained (Img.1). For data analysis, Kruskal-Wallis and Tau-Kendall test were used. Resultados e Conclusões: Five patients were evaluated, with a mean age of 71 years (61-78) and a mean BMI of 30.2 (25.3–38.7). The average maximum diameter was 75.18mm. Geometrical and biomechanical aspects are shown in Img 2. Between patients, the average of PWSmax was 1.859MPa and of PWSmean was 0.2814MPa. Although the average PWS for all patients remained within the tension values observed in stable and smaller aneurysms described in literature (below 0.45MPa), all patients presented maximum PWS values similar to those found in ruptured AAA (above 0.7MPa). This suggests that the point of highest tension is significantly more relevant for predicting aneurysmal rupture than just the average AAA wall tension. The same can be observed in RAW, which although meanRAW suggests low levels of wall weakness, the high maximum value of RAW indicates that there is structural heterogeneity with localized regions of lower resistance. And this heterogeneity may play an important role in initiating rupture. Thus, this suggests that AAA distorts aortic wall biomechanical properties region specific.



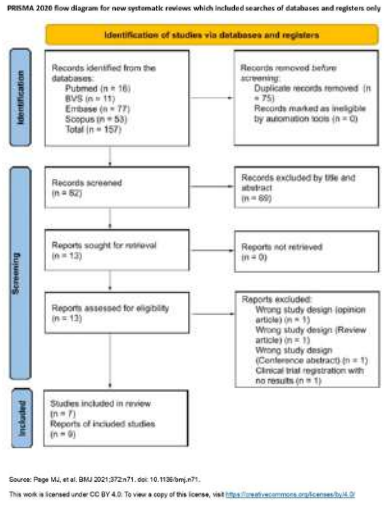
PATIENT	A	B	C	D	E	Average
Dmax	95.62 mm	72.71 mm	76.38 mm	59.99 mm	71.21 mm	75.18 mm
Dmin	46.92 mm	31.36 mm	37.91 mm	37.92 mm	31.36 mm	37.09 mm
Dmean	83.74 mm	53.50 mm	69.89 mm	48.46 mm	54.26 mm	61.97 mm
Dmean eq	77.12 mm	48.14 mm	62.38 mm	43.37 mm	47.94 mm	55.79 mm
Geometric Asymmetry	0.1589	0.262	0.155	0.2537	0.26	0.2179
PWSmax	2.226 MPa	1.835 MPa	2.658 MPa	1.327 MPa	1.249 MPa	1.859 MPa
PWSmean	0.387 MPa	0.216 MPa	0.353 MPa	0.225 MPa	0.226 MPa	0.2814 MPa
PWRImax	8.88E-06	6.12E-06	6.24E-06	5.11E-06	4.17E-06	6.10E-06
PWRImean	1.2750 e-6	7.17404 e-7	1.1811 e-6	7.3016 e-07	7.5419 e-7	9.32E-07
RAWmax	0.748	0.606	0.877	0.438	0.412	0.6162
RAWmean	0.128	0.071	0.116	0.074	0.074	0.0926

17074

EFFECTS OF GLP-1 RECEPTOR AGONISTS ON CARDIAC REMODELING AND EPICARDIAL ADIPOSE TISSUE ASSESSED BY CARDIAC MAGNETIC RESONANCE: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Cardiometabolic diseases are key determinants of pathological cardiac remodeling and epicardial adipose tissue (EAT) expansion, both recognized as early markers of cardiovascular risk. GLP-1 receptor agonists (GLP-1RA) have emerged as a promising therapeutic class, with demonstrated reduction in major adverse cardiovascular events (MACE). In this context, cardiac magnetic resonance (CMR) represents the gold standard for the assessment of cardiac structure, function, and tissue characterization. Objetivos: To evaluate the effects of GLP-1 receptor agonists on cardiac remodeling and epicardial adipose tissue volume in patients with cardiometabolic diseases, as assessed by CMR. Métodos: This systematic review followed PRISMA guidelines. The PICO strategy included patients with cardiometabolic diseases; intervention with GLP-1RAs; comparison with placebo or standard care; and outcomes defined as CMR-derived parameters of cardiac remodeling and EAT. A search was performed in PubMed, BVS, Scopus, and Embase from database inception to 2026. Study selection was conducted independently by two reviewers, followed by standardized data extraction. The protocol was registered in PROSPERO. Risk of bias was assessed by Cochrane RoB 2 and ROBINS-I V2 tools. Resultados e Conclusões: A total of 157 records were identified, of which 13 were selected for full-text assessment. After exclusions, 9 studies were analyzed (6 evaluating liraglutide, 2 tirzepatide, and 1 exenatide). Populations predominantly comprised middle-aged women (mean age 52–62 years). CMR assessments focused on left ventricular (LV) mass/volumes (cine imaging) and ectopic fat quantification (planimetry, Dixon techniques, and proton magnetic resonance spectroscopy). Tirzepatide demonstrated more effects on cardiac remodeling, including reductions in LV mass. In contrast, liraglutide findings were heterogeneous: some studies reported reverse atrial remodeling and prevention of LV dilation, others showed no structural changes. Liraglutide and exenatide generally reduced EAT, although the magnitude and consistency of these effects varied across studies. Exenatide did not significantly impact cardiac remodeling. GLP-1-based therapies improve favorable cardiometabolic effects, reducing weight and ectopic fat, with more consistent improvements in cardiac remodeling observed with tirzepatide. The effects on epicardial adipose tissue remain heterogeneous. High-quality CMR trials are warranted to clarify mechanisms and long-term cardiovascular outcomes.



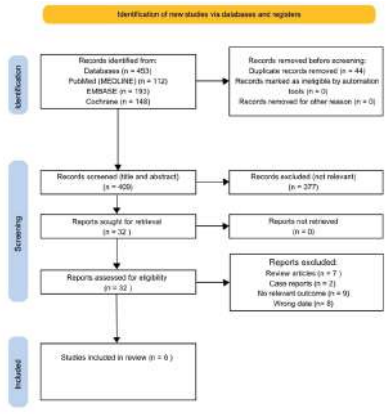
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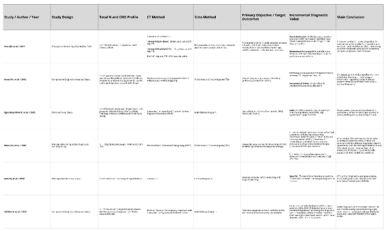
INCREMENTAL DIAGNOSTIC VALUE OF CARDIAC COMPUTED TOMOGRAPHY FOLLOWING INCONCLUSIVE ECHOCARDIOGRAPHY IN ADULT AND PEDIATRIC PATIENTS WITH CONGENITAL HEART DISEASE: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Congenital heart disease (CHD) often requires multimodality imaging. While Echocardiography is the first-line tool, limited acoustic windows or complex anatomy may yield inconclusive results. Cardiac computed tomography provides crucial incremental diagnostic value in these scenarios. Objetivos: The purpose of this study was to conduct a systematic review of the incremental diagnostic value of cardiac CT after inconclusive echocardiography in adult and pediatric CHD patients. Métodos: Following Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, we searched PubMed, Cochrane, and EMBASE databases up to March 2026 for studies evaluating the incremental diagnostic value of cardiac computed tomography following inconclusive echocardiography in adult and pediatric patients with congenital heart disease. Randomized clinical trials and observational studies published within the last 15 years were included. Two independent reviewers screened 453 records, with disagreements resolved by a third reviewer. The included studies demonstrated overall high methodological quality and were carefully assessed for potential bias. Resultados e Conclusões: Six studies (N=1,225) were analyzed. CT showed substantial incremental value mainly for extracardiac structures and complex cases. In pediatric CHD, CT identified 36 additional morphological lesions missed by echo. It demonstrated high sensitivity for systemic venous return and coronary anomalies, while echo was superior for intracardiac structures (valves) and infants (<1 year). In adults, CT clarified septal defect subtypes. For infective endocarditis, PET/CT increased definitive diagnosis from 39% to 88%, detecting elusive right-sided lesions. However, for broad clinical severity restratification in adults, CT reclassified only 1% of cases. In conclusion, while echocardiography remains the standard for intracardiac defects, cardiac CT offers crucial incremental diagnostic value for detailing extracardiac anatomy, coronaries, and right-sided lesions, serving as a vital complementary tool for presurgical planning in complex cases.





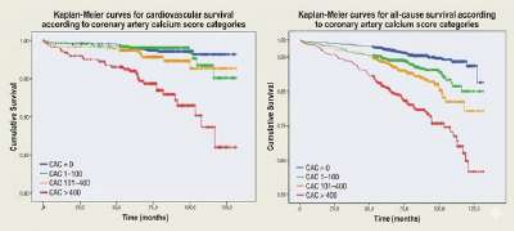
19059

PROGNOSTIC VALUE OF CORONARY ARTERY CALCIUM SCORE IN PREDICTING MORTALITY: A COHORT STUDY FROM SOUTHERN BRAZIL

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Introdução/Fundamentos: The coronary artery calcium score (CAC) is a well-established marker of subclinical atherosclerosis and is widely used for cardiovascular risk re-stratification. However, its association with mortality, particularly across different stratification levels, requires further definition. Objetivos: To evaluate the association between different CAC values and all-cause and cardiovascular mortality, aiming to identify CAC ranges that act as independent risk predictors regardless of clinical comorbidities. Métodos: This retrospective observational study included 2,784 patients who underwent CAC evaluation at a diagnostic imaging center in Southern Brazil. Individuals were categorized into four groups: CAC 0, 1–100, 101–400, and >400. Clinical variables and cardiovascular risk factors (age, sex, hypertension, diabetes mellitus, dyslipidemia, smoking, and BMI) were collected. The outcomes analyzed were all-cause mortality and cardiovascular mortality. Statistical analysis included Chi-square and ANOVA for group comparisons, Kaplan-Meier curves with log-rank tests for survival analysis, and univariate/multivariate Cox regression to identify independent predictors. The mean follow-up period was 80.79 months. Resultados e Conclusões: All-cause mortality was 9.2% and cardiovascular mortality was 2.4%. A progressive increase in mortality was observed as CAC levels rose (p<0.001). Kaplan-Meier curves showed a significant reduction in survival across groups (log-rank p<0.001). In multivariate analysis, age and dyslipidemia were independent predictors of both general and cardiovascular mortality. CAC >400 remained independently associated with the outcomes: all-cause mortality (HR 1.59; 95%CI 1.08–2.33; p=0.019) and cardiovascular mortality (HR 2.21; 95%CI 1.09–4.49; p=0.028). Intermediate categories did not maintain significance after adjustment. CAC >400 was independently associated with all-cause and cardiovascular mortality, with a greater impact on the latter. The lack of association in intermediate categories reinforces a threshold effect, identifying high CAC as a high-risk marker and a valuable tool for prognostic re-stratification.



Variable	General Mortality HR (IC95%)	p	Cardiovascular Mortality HR (IC95%)	p
Age (years)	**1,09 (1,08–1,10)**	**<0,001**	**1,09 (1,06–1,12)**	**<0,001**
Male sex	**1,41 (1,08–1,83)**	**0,012**	1,69 (0,98–2,91)	0,060
Dyslipidemia	**1,58 (1,22–2,06)**	**0,001**	**2,23 (1,29–3,85)**	**0,004**
Hypertension	1,15 (0,87–1,51)	0,327	1,09 (0,63–1,89)	0,758
Diabetes	1,23 (0,93–1,63)	0,146	1,04 (0,59–1,86)	0,887
Tabagism	1,32 (0,98–1,77)	0,065	0,92 (0,49–1,72)	0,794
CAC 1–100	1,11 (0,76–1,62)	0,582	0,72 (0,33–1,58)	0,409
CAC 101–400	1,06 (0,71–1,59)	0,775	0,81 (0,36–1,83)	0,618
CAC >400	**1,59 (1,08–2,33)**	**0,019**	**2,21 (1,09–4,49)**	**0,028**

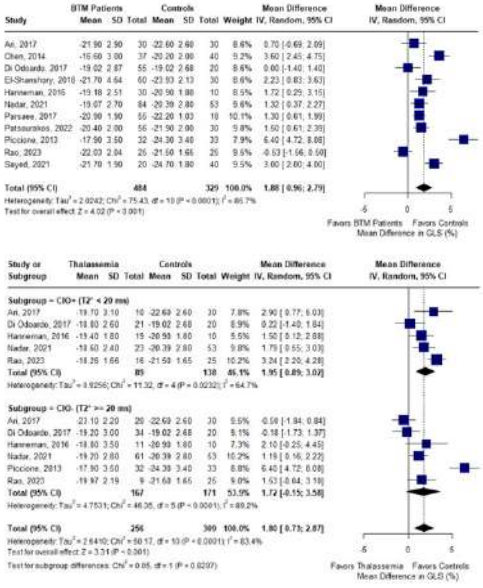
18163

SUBCLINICAL LEFT VENTRICULAR DYSFUNCTION IN PATIENTS WITH BETA-THALASSEMIA MAJOR: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Beta-thalassemia major (BTM) is associated with long-term cardiovascular morbidity, historically attributed to cardiac iron overload (CIO) from chronic transfusion therapy. Despite preserved left ventricular ejection fraction (LVEF) in most patients, speckle-tracking echocardiography suggests that myocardial dysfunction may already be present at a subclinical stage. The magnitude of this early dysfunction, and its relationship with iron burden assessed by T2* cardiac MRI, remains incompletely defined. Objetivos: To systematically review and meta-analyze subclinical left ventricular dysfunction in BTM compared with healthy controls, and to assess its relationship with cardiac iron overload. Métodos: PubMed, Embase, and Cochrane were searched for studies evaluating subclinical cardiac dysfunction in BTM patients with preserved LVEF versus healthy controls. Global longitudinal strain (GLS) was the primary outcome and LVEF the secondary outcome. For studies stratified by T2* CMR, subgroup data were extracted for CIO+ (T2* <20 ms) and CIO− (T2* ≥20 ms). Pooled mean differences (MD) were estimated with a random-effects model; heterogeneity was assessed using I². Analyses were performed in RStudio. Resultados e Conclusões: Eleven observational studies were included, comprising 484 BTM patients and 329 controls. GLS was significantly impaired in BTM patients versus controls (MD 1.88 [95% CI 0.96 to 2.79]; p < 0.001; I² = 86.7%). LVEF did not differ significantly (MD −1.17 [95% CI −2.54 to 0.21]; p = 0.097; I² = 77.1%). In the subgroup analysis of six studies stratified by T2*, GLS was significantly impaired in CIO+ patients versus controls (MD 1.95 [95% CI 0.89 to 3.02]; I² = 64.7%), with a similar directional impairment in CIO− patients that did not reach significance (MD 1.72 [95% CI −0.15 to 3.58]; I² = 89.2%). No significant difference was observed between CIO+ and CIO− subgroups (p = 0.83). Conclusions: Patients with beta-thalassemia major exhibit impaired left ventricular global longitudinal strain despite preserved ejection fraction, consistent with early subclinical myocardial dysfunction. The presence of reduced GLS even in patients without cardiac iron overload, and the absence of significant subgroup differences by T2* status, suggest that mechanisms beyond iron deposition contribute to early myocardial involvement, supporting strain imaging for early cardiovascular risk stratification in BTM.



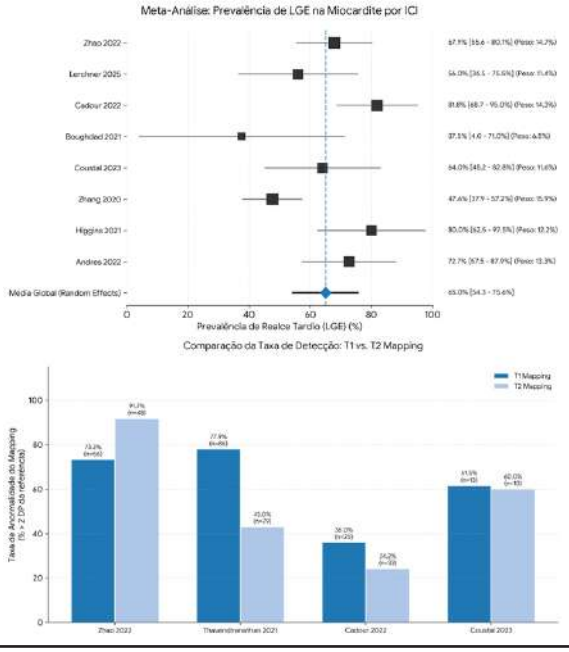
19167

T1 MAPPING OUTPERFORMS LGE AND T2 MAPPING IN ICI-ASSOCIATED MYOCARDITIS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Immune checkpoint inhibitor (ICI)-associated myocarditis has a high case fatality rate (25–50%). Although cardiovascular magnetic resonance (CMR) is the main non-invasive diagnostic tool, the real-world performance of late gadolinium enhancement (LGE) and parametric mapping remains uncertain, particularly after early corticosteroid use, which may limit the applicability of the Lake Louise criteria. Objetivos: Primary: to estimate pooled LGE prevalence and compare diagnostic stability of T1 and T2 mapping in ICI-associated myocarditis. Secondary: to assess the prognostic value of CMR parameters for major adverse cardiovascular events (MACE). Métodos: PRISMA systematic review (PubMed, Embase, Cochrane). Eligibility: adults with confirmed or suspected ICI-associated myocarditis, CMR performed, comparator by endomyocardial biopsy or validated clinical criteria (Bonaca/ESC). Study selection and data extraction were performed independently. Risk of bias was assessed using QUADAS-2. Prevalence meta-analysis using random-effects model (DerSimonian-Laird) with pre-specified sensitivity analysis. Resultados e Conclusões: Of 31 full-text articles assessed, 18 were included (n=870). Pooled LGE prevalence was 65.0% (95% CI 54.3–75.6; 8 studies, n=303; I²=73.2%). The study with the highest histological confirmation rate reported the lowest LGE prevalence (47.6%), arguing against methodological bias. Sensitivity analysis confirmed robustness (66.9%; 95% CI 56.1–77.7%). T1 mapping showed consistent detection rates (66–78%), whereas T2 mapping was highly variable (24–92%) and inversely associated with prior corticosteroid use. According to the 2018 Lake Louise criteria, 95% met non-ischemic injury criteria, but only 53% met edema criteria. T1 mapping independently predicted MACE (AUC 0.91; HR 1.44 per z-score), while septal LGE was the only morphological predictor (HR 2.7). LGE has limited sensitivity for ICI-associated myocarditis in real-world settings, particularly after early immunosuppression (fails in 35% of histologically confirmed cases). T2 mapping is highly variable and influenced by corticosteroid use. In contrast, T1 mapping is more stable and strongly associated with outcomes, supporting its role as the primary CMR diagnostic marker in this population.



21103

3D CARDIAC MODELS WITH HIPSC-CMS IN HEREDITARY CARDIOMYOPATHIES AND ONCOLOGIC CARDIOTOXICITY: A SYSTEMATIC REVIEW

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(1) UNIFACISA - CAMPINA GRANDE - PB - BRASIL; (2) UNIVERSIDADE NOVE DE JULHO - SÃO PAULO - SP - BRASIL; (3) UNINASSAU - RECIFE - PE - BRASIL;

Introdução/Fundamentos: Hereditary cardiomyopathies (hypertrophic and dilated cardiomyopathy, inherited arrhythmia syndromes) and chemotherapy-induced cardiotoxicity lack physiologically relevant human models. Human induced pluripotent stem cell–derived cardiomyocytes (hiPSC-CMs) in three-dimensional platforms (engineered heart tissues – EHTs, organoids, heart-on-a-chip – HoC) have emerged as alternatives to animal models. This review synthesizes evidence on their application in hereditary cardiac diseases and cancer therapy–related cardiotoxicity. Objetivos: To evaluate the ability of hiPSC-CM-based 3D cardiac models to recapitulate phenotypes of hereditary cardiomyopathies, inherited arrhythmia syndromes, and anticancer therapy–induced cardiotoxicity, and to identify underlying mechanisms. Métodos: Systematic review conducted according to PRISMA guidelines. Studies published between 2019 and 2026 were identified in PubMed using descriptors related to “hiPSC-CMs”, “heart-on-a-chip”, “engineered heart tissue”, “cardiomyopathy”, and “cardiotoxicity”. Inclusion criteria: studies using hiPSC-CMs from patients or controls in 3D platforms (EHTs, HoC, organoids); evaluation of hereditary cardiomyopathies, inherited arrhythmia syndromes (long QT, CPVT, Brugada), or anticancer-induced cardiotoxicity; and reporting functional outcomes or molecular mechanisms. Studies not meeting these criteria were excluded. Data were qualitatively synthesized. Resultados e Conclusões: hiPSC-CMs reproduced features of hypertrophic and dilated cardiomyopathy, long QT syndrome (types 1–3), CPVT, and Brugada syndrome. HoC systems modeled long QT and myocardial fibrosis. Cardiovascular disease is the second leading cause of death in cancer survivors. Mechanisms including oxidative stress, mitochondrial dysfunction, and apoptosis were replicated. Endothelial cells attenuated doxorubicin cardiotoxicity in tri-culture HoC. High-throughput platforms showed dose-dependent drug responses. Limitations include structural and electrophysiological immaturity. 3D hiPSC-CM platforms recapitulate hereditary cardiomyopathies and cancer therapy–related cardiotoxicity, enabling mechanistic insights and supporting their use in precision medicine and drug screening despite current limitations.

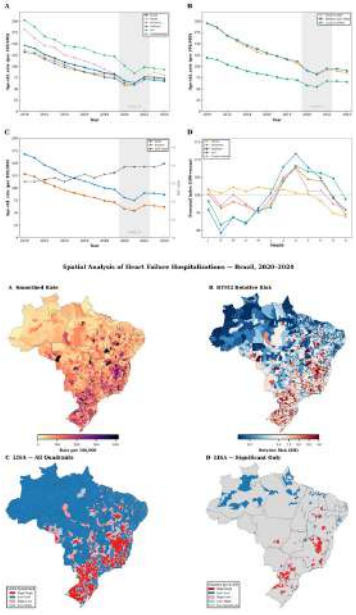
15175

A 50% DECLINE WITH RISING CASE-FATALITY, PERSISTENT HOT SPOTS, AND LATITUDE-DEPENDENT SEASONALITY: BAYESIAN MAPPING OF 3.2 MILLION HEART FAILURE HOSPITALIZATIONS IN 5,570 BRAZILIAN MUNICIPALITIES (2010-2024)

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(1) UNIVERSIDADE REGIONAL INTEGRADA DO ALTO URUGUAI E DAS MISSÕES (URI) - ERECHIM - RS - BRASIL;

Introdução/Fundamentos: Heart failure (HF) is a leading cause of cardiovascular hospitalization worldwide, especially in low and middle-income countries. In Brazil, comprehensive municipal analyses of HF distribution and trends are still lacking. No prior study applied Bayesian spatial modeling to HF across all Brasilian municipalities. Objetivos: To analyse spatiotemporal trends and spatial clustering of HF hospitalizations across all 5,570 Brazilian municipalities from 2010 to 2024, stratified by sex, age, and municipality size. Métodos: Ecological time-series study using the Brazilian Hospital Information System (SIH-SUS). All HF admissions (ICD-10: I50) from 2010 to 2024 were included. Age-standardized rates (WHO standard population) were computed per municipality, year, sex, and population size stratum. Temporal trends were assessed using joinpoint regression. Spatial autocorrelation was evaluated by Moran’s I and LISA at municipal and state levels. Disease mapping used BYM2 models (R-INLA) to estimate posterior relative risks by quinquennium. Seasonality was assessed via STL decomposition. Data were publicly available and de-identified, ethics approval was waived per Resolution CNS 510/2016. Resultados e Conclusões: A total of 3,221,730 HF hospitalizations were analyzed. Age-standardized rates declined 50%, from 145.9 to 72.8 per 100,000 (APC - 6.8%, 2010–2021; p < 0.001), with non-significant increase post-2022 (APC +3.9%; p = 0.06). In-hospital case-fatality rose from 9.0% to 13.5% (2021 peak). Male-to-female rate ratio increased from 1.31 to 1.41. Small municipalities showed rates 62% higher than large centers (169.3 vs. 104.3/100,000) but lower case-fatality (7.6% vs. 10.8%), suggesting larger centers admit more severe cases. Moran’s I confirmed strong spatial clustering (I~0.40; p < 0.001) across all three quinquennia. BYM2 identified 2,110 municipalities (37.9%) with significantly elevated relative risk in 2020–2024, concentrated in the South and Central-West regions. LISA classified 28% of municipalities as high-high clusters, stable over time. Seasonal decomposition revealed winter peaks in the Southeast (index 108–112) absent in the equatorial North (94–102). HF hospitalizations in Brazil declined 50% over 15 years, yet persistent spatial clusters and an inverse relationship between admission rates and case-fatality across municipality sizes suggest ongoing disparities in primary care access. These findings provide actionable evidence for targeted resource allocation in continental-scale health systems.



21001

ACUTE NEUROLOGICAL EVENTS AS TRIGGERS OF TAKOTSUBO SYNDROME: HIGHER INCIDENCE AND WORSE PROGNOSIS – A SYSTEMATIC REVIEW OF REGISTRIES AND COHORTS

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Introdução/Fundamentos: Patients with acute brain injury, including stroke and traumatic brain injury (TBI), have an increased risk of cardiovascular (CV) events even without prior heart disease. The brain–heart axis involves autonomic dysfunction characterized by sympathetic overactivity and reduced vagal modulation. However, the association between injury severity and subsequent CV risk has not been systematically synthesized. Objetivos: To evaluate the association between brain injury severity in stroke and TBI and adverse cardiovascular outcomes, and the potential role of autonomic dysfunction. Métodos: PRISMA-based review. PubMed was searched from 2011–2026. Cohort studies and meta-analyses including patients with stroke or TBI were eligible if they reported follow-up ≥1 year, adjusted risk estimates (HR, OR, RR), and cardiovascular outcomes including MACE, stroke, coronary artery disease, hypertension or cardiac mortality. Injury severity was assessed using NIHSS or TBI classification (mild, moderate–severe, penetrating). Data on heart rate variability, baroreflex sensitivity, and troponin were extracted. Only studies with adjusted analyses were included. Resultados e Conclusões: Eight studies involving >5.6 million participants were included. In TBI, a dose–response association was observed for composite CVD: mild (HR 1.62; 95% CI 1.58–1.66), moderate–severe (HR 2.63; 2.51–2.76), and penetrating injury (HR 4.60; 4.26–4.96). Stroke risk also increased progressively (HR 2.53, 5.32, and 12.15). A meta-analysis showed increased CVD risk (OR 1.78; 95% CI 1.39–2.29) and cardiac mortality (RR 3.07; 2.17–3.98). In stroke, elevated rates of major CV events and troponin elevation (30–60%) were reported. Neurological severity correlated with autonomic dysfunction (ρ 0.29–0.47). Right insular lesions were associated with higher mortality (HR 2.11) and new-onset atrial fibrillation (39%). Reduced heart rate variability and impaired baroreflex sensitivity were consistently observed. Beta-blocker use in TBI was associated with lower in-hospital mortality (OR 0.39; 0.30–0.51). There is a consistent dose–response association between brain injury severity and cardiovascular risk, possibly mediated by autonomic dysfunction. Patients with more severe injury and insular involvement represent a high-risk group. Findings regarding beta-blockers should be interpreted cautiously given the observational nature of the data. Limitations include study heterogeneity and lack of causal inference data

16632

ANALYSIS OF PHARMACOLOGICAL TREATMENT AND FACTORS PREVENTING ITS OPTIMIZATION IN PATIENTS WITH HFREF

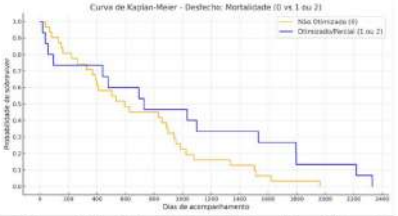
PEDRO AUGUSTO SOUZA1; CAROLINA CAMBI ANDRIETTA1; MICAEL OGURI REIS1; MARIA EDUARDA PEQUENO DA COSTA REIS1; MARCUS VINICIUS SIMÕES1;

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Introdução/Fundamentos: Heart failure (HF) presents high morbidity and mortality, along with high rates of rehospitalization. The main studies on this syndrome indicate that optimizing drug therapy reduces decompensation and deaths Objetivos: This study evaluates the incorporation of new therapies, the factors associated with non-optimization, and the clinical outcomes of optimized versus non-optimized patients. Métodos: This is a retrospective study involving data collection from electronic medical records of stable outpatients with chronic Heart Failure with reduced Ejection Fraction (HFrEF), treated in 2022 at a high-volume specialized heart failure center, with at least 18 months of follow-up. Chi square tests assessed associations while graphs and Kaplan Meier curves illustrated outcomes Resultados e Conclusões: The study population included 304 patients, 62% of whom were male, with a mean age of 59.4 years. The primary etiologies were ischemic (30.26%) and hypertensive (13.49%). Regarding functional class (NYHA), 40.46% were in class II, 35.53% in class III. Notable comorbidities included systemic arterial hypertension (61.18%) and type 2 diabetes mellitus (34.86%). Regarding drug therapy, it was observed that: 99% were using beta-blockers, with 88.10% optimized; 84% were using mineralocorticoid receptor antagonists, with 93% optimization; and 36.51% were using SGLT2 inhibitors (SGLT2i), with financial constraints being the main limiting factor. Additionally, 89.47% were using ACE inhibitors/ARBs/ARNIs, and 37% were using Angiotensin Recepto rNeprilysin Inhibitors (ARNIs). The majority of hospitalizations occurred in non-optimized patients (71.01%). A lower frequency of hospitalizations was observed in the optimized group, though without a statistically significant association (p = 0.074). Event-free survival was numerically higher in optimized vs. non-optimized patients (HR 0.86; 95% CI 0.55–1.36; p = 0.37): “Kaplan-Meier Curve 2”. Overall survival was higher among optimized patients, with a relative reduction in the risk of death (HR 0.73; 95% CI 0.39–1.35; p = 0.088). The study demonstrates that, despite the use of the main drug classes in HFrEF patients, barriers to treatment optimization persist, primarily financial and clinical. Non-optimization was associated with higher rates of hospitalization and mortality. These results reinforce the need for strategies to expand access and adherence, with low influence from therapeutic inertia, indicating good clinical practice and the medical staff’s commitment to guidelines.

Tabela 4 – Uso de cada medicação e motivos da não otimização (n = 304)

Medicação	Variável	Pacientes n (%)
Betabloqueador	Em uso	301 (99,02)
	<50% da dose alvo	31 (10,29)
	>50% da dose alvo	270 (89,70)
	Não otimizados	34 (11,18)
	• Hipotensão	16 (47,05)
	• Má adesão	5 (14,70)
	• Broncoespasmo	4 (11,76)
ARM	Em uso	258 (84,87)
	Não otimizados	63 (20,72)
	• Distúrbios do potassio	27 (42,85)
	• Função renal	17 (26,98)
INRA	Em uso	115 (37,82)
	Não otimizados	211 (69,41)
	• Em uso de IECA/BRA	75 (35,56)
	• DRC	24 (11,37)
IECA/BRA	Em uso	157 (51,64)
	Não otimizados	173 (56,91)
	• Em uso de INRA	115 (66,47)
	• Hipotensão	16 (9,24)
iSGLT2	Em uso	111 (36,51)
	Não otimizados	193 (63,49)
	• Restrição financeira	81 (41,97)
	• Inércia	35 (18,13)



Desfecho	Otimizados e Parcialmente Otimizados	Não Otimizados	HR	IC95%	p - valor
Óbito	15	21	0,73	0,39 - 1,35	0,088

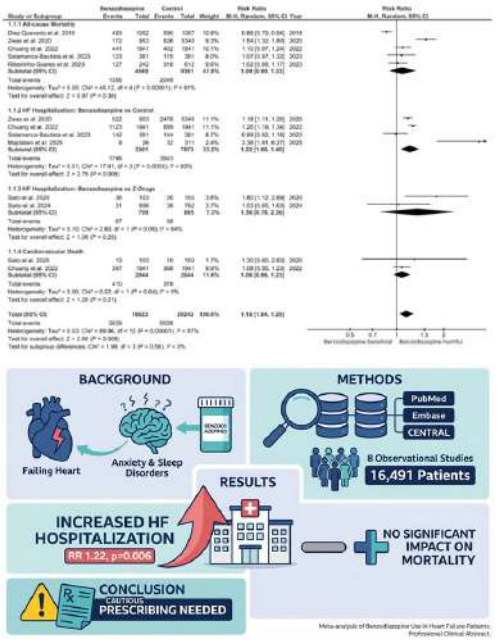
18047

BENZODIAZEPINES IN HEART FAILURE: REASSURING THERAPY OR HIDDEN RISK? A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Anxiety and insomnia are common comorbidities in patients with heart failure (HF) and have been consistently associated with worse clinical outcomes. These conditions may share underlying pathophysiological mechanisms with HF, including heightened neurohormonal activation and autonomic imbalance. Benzodiazepines (BZDs) are among the most frequently prescribed therapies for anxiety and insomnia; however, their safety profile and prognostic impact in patients with HF remain uncertain. Objetivos: To systematically evaluate the association between benzodiazepine use and clinical outcomes in patients with heart failure through a meta-analysis. Métodos: A systematic search of PubMed, Embase, and the Cochrane Central Register of Controlled Trials (CENTRAL) was performed to identify studies assessing cardiovascular and clinical outcomes in patients with HF using benzodiazepines. Eligible studies included randomized and observational designs comparing BZD users versus non-users. Pooled effect estimates were calculated using a random-effects model, and results were reported as risk ratios (RRs) with 95% confidence intervals (CI). Statistical heterogeneity was assessed using the I² statistic. Resultados e Conclusões: Eight observational studies comprising 16,491 patients (61% male; 32.4% BZD users) were included. BZD use was associated with a higher risk of adverse clinical events (RR 1.16; 95% CI 1.04–1.29; p=0.008). Compared with non-users, BZD users had a significantly increased risk of HF hospitalization (RR 1.22; 95% CI 1.06–1.40; p=0.006). No significant differences were observed in all-cause mortality (p=0.38) or cardiovascular mortality (p=0.21). In a subgroup comparison, HF hospitalization rates were not significantly different between BZDs and Z-drugs (RR 1.36; 95% CI 0.78–2.36; p=0.28). Conclusions: In patients with HF, BZP use is associated with an increased risk of HF hospitalization without a significant impact on mortality. These findings raise concerns regarding the safety of BZDs in this population and highlight the need for cautious prescribing and further prospective evaluation.



18340

BRIDGE TO TRANSPLANT OR DESTINATION THERAPY? A SYSTEMATIC REVIEW AND COMPARATIVE EFFECTIVENESS OF CONTEMPORARY LVADS VERSUS HEART TRANSPLANTATION IN ADVANCED HEART FAILURE

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Introdução/Fundamentos: Advanced heart failure remains a major global health burden associated with high morbidity and mortality despite optimized guideline-directed medical therapy. Heart transplantation is considered the gold standard treatment, offering the best long-term survival and quality of life. However, its widespread application is limited by donor organ scarcity and strict eligibility criteria. In parallel, Left Ventricular Assist Devices (LVADs) have evolved from temporary bridge-to-transplant strategies into durable destination therapy options, particularly with the advent of fully magnetically levitated centrifugal-flow pumps, which have significantly improved hemocompatibility and clinical outcomes. Objetivos: To compare survival outcomes, major adverse events, and quality of life between contemporary LVAD therapy and heart transplantation in adults with advanced heart failure, and to assess whether the outcome gap between these two strategies has narrowed in the modern era. Métodos: A systematic review was conducted following PRISMA 2020 guidelines, with a structured search in PubMed covering January 2015 to March 2025. Of 132 studies identified, 21 met inclusion criteria, comprising randomized controlled trials, prospective cohort studies, and large-scale registry analyses. Key sources included the MOMENTUM 3 trial and data from the ISHLT registry. A qualitative synthesis was performed due to substantial heterogeneity across studies. Resultados e Conclusões: The MOMENTUM 3 trial demonstrated two-year survival of approximately 81% with HeartMate 3 while the ISHLT 2023 registry data report one-year post-transplant survival of 85–90% and five-year survival near 60%. Adverse event profiles differ markedly: LVADs carry higher risks of bleeding and device-related infections, while transplantation involves lifelong immunosuppression-related complications. Both therapies improve quality of life, with LVADs providing early functional gains and transplantation maintaining superior long-term physiological outcomes. Heart transplantation remains the gold standard, however, modern LVADs have significantly narrowed the survival gap, establishing themselves as a robust destination therapy, particularly for transplant-ineligible patients. These findings underscore the importance of individualized, multidisciplinary decision-making in advanced heart failure management.

Contemporary LVAD vs. Heart Transplantation in Advanced Heart Failure

Systematic Review — Comparative Effectiveness Summary

Parameter	Contemporary LVAD (HeartMate 3)	Heart Transplantation
1-year survival	~83%	85–90%
2-year survival	~81%	~80–85%
5-year survival	~58%	~60%
Main adverse events	Bleeding, device-related infection, stroke	Rejection, opportunistic infection, nephrotoxicity
Quality of life improvement	Early functional gains	Superior long-term physiological outcomes
Patient eligibility	Broader population, including transplant-ineligible patients	Donor scarcity and strict selection criteria
Immunosuppression	Not required	Lifelong
Destination therapy	Yes	N/A

Sources: MOMENTUM 3 Trial; ISHLT Registry Data (2015–2025)

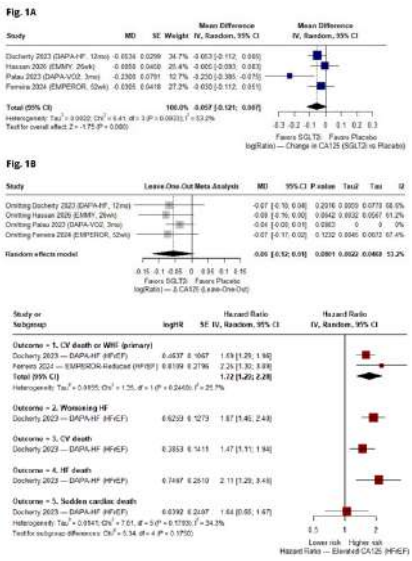
18210

CA125 AND SGLT2 INHIBITORS IN HEART FAILURE: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Carbohydrate antigen 125 (CA125) is a glycoprotein produced by mesothelial cells under mechanical stress and inflammation. It has emerged as a congestion biomarker and independent predictor of outcomes in heart failure (HF). SGLT2 inhibitors (SGLT2i) reduce HF events through mechanisms that may include extravascular decongestion. Whether SGLT2i reduces CA125 and whether baseline CA125 modifies their efficacy remain unclear, with no prior meta-analysis addressing this question. Objetivos: To evaluate the effect of SGLT2i versus placebo on CA125 levels in HF patients, and to assess the prognostic value of elevated CA125 in this population Métodos: Systematic review following PRISMA guidelines, searching PubMed, Cochrane Library, and Embase through April 2026. Studies derived from randomized controlled trials (RCTs) reporting serial CA125 in HF patients receiving SGLT2i versus placebo were included. Data were converted to log-ratio scale and pooled using inverse-variance random-effects models (DerSimonian-Laird). Heterogeneity was assessed with I² and Cochran Q. Leave-one-out sensitivity analysis was performed. Risk of bias was assessed using RoB 2. All analyses were conducted in R version 4.4 using the meta package. Resultados e Conclusões: Four RCT-derived studies were included (n=4,739). SGLT2i showed a trend toward CA125 reduction (pooled log-ratio: −0.057; 95%CI: −0.121 to 0.007; p=0.080; I²=53.2%). Leave-one-out analysis confirmed robustness, with pooled estimates ranging from −0.04 to −0.08 across iterations. In pooled prognostic analysis of 2 HFrEF studies, elevated CA125 independently predicted cardiovascular death or worsening HF (HR: 1.72; 95%CI: 1.29–2.28; I²=25.7%) after adjustment for NT-proBNP. CA125 was also predictive of worsening HF (HR: 1.87; 95%CI: 1.46–2.40), cardiovascular death (HR: 1.47; 95%CI: 1.11–1.94), and HF death (HR: 2.11; 95%CI: 1.29–3.45), but not of sudden cardiac death (HR: 1.04; 95%CI: 0.65–1.67). Conclusions: SGLT2i showed a borderline CA125 reduction. Elevated CA125 independently predicts adverse HF outcomes beyond natriuretic peptides, specifically congestion-related rather than arrhythmic mortality, reinforcing its complementary role in HFrEF risk stratification.



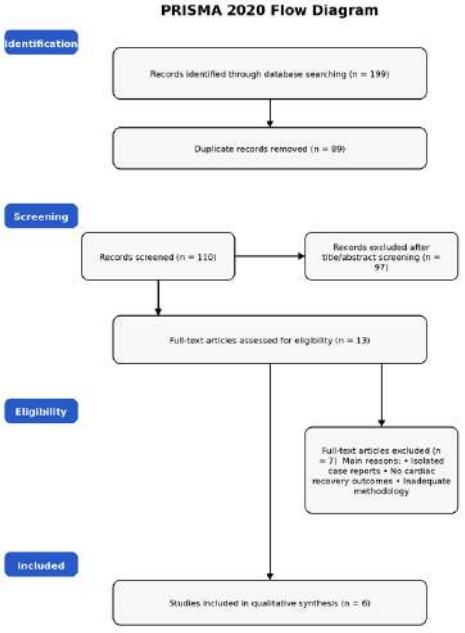
22089

CARDIAC FUNCTION RECOVERY AFTER PHEOCHROMOCYTOMA TREATMENT: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Pheochromocytoma and paraganglioma (PPGL) may cause severe cardiovascular manifestations, including Takotsubo cardiomyopathy, catecholamine-induced dilated cardiomyopathy, cardiogenic shock, malignant ventricular arrhythmias, and subclinical myocardial dysfunction. Excess catecholamine exposure promotes myocardial stunning, oxidative stress, microvascular dysfunction, and ventricular remodeling, potentially leading to acute or chronic heart failure. However, the reversibility of cardiac dysfunction after treatment remains incompletely characterized. Objetivos: To evaluate cardiac function recovery and cardiovascular outcomes following treatment of PPGL-associated cardiomyopathy. Métodos: This systematic review was conducted according to PRISMA recommendations. Literature searches were performed in PubMed/MEDLINE, Scopus, and Web of Science using terms related to “pheochromocytoma”, “paraganglioma”, “cardiomyopathy”, “Takotsubo”, and “cardiac recovery”. Eligible studies included adult patients with PPGL-associated cardiac dysfunction reporting post-treatment functional outcomes. Isolated case reports, pediatric studies, and articles without cardiac recovery assessment were excluded. Resultados e Conclusões: The included studies demonstrated significant reversibility of cardiac dysfunction following catecholamine control and adrenalectomy. Patients with Takotsubo phenotype exhibited the highest recovery rates, with ventricular function normalization exceeding 90% in some cohorts. In contrast, chronic catecholamine-induced dilated cardiomyopathy showed lower recovery rates, suggesting persistent remodeling and myocardial fibrosis. In severe presentations with cardiogenic shock, temporary mechanical circulatory support, including extracorporeal membrane oxygenation (ECMO), Impella, and intra-aortic balloon pump, was associated with significant improvement in left ventricular ejection fraction and low in-hospital mortality. Speckle-tracking studies demonstrated reversal of subclinical myocardial dysfunction after adrenalectomy, even in patients with preserved LVEF. Early diagnosis and surgical treatment were consistently associated with better recovery and prognosis. PPGL-associated cardiomyopathy demonstrates high potential for reversibility following appropriate treatment, particularly in acute catecholamine-mediated phenotypes such as Takotsubo cardiomyopathy. Early recognition, hemodynamic stabilization, and adrenalectomy appear critical for cardiac recovery and improved cardiovascular outcomes.



18281

CARDIAC REMODELING ASSOCIATED WITH THE USE OF ANABOLIC-ANDROGENIC STEROIDS AND ITS IMPLICATIONS FOR LEFT VENTRICULAR HYPERTROPHY AND THE RISK OF HEART FAILURE: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: The use of anabolic-androgenic steroids (AAS) has increased among athletes and the general population and is associated with adverse cardiovascular effects. Among these, left ventricular hypertrophy (LVH) stands out, as it may progress to the development of heart failure. AAS promote structural and functional cardiac remodeling, including increased ventricular mass and reduced systolic function. Objetivos: To analyze the association between AAS use, the development of left ventricular hypertrophy, and the subsequent risk of heart failure. Métodos: A systematic review based on the PRISMA protocol was conducted. The search was performed in the PubMed and SciELO databases up to December 2025, using descriptors such as “anabolic steroids,” “left ventricular hypertrophy,” and “heart failure,” combined with Boolean operators (AND/OR). Observational studies, clinical trials, and systematic reviews published in English and Portuguese that evaluated structural and functional cardiac parameters in AAS users were included. Study selection involved an initial screening of titles and abstracts, followed by full-text analysis. Duplicates and studies unrelated to the topic were excluded. A total of 10 studies were identified, of which 5 were included after exclusions. Resultados e Conclusões: A significant association between AAS use and cardiac impairment was observed. A retrospective cohort study including 1,189 AAS users and 59,450 controls, with a mean follow-up of 11 years, demonstrated an almost ninefold increased risk of developing cardiovascular disease (adjusted hazard ratio (aHR 8.90; 95% CI 4.99-15.88). The risk of heart failure was 3.63 times higher among AAS users (aHR 3.63; 95% CI 2.01-6.55). Additionally, another study reported an increase in left ventricular mass of +28.3 g during an average 16-week cycle of AAS use, with a positive correlation with weekly dose. Although partial reversibility was observed after months without use, prolonged exposure may lead to irreversible damage. Therefore, AAS use is associated with the development of LVH, an important risk factor for heart failure. These findings highlight the need for increased awareness, the implementation of public health strategies to reduce misuse of these substances, and rigorous cardiovascular assessment in individuals with a history of AAS use.

Authors (Year)	Study Design	Main Cardiac Findings	Key Findings
Windfeld-Mathiasen J, et al. (2025)	Comparison between steroid users vs controls	aHR 8.90 for cardiovascular diseases; aHR 3.63 for heart failure	Significantly higher risk of cardiovascular diseases and heart failure in AAS users.
Smit DL, et al. (2021)	Longitudinal follow-up of AAS users with echocardiography	Increase of 28.3 g in left ventricular mass; 4.9% reduction in LVEF	LVH and systolic dysfunction induced by AAS, with reversibility after cessation.
Cavalcante DN, et al. (2025)	Quantitative synthesis of observational studies	Reduction in LVEF (MD -2.25%); increased septal thickness (MD 1.24 mm) and posterior wall thickness (MD 1.09 mm); increase in LV mass (MD 13.29 g)	Adverse cardiac remodeling in AAS users.
Fyksen TS, et al. (2025)	Cross-sectional assessment of cardiac structure and function	Increased LV wall thickness; reduced GLS	Association between AAS use and structural and functional LV alterations.
Alhusban Z, et al. (2025)	Combined aggregated evidence + clinical illustration	Left ventricular hypertrophy, myocardial fibrosis, and diastolic dysfunction	Severe cardiac complications, including steroid-induced cardiomyopathy.

19884

CHAGASIC VS. NON-CHAGASIC HFREF ON DOBUTAMINE: CLINICAL CHARACTERISTICS AND IN-HOSPITAL OUTCOMES

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Introdução/Fundamentos: Advanced heart failure with reduced ejection fraction (HFrEF) carries high in-hospital mortality. Patients requiring inotropic support with dobutamine represent a particularly high-risk population, heterogeneous in etiology. Chagas cardiomyopathy, still endemic in Latin America, may confer a distinct clinical profile compared to non-chagasic etiologies, with potential implications for management and prognosis. Objetivos: To compare clinical characteristics, comorbidities, in-hospital management and outcomes between HFrEF patients on dobutamine, according to chagasic vs. non-chagasic etiology. Métodos: Retrospective, single-center cohort of 67 hospitalized HFrEF patients on dobutamine. Continuous variables were compared using the Mann-Whitney U test and categorical variables using Fisher’s exact test, with a significance level of 5%. Resultados e Conclusões: Non-chagasic patients (n=26) had higher prevalence of coronary artery disease or prior myocardial infarction (42.3% vs. 9.8%; p=0.003) and systemic arterial hypertension (61.5% vs. 29.3%; p=0.012), reflecting a predominantly ischemic-hypertensive background. Chagasic patients (n=41) presented lower admission heart rate (68 vs. 77 bpm; p=0.036), higher amiodarone use (65.9% vs. 38.5%; p=0.043) and greater prevalence of pacemaker implantation (26.8% vs. 3.8%; p=0.021), consistent with conduction system involvement typical of Chagas disease. Left ventricular ejection fraction was lower in chagasic patients (25% vs. 32%; p=0.023). Non-chagasic patients required orotracheal intubation more frequently (30.8% vs. 7.3%; p=0.018) (Figure 1). In-hospital outcomes were similar: mortality (41.5% vs. 42.3%; p=1.000), composite endpoint of death or 3-month readmission (63.4% vs. 65.4%; p=1.000) and length of stay (20.0 vs. 15.5 days; p=0.444) (Figure 2). Chagasic and non-chagasic patients with HFrEF on dobutamine present distinct clinical profiles — greater ischemic-hypertensive burden in non-chagasic patients and greater conduction system involvement in chagasic patients. Despite these differences, in-hospital morbimortality was equally high in both groups, suggesting that at this advanced stage of disease, etiology alone does not determine prognosis.



20373

CLINICAL OUTCOMES AND PREDICTORS OF IN-HOSPITAL MORTALITY IN ADVANCED HFREF REQUIRING DOBUTAMINE: A MULTIVARIATE ANALYSIS

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Introdução/Fundamentos: Advanced heart failure with reduced ejection fraction (HFrEF) requiring inotropic support represents the most severe end of the disease spectrum, with markedly elevated in-hospital mortality. Identifying independent predictors of death in this population is critical for risk stratification and therapeutic intensification before refractory decompensation, particularly in settings with heterogeneous access to optimized medical therapy. Objetivos: To identify independent predictors of in-hospital mortality and three-month composite morbimortality in patients with HFrEF receiving dobutamine. Métodos: Retrospective, single-center cohort of 67 consecutive adult patients with HFrEF on intravenous dobutamine. Clinical, echocardiographic, laboratory and pharmacological variables were analyzed. Candidate predictors were selected by p<0.10 in univariate analysis combined with biological plausibility; intubation and dialysis were excluded due to reverse causality. Standard multivariate logistic regression was performed; discrimination was assessed by AUC-ROC with bootstrap 95% CI (1,000 resamples) and calibration by Hosmer-Lemeshow test. Resultados e Conclusões: In-hospital mortality was 41.8% (n=28) and composite outcome 64.2%, in a severely ill population (median LVEF 26%; NYHA IV in 58.2%; 61.2% Chagas etiology). Only 20.9% received the four pillars of guideline-directed therapy and no patient used sacubitril/valsartan, likely reflecting hemodynamic contraindications and socioeconomic barriers to access in this public hospital cohort (Figure 1). The final model (AUC=0.804; 95% CI 0.695–0.901; H-L p=0.574) identified three independent predictors: mitral regurgitation grade (OR=3.13; 95% CI 1.43–6.84; p=0.004), reflecting advanced ventricular remodeling; serum sodium (OR=0.86 per mEq/L; 95% CI 0.75–0.98; p=0.023), a marker of neurohormonal activation; and dapagliflozin at admission (OR=0.20; 95% CI 0.06–0.70; p=0.012), suggesting a protective association, though limited by possible indication bias. All three predictors remained significant in sensitivity analysis (n=50) (Figure 2). The convergence of mechanical, neurohormonal and pharmacological predictors reflects multifactorial risk in this population. Early recognition of hyponatremia and mitral regurgitation may identify candidates for therapeutic intensification before the window of intervention is lost to dobutamine dependence. The marked undertreatment observed reinforces the urgent need for optimized medical therapy at earlier stages of disease progression.





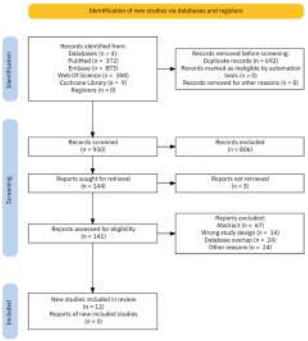
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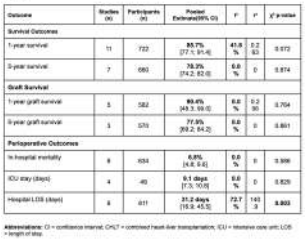
COMBINED HEART-LIVER TRANSPLANTATION: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Combined heart–liver transplantation (CHLT) is an increasingly used strategy for selected patients with concomitant advanced cardiac and liver disease. However, outcome estimates remain limited by small observational cohorts and heterogeneous indications. Objetivos: To provide pooled estimates of patient survival, graft survival, and perioperative outcomes after CHLT. Métodos: PubMed, Embase, Web of Science, and Cochrane Library were searched from inception to March 2026. Full-text studies including adults undergoing CHLT and reporting at least one outcome of interest were eligible. Random-effects models estimated pooled proportions or means with 95% confidence intervals (95% CI). For overlapping cohorts, the study with the longest temporal coverage was prioritized. The review was prospectively registered in PROSPERO and reported according to PRISMA 2020. Resultados e Conclusões: Twelve observational studies comprising 735 patients were included, most of which reported mixed indications for CHLT. The most common cardiac indications were non-ischemic cardiomyopathy (n=293; 39.9%) and congenital heart disease (n=282; 38.4%). Among patients with available liver-specific indications, cardiac cirrhosis was the leading indication for liver transplantation (n=73; 51.4%), followed by amyloidosis (n=36; 25.4%). Overall, the majority of patients were male (n=480/682; 70.3%), with a mean age of 46.2 ± 16.8 years. Mean MELD and MELD-XI scores were 14.3 ± 6.7 and 14.3 ± 6.8, respectively, and mean ejection fraction was 34.5 ± 20.8%. Pooled patient survival was 85.7% at 1 year (95% CI, 77.1-91.4; I²=41.6%) and 78.3% at 5 years (95% CI, 74.2-82.0; I²=0.0%). Pooled combined graft survival was 90.4% at 1 year (95% CI, 48.3-99.0; I²=0.0%) and 77.5% at 5 years (95% CI, 69.2-84.2; I²=0.0%). In-hospital mortality was 6.8% (95% CI, 4.8–9.6; I²=0.0%). Postoperative resource use was substantial, with a mean ICU stay of 9.1 days (95% CI, 7.3–10.8; I²=0.0%) and a mean hospital stay of 31.2 days (95% CI, 16.9–45.5; I²=72.7%). Despite its complexity, CHLT was associated with preserved mid-term survival and apparently favorable graft survival, although the 1-year graft estimate was highly imprecise. These findings should be interpreted in light of clinical heterogeneity, center-level differences, and the observational nature of the included studies. Nevertheless, CHLT appears feasible in experienced centers with rigorous selection criteria and individualized multidisciplinary assessment.





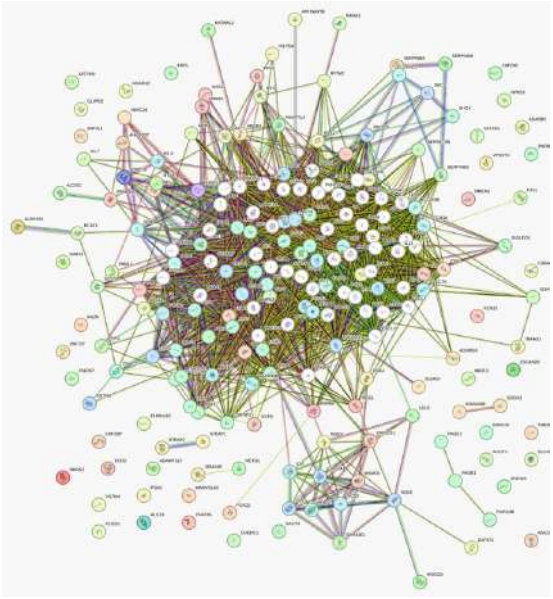
15973

COMPUTATIONAL DISSECTION OF THE TRANSCRIPTOMIC LANDSCAPE IN LIGHT-CHAIN AMYLOIDOSIS

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Introdução/Fundamentos: Cardiac amyloidosis is classified into light-chain (AL) and transthyretin forms. The former tends to result in fatal outcomes due to early systemic involvement preceding heart failure. The literature already acknowledges the influence of risk factors on clinical outcomes; however, bioinformatic analysis of gene expression may promote new hypotheses and study designs, opening possibilities for therapeutic interventions. Objetivos: To evaluate gene expression patterns and protein-protein interaction networks (PPINs) in cell lines expressing light-chains from patients with AL amyloidosis, aiming to identify Hub and Bottleneck genes with potential as therapeutic targets of interest. Métodos: Gene expression data were obtained from the National Center for Biotechnology Information (NCBI) at the Gene Expression Omnibus (GEO) datasets under the identification number GSE176119. Differentially expressed genes between the amyloidosis and control groups were evaluated using GEO2R. We used the resulting gene list as input for PPINs analysis performed with STRING. Hub and Bottleneck genes were subsequently identified using network topology algorithms implemented in CytoHubba, and the 10% most relevant genes were selected for further analysis. Resultados e Conclusões: The computational transcriptomic analysis in STRING generated 212 nodes and 3,351 edges. When imported into Cytohubba, it yielded 6 Hub genes (JUN, IL6, STAT3, IL1B, NFKB1 and TNF), 5 Bottleneck genes (CD4, HIF1A, TP53, EGR2 and SQLE), and 4 Hub-Bottleneck genes (MYC, AKT1, FOS and ACTB). Of these, 66.7%, 40% and 50%, respectively, were directly related to the pathophysiology of infiltrative heart diseases, cardiomyopathy, and heart failure. Among the Hub genes, JUN overexpression has been associated with cardiac hypertrophy, whereas its inhibition has been reported to reduce hypertrophic remodeling. Similarly, IL1B inhibition has been associated with attenuation of both cardiac hypertrophy and fibrosis. Among the Hub–Bottleneck genes, AKT1 expression has been documented as being involved in the induction of heart failure. The analysis demonstrates that the identified molecular interactions reinforce the relevance and potential of bioinformatics as a valuable tool for guiding pharmacogenetic and nanotechnology-based research strategies aimed at improving prognosis in patients with AL amyloidosis.



18570

DXA-DERIVED FAT MASS TO FAT-FREE MASS RATIO AND ITS ANTHROPOMETRIC AND METABOLIC CORRELATES IN MIDDLE-AGED PATIENTS WITH HEART FAILURE

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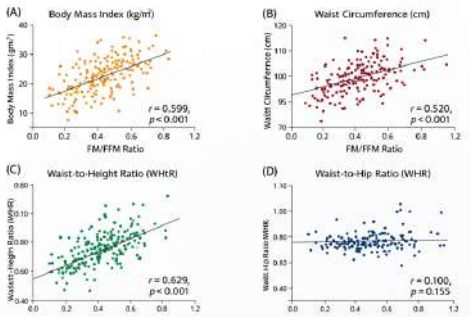
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Introdução/Fundamentos: Adiposity plays a key role in the metabolic and clinical profile of patients with heart failure (HF), but conventional anthropometric measures may inadequately reflect body fat distribution. Dual-energy X-ray absorptiometry (DXA) provides a more accurate assessment, although its correlates remain unclear. Objetivos: To investigate DXA-derived adiposity in middle-aged patients with HF, emphasizing the fat mass to fat-free mass ratio (FM/FFM) as a marker of relative adiposity excess, and its association with anthropometric and metabolic parameters. Métodos: In this cross-sectional study, patients aged 40–64 years with established HF from a tertiary center were evaluated. DXA assessed body fat percentage (%BF) and FM/FFM, with high %BF defined as >25% in men and >35% in women. Anthropometric parameters included waist circumference (WC), waist-to-height ratio (WHtR), and waist-to-hip ratio (WHR). Laboratory measures included glycated hemoglobin (HbA1c) and triglyceride-to–high-density lipoprotein (HDL) ratio. HF phenotype was defined by New York Heart Association (NYHA) class, ejection fraction, and ischemic etiology. Spearman's correlation, one-way ANOVA, and linear regression were used for analyses, including trend assessment across FM/FFM quartiles. Resultados e Conclusões: A total of 203 patients were included (median age 57 years [IQR 51–61], 54.7% male). Reduced ejection fraction was present in 38.4%, 59.1% were NYHA III–IV, and 54.7% had ischemic etiology. Diabetes and prediabetes were observed in 46.3% and 33.5%, respectively, while 63.5% had high %BF. Mean FM/FFM was 0.48 ± 0.22. FM/FFM correlated with BMI (r = 0.599; p < 0.001), WC (r = 0.520; p < 0.001), and WHtR (r = 0.629; p < 0.001), but not with WHR (p = 0.155). HbA1c did not differ across FM/FFM quartiles (p = 0.679). In contrast, triglyceride-to-HDL ratio differed significantly (p = 0.001) and increased progressively across quartiles (B = 0.466; 95% CI 0.071–0.860; p for trend = 0.021). These findings indicate that FM/FFM captures metabolically relevant adiposity beyond traditional anthropometric measures and is associated with adverse lipid profile. Moreover, its consistent correlation with BMI, WC, and WHtR—but not WHR—suggests that waist-to-hip ratio may be a less reliable marker of adiposity in patients with HF.

Table 1 – Baseline characteristics of the study population (n = 203)

Variable	Value
Age, years	57 (IQR 51–61)
Male sex, n (%)	111 (54.7)
LVEF ≤40%, n (%)	91 (44.8)
NYHA class III–IV, n (%)	120 (59.1)
Ischemic etiology, n (%)	111 (54.7)
Diabetes, n (%)	94 (46.3)
Prediabetes, n (%)	68 (33.5)
High body fat, n (%)	129 (63.5)
FM/FFM ratio	0.48 ± 0.22

Note: Data are presented as median (interquartile range) or n (%). FM/FFM = fat mass to fat-free mass ratio; LVEF = left ventricular ejection fraction; NYHA = New York Heart Association.



15038

EARLY IN-HOSPITAL INITIATION OF SGLT2 INHIBITORS IN PATIENTS HOSPITALIZED FOR ACUTE DECOMPENSATED HEART FAILURE: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Early initiation of sodium-glucose cotransporter 2 inhibitors (SGLT2i) during hospitalization for acute decompensated heart failure (ADHF) has emerged as a promising therapeutic strategy. However, evidence regarding its impact on clinical outcomes remains limited and heterogeneous. Objetivos: To evaluate the effects of early in-hospital initiation of SGLT2i on clinical outcomes in patients hospitalized for ADHF. Métodos: We conducted a systematic review and meta-analysis in accordance with PRISMA guidelines. Randomized controlled trials evaluating in-hospital initiation of SGLT2i (dapagliflozin, empagliflozin, or sotagliflozin), compared with placebo or usual care in adults hospitalized for ADHF, were included. PubMed, Embase, and the Cochrane Central Register of Controlled Trials were systematically searched through March 2026. The primary outcomes were all-cause mortality and heart failure events (HFE), including rehospitalization when available. Secondary outcomes included cardiovascular (CV) mortality. Risk ratios (RR) with 95% confidence intervals (CI) were pooled using a random-effects model. Risk of bias was assessed using the Cochrane RoB 2 tool. Resultados e Conclusões: We included 5 randomized controlled trials comprising 2,128 patients. Mean follow-up ranged from 1 to 9 months. Early in-hospital initiation of SGLT2 inhibitors was associated with a significant reduction in HFE, including rehospitalizations (RR 0.76; 95% CI 0.62–0.93; p=0.007). Reductions in all-cause mortality (RR 0.77; 95% CI 0.58–1.01; p=0.06) and CV mortality (RR 0.87; 95% CI 0.61–1.23; p=0.42) did not reach statistical significance, although effect estimates consistently favored SGLT2i. These findings support that early in-hospital initiation of SGLT2i reduces heart failure-related morbidity, particularly recurrent decompensation, without a significant impact on mortality. The effect on mortality in the acute setting remains uncertain and warrants further investigation.

Figure 1A. All-cause mortality was not significantly lower in the SGLT2 inhibitor group.

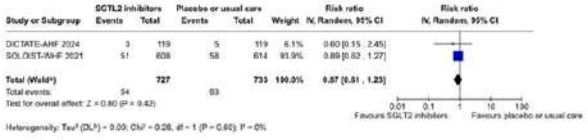
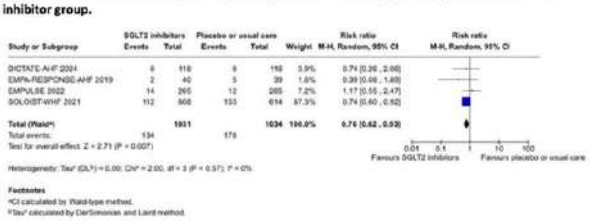


Figure 1B. Heart failure events, including rehospitalizations, were significantly lower in the SGLT2 inhibitor group.



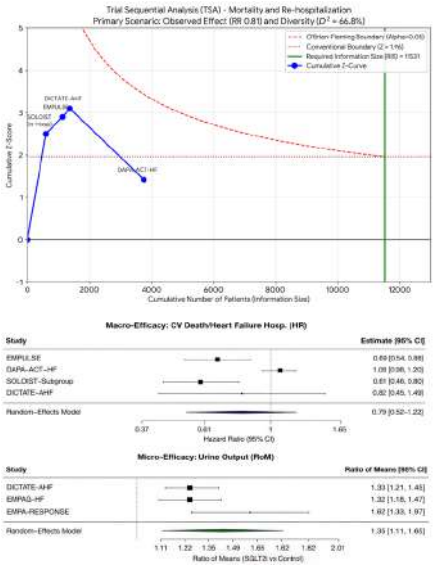
19046

EFFECT OF EARLY IN-HOSPITAL INITIATION OF SGLT2 INHIBITORS ON CLINICAL OUTCOMES AND DECONGESTION IN ACUTE HEART FAILURE: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CLINICAL TRIALS

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Introdução/Fundamentos: Acute heart failure (AHF) is associated with a high risk of early post-hospitalization events. Despite early incorporation of SGLT2 inhibitors (SGLT2i) into guidelines, their short-term clinical impact remains uncertain due to trial heterogeneity and limited sample size. It is also unclear whether benefits reflect prognostic effects or immediate physiological responses. Objetivos: To evaluate the clinical and decongestive efficacy of early SGLT2i initiation in AHF and assess the robustness of the available evidence. Métodos: Systematic review conducted according to PRISMA 2020. MEDLINE, Embase, and Cochrane were searched through March 2026. Randomized clinical trials evaluating SGLT2i initiation within 72 hours of admission were included. Risk of bias was assessed using RoB 2 and certainty of evidence using GRADE. Random-effects models (REML) with Knapp-Hartung adjustment were applied. Effect measures included HR, RR, and ratio of means (RoM) with 95% CI. Heterogeneity was assessed by I². Trial Sequential Analysis (α=5%, power=80%, RRR=20%) evaluated evidence robustness. Pre-specified subgroup analyses were performed according to timing of initiation (<24h vs 24–72h) and study size Resultados e Conclusões: Fourteen RCTs (n≈4.000) were included; 4 contributed to the primary outcome. No significant reduction in cardiovascular death or heart failure rehospitalization was observed (HR 0.79; 95% CI 0.52–1.22; I²=87%). Trial Sequential Analysis showed that only 32% of the required information size was achieved (RIS=11,531), indicating insufficient evidence and risk of type II error. Early diuresis significantly increased (RoM 1.33; 95% CI 1.21–1.45), with consistent direction but lower precision in subsequent analyses. No increased risk of renal dysfunction was observed (RR 1.04; 95% CI 0.90–1.21). No significant interaction was observed according to timing of initiation (p=0.445). Evidence certainty was low to moderate due to imprecision and heterogeneity. In conclusion, although SGLT2i improve early decongestion in AHF, they did not demonstrate robust clinical benefit during the in-hospital phase, suggesting predominance of physiological effects without consistent short-term clinical impact. These findings support the use of SGLT2i as adjunctive decongestive therapy rather than as a strategy for immediate prognostic improvement



20821

EFFECTIVENESS AND SAFETY OF SEQUENTIAL NEPHRON BLOCKADE IN HEART FAILURE PATIENTS FOLLOWED IN A SPECIALIZED OUTPATIENT CLINIC

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Introdução/Fundamentos: Persistent congestion and diuretic resistance are associated with worse prognosis in heart failure (HF). Sequential nephron blockade (SNB), combining diuretics acting at different tubular sites, has emerged as a strategy to enhance natriuresis and decongestion, although evidence in outpatient and real-world settings remains limited. Objetivos: To evaluate the effectiveness and safety of SNB in HF patients followed in a specialized outpatient clinic. Métodos: This retrospective observational study included HF patients followed in a specialized outpatient clinic, divided according to the use of optimized HF therapy alone or additional SNB, defined as concomitant use of hydrochlorothiazide and/or acetazolamide. Among SNB patients, 93.1% received hydrochlorothiazide, 6.9% acetazolamide, and one patient received both agents. Median outpatient follow-up was 756 days in the SNB group and 511 days in the non-SNB group. Clinical, laboratory, and echocardiographic variables were assessed, including renal function, electrolyte abnormalities, NT-proBNP levels, and diuretic use. Continuous variables were compared using Student's t-test, while categorical variables were analyzed using chi-square or Fisher's exact tests, as appropriate. Statistical significance was set at 5%. Analyses were performed using Jamovi software. Resultados e Conclusões: A total of 191 patients were included, of whom 28 received SNB. Patients in the SNB group showed higher prevalence of atrial fibrillation (46.4% vs 26.1%; p=0.041), higher prevalence of furosemide use (92.9% vs 75.6%; p=0.047), higher prevalence of renal dysfunction defined as eGFR <60 mL/min/1.73m² (67.8% vs 37.3%; p=0.001), and higher NT-proBNP levels [2615 (814–6400) vs 1227 (506–2541) pg/mL; p=0.069], suggesting greater clinical severity and congestion burden. No significant difference was observed in hyperkalemia between groups (7.1% vs 7.3%; p=1.0). These findings suggest that SNB is predominantly used in patients with more advanced HF and possible diuretic resistance, without a substantial increase in laboratory complications. In a real-world outpatient setting, SNB demonstrated an acceptable safety profile, supporting its role as an adjunctive therapeutic strategy in selected HF patients.

Table 1. Clinical and laboratory comparison between patients with and without Sequential Nephron Blockade (SNB).

Variable	BNS (n=28)	No BNS (n=163)	p-value
Age (years), median (IQR)	64 (53.8–72.5)	62 (50.5–72.0)	0,430
Male sex, n (%)	19 (67.9%)	89 (54.3%)	0,219
LVEF (%), median (IQR)	30.5 (23.0–36.3)	32.0 (25.8–40.0)	0,490
Chronic kidney disease, n (%)	13 (46.4%)	57 (35.4%)	0,293
Atrial fibrillation, n (%)	13 (46.4%)	42 (26.1%)	0,041
Furosemide use, n (%)	26 (92.9%)	121 (75.6%)	0,047
eGFR (mL/min/1.73m²)	54.0 ± 25.8	66.7 ± 28.7	0,066
Hyperkalemia, n (%)	2 (7.1%)	12 (7.3%)	1,000
Weight gain, n (%)	13 (50%)	76 (52.4%)	0,835
NT-proBNP (pg/mL), median (IQR)	2615 (814–6400)	1227 (506–2541)	0,069
eGFR <60 mL/min/1.73m², n (%)	19 (67.8%)	60 (37.3%)	0,001

Note: Continuous variables were analyzed using Student's t-test and categorical variables using the chi-square or Fisher's exact test. Statistical significance was set at p<0.05. Analyses were performed using jamovi.

18523

ELECTROCARDIOGRAPHIC FINDINGS AND VOLTAGE-TO-LEFT VENTRICULAR MASS RATIO IN PATIENTS WITH CARDIAC AMYLOIDOSIS: A TERTIARY CENTER COHORT ANALYSIS

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Introdução/Fundamentos: Cardiac amyloidosis (CA) has gained increasing relevance due to population aging, advances in noninvasive diagnostic methods, and the availability of disease-modifying therapies, yet it remains underdiagnosed. The electrocardiogram (ECG) is a widely available tool that may raise clinical suspicion. The voltage-to-mass ratio (VMR) has been proposed as a complementary parameter to help differentiate CA from other hypertrophic phenotypes, although it is not routinely used in clinical practice. Objetivos: To describe electrocardiographic findings, including the voltage-to-mass ratio, in patients with confirmed CA followed at a specialized cardiology clinic. Métodos: Retrospective observational study including patients with confirmed CA (ATTRv, ATTRwt, or AL) evaluated between 2023 and 2026. ECG analysis included rhythm, heart rate, axis, PR interval, QTc (Bazett), QRS duration, low voltage criteria (<0.5 mV in limb leads, <1.0 mV in precordial leads), SV1+RV5, conduction disturbances, pseudo-infarction patterns, and R-wave progression. VMR was calculated as SV1+RV5 divided by left ventricular mass indexed to body surface area (mV/kg/m²), with lower values (previously reported as <17.9) suggesting a higher likelihood of CA. The study was approved by the local ethics committee. Resultados e Conclusões: Thirty-three patients were included: 66% ATTRv, 19% ATTRwt, and 15% AL; 66% were male, with mean age of 71 ± 12 years. Sinus rhythm was present in 70%, atrial fibrillation in 18%, and pacemaker rhythm in 12%. Mean heart rate was 72 ± 12 bpm, PR interval 212 ± 47 ms, QTc 446 ± 35 ms, QRS duration 101 ± 22 ms, and SV1+RV5 1.16 ± 0.5 mV. Low voltage was present in 42% of limb leads and 13% of precordial leads. First-degree atrioventricular block occurred in 44%, and left anterior fascicular block in 35%. Pseudo-infarction pattern was observed in 70%, and poor R-wave progression in 64%. Mean left ventricular ejection fraction was 55 ± 13%, with 61% preserved EF. Left ventricular mass index was 140 ± 66 g/m², and mean VMR was 8.9 ± 7.9 mV/kg/m². Pseudo-infarction patterns, low voltage, and conduction abnormalities were frequent findings in this cohort. The voltage-to-mass ratio was markedly reduced compared with previously reported reference values, supporting its potential role as a complementary noninvasive parameter to increase clinical suspicion and aid in the differential diagnosis of cardiac amyloidosis.

16011

HEALTH INSURANCE AS A SOCIOECONOMIC PROXY IN DECOMPENSATED HEART FAILURE: MORTALITY GRADIENTS SHAPED BY HOSPITAL CONTEXT

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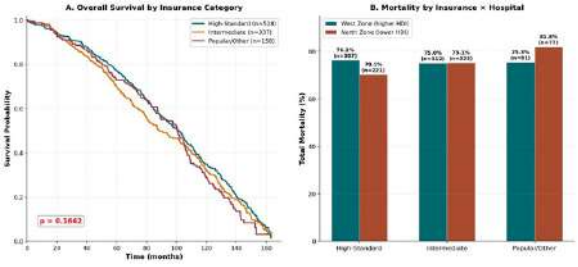
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Introdução/Fundamentos: In the Brazilian supplementary healthcare system, health insurance tier reflects socioeconomic status and shapes access to specialized post-discharge care. Whether insurance category functions as an independent social determinant associated with differential mortality in DHF, and whether hospital context modifies this relationship remains underexplored. Objetivos: To analyze the association between health insurance category and mortality in DHF patients at two private tertiary centers in contrasting socioeconomic zones, and to evaluate the interaction between insurance tier and hospital context. Métodos: Retrospective cohort of 1,023 DHF patients (two centers, West Zone HDI 0.959 vs. North Zone HDI 0.814; median follow-up 6.9 years, IQR 4.4–9.9) classified by insurance: high-standard (n=528; 51.6%), intermediate (n=337; 32.9%), and popular/other (n=158; 15.4%). Estimated household income (derived from occupation, residential neighborhood, and PNAD survey data) validated the socioeconomic gradient. Kaplan-Meier curves, logistic regression, and hospital-stratified subgroup analyses were performed. Resultados e Conclusões: Median household income decreased progressively: R$5,512 (IQR 3,600–7,200), R$4,134 (IQR 3,465–4,500), and R$2,668 (IQR 2,079–2,700) for high-standard, intermediate, and popular/other, respectively. Total mortality increased across categories: 389/528 (73.7%) vs. 253/337 (75.1%; P=0.691) vs. 124/158 (78.5%; P=0.251 vs. reference). Insurance distribution differed markedly by hospital zone (P<0.001; Cramer's V=0.8), consistent with geographic socioeconomic clustering. The insurance–hospital interaction was numerically relevant: popular/other patients at the North Zone had 63/77 (81.8%) mortality vs. 61/81 (75.3%) at the West Zone (P=0.340). Although marginal p-values for insurance alone were non-significant, possibly reflecting confounding by hospital location, the progressive income gradient and institutional amplification of disadvantage support health insurance tier as a pragmatic marker of social vulnerability in DHF, particularly within the healthcare delivery context.

Table. Clinical and Mortality Profile by Health Insurance Category (n=1,023)

Characteristic	High-Standard (n=528)	Intermediate (n=337)	Popular/Other (n=158)	P-value
Income, median (IQR), R$	5,512 (3,600–7,200)	4,134 (3,465–4,500)	2,668 (2,079–2,700)	<0.001
Age, median (IQR), years	77 (67–85)	80 (71–86)	78 (69–84)	NS
LVEF, median (IQR), %	44 (33–58)	48 (36–59)	45 (34–54)	NS
BNP, median (IQR), pg/mL	2,120 (954–6,638)	3,500 (1,360–10,200)	2,045 (844–5,452)	NS
Follow-up, median (IQR), years	7.1 (4.7–9.9)	6.0 (4.0–9.8)	7.4 (4.5–9.7)	NS
North Zone, n (%)	221 (41.9%)	225 (66.8%)	77 (48.7%)	<0.001
Brown/Black, n (%)	52 (9.8%)	24 (7.1%)	4 (2.5%)	0.009
Total mortality, n (%)	389 (73.7%)	253 (75.1%)	124 (78.5%)	0.251*
In-hospital mortality, n (%)	61 (11.6%)	33 (9.8%)	16 (10.1%)	0.669*
Popular @ North Zone mort.	–	–	63/77 (81.8%)	–
Popular @ West Zone mort.	–	–	61/81 (75.3%)	0.340†

*vs. High-Standard (Fisher's exact). †North Zone vs. West Zone within Popular/Other. LVEF=left ventricular ejection fraction; BNP=B-type natriuretic peptide.



20374

HEART FAILURE POST PULMONARY EMBOLISM: A PROSPECTIVE OBSERVATIONAL FOLLOW UP STUDY

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Introdução/Fundamentos: Venous thromboembolism as DVT or PE, third most frequent acute cardiovascular syndrome .Heart failure secondary to pulmonary embolism is underdiagnosed and potentially life-threatening complication of deep vein thrombosis. Death usually occurs due to right ventricular failure in the setting of sustained hypotension and cardiogenic shock.The aim of this study was to evaluate & follow patients with Acute Pulmonary Embolism Objetivos: To Observe the effect of PE on RV and LV function on admission, discharge & follow up On Folow up - MACE or any Recurrent Venous thrombotic events Métodos: A prospective observational study entitled "Assessment of right & left ventricular functions in patients with Pulmonary embolism: An observational study" was conducted from Mar 2019 to April 2022 in the Department of Cardiology, Superspeciality hospital, North India.The study was conducted after securing informed consent from patients or attendants for participation in the study. Resultados e Conclusões: Patients were categorized as those (1) without RVD (125 patients [53.1%])(2) with RVD regression (RVD on admission but not at discharge or first follow up); 52 patients [22.1%])(3) with persistent RVD (RVD on admission, discharge & follow up; 26 patients [11.0%]), and (4) With both RVD & LVD at admission, discharge & follow up; 32 patients [13.6%]. After a mean ± SD of 2.1 ± 0.6 years, patients with RVD & LVD persistence showed an increased risk of recurrent VTE (12 patients, 5.1% patient-years) compared with those with only RVD (8 patients, 3.4% patient-years), without RVD (4 patients, 1.7% patient-years) or RVD regression (3 patients, 1.2% patient-years) (P = .001). 11of 18 deaths related to pulmonary embolism occurred in patients with RVD & LVD persistence. At multivariate analysis, adjusted by anticoagulant treatment duration, RVD persistence was an independent predictor of recurrent VTE (hazard ratio, 3.79; P<.001).

22105

IMPACT OF ACCELERATED ADRENERGIC BLOCKADE ON LONG-TERM REVERSE VENTRICULAR REMODELING AND BNP KINETICS: A 12-MONTH MECHANISTIC ANALYSIS OF A RANDOMIZED TRIAL

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Introdução/Fundamentos: Left ventricular reverse remodeling (LVRR) is the definitive structural surrogate for improved prognosis in HFrEF. While beta-blockers are known catalysts for LVRR, the relationship between the speed of achieving target doses and the magnitude of structural recovery remains poorly defined. Furthermore, the role of B-type Natriuretic Peptide (BNP), as a marker of parietal stress, may serve as a biological guide for the safety and efficacy of this therapeutic progression, predicting long-term structural success. Objetivos: To investigate the impact of accelerated versus conventional beta-blocker titration on LVRR parameters and to assess the predictive value of early BNP kinetics over a 12-month follow-up. Métodos: In this longitudinal sub-analysis of 92 randomized patients (NYHA IV, LVEF <45%), we performed blinded transthoracic echocardiography and serial BNP measurements at admission, discharge, and 12 months. The primary structural endpoints were the absolute and percentage variations in Left Ventricular End-Systolic Diameter (LVESD) and End-Diastolic Diameter (LVEDD). Correlation between variables was assessed using Pearson's r, and the predictive accuracy for dose tolerance was determined via ROC curve analysis. Resultados e Conclusões: The accelerated titration group (IG) exhibited a significantly more pronounced reduction in BNP levels already at the time of discharge ($p<0.05$). At 12 months, the IG demonstrated robust structural recovery, with mean LVESD decreasing from 58.1 to 51.0 mm ($p<0.001$) and LVEDD from 66.7 to 62.3 mm ($p<0.001$). Conversely, the control group showed no statistically significant reduction in LVESD ($p=0.337$). A strong linear correlation ($r=0.72$) was identified between the magnitude of early BNP drop and the degree of LVESD reduction at one year. Furthermore, an early BNP reduction of >30% demonstrated high predictive accuracy for long-term full-dose tolerance (AUC-ROC 0.82). In conclusion, accelerated beta-blocker titration significantly catalyzes LVRR in advanced HFrEF. The early reduction in BNP reflects a vigorous decrease in parietal stress, predicting superior long-term structural recovery and modifying the natural history of the disease more effectively than conventional titration.

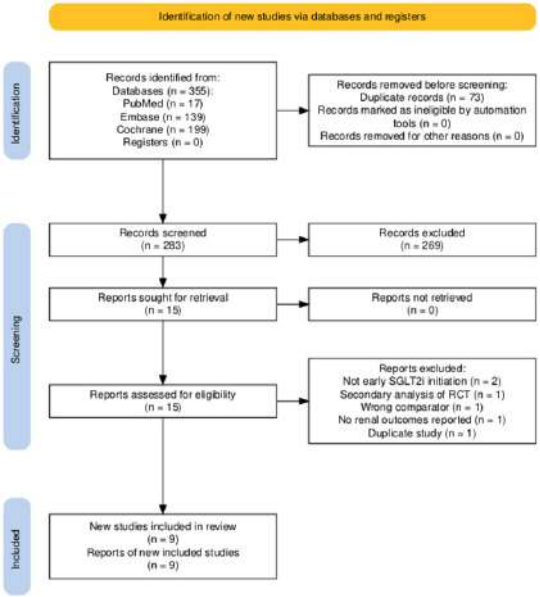
18390

IMPACT OF EARLY SGLT2 INHIBITOR INITIATION ON RENAL FUNCTION IN ACUTE HEART FAILURE: A SYSTEMATIC REVIEW OF RANDOMIZED CONTROLLED TRIALS

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Introdução/Fundamentos: Acute heart failure (AHF) is associated with high morbidity and an increased risk of worsening renal function. Although Sodium–Glucose Cotransporter 2 (SGLT2) inhibitors have demonstrated benefits in chronic heart failure, evidence regarding their early in-hospital use in AHF, particularly on renal outcomes, remains limited. Objetivos: To evaluate the effects of early (within the first 72 hours of hospitalization) initiation of SGLT2 inhibitors on renal outcomes and its safety in patients hospitalized with acute heart failure. Métodos: A systematic review was conducted in accordance with PRISMA guidelines. PubMed, Embase, and the Cochrane Library were searched in April 2026. The initial search identified 355 articles. After applying inclusion and exclusion criteria, 9 randomized controlled trials evaluating early (≤72 hours) SGLT2 inhibitor initiation in AHF were included. Data on renal outcomes and adverse events were extracted and qualitatively synthesized. Resultados e Conclusões: Across the included randomized controlled trials, early initiation of SGLT2 inhibitors in patients with AHF demonstrated a predominantly neutral impact on renal function. Baseline renal parameters were comparable between intervention and control groups. No significant differences were observed in eGFR decline or in the incidence of worsening renal function (WRF) during hospitalization. Mild, transient increases in serum creatinine were reported in some studies, without an increase in serious renal adverse events. Importantly, early SGLT2 inhibitor use was not associated with higher rates of acute kidney injury. Some trials suggested potential renal benefits, including increased 24-hour urine output and improved decongestion markers without compromising renal perfusion. Additionally, patients treated with SGLT2i required less loop diuretic dose escalation, suggesting a more efficient diuretic response. These findings were consistent across different SGLT2 inhibitors and patient subgroups, including those with chronic kidney disease. In conclusion, early initiation of SGLT2 inhibitors in AHF appears to be safe from a renal perspective, with neutral to mildly favorable effects. However, limitations include the relatively small number of studies, short follow-up periods, and methodological heterogeneity. Further large-scale studies with longer follow-up are warranted to better define long-term renal outcomes.



16251

IMPACT OF OPTIMIZED DRUG THERAPY ON THE PROGNOSIS OF HEART FAILURE

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Introdução/Fundamentos: Hospitalization for heart failure (HF) represents a high-risk period for mortality and readmission, especially in the first months following discharge. Although guideline-directed medical therapy significantly reduces morbidity and mortality, its implementation in clinical practice at the time of hospital discharge remains suboptimal. Objetivos: To evaluate the association between optimized medical therapy at hospital discharge and the composite outcome of heart failure (HF) readmission or death within 180 days. Métodos: A retrospective, single-center observational study including 140 patients with HF and an ejection fraction ≤40%. Optimized therapy was defined as the prescription of the four prognosis-modifying classes (beta-blocker; Angiotensin-Converting Enzyme Inhibitor (ACEI), Angiotensin Receptor Blocker (ARB), or Angiotensin Receptor-Neprilysin Inhibitor (ARNI); mineralocorticoid receptor antagonist (MRA); and SGLT2 inhibitor). The primary outcome was HF readmission or death within 180 days. Resultados e Conclusões: Results: Forty-four patients (31.4%) received optimized therapy at hospital discharge. The composite outcome occurred in 53 (37.9%) patients during the 180-day follow-up. The absence of optimized therapy was associated with a higher risk of events in univariate analysis (RR 1.33; 95% CI 1.04–1.70; p=0.04) and maintained an independent association after multivariate adjustment (adjusted RR 2.48; 95% CI 1.12–5.49; p=0.025). A progressive reduction in the event rate was observed as the number of prescribed therapeutic classes increased (AUC 0.642; 95% CI 0.547–0.738; p=0.005). Conclusion: The absence of optimized medical therapy at hospital discharge was independently associated with a poorer 180-day prognosis, reinforcing hospital discharge as a critical moment for the full implementation of optimized therapy.

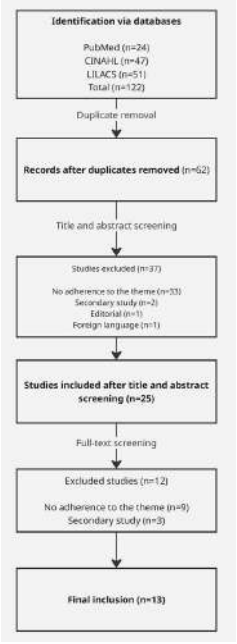
21316

IMPACTS OF THE IMPLANTABLE CARDIOVERTER-DEFIBRILLATOR ON BODY IMAGE AND IDENTITY: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: The implantable cardioverter-defibrillator (ICD) is an essential tool for preventing sudden cardiac death. However, alongside the survival guaranteed by the device, profound changes in the patient's self-image may also arise. Beyond the scars and the protrusion under the skin, which have an aesthetic impact, the feeling of constant dependence on a machine to stay alive can transform the individual's perception of life. Objetivos: To synthesize evidence regarding changes in identity and body image among ICD patients and their negative impacts. Métodos: This is a systematic review following the PRISMA methodology. PICO question: "What are the impacts of the ICD on patients' body image and identity?". The search strategy used descriptors such as "Implantable defibrillator", "Identity", and "Psychosocial Impact". Searches were conducted in April 2026 across the PubMed, CINAHL, and LILACS databases. Inclusion criteria were: primary studies, thematic adherence, and English or Portuguese languages. Secondary studies, editorials, and letters were excluded. After duplicate removal, title and abstract screening, and full-text review by two independent reviewers, 13 studies were included, totaling 1,219 patients. Data were subjected to thematic synthesis. Resultados e Conclusões: The ICD alters the patient's perception of body image through the device's protrusion under the skin and scars. The main negative impacts are feelings of embarrassment and being less attractive. This leads patients to restrict their clothing and avoid locations such as beaches or pools, in addition to avoiding physical proximity with sexual partners. Profound changes were observed in how patients perceive their own identity after the implant. One patient stated: "It's not the same!" "I feel deficient!" Patients reported a lack of doctor-patient communication and that the only alternative provided by physicians to the ICD was death. Thus, the presence of the ICD serves as a constant reminder of their finitude and loss of control over their own lives, as reported by one patient: "I am being controlled and regulated by a machine." Therefore, ICDs have the potential to alter the patient's self-perception and social relationships. The literature reveals a gap in doctor-patient communication prior to implantation, such that psychosocial aspects are often ignored. Studies suggest that psychosocial support and cardiac rehabilitation programs are effective in facilitating adaptation and improving the perception of self-image in ICD patients.



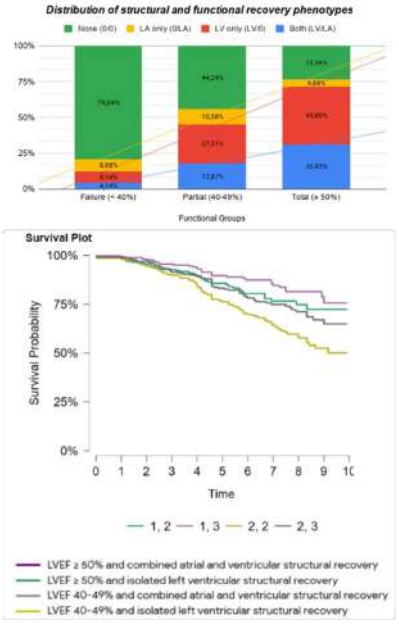
15377

IMPORTANCE AND SIGNIFICANCE OF LEFT ATRIAL REVERSE REMODELING IN THE FOLLOW-UP OF PATIENTS WITH HEART FAILURE ABSTRACT TEXT

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Introdução/Fundamentos: Heart failure (HF) phenotypes are clinically classified based on left ventricular ejection fraction (LVEF). While cardiac reverse remodeling is a well-established marker of favorable outcome, clinical focus remains predominantly on the left ventricle (LV), which may underestimate significant structural changes in other chambers. The left atrium (LA) is a sensitive marker of hemodynamic burden and filling pressures; however, consensus is lacking regarding the prevalence and prognostic impact of left atrial reverse remodeling (LARR) in relation to left ventricular reverse remodeling (LVRR). Objetivos: To simultaneously analyze atrial and ventricular reverse remodeling to classify recovery phenotypes in patients with HF and evaluate the impact of structural dissociation on 10-year survival. Métodos: A retrospective cohort study (2006–2019) included 7,981 patients with baseline LVEF <40%. Subjects were stratified by functional recovery (Total: LVEF ≥50%; Partial: LVEF 40–49%) and by diameter normalization patterns: combined (LV/LA), isolated (LV or LA only), and absent. Statistical analysis included Pearson correlation and Kaplan–Meier survival curves with log-rank tests. Resultados e Conclusões: In the total functional recovery group (n=1,005), isolated ventricular normalization (LV only) was predominant (40.8%), surpassing the combined LV/LA profile (30.9%). A weak correlation was found between LVEF gain and atrial reduction (r=0.169). In the partial recovery group (n=1,494), absent structural improvement predominated (44.2%), with near-zero atrial variation (0.12%). Survival analysis at 5 and 10 years revealed that LA normalization significantly reduces mortality: in the total functional recovery group, mortality decreased from 20.2% (isolated LV) to 8.0% (combined LV/LA); in the partial recovery group, it fell from 31.1% (isolated LV) to 16.5% (combined LV/LA) (p < 0.001). Functional recovery is frequently independent of structural recovery; thus, current definitions of reverse remodelling may underestimate patient prognosis. Persistent atrial dilatation in patients with normalized LVEF suggests residual cardiac impairment, which maintains elevated mortality rates.



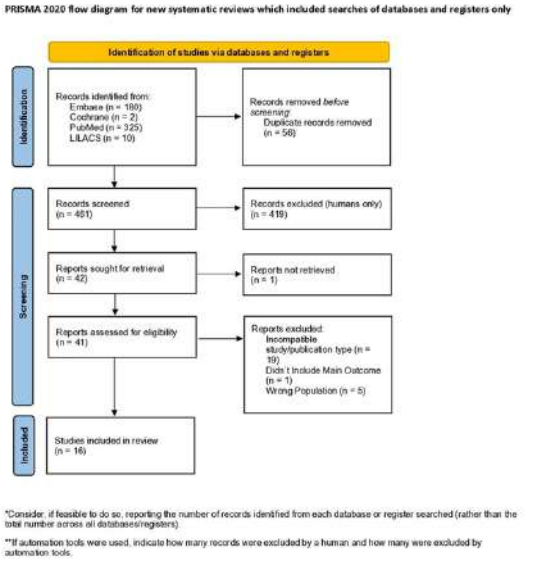
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INDEPENDENT PROGNOSTIC VALUE OF THE NEUTROPHIL-TO-LYMPHOCYTE RATIO IN ACUTE HEART FAILURE: A SYSTEMATIC REVIEW.

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Introdução/Fundamentos: Acute heart failure (AHF) is associated with high morbidity and mortality, and early risk stratification remains a major clinical challenge. Systemic inflammation is recognized as a key mechanism in its pathophysiology, and the neutrophil-to-lymphocyte ratio (NLR) at admission has emerged as a cost-effective prognostic biomarker. Elevated NLR has been associated with worse clinical outcomes, including increased in-hospital and long-term mortality. However,the prognostic reliability of NLR is often challenged by non-cardiac inflammatory triggers, and cut-off variability limits comparability and clinical applicability across studies. Therefore, a synthesis focusing on the independent role of this marker is necessary. Objetivos: This review aims to analyze the independent prognostic impact of high versus low admission NLR on mortality and major clinical outcomes in patients with acute heart failure, both de novo and Acute Decompensated Heart Failure cases (ADHF), while specifically accounting for major inflammatory confounders. Métodos: The systematic review followed PRISMA guidelines. A literature search was conducted in Embase, Cochrane, LILACS and PubMed, covering studies up to April 2026. MeSH and DeCS terms used include “Acute Heart Failure”, “Neutrophil-to-Lymphocyte Ratio”, “Mortality”, and “Prognosis”, combined with AND/OR. Resultados e Conclusões: A total of 16 studies were included in this review with the selection process detailed in the PRISMA flow diagram. The studies were primarily retrospective cohort studies, encompassing 22,250 patients with AHF, including both de novo cases and ADHF. Although thresholds varied, most studies found that an NLR above the range of 3.0 to 5.5 is associated with a significantly higher risk of in-hospital and long-term all-cause mortality. The predictive value of the NLR remained significant even in populations specifically screened to exclude active infections, the use of corticosteroids, or other primary inflammatory confounders, suggesting that in the context of AHF, the NLR serves as a marker of immune-metabolic stress associated with cardiac decompensation. Notably, integrating NLR into the AHEAD score (Atrial fibrillation, Hemoglobin, Elderly, Abnormal renal function, Diabetes) improved Net Reclassification Improvement (NRI), outperforming standard scores. These findings highlight that elevated admission NLR is a robust predictor of both acute and long-term adverse clinical outcomes in AHF, helping identify patients requiring intensive monitoring.



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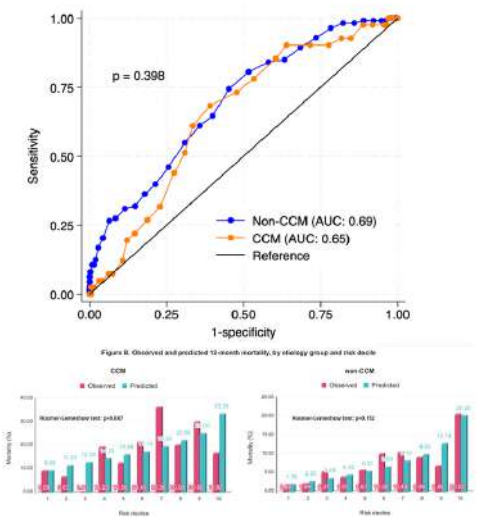
MAGGIC SCORE VALIDATION IN CHAGAS CARDIOMYOPATHY IN A MULTICENTER BRAZILIAN COHORT

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Introdução/Fundamentos: Chagas cardiomyopathy (CCM) is a major public health problem in endemic countries, associated with a distinct clinical profile and worse prognosis than other etiologies. The Meta-Analysis Global Group in Chronic Heart Failure (MAGGIC) score is a widely used prognostic tool; however, its applicability in CCM remains uncertain. Objetivos: To evaluate MAGGIC's performance in predicting 12-month mortality in CCM patients, comparing discrimination and calibration with non-CCM patients. Métodos: This was a prospective, multicenter cohort of outpatients with chronic heart failure (aged ≥18 years and left ventricular ejection fraction [LVEF] <50%) from 30 specialized centers in Brazil between June 2021 and June 2025. Baseline data and variables required for MAGGIC calculation were obtained through standardized in-person questionnaires and chart reviews. Chagas etiology was defined by serological testing, and patients were categorized as CCM or non-CCM; undetermined cases were excluded. Follow-up via telephone interviews concluded in September 2025. The outcome was 12-month all-cause mortality. Resultados e Conclusões: Of 2,128 patients, 263 (12.4%) had CCM and, of those, 162 (7.6%) died. Mean age was similar between groups (63±12 years in CCM vs. 61±14 in non-CCM; p=0.08), as was the proportion of female sex (40% vs. 35%; p=0.113). CCM patients were less frequently White (25% vs. 34%; p=0.002) and had lower LVEF (31±8% vs. 34±9%; p<0.001), higher MAGGIC scores (20.1±6.7 vs. 18.4±6.8; p<0.001), worse New York Heart Association functional class (34% vs. 26% in III-IV; p=0.008), lower systolic blood pressure (108±18 vs. 121±23; p<0.001) and body mass index (25 [22; 28] vs. 27 [24; 30]; p<0.001). MAGGIC showed moderate discrimination, with similar performance in both groups (AUC 0.65 vs. 0.69; p=0.398; Figure A). Calibration was overall adequate in both groups (Hosmer–Lemeshow test: p=0.087 vs. p=0.152; Figure B), although discrepancies between observed and predicted mortality across risk deciles were evident in the bar plot, particularly among CCM patients. In conclusion, In this large contemporary cohort, the MAGGIC score demonstrated acceptable overall performance in patients with CCM, with moderate discrimination and similar performance compared with non-CCM. However, variability in risk estimation across strata suggests potential limitations of the score in this population.

Figure A. Receiver operating characteristic (ROC) curves of the MAGGIC score for predicting 12-month mortality by etiology group.



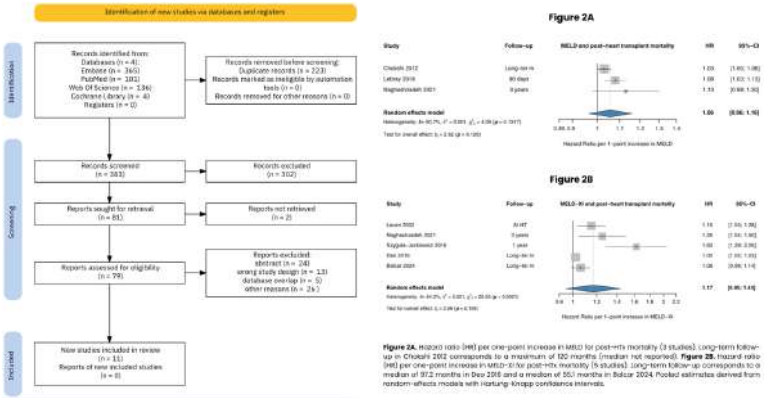
20571

MELD AND MELD-XI AS PREDICTORS OF MORTALITY AFTER HEART TRANSPLANTATION: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Liver dysfunction is common in end-stage heart failure and may affect outcomes after heart transplantation (HTx). The Model for End-Stage Liver Disease (MELD) and MELD excluding INR (MELD-XI) are the most commonly used hepatic risk scores in this setting, with MELD-XI offering a potential advantage by excluding INR, which may be affected by anticoagulation. However, the prognostic utility of both scores in HTx remains uncertain. Objetivos: To separately evaluate the prognostic utility of preoperative MELD and MELD-XI for post-HTx mortality and to compare their discriminatory performance. Métodos: PubMed, Embase, Cochrane Library, and Web of Science were searched from inception to March 2026. We included studies of adults undergoing isolated HTx with preoperative MELD or MELD-XI assessment, excluding patients with Fontan circulation because of their distinct liver pathophysiology and prognosis. The primary outcome was the hazard ratio (HR) for post-HTx mortality per one-point increase in the score. Discriminatory performance comparing MELD and MELD-XI was defined as a secondary outcome. Data were synthesized using a random-effects model with REML and Hartung-Knapp confidence intervals (CI). The review was reported in accordance with PRISMA 2020. Resultados e Conclusões: Eleven observational studies comprising 38,466 patients were included. Three studies reported continuous HRs for MELD and five for MELD-XI. Among studies reporting continuous HRs, all individual estimates exceeded 1.0, indicating higher mortality risk per additional score point. However, neither pooled estimate reached statistical significance. The pooled HR was 1.06 per additional point for MELD (95% CI 0.96-1.16; I^2=50.7%; p=0.120) and 1.17 for MELD-XI (95% CI 0.95-1.44; I^2=84.3%; p=0.109). The remaining studies reported categorical analyses only, using heterogeneous cut-offs that precluded meta-analysis, although they generally suggested worse prognosis in higher-score groups. The secondary outcome could not be synthesized because discriminatory metrics were inconsistently reported, preventing direct comparison between MELD and MELD-XI. Thus, despite a consistent directional signal, wide confidence intervals around the pooled HRs, substantial heterogeneity and incomplete reporting prevent either score from being established as a robust independent predictor of post-HTx mortality. More consistent reporting of effect estimates and discriminatory metrics is needed to clarify the prognostic role of MELD and MELD-XI in HTx.



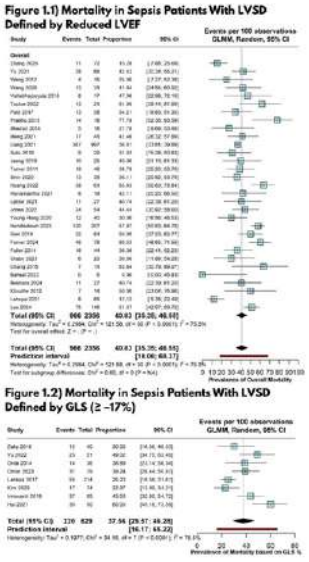
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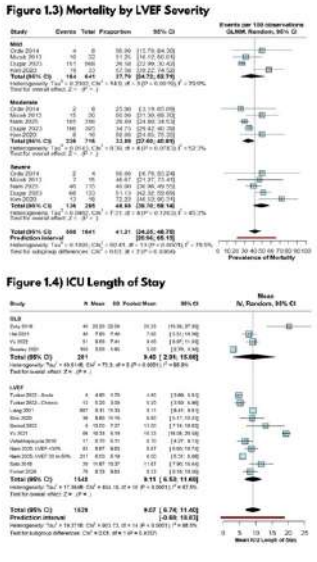
MORTALITY AND ICU OUTCOMES IN SEPSIS PATIENTS WITH LEFT VENTRICULAR SYSTOLIC DYSFUNCTION: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Left ventricular systolic dysfunction (LVSD) is frequently observed in patients with sepsis, but its prognostic significance remains unclear due to inconsistent diagnostic definitions. While some studies assess LVSD by left ventricular ejection fraction (LVEF), others employ global longitudinal strain (GLS), leading to heterogeneous findings. Objetivos: To evaluate the association between left ventricular systolic dysfunction and mortality and ICU outcomes in patients with sepsis through a systematic review and meta-analysis of observational studies. Métodos: This systematic review and meta-analysis was conducted in accordance with PRISMA guidelines. We systematically searched PubMed, Embase, and the Cochrane Library for studies reporting outcomes of sepsis patients with LVSD. Random-effects models were used to pool estimates of mortality and intensive care unit (ICU) length of stay (LOS). Subgroup analyses stratified results by LVSD severity (based on LVEF) and by diagnostic method (LVEF vs GLS). Resultados e Conclusões: A total of 44 studies encompassing 4,781 patients were included. Pooled mortality was 40.8% (95% CI, 35.4–46.6; Fig. 1.1) in LVEF-defined LVSD and 37.6% (95% CI, 29.6–46.3; Fig. 1.2) in GLS-defined LVSD. Stratification by LVEF severity revealed the highest mortality in severe LVSD (48.9%), compared with moderate (33.9%) and mild dysfunction (37.7%; Fig. 1.3). Mean ICU LOS was approximately 9 days (95% CI, 6.7–11.4; Fig. 1.4), with no significant difference between GLS- and LVEF-defined LVSD. In this meta-analysis of nearly 5,000 patients, LVSD in sepsis was consistently associated with high mortality and prolonged ICU stay. Mortality was greatest among patients with severe LVSD, underscoring its prognostic relevance. These findings highlight the need for standardized criteria to define LVSD in the context of sepsis.





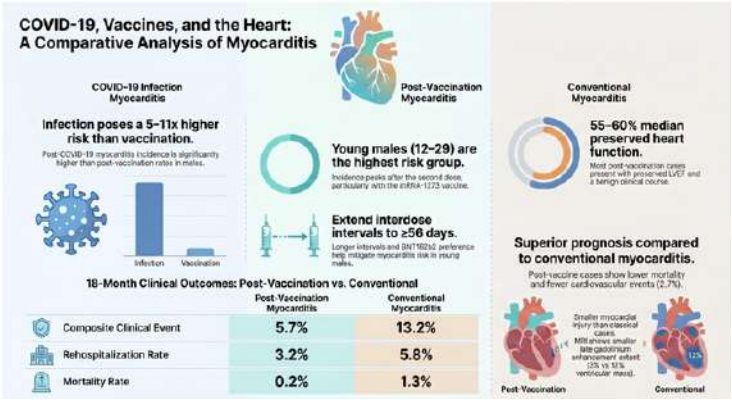
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MYOCARDITIS ASSOCIATED WITH COVID-19 AND MRNA VACCINATION: A SYSTEMATIC REVIEW OF CLINICAL OUTCOMES, DIAGNOSTIC FINDINGS, AND LONG-TERM PROGNOSIS.

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Introdução/Fundamentos: Myocarditis has been reported after both SARS-CoV-2 infection and mRNA COVID-19 vaccination, but evidence on its clinical course, cardiac magnetic resonance (CMR) findings, and long-term prognosis remains fragmented. Objetivos: To systematically review myocarditis associated with COVID-19 and mRNA vaccination, synthesizing evidence on incidence, risk factors, clinical presentation, diagnostic findings, treatment, and long-term cardiovascular outcomes. Métodos: We performed a PRISMA 2020-compliant systematic review of PubMed/MEDLINE, Embase, Cochrane CENTRAL, and Web of Science from January 2020 to March 2026, without language restrictions. Eligible studies included randomized, observational, population-based, and case-series designs with diagnostic confirmation. Two reviewers independently screened studies and extracted data. Risk of bias was assessed with RoB 2, Newcastle-Ottawa Scale, and JBI tools, and certainty of evidence for incidence and risk factors was evaluated with GRADE. Owing to major heterogeneity in populations, diagnostic criteria, and outcomes, findings were synthesized narratively. Resultados e Conclusões: Of 8,742 records, 68 studies were included, comprising approximately 487 million mRNA vaccine doses, 6,847 confirmed post-vaccination myocarditis cases, 1,294 post-COVID-19 cases, and 3,779 conventional myocarditis comparators. Post-vaccination myocarditis occurred predominantly in males aged 12-29 years, especially after the second dose, with highest incidence after mRNA-1273. Main risk factors were male sex, younger age, second dose, short interdose interval, and mRNA-1273 versus BNT162b2. Typical presentation included chest pain, symptom onset within 2-4 days, troponin elevation, abnormal ECG, and preserved LVEF. CMR usually showed subepicardial inferolateral late gadolinium enhancement with smaller scar burden than conventional myocarditis; LGE often persisted despite edema resolution. Available long-term data suggest that post-vaccination myocarditis generally follows a mild clinical course and has more favorable outcomes than conventional myocarditis, whereas post-COVID-19 myocarditis appears closer to conventional disease. Overall, post-vaccination and post-COVID-19 myocarditis show distinct epidemiological, clinical, and prognostic profiles. Although post-vaccination myocarditis is rare, it disproportionately affects young males and may be mitigated by longer interdose intervals and preferential BNT162b2 use in higher-risk groups.



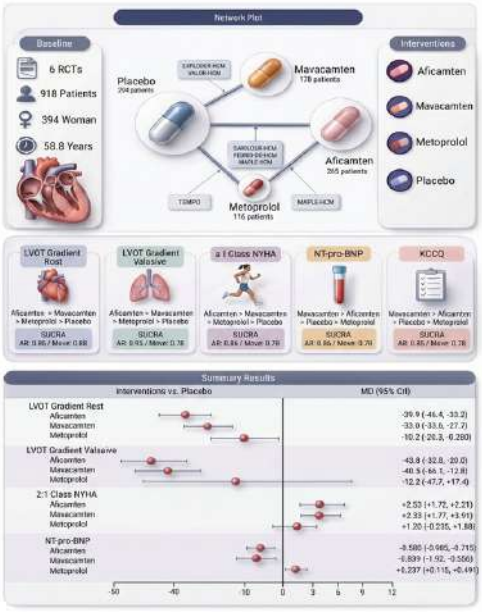
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MYOSIN INHIBITORS REDEFINE TREATMENT IN OBSTRUCTIVE HYPERTROPHIC CARDIOMYOPATHY: A BAYESIAN NETWORK META-ANALYSIS

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Introdução/Fundamentos: Obstructive hypertrophic cardiomyopathy (oHCM) is characterized by left ventricular outflow tract obstruction and debilitating symptoms. Although beta-blockers remain first-line therapy, their disease-specific efficacy is limited. Novel cardiac myosin inhibitors, including aficamten and mavacamten, have emerged as targeted therapies; however, comparative evidence among available pharmacologic strategies remains scarce. Objetivos: To compare the efficacy of aficamten, mavacamten, metoprolol, and placebo in patients with symptomatic oHCM through a Bayesian network meta-analysis. Métodos: A systematic review and Bayesian network meta-analysis were conducted according to PRISMA guidelines. Randomized controlled trials evaluating aficamten, mavacamten, metoprolol, or placebo in adults with symptomatic oHCM were included. Outcomes assessed comprised Kansas City Cardiomyopathy Questionnaire (KCCQ), N-terminal pro-B-type natriuretic peptide (NT-proBNP), ≥1 New York Heart Association (NYHA) functional class improvement, resting left ventricular outflow tract (LVOT) gradient, and post-Valsalva LVOT gradient. Effect estimates were pooled as mean differences (MD), risk ratios (RR), and 95% credible intervals (CrI). Resultados e Conclusões: Six randomized controlled trials involving 918 patients were included. Both aficamten and mavacamten significantly improved KCCQ, reduced NT-proBNP, increased the likelihood of NYHA functional improvement, and reduced resting and post-Valsalva LVOT gradients compared with metoprolol and/or placebo. Mavacamten demonstrated the greatest improvement in KCCQ (MD 9.07; 95% CrI 5.78–12.2), whereas aficamten showed the highest probability of benefit for NYHA improvement (RR 2.33; 95% CrI 1.73–3.21), resting LVOT reduction (MD −39.9 mmHg; 95% CrI −46.4 to −33.2), and post-Valsalva LVOT reduction (MD −43.8 mmHg; 95% CrI −62.6 to −20.8). No statistically significant differences were observed between aficamten and mavacamten across outcomes. Metoprolol did not demonstrate significant benefit in most comparisons versus placebo. Overall, these findings suggest consistent superiority of myosin inhibitors over conventional beta-blockade, supporting their potential as a preferred therapeutic strategy in patients with symptomatic oHCM.



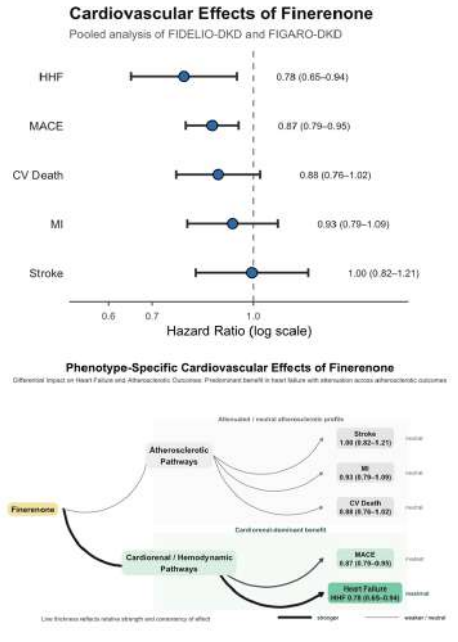
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PHENOTYPE-SPECIFIC CARDIOVASCULAR EFFECTS OF FINERENONE IN TYPE 2 DIABETES AND CHRONIC KIDNEY DISEASE: DIFFERENTIAL IMPACT ON HEART FAILURE AND ATHEROSCLEROTIC OUTCOMES

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Introdução/Fundamentos: Finerenone reduces cardiovascular events in patients with type 2 diabetes and chronic kidney disease (CKD). However, whether these benefits are consistent across cardiovascular outcomes or vary by event type remains unclear. Prior trials have reported heterogeneous effects across heart failure–related and atherosclerotic outcomes, but this pattern has not been formally evaluated as a primary analytical focus. Objetivos: To determine whether the cardiovascular effects of finerenone differ across clinically relevant outcomes and are consistent with a phenotype-specific pattern between heart failure–related and atherosclerotic events. Métodos: A systematic review and meta-analysis of randomized controlled trials comparing finerenone versus placebo in patients with type 2 diabetes and CKD was conducted (PRISMA; PROSPERO-registered). PubMed, Embase, and Cochrane Library were searched through April 2026. Risk of bias was assessed using RoB2. Hazard ratios (HRs) and 95% confidence intervals (CIs) were extracted for hospitalization for heart failure (HHF), major adverse cardiovascular events (MACE), cardiovascular (CV) death, myocardial infarction (MI), and stroke. Analyses prioritized outcome-specific effects rather than composite estimates using random-effects models (REML). Given the limited number of trials, analyses were prespecified as pattern-oriented, focusing on consistency and gradients of effect. Certainty of evidence was assessed using GRADE. Resultados e Conclusões: Two large-scale randomized trials (>13,000 participants) were included. Finerenone reduced HHF (HR 0.78, 95% CI 0.65–0.94) and modestly reduced MACE (HR 0.87, 95% CI 0.79–0.95), with no significant effects on CV death (HR 0.88, 95% CI 0.76–1.02), MI (HR 0.93, 95% CI 0.79–1.09), or stroke (HR 1.00, 95% CI 0.82–1.21). A graded, consistent pattern was observed, with maximal benefit in heart failure outcomes and attenuation across atherosclerotic events. Heterogeneity and risk of bias were low. Finerenone appears to demonstrate a phenotype-specific cardiovascular profile, with more pronounced effects on heart failure outcomes and attenuated or neutral effects on atherosclerotic events. This pattern is consistent with differential modulation of cardiorenal and hemodynamic pathways rather than indicating a strong direct anti-atherosclerotic effect. These findings support outcome-specific interpretation of cardiometabolic therapies and may have implications for therapeutic positioning and trial design.



16283

PREDICTION OF MORBIDITY AND MORTALITY USING THE BAN-ADHF SCORE IN PATIENTS HOSPITALIZED FOR ACUTE DECOMPENSATED HEART FAILURE

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Introdução/Fundamentos: Prognostic stratification in acute decompensated heart failure (ADHF) is essential for guiding resource allocation and clinical decision-making. The BAN-ADHF score has been proposed as a simple tool for predicting adverse events; however, its utility in different clinical settings requires validation. Objetivos: To evaluate the performance of the BAN-ADHF score as a predictor of morbidity and mortality in patients with ADHF hospitalized at a tertiary center. Métodos: A retrospective observational study of patients hospitalized for acute decompensated heart failure (ADHF). The primary outcome was a composite of in-hospital mortality and/or 30-day readmission. The secondary outcome was the length of hospital stay. The association between the BAN-ADHF score and the outcomes was evaluated through bivariate analyses and multivariate logistic regression, with estimates of relative risk (RR) and 95% CI. The score's discrimination was assessed using the ROC curve (AUC). Resultados e Conclusões: Results: Three hundred patients were analyzed, with 50 events (16.7%) of the primary composite outcome. The occurrence of the outcome was higher in the high-risk group according to the BAN-ADHF score (>12) compared to the low-risk group (≤12). The BAN-ADHF score maintained an independent association with the primary outcome in the multivariate model, with additional influence from age and creatinine. The score's discrimination was moderate (AUC 0.642; 95% CI 0.558–0.735; p=0.001). The length of hospital stay was longer in the high-risk group (median 11 days [IQR 6–18] vs. 8 days [IQR 4.8–13.2]; p=0.003). Conclusion: The BAN-ADHF score showed moderate discrimination and an independent association with morbidity and mortality in ADHF, in addition to being related to a longer length of stay. Therefore, it may contribute to initial risk stratification in the hospital setting.

21213

PRIMARY PREVENTION IMPLANTABLE CARDIOVERTER-DEFIBRILLATOR USE IN HEART FAILURE WITH REDUCED EJECTION FRACTION

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Introdução/Fundamentos: Heart failure with reduced ejection fraction (HFrEF) is associated with high mortality, and sudden cardiac death remains one of its leading causes. Implantable cardioverter-defibrillators (ICDs) are recommended for primary prevention in selected patients according to contemporary guidelines. However, ICD utilization in real-world practice remains suboptimal, particularly in middle-income countries. Objetivos: To evaluate ICD utilization for primary prevention in patients with HFrEF and to identify clinical factors associated with device implantation. Métodos: This was an observational study including 70 patients with HFrEF followed at a tertiary referral center in Brazil. Patients with left ventricular ejection fraction ≤35% were evaluated regarding clinical, laboratory, therapeutic, and socioeconomic characteristics. Comparisons between patients with and without ICD were performed using parametric and nonparametric tests. Multivariable logistic regression analysis was conducted to identify independent predictors associated with ICD implantation. Resultados e Conclusões: Mean age was 63.1±12.3 years, and 54.3% of patients were female. Overall, only 9 patients (12.9%) had an ICD implanted. Among the 21 patients with clear guideline-based indication for primary prevention, only 4 (19.0%) received the device. Patients with ICD had a significantly higher number of hospital admissions since heart failure diagnosis (p<0.001), higher prevalence of Chagas cardiomyopathy (33.3% vs. 4.9%; p=0.014), and more frequent use of SGLT2 inhibitors (77.8% vs. 42.6%; p=0.049). They also presented lower systolic blood pressure (104.1±17.0 vs. 120.5±21.8 mmHg; p=0.034) and diastolic blood pressure (64.8±13.1 vs. 75.4±13.1 mmHg; p=0.025). In multivariable analysis, a higher number of hospitalizations was independently associated with ICD implantation (OR 5.16; 95% CI 1.84–14.44; p=0.002), whereas hypertension was negatively associated with device use (OR 0.07; 95% CI 0.008–0.69; p=0.023). ICD utilization for primary prevention was low even among patients with clear guideline-based indications, highlighting a substantial gap between recommendations and real-world practice. Device implantation appeared to occur preferentially in patients with greater clinical severity and perceived arrhythmic risk, particularly those with Chagas cardiomyopathy and recurrent hospitalizations. These findings reinforce the need for strategies aimed at improving access to device therapy in patients with HFrEF in Brazil.

Table 1. Baseline Characteristics According to ICD Status

Variable	No ICD (n=61)	ICD (n=9)	p-value
Age, years	63.1 ± 12.8	62.8 ± 8.9	0.94
Female sex, n (%)	31 (50.8)	7 (77.8)	0.13
Hypertension, n (%)	47 (77.0)	4 (44.4)	0.040
Diabetes mellitus, n (%)	30 (49.2)	5 (55.6)	0.72
Previous myocardial infarction, n (%)	19 (31.1)	4 (44.4)	0.43
Chagas etiology, n (%)	3 (4.9)	3 (33.3)	0.014
Left ventricular ejection fraction, %	28.3 ± 5.7	25.7 ± 3.6	0.20
>3 hospital admissions since HF diagnosis, n (%)	5 (8.2)	6 (66.7)	<0.001
Systolic blood pressure, mmHg	120.5 ± 21.8	104.1 ± 17.0	0.034
Diastolic blood pressure, mmHg	75.4 ± 13.1	64.8 ± 13.1	0.025
SGLT2 inhibitor use, n (%)	26 (42.6)	7 (77.8)	0.049

Abbreviations: HF, heart failure; ICD, implantable cardioverter-defibrillator; SGLT2, sodium–glucose cotransporter 2.

Table 2. ICD Eligibility and Predictors of ICD Implantation

Variable	Result		
Patients with ICD, n (%)	9 (12.9)		
Patients with guideline-based indication for ICD, n	21		
Eligible patients receiving ICD, n (%)	4 (19.0)		
Multivariable Logistic Regression for ICD Implantation			
Variable	Odds Ratio (95% CI)		p-value
Number of hospital admissions	5.16 (1.84–14.44)		0.002
Hypertension	0.07 (0.008–0.69)		0.023

Abbreviations: ICD, implantable cardioverter-defibrillator.

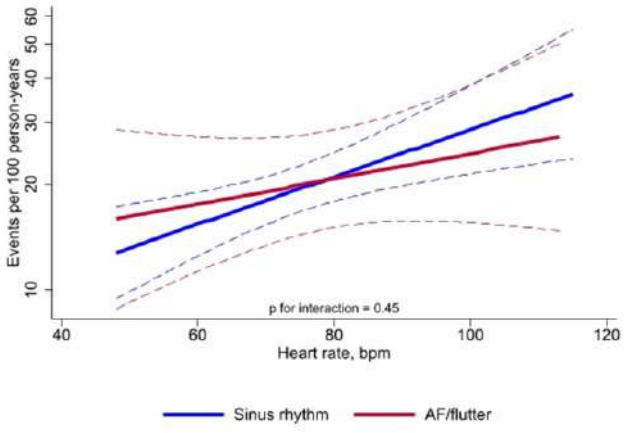
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PROGNOSTIC ROLE OF HEART RATE IN HEART FAILURE WITH REDUCED EJECTION FRACTION: THE INFLUENCE OF ATRIAL FIBRILLATION

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Introdução/Fundamentos: The prognostic value of heart rate (HR) in patients with heart failure with reduced ejection fraction (HFrEF) may differ according to cardiac rhythm; however; this relationship may differ in patients with atrial fibrillation (AF) or flutter. Objetivos: To assess the association between HR and a composite endpoint of cardiovascular (CV) death or HF hospitalization in HFrEF, and to evaluate whether this relationship is modified by cardiac rhythm. Métodos: This prospective cohort included patients with chronic HFrEF from June 2021 to June 2024 across 30 sites in Brazil. Patients were followed for 6 and 12 months. HR was measured during outpatient visit at baseline and analyzed stratified by rhythm (sinus vs AF/flutter) as a continuous variable per 10 bpm increase. Patients with pacemaker were excluded. The primary endpoint was the composite of HF hospitalization or CV death. Associations between HR and outcomes were assessed using Cox models adjusted for age, sex, LVEF, MAGGIC score and beta-blocker dose. Resultados e Conclusões: Among 1314 patients (mean age 59.6 years, 35% women, mean LVEF 29.7%, 16% with AF/flutter), 247 experienced the primary endpoint. Patients in sinus rhythm had lower HR (72±13 vs 77±18 bpm, p<0.001), despite similar use of betablocker at target dose (35% vs 41%, p=0.12) compared to those in AF/flutter. In sinus rhythm, higher HR was independently associated with increased risk of the composite outcome (HR=1.17 per 10 bpm increase (95% CI 1.06-1.29); p=0.002). In patients with AF/Flutter, this association was attenuated and not statistically significant (HR=1.08 (95% CI 0.92-1.26); p=0.34; Figure). However, there was no significant interaction between HR and rhythm (p for interaction=0.45), indicating no effect modification. In this large contemporary cohort of patients with HFrEF, increased HR was associated with worse prognosis, irrespective of cardiac rhythm.



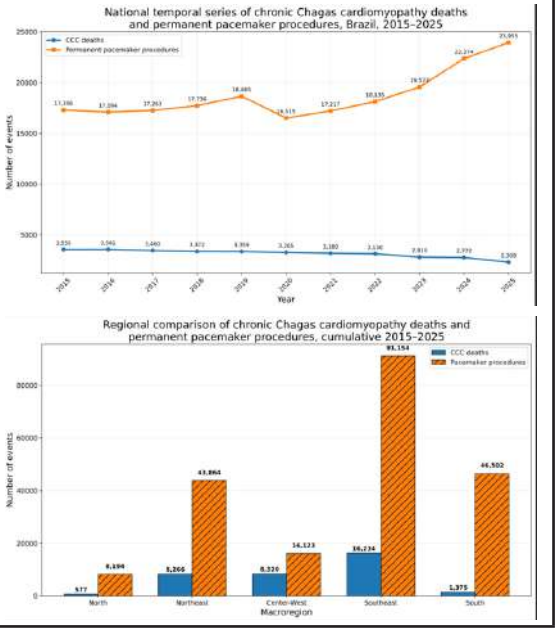
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REGIONAL MISMATCH BETWEEN CHRONIC CHAGAS CARDIOMYOPATHY MORTALITY BURDEN AND PERMANENT PACEMAKER PROCEDURES IN BRAZIL: AN ECOLOGICAL TIME-SERIES ANALYSIS, 2015–2025

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Introdução/Fundamentos: Chronic Chagas cardiomyopathy (CCC) is an important cause of conduction system disease and permanent pacemaker implantation in Brazil. Although Chagas disease burden is historically concentrated in specific Brazilian regions, it remains unclear whether the regional distribution of definitive cardiac stimulation procedures corresponds to the distribution of CCC-related mortality burden. Objetivos: To compare, across Brazilian macroregions from 2015 to 2025, the distribution of deaths due to chronic Chagas cardiomyopathy and the distribution of permanent pacemaker implantation procedures, in order to assess whether the supply of definitive cardiac stimulation corresponds to the regional burden of disease. Métodos: This ecological time-series study used nationwide secondary data from the Mortality Information System and the Hospital Information System of the Brazilian Unified Health System. Deaths with underlying cause ICD-10 code B57.2 were extracted by year and macroregion. Permanent pacemaker procedures were identified by combining seven SIGTAP codes related to definitive single-chamber, dual-chamber, and multi-site devices, excluding temporary pacemakers. Absolute frequencies and proportional regional distributions were analyzed over time. Data from 2025 were considered preliminary. Resultados e Conclusões: From 2015 to 2025, 34,772 deaths due to CCC and 205,837 permanent pacemaker procedures were recorded in Brazil. The Southeast concentrated the highest cumulative number of CCC deaths (16,234), followed by the Center-West (8,320) and Northeast (8,266), whereas the North and South accounted for the lowest totals. Over the same period, the Southeast also recorded the largest number of pacemaker procedures (91,154), followed by the South (46,502) and Northeast (43,864). A marked geographic mismatch was observed between mortality burden and procedure distribution: the Center-West showed a high CCC mortality burden but comparatively modest pacemaker volume, whereas the South displayed the opposite pattern, with relatively low mortality burden but high procedural concentration. Nationally, CCC deaths declined over time, from 3,555 in 2015 to 2,308 in 2025, while pacemaker procedures increased from 17,306 to 23,955. These findings suggest persistent regional disparity between CCC-related mortality burden and the distribution of definitive cardiac stimulation procedures in Brazil, supporting further analyses adjusted for population size, age structure, and access to specialized cardiovascular care.



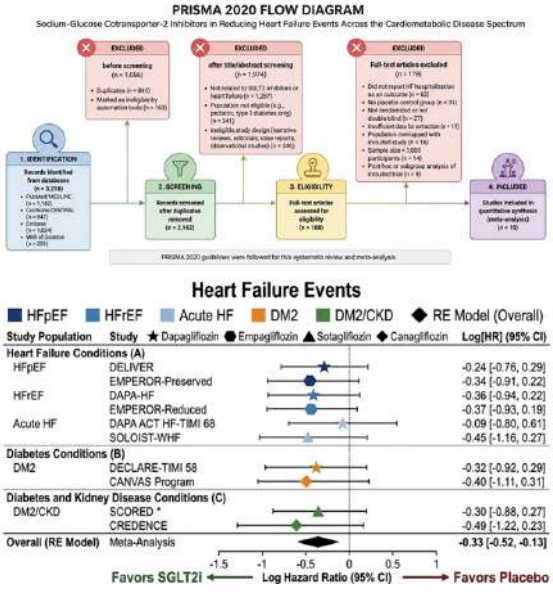
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SODIUM-GLUCOSE COTRANSPORTER-2 INHIBITORS IN REDUCING HEART FAILURE EVENTS ACROSS THE CARDIOMETABOLIC DISEASE SPECTRUM: A META-ANALYSIS OF 10 RANDOMIZED CLINICAL TRIALS INCLUDING 66,635 PATIENTS

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Introdução/Fundamentos: Heart failure (HF) remains a leading cause of hospitalization and cardiovascular mortality worldwide. SGLT2 inhibitors (SGLT2i) have shown consistent cardiovascular benefits, but prior meta-analyses focused predominantly on HF with reduced ejection fraction. Consequently, a comprehensive synthesis across type 2 diabetes (T2D), chronic kidney disease (CKD), and acute HF populations is lacking to inform clinical practice. Objetivos: To quantify the effect of SGLT2i on HF-related events, including hospitalization, urgent visits, and worsening HF, through a meta-analysis of randomized clinical trials spanning diverse cardiometabolic populations, and to assess heterogeneity, publication bias, and result stability. Métodos: A PRISMA 2020-compliant systematic review was conducted across PubMed, Cochrane Library, Embase, and Web of Science (2017–2025). Ten randomized, double-blind, placebo-controlled trials (DAPA-HF, EMPEROR-Reduced, DELIVER, EMPEROR-Preserved, DECLARE-TIMI 58, SCORED, SOLOIST-WHF, CREDENCE, CANVAS, DAPA ACT HF-TIMI 68) totaling 66,635 patients were included. Drugs analyzed were dapagliflozin, empagliflozin, canagliflozin, and sotagliflozin. Endpoints varied across studies (first HF hospitalization, urgent visits, worsening HF). HRs were pooled via random-effects model (REML) using JAMOVI with the MAJOR module. Bias was assessed with Cochrane RoB 2, heterogeneity with I² and Cochran's Q, publication bias with Egger's test and Fail-Safe N and stability via leave-one-out analysis. Resultados e Conclusões: Among 66,635 patients, 2,264 HF events occurred with SGLT2i versus 3,020 with placebo (pooled HR 0.72; 95% CI 0.59–0.87; p 0.001). I² was 0% (Q p = 1.000). No publication bias was detected (Egger's p = 0.789; Fail-Safe N = 32). By subgroup: HF trials (HR 0.71; 95% CI 0.64–0.79), T2D trials (HR 0.71; 95% CI 0.61–0.83) and T2D/CKD trials (HR 0.72; 95% CI 0.59–0.87) showed consistent benefit. Acute HF trials showed a non-significant trend (HR 0.75; 95% CI 0.53–1.06). Benefits were consistent across dapagliflozin, empagliflozin, canagliflozin, and sotagliflozin. SGLT2i reduced HF-related events by 28% across the cardiometabolic spectrum, with consistent benefit in chronic HF, T2D, and CKD populations. The benefit in acute HF was directionally favorable but not statistically significant. Endpoint heterogeneity across trials and early termination of SOLOIST-WHF and SCORED are limitations. These findings support a class effect of SGLT2i, reinforcing their role in cardiometabolic disease management.



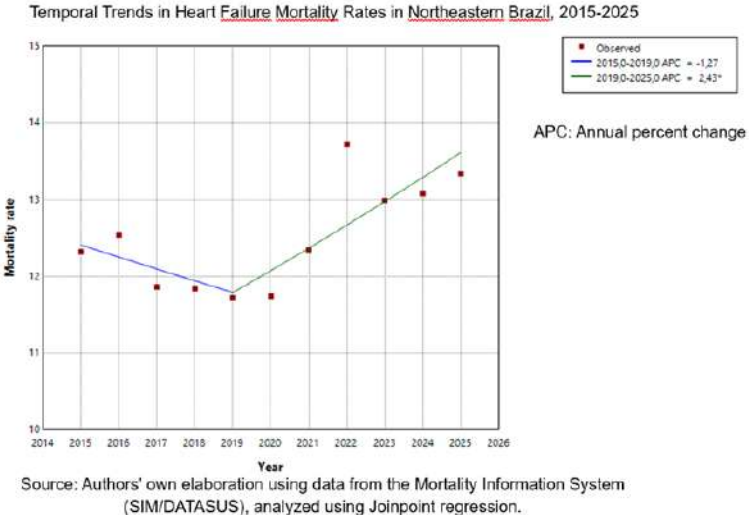
21665

TEMPORAL ANALYSIS OF HEART FAILURE MORTALITY DURING THE PRE- AND POST-COVID-19 PANDEMIC PERIODS IN NORTHEASTERN BRAZIL

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Introdução/Fundamentos: Heart failure (HF) is a common outcome of several cardiomyopathies and one of the leading causes of cardiovascular mortality in Brazil and worldwide, particularly among older adults. Additionally, the COVID-19 pandemic had substantial impacts on healthcare delivery, affecting the follow-up and clinical outcomes of patients with HF. Objetivos: To analyze the epidemiological profile and temporal trends of heart failure mortality in Northeastern Brazil during the pre- and post-COVID-19 pandemic periods. Métodos: This ecological study of time series evaluated the mortality due to heart failure in northeastern Brazil between 2015 and 2025. The data were obtained from the Mortality Information System (SIM/DATASUS), and the Brazilian Institute of Geography and Statistics (IBGE), were used to calculate the mortality rates per 100,000 inhabitants. Time trends were evaluated using Joinpoint regression to estimate the Annual Percentage Change (APC) and the corresponding 95% confidence intervals (95% CI). Resultados e Conclusões: During the study period, the highest heart failure mortality rate was observed in 2022, with 13.72 deaths per 100,000 inhabitants, predominantly among individuals aged ≥60 years (85.7%). Joinpoint regression identified an inflection point in mortality trends in 2019. From 2015 to 2019, a non-significant decreasing trend was observed (APC = -1.27%; 95% CI: -6.03 to 0.59; p = 0.21). However, from 2019 to 2025, there was a statistically significant increase in mortality rates, with an annual growth of 2.43% (95% CI: 1.40–6.15; p = 0.002). Sex-stratified analysis revealed distinct temporal patterns. Among women, mortality increased steadily throughout the study period (APC = 1.29%; 95% CI: 0.04–2.52; p = 0.039). Among men, mortality remained stable until 2019, followed by a significant increase in the post-pandemic period (APC = 2.65%; 95% CI: 1.42–6.52; p = 0.009). The predominance of deaths among older adults highlights the persistent burden of heart failure in vulnerable populations. Furthermore, the observed increase in mortality, together with sex-specific temporal patterns after the pandemic, suggests recent changes in the epidemiological profile of heart failure in Northeastern Brazil.



Source: Authors' own elaboration using data from the Mortality Information System (SIM/DATASUS), analyzed using Joinpoint regression.

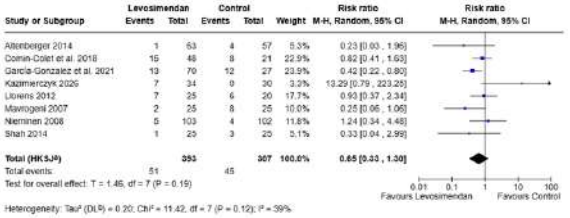
22000

THE EFFICACY AND SAFETY OF LEVOSIMENDAN IN PATIENTS WITH ADVANCED HEART FAILURE: AN UPDATED META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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Introdução/Fundamentos: This study aims to examine efficacy and safety of intermittent levosimendan compared to a placebo control group in advanced heart failure patients Objetivos: This study aims to examine efficacy and safety of intermittent levosimendan compared to a placebo control group in advanced heart failure patients Métodos: PubMed, Embase Cochrane, SCOPUS and Web of Science were searched for randomized controlled trials comparing levosimedan to a placebo in patients with advanced heart failure. Risk ratios (RR) and Mean Differences (MD) with 95% confidence intervals [CI] were pooled with a random-effects model. Endpoints were the all cause mortality rate, Improved left ventricular ejection and all cause rehospitalization rate. R 4.4.2 was used for all statistical analyses. Resultados e Conclusões: 17 randomized controlled trials with 1299 patients were included. Intermittent levosimendan was significantly associated with an improved left ventricular ejection fraction compared with placebo (MD 4.75 [95% CI 1.24–8.26], P = 0.008; I2 = 100, P <0.00001), with cumulative z-score of change after ≤ 1 week passing the monitoring boundaries, favoring the levosimendan, but did not cross the required information size. Additionally, we found no difference between levosimendan and placebo in all-cause rehospitalization rate (RR 0.75 [95% CI 0.46–1.22], P = 0.25; I2 = 70, P = 0.04) and in all-cause mortality rate (RR 0.65 [95% CI 0.33–1.30], P = 0.19; I2 = 39, P = 0.12). In ambulatory patients with advanced Heart Failure (left ventricular ejection fraction ≤35%, New York Heart Association Classes III and IV), repetitive levosimendan 24h infusion might be an additional therapeutic option but observed deaths may raise its safety issue. Although the new study suggests a higher rate of observed deaths, it has inherent design limitations which may affect the generalizability of the findings



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18243

ANTICOAGULANT MONOTHERAPY VERSUS DUAL THERAPY IN PATIENTS WITH ATRIAL FIBRILLATION AND STABLE CORONARY ARTERY DISEASE: AN UPDATED SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Atrial Fibrillation (AF) and Coronary Artery Disease (CAD) are frequently associated in high-risk patients, presenting a complex clinical challenge. Traditionally, management requires anticoagulation to prevent cardioembolic strokes and antiplatelet therapies to reduce ischemic events. However, this combination substantially increases major bleeding risk. In light of new evidence, an updated meta-analysis is needed to reassess the efficacy and safety of monotherapy or combination regimens. Objetivos: To compare the efficacy and safety of anticoagulant monotherapy versus dual therapy in patients with AF and CAD. Métodos: A systematic search of PubMed, Embase, and Scopus was conducted following the PRISMA guidelines to identify randomized controlled trials (RCTs) and observational studies comparing efficacy and safety of anticoagulant monotherapy vs dual therapy in patients with AF and stable coronary artery disease. Statistical analysis was performed using R 4.5.3 software with random-effects models. Risk of bias was assessed using the Cochrane RoB 2 tool and Newcastle-Ottawa Scale. Resultados e Conclusões: Seven studies (4 RCTs, 3 cohorts) were selected, including 9,549 patients (mean age 73.3 years, 73.16% male), of whom 4,831 (50.6%) underwent anticoagulant monotherapy, with a median follow-up of 2.76 years. There were no significant differences between both groups regarding major bleeding, myocardial infarction, stroke, systemic embolism, cardiovascular death and all-cause death. RCT-only subanalysis demonstrated that anticoagulant monotherapy reduced major bleeding compared to dual therapy (RR=0.57, 95% CI 0.38–0.87, $p<0.05$, $I^2=49.9\%$), with no significant differences in other outcomes. However, no other significant differences were identified regarding the outcomes. In conclusion, in patients with AF and stable CAD, anticoagulant monotherapy appears safe and may reduce major bleeding compared to dual therapy, without a statistically significant increase in ischemic events, although the limited sample size may preclude detection of modest differences in these outcomes. Heterogeneity among the studies, the inclusion of observational studies and limited sample sizes restrict the generalizability of the findings. Thus, individualized therapy, balancing hemorrhagic and ischemic risks for each patient profile, remains essential until targeted clinical trials with greater statistical power are conducted to consolidate the evidence.

17719

BEYOND GLYCEMIC CONTROL: CARDIOVASCULAR BENEFITS OF SGLT2 INHIBITORS IN NON-DIABETIC HEART FAILURE PATIENTS.

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Introdução/Fundamentos: Heart failure (HF) is a major cause of global morbidity and mortality, affecting over 60 million people, with poor prognosis, especially in patients with preserved ejection fraction, who historically had limited therapeutic options. Sodium-glucose cotransporter 2 inhibitors (SGLT2 inhibitors), initially developed for type 2 diabetes mellitus, have shown cardiovascular and renal benefits beyond glycemic control, including reductions in HF hospitalizations and cardiovascular death across different phenotypes. These effects appear independent of diabetes, suggesting non-glycemic mechanisms. Objetivos: Evaluate the effects of SGLT2 inhibitors in HF patients, comparing outcomes between individuals with and without diabetes, focusing on cardiovascular death, HF hospitalization, renal outcomes, and consistency across ejection fraction phenotypes. Métodos: Systematic review conducted in PubMed including studies up to 2025, using the descriptors "SGLT2 inhibitors," "heart failure," and "non-diabetic." Five randomized clinical trials were included, assessing SGLT2 inhibitors in HF patients regardless of ejection fraction, with subgroup analyses by diabetes status. Observational studies, reviews, mechanistic studies, populations without HF, and those lacking relevant clinical outcomes were excluded. Resultados e Conclusões: SGLT2 inhibitors reduced the composite outcome of cardiovascular death or HF hospitalization across phenotypes. In HF with preserved ejection fraction, empagliflozin reduced the primary outcome (13.8% vs. 17.1%; HR 0.79), mainly driven by fewer hospitalizations. Dapagliflozin showed similar results (16.4% vs. 19.5%; HR 0.82) in preserved or mildly reduced EF. Benefits were consistent regardless of diabetes. In non-diabetic patients, empagliflozin reduced the primary outcome (HR 0.78) without interaction with glycemic status. There was also a reduction in total HF hospitalizations (HR 0.73) and slower decline in renal function, with smaller reductions in estimated glomerular filtration rate. SGLT2 inhibitors consistently reduce cardiovascular death and HF hospitalization across phenotypes, regardless of diabetes, with similar effect magnitude in diabetic and non-diabetic patients. They also improve renal outcomes, reinforcing their role in the cardiorenal axis. These findings support SGLT2 inhibitors as a cornerstone therapy in HF management, independent of glycemic status.

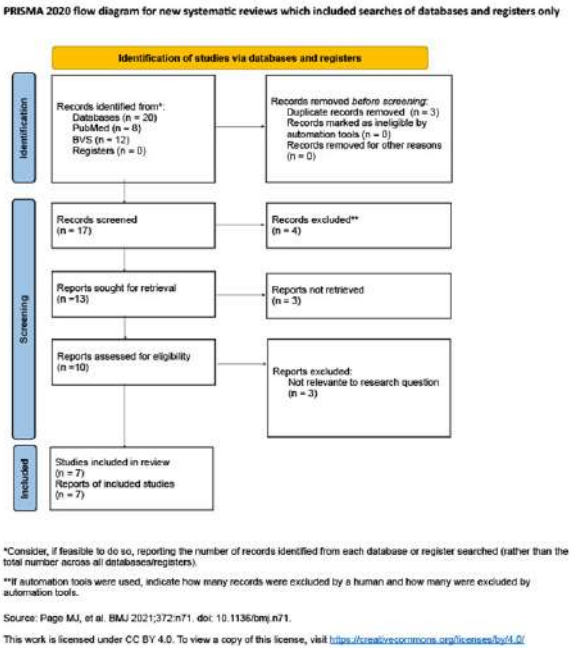
16663

CARDIOVASCULAR EFFECTS OF GLP-1 RECEPTOR AGONISTS IN OVERWEIGHT AND OBESE PATIENTS WITHOUT DIABETES: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: To this day, cardiovascular diseases remain the leading cause of mortality worldwide, accounting for approximately 17.9 million deaths annually. Among the main modifiable risk factors, obesity stands out due to its strong association with adverse cardiovascular outcomes. In Brazil, where over 60% of adults are overweight and 25% live with obesity, this relationship further highlights the urgent need for strategies targeting both weight reduction and cardiovascular risk. In this context, glucagon-like peptide-1 receptor agonists (GLP-1 RAs), initially developed for type 2 diabetes, have shown benefits beyond glycemic control, including reductions in major adverse cardiovascular events (MACE), even in non-diabetics. Despite these findings, the mechanisms of cardiovascular protection aren't fully understood. Therefore, this study aims to address the following research question: What are the cardiovascular effects of GLP-1 receptor agonists in overweight and obese patients without diabetes? Objetivos: To evaluate cardiovascular effects of GLP-1 RAs in overweight and obese individuals without diabetes. Métodos: This systematic review was conducted in accordance with PRISMA guidelines. Studies were included if they aligned with the research objective, including MACE, cardiovascular mortality, and abdominal circumference. Only randomized, double-blind clinical trials published in English within the last five years and with full-text availability were considered. Exclusion criteria included duplicates, renal or diabetes-focused studies, non-human studies, abstracts, case reports, descriptive studies, theses, editorials, and reviews. Data from the studies were extracted for qualitative analysis and narrative synthesis of the main results. Resultados e Conclusões: Among the seven studies, six showed a consistent reduction in MACE and overall cardiovascular risk with GLP-1 RAs in overweight or obese individuals without diabetes. One study found that these benefits were independent of weight loss, suggesting additional metabolic, anti-inflammatory, and vascular effects. Only one study reported treatment discontinuation due to gastrointestinal adverse effects (16%), while the overall safety profile remained favorable. These findings support a cardioprotective effect of GLP-1 receptor agonists beyond weight reduction. The search in only two databases constitutes a limitation of this study; it's recommended to expand the sources and evaluate the performance of a meta-analysis for greater strength of the evidence



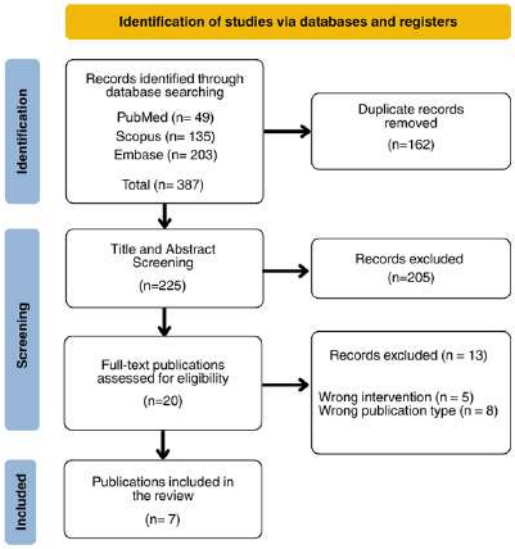
18442

Combined Abatacept and Ruxolitinib Therapy in Immune Checkpoint Inhibitor–Associated Myocarditis: A Systematic Review of Published Cases

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Introdução/Fundamentos: The oncological treatment landscape has been revolutionized by the use of Immune Checkpoint Inhibitors (ICI), which function by increasing T-lymphocyte-mediated antitumoral activity. However, this heightened immune expression can trigger adverse responses, such as immune-related myocarditis, which carries a high mortality rate, specially when refractory to conventional treatment with high-dose corticosteroids. Given this scenario, combined therapy with Abatacept and Ruxolitinib emerges as a promising approach. Objetivos: To evaluate the efficacy and safety of combined abatacept and ruxolitinib therapy in the treatment of ICI-induced myocarditis. Métodos: A systematic search of PubMed, Embase, and Scopus was conducted following the PRISMA guidelines to identify case reports and case series describing the use of abatacept and ruxolitinib for the treatment of ICI–induced myocarditis. Resultados e Conclusões: A total of 36 cases of ICI-induced myocarditis were identified. The majority of patients were male (n=22), with a median age of 70.1 years. Patients received anti-PD(L)1 (n=26) or anti-PD(L)1 plus anti-CTLA-4 (n=10). Median onset of symptoms was 33.6 days (range 14–168) after a median of 2 ICI cycles. The most common presenting symptoms were muscle weakness (n=26), dyspnea (n=19), diplopia (n=12), and dysphagia (n=12). 31 cases were promptly initiated on combined therapy of abatacept (10–20 mg/kg) and ruxolitinib (10–20 mg BID), and 5 cases received secondary immunosuppressive therapy prior to the initiation of combined therapy. Concomitant immunosuppressive agents were used in 19 cases alongside the primary protocol. Overall, 33 cases (91.7%) demonstrated clinical improvement and resolution of acute myotoxicity over a follow-up period of up to 1 year. One case experienced a recurrence of myocarditis, which was successfully retreated with abatacept and ruxolitinib. The myotoxicity-specific fatality rate was 2.7% (n=1). All-cause mortality over a follow-up period of up to 1 year was 33% (n=12), due to unrelated causes. No adverse events were reported in association with the combined use of Abatacept and Ruxolitinib. In conclusion, combined abatacept and ruxolitinib therapy demonstrated promising results in published cases of ICI-induced myocarditis. However, curente evidence is limited. Controlled prospective studies are needed to establish specific dosing protocols, treatment duration, and potential oncological outcomes in patients receiving this combination.



15084

COMPARATIVE EFFICACY AND SAFETY OF ASUNDEXIAN VERSUS APIXABAN IN ATRIAL FIBRILLATION: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Anticoagulation in Atrial Fibrillation (AF) is mandatory for the prevention of stroke and systemic embolism. Apixaban is a consolidated therapy, yet its application remains limited by the intrinsic risk of bleeding complications. Asundexian, a novel Factor XIa inhibitor, proposes a pharmacological decoupling of hemostasis and thrombosis, theoretically aiming for greater clinical safety. This meta-analysis evaluates the comparative efficacy and safety profiles of these therapies. Objetivos: To evaluate the comparative efficacy and safety of asundexian versus apixaban for the prevention of stroke and systemic embolism, as well as the risk of major bleeding in adult populations with AF. Métodos: A systematic review and meta-analysis was conducted in accordance with PRISMA guidelines, systematically searching the PubMed and Embase databases. Clinical trials evaluating adult patients with AF requiring oral anticoagulation were included. The intervention involved the administration of asundexian compared directly to a control group receiving apixaban. Analyzed clinical outcomes encompassed the incidence of major bleeding events, all-cause mortality, and cardiovascular mortality. The screening process removed duplicate records and excluded studies with inadequate methodological designs, incorrect populations, or inappropriate interventions. Statistical analyses calculated the pooled Relative Risk (RR) with 95% Confidence Intervals (CI) and assessed inter-study heterogeneity using the I^2 statistic. Resultados e Conclusões: Three clinical trials comprising a total cohort of 16,247 participants were included. Asundexian demonstrated a statistically significant reduction in the risk of bleeding events compared to apixaban, yielding a pooled Relative Risk of 0.52 (95% CI: 0.46–0.60; I^2=0%). Conversely, the intervention did not demonstrate a significant reduction in all-cause mortality (RR=0.82; 95% CI: 0.59–1.12; I^2=0%) or cardiovascular mortality (RR=0.75; 95% CI: 0.42–1.33; I^2=67.6%). In conclusion, asundexian presents a superior safety profile, effectively reducing the bleeding risk by nearly half. However, this distinct hemostatic advantage does not translate into an overall survival or cardiovascular mortality benefit. Given the lack of superiority in fatal clinical outcomes, further studies are required to define the definitive therapeutic role of Factor XIa inhibition in the routine management of AF.

22042

COMPARATIVE PHARMACOLOGICAL ASSESSMENT OF THE DIURETIC AND ELECTROLYTE-MODULATING EFFECTS OF SYAGRUS COCOIDES EXTRACT VERSUS HYDROCHLOROTHIAZIDE

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Introdução/Fundamentos: Thiazide diuretics remain first-line agents in hypertension management; however, their adverse metabolic effects underscore the need for alternative compounds with distinct renal mechanisms. Plant-derived bioactive substances represent a promising source of novel diuretic candidates, yet their comparative pharmacological profiles remain insufficiently explored. Objetivos: This study aimed to evaluate the acute diuretic and electrolyte effects of the hydroalcoholic extract of Syagrus cocoides (SYA) and hydrochlorothiazide (HCTZ), with emphasis on temporal patterns of renal response. Métodos: S. cocoides kernels were dried, milled, and macerated in 70% hydroalcoholic solution, concentrated under reduced pressure (40°C), lyophilized, and stored at 5°C. Male, young, normotensive Wistar rats (200–250 g) were maintained under controlled conditions (24–25°C; 12 h light/dark cycle) with food and water ad libitum. Following 15 days of acclimatization, animals were randomized into four groups (n=5): vehicle, HCTZ (25 mg/kg), SYA (100 mg/kg), and SYA (300 mg/kg). Urinary output was measured over 24 hours, and sodium, potassium, and chloride excretion were quantified at 6 and 24 hours. Data were expressed as mean ± SEM and analyzed by one-way ANOVA followed by Tukey's test ($p<0.05$). Resultados e Conclusões: SYA induced a significantly faster onset of diuresis compared with HCTZ, particularly at 300 mg/kg, with sustained urine output persisting up to 24 hours. HCTZ exhibited a delayed but pronounced early-phase diuretic effect. Regarding electrolyte handling, HCTZ enhanced early natriuresis, consistent with distal tubular sodium reabsorption inhibition, whereas SYA promoted delayed yet robust sodium excretion at 24 hours, suggesting alternative tubular mechanisms. SYA also induced a marked and persistent increase in chloride excretion surpassing HCTZ, while potassium excretion was moderately elevated across all treated groups. The divergent temporal and electrolyte profiles indicate that S. cocoides extract likely acts through renal mechanisms distinct from thiazide diuretics, supporting the hypothesis that SYA modulates tubular ion transport via non-thiazide pathways. These findings highlight its potential as a novel natural candidate for diuretic drug discovery and translational nephrology research.

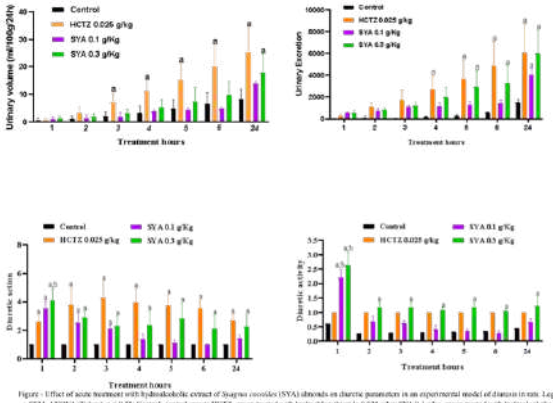


Figure - Effect of acute treatment with hydroalcoholic extract of *Syagrus cocoides* (SYA) almonds on diuretic parameters in an experimental model of diuresis in rats. Legend: Mea ± SEM, ANOVA (Tukey), $p \leq 0.05$; Control, control group; HCTZ, group treated with hydrochlorothiazide 0.025 g/kg; SYA 0.1 g/kg, group treated with hydroalcoholic extract of Syagrus cocoides almonds 0.1 g/kg; SYA 0.3 g/kg, group treated with hydroalcoholic extract of Syagrus cocoides almonds 0.3 g/kg; a comparison with the control group, b comparison with the hydrochlorothiazide group; c comparison with the SYA 0.1 g/kg group.

18471

EFFECT OF GLP-1 RECEPTOR AGONISTS (GLP-1RAS) ON THE REDUCTION OF MAJOR ADVERSE CARDIOVASCULAR EVENTS (MACE) IN PATIENTS AT HIGH CARDIOVASCULAR RISK.

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Introdução/Fundamentos: Glucagon-like peptide-1 receptor agonists (GLP-1RAs) are antidiabetic agents that stimulate glucose-dependent insulin secretion and delay gastric emptying, promoting satiety and weight loss. Given the high cardiovascular risk associated with metabolic syndrome, this drug class has gained attention for its potential to reduce adverse cardiovascular events. Objetivos: To analyse the protective effect of GLP-1RAs on major adverse cardiovascular events (MACE) in patients at high cardiovascular risk. Métodos: A systematic review was conducted in accordance with PRISMA guidelines, with a search performed in PubMed using descriptors related to “GLP-1 receptor agonists” and “cardiovascular outcomes.” Studies including patients with type 2 diabetes mellitus, obesity, or cardiovascular diseases using GLP-1RAs and evaluating cardiovascular outcomes, including MACE, were selected based on predefined eligibility criteria. After screening, 12 studies were included in the final analysis. Resultados e Conclusões: GLP-1RAs were shown to reduce ischemia–reperfusion injury and promote favorable modulation of cardiovascular risk factors. An observational study demonstrated a 21% reduction in the risk of MACE, corroborated by clinical trials. Obese patients showed greater benefit in reducing hospitalizations due to heart failure. Functional improvement was observed in patients with heart failure and chronic kidney disease, including reduction in NYHA functional class, increased distance in the 6-minute walk test, and greater response to cardiac resynchronization therapy, as well as benefits in heart failure with preserved ejection fraction. There was also a reduction in atherosclerotic events, such as myocardial infarction, stroke, and cardiovascular death, in addition to a decrease in arrhythmic events. In secondary prevention, meta-analyses demonstrated a reduced risk of total stroke (RR 0.85; 95% CI 0.77–0.93) and non-fatal stroke (RR 0.87; 95% CI 0.79–0.95). The combination with SGLT2 inhibitors showed a synergistic effect. GLP-1RAs provide consistent benefits in reducing cardiovascular events and mortality across the cardiometabolic spectrum. Despite this, their use remains suboptimal in eligible populations, highlighting the need for greater implementation in clinical practice, with potential to reduce major adverse cardiovascular events and cardiovascular mortality.

20866

EFFECT OF GLP-1 RECEPTOR AGONISTS ON CARDIOVASCULAR EVENTS REDUCTION: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: GLP-1 receptor agonists were developed for type 2 diabetes but demonstrated consistent cardiovascular benefits, reducing myocardial infarction, stroke, and cardiovascular death. Recent evidence suggests expansion of this benefit to populations without T2D - individuals with obesity and/or high cardiovascular risk. Objetivos: To evaluate the efficacy of GLP-1 agonists in reducing MACE-3 in patients with and without T2D, including primary and secondary prevention. Métodos: Qualitative systematic review based on eight articles from 2016 to 2026, selected from PubMed, Embase, and Cochrane. Search used descriptors “GLP-1 receptor agonists”, “liraglutide”, “semaglutide”, “cardiovascular outcomes” and “MACE” (Boolean “AND”/”OR”). Inclusion: RCTs, meta-analyses, cohorts with MACE-3 outcome, full text, English/Portuguese. Exclusion: sample <500 patients, follow-up <12 months, narrative reviews, letters. Risk of bias assessed with RoB 2 (RCTs) and ROBINS-I (observational), following PRISMA guidelines. To better organize the levels of evidence, studies were classified as primary evidence (LEADER, SUSTAIN-6, SELECT), secondary evidence (meta-analyses), and observational evidence (real-world cohort SCORE). Strategies were adopted to avoid redundancies and ensure each study was analyzed at its respective hierarchical level. Primary outcome: MACE-3 composite. Resultados e Conclusões: Studies revealed significant MACE-3 reduction with GLP-1 agonists, in patients aged 61-64 years. Meta-analyses: 12-14% reduction (IRR 0.87; 95%CI 0.83-0.91; HR 0.86; 95%CI 0.80-0.92; HR 0.86; 95%CI 0.80-0.93; RR 0.86; 95%CI 0.78-0.95). RCTs: LEADER (HR 0.87; 0.78-0.97), SUSTAIN-6 (HR 0.74; 0.58-0.95), SELECT (HR 0.80; 0.72-0.90). SCORE (primary prevention): 41% reduction (HR 0.59; 0.48-0.73). Benefit extended to all-cause mortality, myocardial infarction, stroke, and heart failure hospitalization, with no significant differences across age, sex, and race subgroups. Safety: gastrointestinal events were more frequent with GLP-1 agonists, with discontinuation rates ranging from 9% to 16% compared to 5% to 8% with placebo. There was no increase in pancreatitis or neoplasms. GLP-1 agonists consistently reduce MACE-3 in T2D at high cardiovascular risk, obesity with prior cardiovascular disease, and primary prevention of obese individuals with multiple risk factors, transcending glycemic control, with robust evidence suggesting a consistent cardioprotective benefit and acceptable safety profile.

Table 1: Characteristics of included studies.

Year	Study / Design	Population	Intervention	N	MACE-3 (HR/RR/IRR; 95%CI)
2025	Meta-analysis (21 RCTs)	T2D + high CV risk	Various GLP-1 RAs	99,599	IRR 0.87 (0.83-0.91)
2025	Meta-analysis (11 RCTs)	T2D + high CV risk	Various GLP-1 RAs	85,373	HR 0.86 (0.80-0.92)
2021	Meta-analysis (8 RCTs)	T2D + high CV risk	Various GLP-1 RAs	60,080	HR 0.86 (0.80-0.93)
2025	Meta-analysis (5 RCTs)	T2D	Oral semaglutide	13,875	RR 0.86 (0.78-0.95)
2023	SELECT (RCT)	Obesity + CVD (no DM)	Semaglutide 2.4 mg/w	17,604	HR 0.80 (0.72-0.90)
2016	LEADER (RCT)	T2D + high CV risk	Liraglutide 1.8 mg/d	9,340	HR 0.87 (0.78-0.97)
2016	SUSTAIN-6 (RCT)	T2D + high CV risk	Semaglutide SC	3,297	HR 0.74 (0.58-0.95)
2026	SCORE (Cohort)	Obesity (Prim Prev)	Semaglutide 2.4 mg/w	144,552	HR 0.59 (0.48-0.73)

RCT: randomized clinical trial; T2D: type 2 diabetes; CV: cardiovascular; CVD: cardiovascular disease; GLP-1 RA: GLP-1 receptor agonist; MACE: major adverse cardiovascular events; HR: hazard ratio; RR: risk ratio; IRR: incidence rate ratio; 95% CI: 95% confidence interval.

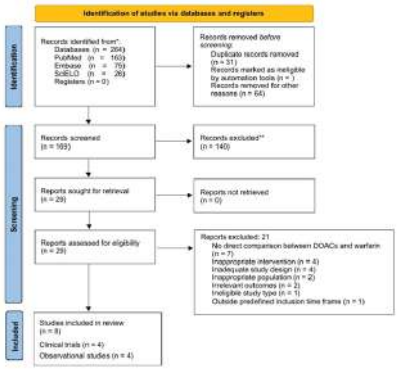
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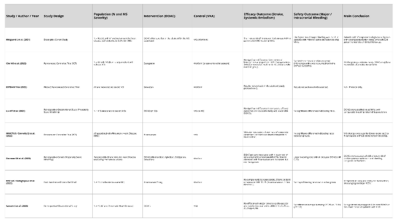
EFFICACY AND SAFETY OF DIRECT ORAL ANTICOAGULANTS VERSUS VITAMIN K ANTAGONISTS FOR STROKE PREVENTION IN ATRIAL FIBRILLATION WITH MITRAL STENOSI: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Patients with mitral stenosis (MS) and atrial fibrillation (AF) constitute a high-risk population for cardioembolism. Although vitamin K antagonists (VKAs) are the established therapy, their narrow therapeutic window and the need for frequent INR monitoring motivate the search for more practical alternatives, such as direct oral anticoagulants (DOACs). This systematic review evaluates current evidence given the lack of consensus on off-label DOAC use. Objetivos: To synthesize current evidence on the efficacy and safety of DOACs versus VKAs for stroke prevention in patients with MS and AF. Métodos: Following PRISMA guidelines, a systematic review of PubMed, SciELO, and EMBASE was conducted, restricted to articles from the last 5 years. Using PICOT criteria, RCTs and observational studies comparing DOACs to VKAs for preventing thromboembolic events in adults with MS and AF were included. Two independent reviewers screened 264 initial records; conflicts were resolved by a third author. After duplicate removal and full-text review of 29 articles, 8 studies were selected. Methodological quality was evaluated using a risk of bias tool. Resultados e Conclusões: The 8 included studies (4 RCTs, 4 observational) yielded divergent findings based on study design. Observational cohorts indicated DOACs had a lower or equivalent risk of stroke/systemic embolism (HR 0.28-0.70) and lower bleeding risk (HR 0.72) compared to VKAs. Pilot RCTs (e.g., RISE MS) showed no symptomatic strokes and acceptable silent ischemia rates. Conversely, the largest RCT (INVICTUS), focusing on rheumatic heart disease, demonstrated significant superiority of VKAs over rivaroxaban in reducing the composite of cardiovascular events and mortality, without increasing bleeding rates. In conclusion, evidence on DOACs in MS with AF is conflicting. While observational data suggest a promising efficacy and safety profile, robust randomized trials establish VKAs as the undisputed gold standard, particularly in rheumatic disease. Routine DOAC use in this population should not be encouraged until ongoing clinical trials definitively clarify their role.





17797

EFFICACY AND SAFETY OF FERRIC CARBOXYMALTOSE IN PATIENTS WITH HEART FAILURE WITH REDUCED EJECTION FRACTION AND IRON DEFICIENCY: A SYSTEMATIC REVIEW OF RECENT EVIDENCE

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Introdução/Fundamentos: Iron deficiency occurs in 30-50% of heart failure with reduced ejection fraction (HFrEF) cases, being associated with higher hospitalization rates and mortality. In the IRONMAN trial, there was no significant difference in cardiovascular death (CVD) or heart failure hospitalizations (HFHs) between the group assigned to ferric derisomaltose and the usual care-only group, although safety endpoints were met; as an alternative, ferric carboxymaltose (FCM) has been tested for its efficacy and safety in subsequent trials. Objetivos: To evaluate the efficacy and safety of FCM in patients with HFrEF and iron deficiency. Métodos: Randomized controlled clinical trials published in the last five years encompassing patients with left ventricular ejection fraction < 50% and serum ferritin level < 100 ng/mL (or serum ferritin level 100 ng/mL–300 ng/mL and transferrin saturation < 20%) were included in the review. Studies that did not meet these criteria were excluded. The outcomes analyzed were CVD, HFHs, and incidence of adverse effects. Initial research was conducted in the MEDLINE and Google Scholar databases using the entry terms “ferric carboxymaltose”, “heart failure with reduced ejection fraction”, “cardiovascular death”, and “heart failure hospitalization”. The articles found were exported to Rayyan in order to remove duplicates, and the PRISMA 2020 checklist was used to systematize the review. Resultados e Conclusões: Three studies were included, comprising 5032 patients, of whom 2657 (52.8%) were assigned to FCM and 2375 (47.2%) were assigned to placebo. The AFFIRM-AFH trial showed no significant difference in CVD between the groups (HR 0.96; 0.70–1.32, p = 0.81), but HFHs were significantly reduced in the FCM group (HR 0·74; 0.58–0.94, p = 0.013). In the HEART-FID trial, no significant difference was observed between the groups in the composite outcome of CVD or HFHs (HR 0.93; 0.81–1.06). In the FAIR-HF2 trial, FCM did not reduce HFHs when compared to placebo (RR 0.80; 0.60–1.06, p = 0.12). In all three studies, no significant difference was observed in the incidence of adverse effects between the groups. The latter two studies were affected by the COVID-19 pandemic. Recent evidence regarding the use of FCM in HFrEF patients with iron deficiency still appears to be controversial, with one study showing a reduction in HFHs; however, it should be noted that two of the studies were impacted by COVID-19, raising the need for further clinical trials.

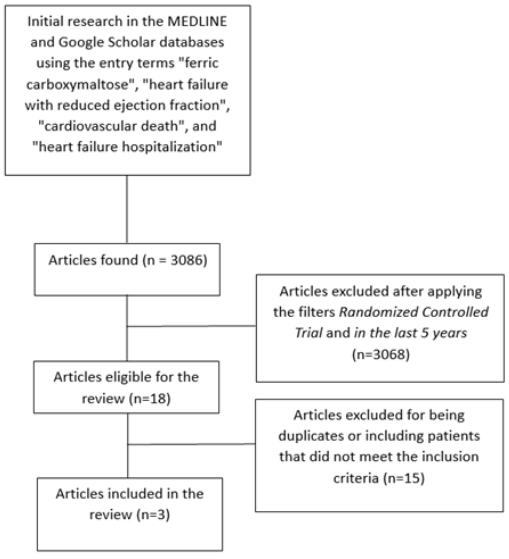


Figure 1. Flowchart of the study selection process

19237

EFFICACY OF SGLT2 INHIBITORS IN NON-DIABETIC PATIENTS WITH HEART FAILURE: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Sodium-glucose cotransporter 2 inhibitors (SGLT2i) have revolutionized the management of type 2 diabetes by demonstrating significant reductions in major adverse cardiovascular events. Emerging evidence suggests that these benefits extend beyond glycemic control, impacting cardiac structure and function through non-hypoglycemic pathways such as improved ion homeostasis, reduced inflammation, and optimized myocardial energetics. However, while the cardioprotective effects in diabetic populations are well-established, there is a need for a contemporary systematic synthesis of high-quality evidence focusing specifically on outcomes in non-diabetic patients to define their role as a foundational therapy in broader cardiology practice. Objetivos: To systematically evaluate the impact of SGLT2 inhibitors on cardiovascular mortality and heart failure outcomes in patients without diabetes mellitus. Métodos: This systematic review was conducted in accordance with PRISMA guidelines. A comprehensive search was performed in PubMed and Scopus in April 2026, including studies published between 2020 and 2026. The search strategy used the terms “SGLT2 inhibitors,” “cardiovascular mortality,” and “non-diabetic,” with appropriate filters applied, such as full-text availability and restriction to the medical field. Eligible studies were selected based on predefined inclusion and exclusion criteria. Two independent reviewers conducted study selection and data extraction. A total of 30 studies were initially identified, of which 14 were included in the final analysis. Resultados e Conclusões: SGLT2 inhibitors significantly reduce the risk of cardiovascular mortality and hospitalizations for heart failure in non-diabetic patients. These clinical benefits are consistent across the spectrum of left ventricular ejection fraction and are directly supported by mechanisms independent of glucose-lowering, including the modulation of the cardiac sodium-interactome and the reduction of oxidative stress. The results confirm that SGLT2 inhibitors provide robust cardioprotection regardless of glycemic status, supporting their implementation as a foundational treatment for heart failure in the non-diabetic population.

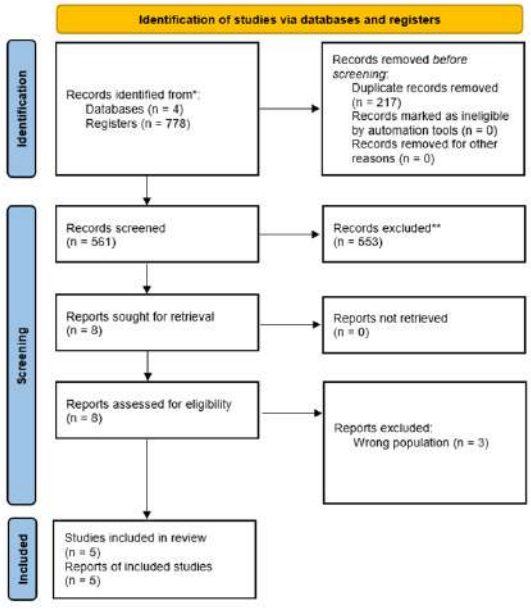
17241

IMPACT OF INHALED TREPROSTINIL ON CARDIOVASCULAR AND HEMODYNAMIC OUTCOMES IN PH-ILD: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Pulmonary hypertension associated with interstitial lung disease (PH-ILD) carries high morbidity and mortality, with limited effective therapies. Inhaled treprostinil has recently emerged as a targeted treatment with potential benefits extending beyond vasodilation. Objetivos: To systematically assess the effects of inhaled treprostinil on hemodynamic, cardiovascular, functional, and clinical outcomes in PH-ILD. Métodos: This systematic review was conducted according to PRISMA guidelines. PubMed, Embase, Cochrane Library, and Scopus were searched through April 2026 for randomized controlled trials and observational studies evaluating inhaled treprostinil in PH-ILD. Relevant outcomes included pulmonary vascular resistance (PVR), cardiac biomarkers (BNP/NT-proBNP), 6-minute walk distance (6MWD), and clinical endpoints such as hospitalization and disease progression. Data were qualitatively synthesized. Resultados e Conclusões: Five studies were included. Inhaled treprostinil demonstrated consistent hemodynamic benefit, with reductions in PVR of up to 40.1% and decreases in NT-proBNP of approximately 15%. Functional capacity improved in randomized trials, with gains of up to 31 m in 6MWD, while real-world data revealed a more variable response, with 38.5% of patients achieving a clinically meaningful improvement (≥30 m) at 6 months. Across studies, treatment was associated with reduced clinical worsening and lower healthcare utilization, including an estimated 30% reduction in hospitalization risk. Notably, the magnitude and consistency of benefit were greater in controlled trial settings compared with observational cohorts. Taken together, Inhaled treprostinil provides robust and consistent hemodynamic improvement in PH-ILD and contributes to stabilization of functional capacity, with signals of reduced clinical worsening. However, the attenuation and variability of benefit in real-world settings underscore the importance of patient selection, early initiation, and treatment optimization. These findings support its role as a cornerstone therapy in PH-ILD while highlighting the need for strategies to enhance effectiveness beyond clinical trial populations.



16822

PREDICTIVE ANALYSIS OF THE CARDIOVASCULAR THERAPEUTIC POTENTIAL OF PHYTOCHEMICAL COMPOUNDS FROM HIBISCUS SABDARIFFA: AN IN SILICO STUDY

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Introdução/Fundamentos: Cardiovascular diseases represent a global health problem. They are associated with oxidative stress and alterations in the renin-angiotensin-aldosterone system. Hibiscus sabdariffa has a high content of anthocyanins and phenolic acids. These compounds may have effects on the cardiovascular system. They may act through modulation of the NO/cGMP pathway and inhibition of the angiotensin-converting enzyme. Nevertheless, its clinical application is limited. This is mainly due to the lack of studies on its molecular interactions. Objetivos: To analyze in silico the propensity of the pharmacological response of volatile compounds from Hibiscus sabdariffa in cardiovascular activities. Métodos: This is an in silico study conducted in sequential steps. Initially, the main phytochemicals present in Hibiscus sabdariffa were identified through a literature review using PubMed, SciELO, and Google Scholar databases. Next, the chemical structures of the selected compounds were obtained from the PubChem® database. A predictive analysis of pharmacological potential was then performed using the Prediction of Activity Spectra for Substances (PASS) software, focusing on cardiovascular-related activities, including angiotensin-converting enzyme inhibition, antioxidant effects, and vasodilatory action. Only compounds with a probability of activity (Pa) greater than 0.5 were considered, and the data were organized for analysis. Resultados e Conclusões: Ten phytochemicals were analyzed, including organic acids (citric, hydroxycitric, hibiscus, malic, tartaric, and caffeic), flavonoids (hibiscitrin and myricetin), and ellagic acid. All compounds demonstrated significant cardiovascular potential (Pa>0.5). Tartaric acid showed the highest probability for lipid metabolism regulation (Pa=0.838) and vasoprotective activity (Pa=0.731). Regarding vascular homeostasis, malic and caffeic acids exhibited peripheral vasodilatory activity (Pa=0.659 and 0.639, respectively). Hibiscitrin (Pa=0.709) and tartaric acid (Pa=0.712) stood out for their antithrombotic and fibrinolytic potential. Furthermore, citric and hibiscus acids demonstrated relevant activity in cholesterol antagonism (Pa=0.583 and 0.542) alongside antioxidant properties, suggesting a multi-target effect across multiple pathophysiological pathways associated with cardiovascular diseases. We conclude that these compounds have therapeutic potential, though robust preclinical and clinical trials remain essential for experimental validation.

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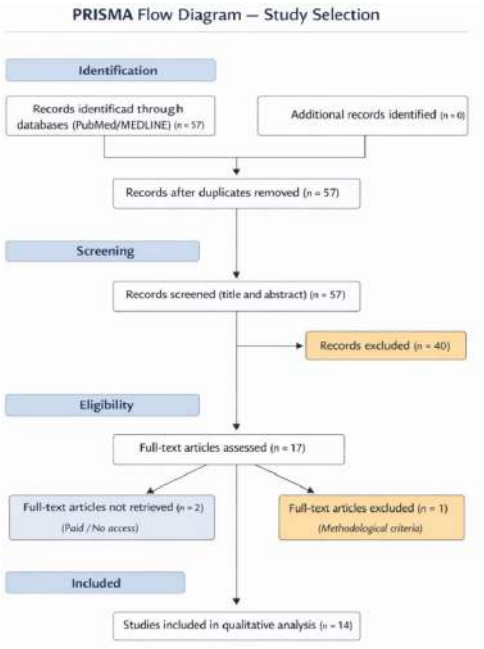
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SS-31 AS A MITOCHONDRIAL MODULATOR IN THE TREATMENT OF HEART FAILURE AND ACUTE KIDNEY INJURY

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Introdução/Fundamentos: SS-31 is a synthetic tetrapeptide that selectively binds to cardiolipin, stabilizing the inner mitochondrial membrane and preserving its structure and function under cellular stress. It has emerged as a potential therapeutic strategy to attenuate tissue injury in high-energy-demand organs such as the heart and kidneys, where mitochondrial dysfunction plays a key role in the pathophysiology of acute kidney injury (AKI) and heart failure (HF). Heart failure and acute kidney injury are closely linked conditions with high morbidity and mortality. Mitochondrial dysfunction and oxidative stress play a central role in their pathophysiology. Current therapies remain limited, highlighting the need for new approaches. In this context, SS-31 emerges as a promising mitochondrial-targeted therapy, although its clinical benefits are still not fully established. Objetivos: To collect, evaluate and summarize the role of SS-31 as a mitochondrial-targeted therapy in heart failure and acute kidney injury, with emphasis on functional, bioenergetic, and inflammatory outcomes. Métodos: Systematic review based on the PICO strategy (P: patients with kidney injury and/or heart failure; I: SS-31; C: standard treatment; O: improvement in clinical outcomes and reduction of oxidative stress). Following PRISMA, a search was conducted in PubMed/MEDLINE (March–April/2026) using the descriptors “Elamipretide”, “SS-31”, “MTP-131”, “Heart Failure”, “Acute Kidney Injury”, “Mitochondrial Dysfunction”, “Oxidative Stress” and “Reactive Oxygen Species”. Of 57 studies, 14 were included after screening. Resultados e Conclusões: Results: Included studies comprised preclinical and clinical models. SS-31 demonstrated dose-dependent effects, with acute administration improving hemodynamic parameters and reducing renal injury, while chronic use promoted sustained structural benefits. Mechanistically, it stabilized cardiolipin, increased ATP production, and reduced oxidative stress. Improvements in cardiac and renal function were observed, with a favorable safety profile and predominantly mild adverse effects. Conclusion: SS-31 shows potential as a mitochondrial modulator in the cardiorenal axis, promoting improved bioenergetics, reduced oxidative stress, and both cardiac and renal benefits. Despite these promising findings, clinical evidence remains limited, requiring larger studies to confirm its efficacy and safety.



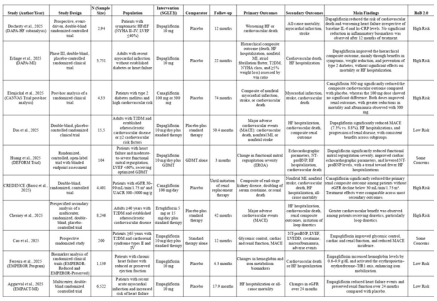
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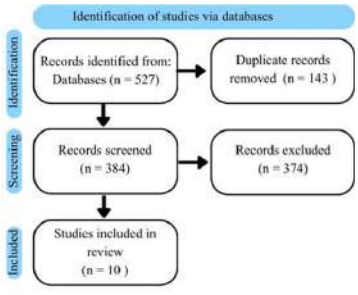
THE ROLE OF SGLT2 INHIBITORS BEYOND DIABETES: CARDIOVASCULAR IMPLICATIONS

BEATRZ BRILHANTE DE SOUSA1; LAURA COSTA DA COSTA1; EVA VITÓRIA FERREIRA VIANA1; DIOGO MACOLA FELIX1; EDUARDO MACHADO DA SILVA ZAMIAN1; MAGNUM DIAS COELHO1; ROBERTO MARCIO DE OLIVEIRA JUNIOR1;

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Introdução/Fundamentos: Sodium-glucose cotransporter 2 inhibitors (SGLT2i), also known as gliflozins, are widely used in the treatment of type 2 diabetes mellitus. Beyond glycemic control, recent evidence has demonstrated significant cardiovascular and renal benefits, including reductions in hospitalizations for heart failure, major adverse cardiovascular events (MACE), and preservation of renal function. Objetivos: To synthesize contemporary evidence regarding the cardiovascular effects of SGLT2 inhibitors on heart failure, cardiovascular mortality, and major adverse cardiovascular events (MACE). Métodos: This systematic review was conducted in accordance with the PRISMA 2020 guidelines and based on the PICO strategy. Searches were performed in the PubMed/MEDLINE, EMBASE, Scopus, and Cochrane Library databases, including studies published between April 24, 2025, and April 24, 2026. The following descriptors were used: “SGLT2 inhibitors,” dapagliflozin, empagliflozin, canagliflozin, ertugliflozin, “Heart Failure,” “cardiovascular death,” “hospitalization for heart failure,” and MACE. Phase III/IV randomized controlled trials and subanalyses of RCTs with a minimum follow-up of 12 weeks and cardiovascular outcome assessment were included. Study selection was performed through blinded peer review, with a third reviewer resolving disagreements. Of the 527 records identified, 10 studies were included in the final synthesis. Risk of bias was assessed using the RoB 2.0 tool, and a descriptive synthesis was conducted due to methodological heterogeneity. The protocol was registered in PROSPERO. Resultados e Conclusões: The studies consistently demonstrated cardiovascular and renal benefits associated with SGLT2 inhibitors, including reductions in hospitalizations for heart failure, improvements in echocardiographic parameters, reductions in NT-proBNP levels, preservation of renal function, and decreased incidence of MACE. Large clinical trials reported an approximate 25–35% reduction in hospitalizations for heart failure, along with lower cardiovascular mortality. Landmark studies such as DAPA-HF, EMPEROR-Reduced, EMPEROR-Preserved, and DELIVER demonstrated benefits even among patients without diabetes mellitus, reinforcing cardioprotective mechanisms independent of glycemic control. These findings consolidate SGLT2 inhibitors as cardioprotective and nephroprotective therapeutic strategies across multiple clinical settings, although further studies are still needed to better define their effects in specific populations.





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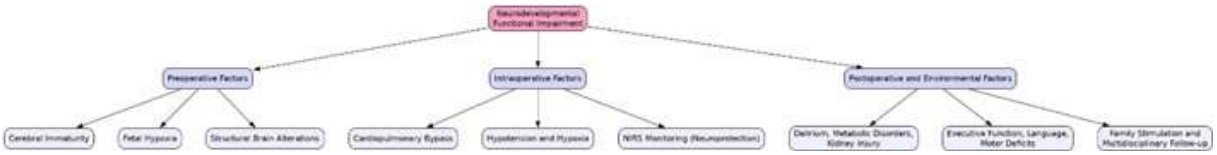
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ASSOCIATION BETWEEN PEDIATRIC HEART SURGERY AND NEURODEVELOPMENTAL ALTERATIONS IN PATIENTS WITH CONGENITAL HEART DISEASE: A SYSTEMATIC REVIEW OF EVIDENCE

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(1) UNIVERSIDADE DE VASSOURAS (UNIVASSOURAS) - VASSOURAS - RJ - BRASIL;

Introdução/Fundamentos: Congenital heart disease is the most frequent malformation at birth, frequently requiring surgical intervention in the first years of life. In recent decades, advances in surgical techniques and pediatric intensive care have promoted a significant reduction in mortality. However, the increase in survival has brought greater relevance to non-cardiac outcomes, especially neurological and cognitive alterations, which directly impact the functionality and quality of life of these patients. Objetivos: This study aimed to analyze the association between pediatric heart surgery and neurocognitive development alterations in children with congenital heart disease. Métodos: A systematic review was conducted according to PRISMA guidelines, searching the PubMed and Virtual Health Library databases using the descriptors “Heart Surgery”, “Neurodevelopment”, and “Children”. The review included studies published in the last five years, with a clinical or observational design, available in full text, and involving a pediatric population undergoing heart surgery in free full text. Duplicate and out-of-scope articles were excluded. After screening 499 records and applying eligibility criteria, 25 studies were selected for qualitative analysis. Resultados e Conclusões: The results indicate that functional impairment is multifactorial. In the preoperative period, structural brain alterations stand out, such as immaturity and lesions associated with fetal hypoxia. During the intraoperative period, especially during cardiopulmonary bypass, episodes of hypotension and hypoxia increase the risk of neurological damage, making NIRS monitoring relevant for prevention. In the postoperative period, complications such as delirium, metabolic disorders, and kidney injury also negatively influence outcomes. The main deficits include alterations in executive functions, language delay, and motor impairments, with repercussions that may persist into adolescence. Furthermore, environmental factors, such as family stimulation and multidisciplinary follow-up, play an important role in recovery. It is concluded that the impairments observed in children undergoing heart surgery result from the interaction between pre-, intra-, and postoperative factors. Strategies aimed at maintaining cerebral perfusion, combined with multidisciplinary follow-up and adequate environmental support, are fundamental to minimize sequelae and improve long-term outcomes.



20988

COMPARATIVE OUTCOMES OF SHUNT TYPES IN THE NORWOOD I PROCEDURE FOR PEDIATRIC CARDIOVASCULAR SURGERY: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: In the Norwood procedure (Stage I) for hypoplastic left heart syndrome, the shunt strategy influences coronary perfusion and hemodynamic stability. The modified Blalock–Taussig shunt (mBTs) may increase diastolic “runoff” and systemic load, while the right ventricle-to-pulmonary artery (RV-PA) shunt reduces runoff but involves a ventriculotomy and higher pulmonary intervention rates. A quantitative synthesis is essential to guide surgical selection and interstage care in high-complexity centers. Objetivos: To compare mBTs vs. RV-PA regarding Stage I hospital mortality, death/transplant by Stage II, interstage reinterventions, and severe acute kidney injury (AKI). Métodos: Systematic review and meta-analysis of comparative observational studies in pediatric patients. Risk of bias was assessed for non-randomized studies. Effect measures were expressed as risk ratios (RR) with 95% confidence intervals (CI), synthesized via restricted maximum likelihood random-effects models with Hartung–Knapp adjustment. Sensitivity was tested via one-study-out exclusion. Resultados e Conclusões: For Stage I hospital mortality, five studies (7,740 patients) showed a robust reduction with RV-PA: RR 0.72 (95% CI: 0.63–0.82), with zero heterogeneity and stable effects, suggesting cross-center reproducibility. For death or transplant by Stage II, three studies (3,822 patients) showed no difference: RR 0.83 (95% CI: 0.55–1.26). Conversely, two studies (1,000 patients) revealed a significant increase in pulmonary reinterventions for the RV-PA group: RR 4.39 (95% CI: 2.67–7.23), with zero heterogeneity, indicating a higher interstage burden. One study (355 patients) found no significant difference in severe AKI. The RV-PA shunt consistently reduces Stage I hospital mortality but substantially increases pulmonary reinterventions by Stage II, defining a clear clinical trade-off. Findings support individualizing shunt strategies based on anatomy and the center’s capacity for interstage surveillance. These estimates assist in family counseling and the implementation of structured protocols for early hemodynamic monitoring, integrating early survival with long-term care planning in pediatric surgery.

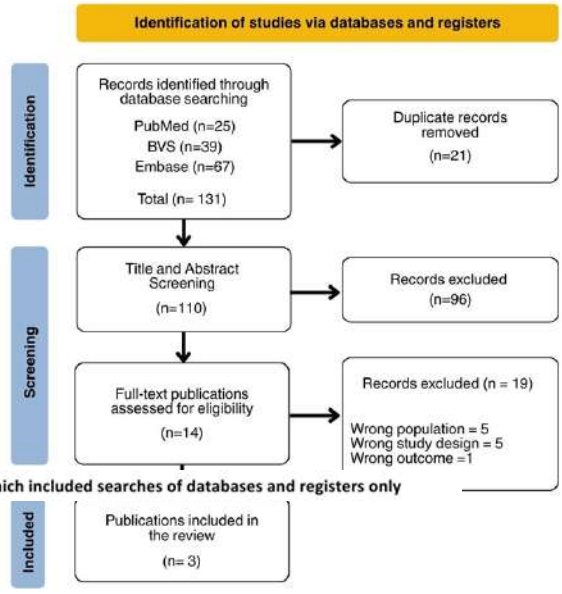
21393

COMPARISON OF PULSATILE AND CONTINUOUS FLOW PERFUSION DURING EXTRACORPOREAL CIRCULATION IN PEDIATRIC CARDIAC SURGERY: A SYSTEMATIC REVIEW OF HEMODYNAMIC IMPACTS AND CLINICAL OUTCOMES

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Introdução/Fundamentos: Introduction: Cardiopulmonary bypass (CPB) constitutes a fundamental aspect in pediatric cardiac surgeries, especially correcting congenital heart defects while maintaining the body's perfusion. Although CPB systems traditionally operate via Non-Pulsatile Flow (NPF), Pulsatile Flow (PF) has been proposed as a physiologically superior alternative. Objetivos: Objectives: This study aims to compare hemodynamic impacts and clinical outcomes of pulsatile flow versus non-pulsatile flow perfusion during CBP in pediatric patients undergoing cardiac surgery. Métodos: Methods: A search was conducted across the PubMed, Embase, and BVS using DeCS/MeSH descriptors, following the PRISMA guidelines. The selection included randomized clinical trials and a retrospective cohort evaluating the Pulsatility Index (PI) and post-surgical recovery. Resultados e Conclusões: Results: The study included a total of 443 pediatric patients with congenital heart defects undergoing CPB with either pulsatile flow (n=215) or non-pulsatile flow (n=228). PRISM-III scores (NPF: 5.4±2.1; PF: 5.8±2.8) were similar between groups, according to the randomized clinical trial, indicating comparable baseline severity. At the retrospective cohort, both groups exhibited similar pre-CPB plasma free hemoglobin levels, however, the pulsatile group demonstrated significantly lower post-CPB levels (p=0.04). Transcranial Doppler ultrasound analysis revealed better-maintained results in the pulsatile group regarding the PI at the right middle cerebral artery and the arterial line (p<0.05) at the randomized trial. Conversely, the cohort demonstrated arterial line pressures were higher in the non-pulsatile group (p=0.003), possibly driven by higher vascular resistance. However, PI returned to baseline values post-CPB in both groups. No statistically significant differences were observed in regional cerebral oxygen saturation or gaseous microemboli counts (GME) between groups at the retrospective study (NPF=176±47; PF=337±74; p=0.079). Likewise, there were no significant di overall hospital stay. C has proven to be safe, the prognoses of CPB using PF and NPF showed similar aspects in both PI and GME scores and clinical outcomes. However, due to the small sample size for comparison between these approaches, further studies on this topic are needed for a more definitive conclusion



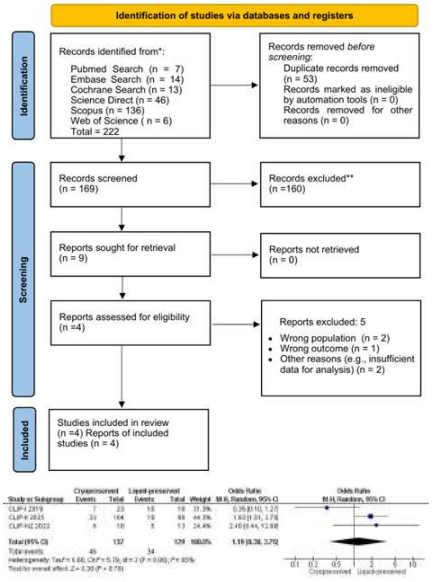
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EFFICACY AND SAFETY OF CRYOPRESERVED VERSUS LIQUID-PRESERVED PLATELETS IN CARDIAC SURGERY: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CLINICAL TRIALS

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Introdução/Fundamentos: Conventionally stored platelets (liquid-preserved at 22°C) have a limited shelf life of 5–7 days, resulting in high discard rates and limited availability in remote areas. Cryopreservation with dimethyl sulfoxide (DMSO) extends this period to up to 2 years, but its in vivo hemostatic efficacy and clinical safety remain controversial, especially following large recent trials. Objetivos: To compare the hemostatic efficacy and clinical safety of cryopreserved platelets versus liquid-preserved platelets in adult patients undergoing cardiac surgery with cardiopulmonary bypass. Métodos: Following PRISMA, a systematic review of randomized clinical trials (RCTs) comparing the two preservation methods was conducted. The search included PubMed, Embase, Cochrane, ScienceDirect, Scopus, and Web of Science databases. Data were extracted, and the meta-analysis was performed using fixed- and random-effects models. Five main outcomes were analyzed: intraoperative bleeding, BARC (Bleeding Academic Research Consortium) bleeding, reoperation for bleeding control, length of hospital stay, and mortality. Results were expressed as Mean Difference (MD) or Odds Ratio (OR) with 95% Confidence Interval (CI). Resultados e Conclusões: A total of 222 articles were identified in the initial search. After duplicate removal, 53 records were excluded. Ultimately, 4 randomized clinical trials were included, comprising 319 patients for hemostatic efficacy analysis and 266 for safety and length of hospital stay outcomes. For intraoperative bleeding, no significant difference was observed between groups (MD 43.67 mL; 95% CI -160.58 to 247.92; p = 0.68), with high heterogeneity (I^2 = 75%). Similar findings were observed for clinically significant bleeding (BARC) incidence (OR 1.19; 95% CI 0.38 to 3.75; p = 0.76; I^2 = 65%) and reoperation for bleeding (OR 0.74; 95% CI 0.34 to 1.61; p = 0.45; I^2 = 12%), with no significant differences between strategies. Length of hospital stay was also comparable (MD -1.36 days; 95% CI -6.08 to 3.36; p = 0.57; I^2 = 62%). However, pooled analysis of mortality showed a significantly higher risk of death in the cryopreserved platelet group (OR 5.54; 95% CI 1.38 to 22.22; p = 0.02), with no heterogeneity (I^2 = 0%). Although cryopreserved platelets offer logistical advantages, they were not superior to liquid-preserved platelets in controlling bleeding in cardiac surgery, and the observed increase in mortality raises critical safety concerns requiring further investigation before routine clinical implementation.



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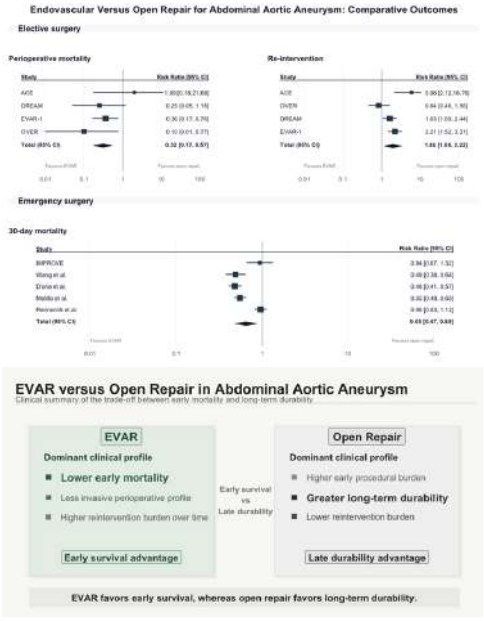
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ENDOVASCULAR VS OPEN REPAIR IN ABDOMINAL AORTIC ANEURYSM: A CONSISTENT EARLY SURVIVAL–LATE DURABILITY TRADE-OFF ACROSS CLINICAL SETTINGS

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Introdução/Fundamentos: Endovascular aneurysm repair (EVAR) has transformed abdominal aortic aneurysm (AAA) management by improving perioperative outcomes versus open repair. However, whether this early survival advantage is offset by reduced long-term durability, and how this relationship manifests across clinical presentations, remains incompletely defined, particularly regarding its implications for clinical decision-making. Objetivos: To characterize the relationship between early survival and long-term durability after EVAR versus open repair in elective and ruptured AAA, integrating short-term mortality and long-term reintervention outcomes. Métodos: A systematic review and meta-analysis were conducted according to PRISMA guidelines. Randomized controlled trials and prospective cohort studies comparing EVAR versus open repair were identified through PubMed, Embase, and the Cochrane Library (inception to April 2026). The primary outcomes were 30-day and perioperative mortality. The secondary outcome was reintervention, defined as any secondary procedure related to the index aneurysm repair. Pooled risk ratios (RRs) with 95% confidence intervals (CIs) were estimated using random-effects Mantel–Haenszel models. Heterogeneity was assessed using the I² statistic, and subgroup analyses were performed by clinical presentation. Certainty of evidence was evaluated using the GRADE system. Resultados e Conclusões: Ten studies (7 RCTs and 3 prospective cohorts), including 55,633 patients, were analyzed. Median follow-up ranged from 2.1 to 15 years. For early outcomes, EVAR was associated with lower perioperative mortality in elective AAA (RR 0.32, 95% CI 0.17–0.57; I² = 32%) and reduced 30-day mortality in ruptured AAA (RR 0.65, 95% CI 0.47–0.89; I² = 0%). For long-term outcomes, EVAR was associated with higher reintervention rates in elective AAA (RR 1.86, 95% CI 1.08–3.22; I² = 28%). This pattern likely reflects a clinically meaningful balance between lower procedural invasiveness and reduced long-term structural durability of EVAR compared with open surgery. EVAR provides a consistent early survival benefit across clinical settings, offset by reduced long-term durability. These findings support a consistent and clinically coherent early survival–late durability trade-off framework and highlight the importance of individualized treatment decisions based on patient characteristics and long-term procedural considerations.



17365

IMPACT OF ATRIAL FIBRILLATION ON HOSPITAL OUTCOMES IN PATIENTS UNDERGOING CORONARY ARTERY BYPASS GRAFTING: A SYSTEMATIC REVIEW OF BRAZILIAN STUDIES

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Introdução/Fundamentos: Atrial fibrillation (AF) is the most common arrhythmic complication in the postoperative period of coronary artery bypass grafting (CABG). Quantifying the impact of this arrhythmia on hospital outcomes is essential to optimize protocols aimed at reducing morbidity and mortality. Objetivos: To perform a systematic review on the impact of AF on hospital outcomes in patients undergoing CABG in Brazil, focusing on in-hospital mortality, length of stay, and incidence of complications. Métodos: This is a systematic review conducted in accordance with the PRISMA guidelines, based on the selection of publications from the PubMed, LILACS, and SciELO databases. The Health Sciences Descriptors used were “Atrial Fibrillation” and “Coronary Artery Bypass Grafting.” Randomized clinical trials and observational studies conducted in Brazil, published between 2015 and 2026, were included if they evaluated patients undergoing CABG and compared outcomes between groups with and without AF. The outcomes analyzed were hospital mortality, length of stay in the intensive care unit (ICU) and total hospitalization, stroke, and acute kidney injury. The final sample comprised six studies. Resultados e Conclusões: The incidence of AF among 7,428 patients undergoing CABG was 15.4% (ranging from 11.4% to 19%). In-hospital mortality in the group that developed the arrhythmia was 9.54%, compared to 3.59% in the sinus rhythm group ($p < 0.05$). AF was associated with an increased need for prolonged mechanical ventilation and longer ICU stay, with total hospitalization ranging from 11 to 14.5 days. Regarding multisystem impact, the incidence of stroke was up to four times higher (4.0% vs. 1.1%), and acute kidney injury was up to five times higher (12.0% vs. 2.4%) in patients with AF. Concerning prophylaxis, analysis of 140 patients using colchicine did not demonstrate a reduction in AF incidence (7.04% vs. 13.04%, $p = 0.271$) and was associated with a higher infection rate. In contrast, maintaining central venous pressure ≤ 15 cmH_2O reduced AF incidence from 22.86% to 8.57% ($p = 0.03$). Factors such as advanced age (>64.5 years), increased left atrial diameter (>40.5 mm), and elevated inflammatory markers were identified as predictors of postoperative AF. The implementation of targeted prophylactic and therapeutic protocols for AF is essential to optimize CABG outcomes in the national setting.

20245

IMPACT OF CARDIOPULMONARY BYPASS ON SYSTEMIC INFLAMMATORY RESPONSE SYNDROME IN PATIENTS UNDERGOING CORONARY ARTERY BYPASS GRAFTING.

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Introdução/Fundamentos: Cardiopulmonary bypass (CPB), although indispensable for myocardial revascularization, induces a complex inflammatory cascade that contributes to systemic inflammatory response syndrome (SIRS) and may influence postoperative recovery. The Systemic Immune-Inflammation Index (SII), derived from peripheral blood cell counts, has been proposed as an integrative marker of inflammatory and immune status. However, its role as a predictor of clinically relevant outcomes after coronary artery bypass grafting (CABG) remains insufficiently defined. Objetivos: This study aimed to evaluate the association between SII and postoperative outcomes in patients undergoing CABG with CPB. Métodos: A retrospective analytical cohort was conducted including adult patients submitted to isolated CABG with CPB between 2022 and 2023. Preoperative and postoperative SII values, as well as their variation (Delta SII), were analyzed. Statistical evaluation included correlation analysis, ROC curves, and multivariate regression models, with adjustment for clinical variables and CPB duration ($p < 0.05$). Resultados e Conclusões: A total of 104 patients were included (mean age 63.6 ± 8.8 years; 77.9% male). The mean ICU length of stay was 5.8 ± 5.1 days, and hospital mortality reached 7.7%. SII and Delta SII showed limited discriminatory capacity for mortality and major cardiovascular complications (AUC < 0.60), and were not independent predictors of death in adjusted analyses. In contrast, both markers demonstrated a consistent positive association with ICU length of stay ($r \approx 0.31$), remaining significant predictors in linear regression models ($p = 0.001$). These findings suggest that, although not useful for mortality prediction, SII may reflect the intensity of postoperative inflammatory response and be associated with prolonged ICU stay, indicating potential value in assessing postoperative morbidity and recovery trajectory in CABG patients.

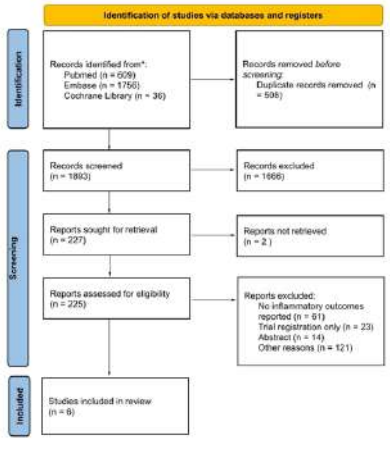
16145

IMPACT OF FASCIAL PLANE BLOCKS ON POSTOPERATIVE INFLAMMATORY MARKERS FOLLOWING CARDIAC SURGERY VIA MEDIAN STERNOTOMY: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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Figure 1 - PRISMA flow diagram



Introdução/Fundamentos: Cardiac surgery via sternotomy triggers a robust systemic inflammatory response involving synthesis of IL-6, TNF-α and CRP. Fascial plane blocks (FPB) have emerged as a multimodal analgesia component with preliminary evidence suggesting attenuation of the surgical stress response, yet their impact on inflammatory markers remains poorly synthesized. Objetivos: To evaluate the impact of FPB on inflammatory response and clinical outcomes in cardiac surgery via median sternotomy. Métodos: We searched PubMed, Embase, and Cochrane Library through March 2026 for randomized controlled trials (RCTs) comparing FPB versus placebo or usual care in adults undergoing cardiac surgery via median sternotomy. Primary outcomes were IL-6 (pg/mL), TNF-α (pg/mL), and CRP (mg/L). Secondary outcomes were ICU stay (hours), hospital stay (days), and extubation time (hours). Inflammatory markers were analyzed in predefined postoperative time windows. A random-effects model was used to estimate mean differences (MDs) with 95% confidence intervals (CIs). Heterogeneity was assessed by I^2. Subgroup analysis was performed based on the use of cardiopulmonary bypass (CPB). The protocol was prospectively registered in PROSPERO (CRD420261364869). Resultados e Conclusões: We included six RCTs involving 440 patients, of whom 224 (50.9%) were allocated to the FPB group. FPB was associated with significantly lower IL-6 levels at 12–24h (MD 21.51; 95% CI 8.01 to 35.02; I^2=46.9%), although no significant differences were observed at 0–1h (MD 10.51; 95% CI −13.10 to 34.12; I^2=69.8%) or 24–48h (MD 16.63; 95% CI −7.83 to 41.10; I^2=33.0%). TNF-α at 12–24h (MD 10.37; 95% CI −8.23 to 28.97; I^2=99.1%) and CRP at 24–48h (MD 18.95; 95% CI −9.84 to 47.74; I^2=92.8%) showed no significant differences; high heterogeneity limits reliability. Regarding secondary outcomes, FPB significantly reduced time to extubation (MD 2.83; 95% CI 0.12 to 5.55; I^2=97.6%) and ICU stay (MD 6.51; 95% CI 1.43 to 11.59; I^2=93.3%), though high heterogeneity limits these estimates. Hospital stay did not differ significantly (MD 0.73; 95% CI −0.37 to 1.83; I^2=92.6%). In the CPB subgroup, findings remained consistent for IL-6 at 0–1h, 12–24h, and hospital stay, whereas ICU stay and extubation time lost significance. Overall, FPB was associated with reduced IL-6 at 12–24h and improved clinical recovery outcomes, suggesting a potential anti-inflammatory role in cardiac surgery via median sternotomy. These findings warrant confirmation in larger RCTs.

Figure 2: Pooled analysis

OUTCOME	PARTICIPANTS	EFFECT ESTIMATE [95% CI]	I^2	P-VALUE
IL-6: 0-1h	185	MD 10.51 [-13.10 – 34.12]	69.8%	0.3831
IL-6: 12-24h*	288	MD 21.51 [8.01 – 35.01]	46.9%	0.0018
IL-6: 24-48h	155	MD 16.63 [-7.83 – 41.10]	33.0%	0.1827
TNF-α: 12-24h	213	MD 10.37 [-8.23 – 28.97]	99.1%	0.2744
CRP: 24-48h	178	MD 18.95 [-9.84 – 47.74]	92.8%	0.1970
ICU stay*	321	MD 6.51 [1.43 – 11.59]	93.3%	0.0120
Hospital stay	326	MD 0.73 [-0.37 – 1.83]	92.6%	0.1963
Time to extubation*	366	MD 2.83 [0.12 – 5.55]	97.6%	0.0406

* Statistically significant outcome

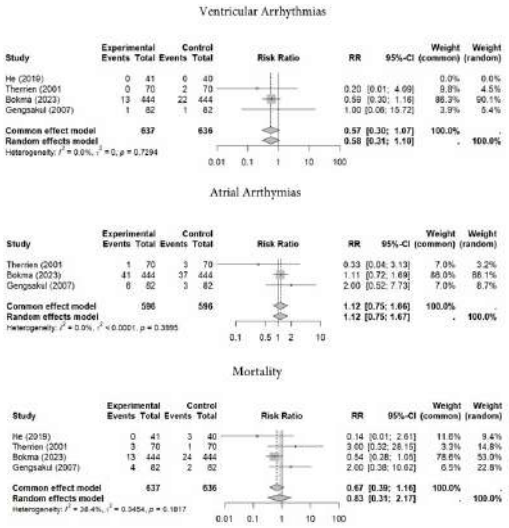
20404

IMPACT OF PULMONARY VALVE REPLACEMENT ON MORTALITY AND ARRHYTHMIC RISK IN REPAIRED TETRALOGY OF FALLOT: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Pulmonary valve regurgitation is a frequent long-term complication after tetralogy of Fallot (TOF) repair, resulting in progressive right ventricular remodeling and dysfunction. Although pulmonary valve replacement (PVR) is frequently performed in this population, its association with long-term survival remains uncertain. Objetivos: To quantify the association between PVR and the incidence of all-cause mortality, sustained ventricular tachycardia (VT), and atrial tachyarrhythmias (SVT) compared to conservative management in patients with repaired TOF. Métodos: Quantitative synthesis was performed using a Random-effects model with the Mantel-Haenszel (MH) method. To ensure data independence and avoid cohort overlap, four independent studies were consolidated. Pooled effects were expressed as Risk Ratios (RR) with 95% confidence intervals (CI). Heterogeneity was quantified by I^2. Resultados e Conclusões: The final analysis included 4 studies (Bokma 2023, He 2019, Therrien 2001, Gengsakul 2007) totaling 1,252 patients (PVR: 637; Control: 615). Median/mean follow-up ranged from 1.9 to 9.1 years, with a weighted average follow-up of 7.8 years, corresponding to a cumulative exposure exceeding 9,800 patient-years. • All-Cause Mortality: PVR was associated with a numerical reduction in mortality risk, although the result did not reach statistical significance (RR 0.58 [95% CI 0.16–2.07]; I2 = 38.4%). • Ventricular Arrhythmias (VT): A consistent protective trend was observed, with PVR accounting for a 51% reduction in the risk of sustained ventricular tachycardia (RR 0.49 [95% CI 0.23–1.04]; I2 = 0%). • Atrial Tachyarrhythmias (SVT): No protective effect was observed for atrial arrhythmias, with a higher incidence in the surgical group (RR 1.15 [95% CI 0.72–1.84]; I2 = 0%). In patients with repaired TOF, PVR demonstrates a consistent clinical trend toward reducing all-cause mortality and sustained ventricular tachycardia. The RR of 0.49 for ventricular arrhythmias suggests a strong potential for electrical stabilization despite the wide confidence interval. Conversely, the increased risk of atrial arrhythmias (RR 1.15) likely reflects surgical sequelae. These findings support PVR as a strategy for ventricular protection, though optimal timing remains critical to translate remodeling into survival benefits.



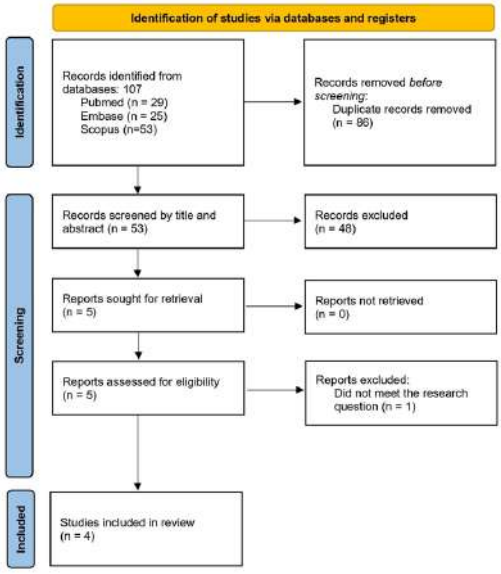
15334

IMPACT OF TRANSCATHETER AORTIC VALVE IMPLANTATION VERSUS SURGICAL AORTIC VALVE REPLACEMENT ON THE INCIDENCE OF STROKE IN LOW-RISK PATIENTS WITH AORTIC STENOSIS: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Aortic stenosis (AS) is one of the most prevalent valvular heart diseases associated with population aging, highlighting the need for continuous evaluation of therapeutic strategies according to clinical severity and operative risk. Currently, transcatheter aortic valve implantation (TAVI) is the preferred treatment for patients with severe AS at high or intermediate surgical risk compared with surgical aortic valve replacement (SAVR). However, there is no consensus regarding its use as first-line therapy in low-risk patients. In this population, often characterized by longer life expectancy, stroke remains a major concern due to its significant impact on quality of life. Objetivos: To evaluate the incidence of stroke following TAVI compared with SAVR in patients with severe AS and low surgical risk. Métodos: A systematic review of randomized controlled trials (RCTs) published between 2022 and March 2026, investigating the incidence of stroke after TAVI compared to SAVR in low-risk patients with severe AS. Secondary analyses of RCTs and incomplete articles were excluded. The literature search was conducted across PubMed, Embase, and Scopus databases using DeCS/MeSH descriptors and free-text terms such as “Transcatheter Aortic Valve Replacement”, “Surgical Aortic Valve Replacement”, and “Low Surgical Risk”. Resultados e Conclusões: From 107 studies identified in the databases, 4 RCTs (n = 4,187) were included in the review, with a mean follow-up of approximately 4 years. The population was predominantly male, with low surgical risk evidenced by a mean Society of Thoracic Surgeons (STS) score of 1.7%. Regarding the incidence of stroke, none of the analyzed studies showed a statistically significant difference between TAVI and SAVR, as 95% confidence intervals crossed the unit and p-values were greater than 0.05. Two studies observed a higher frequency of non-disabling stroke in the TAVI group (HR = 1.93 and 1.22); however, this difference was also not statistically significant. Therefore, the findings of this updated review indicate that there is no consistent evidence supporting the superiority of TAVI over SAVR in low-risk patients with AS. Further multicenter studies with long-term follow-up are required to confirm these findings.



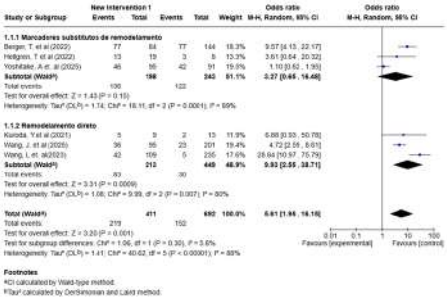
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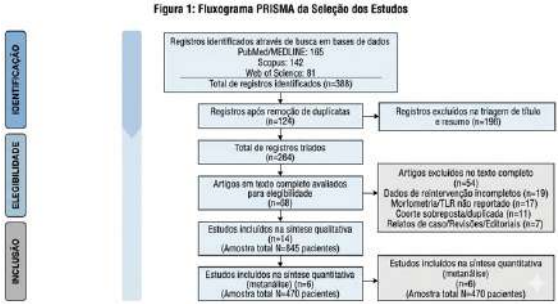
IMPACT OF TRUE LUMEN RATIO ON REINTERVENTION AND AORTIC REMODELING AFTER FROZEN ELEPHANT TRUNK SURGERY FOR AORTIC DISSECTION: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: The Frozen Elephant Trunk (FET) technique has become a standard strategy for the treatment of complex aortic dissections involving the aortic arch and descending thoracic aorta. Despite technical advances, persistent false lumen patency and distal remodeling failure remain associated with aneurysmal degeneration and late reinterventions. Traditionally, prognosis has been based on anatomical inference and chronicity of dissection. However, recent evidence suggests that geometric parameters, particularly the True Lumen Ratio (TLR), may provide superior prognostic value. Objetivos: To evaluate the impact of true lumen ratio and anatomical medidors as predictors on distal reintervention rates and aortic remodeling after FET surgery. Métodos: A systematic review and meta-analysis were conducted according to PRISMA guidelines. Searches were performed in PubMed, Scopus, and Web of Science using the terms (“aortic dissection”) AND (“frozen elephant trunk” OR “FET”). A total of 388 articles were identified,68 underwent full-text assessment. 15 studies were included in the systematic review and 6 in the meta-analysis. Observational studies and clinical trials were included.Methodological quality and risk of bias were assessed using the ROBINS-I tool for observational studies and the Cochrane RoB 2 tool for randomized clinical trials.Quantitative analysis was performed using RevMan 5.4 with a random-effects Mantel-Haenszel model, calculating Odds Ratio and 95% confidence intervals. Resultados e Conclusões: The systematic review included 845 patients, while the meta-analysis comprised 692 individuals. Overall analysis demonstrated that unfavorable remodeling or reduced true lumen geometry was significantly associated with increased distal reintervention risk (OR 5.61; 95% CI 1.95–16.15; p = 0.001).The subgroup based on anatomical inference and dissection chronicity demonstrated a trend toward increased distal reintervention (OR 3.27; 95% CI 0.65–16.48; p = 0.15).High heterogeneity (I^2=88%) due to variations in devices.The subgroup based on direct geometric remodeling demonstrated a strong and statistically significant association between reduced true lumen geometry and distal reintervention (OR 9.93; 95% CI 2.55–38.71; p = 0.0009). Volumetric studies identified higher rates of distal aneurysmal degeneration and dSINE among patients with reduced True Lumen Ratio.Reduced postoperative true lumen (<0.30) was a significant predictor of distal failure after FET, increasing reintervention risk nearly 10-fold.





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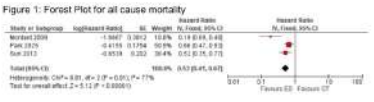
MANAGEMENT OF SEVERE ASYMPTOMATIC MITRAL REGURGITATION: EARLY SURGERY OR WATCHFUL WAITING? A SYSTEMATIC REVIEW AND META-ANALYSIS

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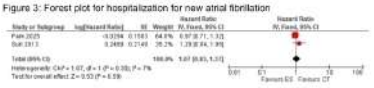
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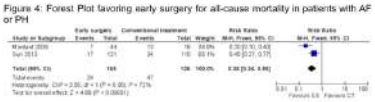
Introdução/Fundamentos: Mitral regurgitation (MR) is a valvular heart disorder that impacts significantly in cardiovascular morbidity and mortality, increasing its prevalence with age. In severe cases, surgery becomes the only definitive therapeutic option, yet the optimal timing for intervention in asymptomatic patients remains controversial. Objetivos: To compare early surgical intervention versus conservative management in adults with severe asymptomatic primary MR and preserved left ventricular function. Métodos: A systematic review and meta-analysis was conducted in accordance with PRISMA 2020 guidelines. Searches were performed in MEDLINE, Embase, and Web of Science without restrictions in language or publication date, using the descriptors “Mitral Valve Insufficiency” AND severe AND ‘early surgery’ AND asymptomatic. Primary outcomes were all-cause and cardiac mortality; secondary outcomes included hospitalization for heart failure and new-onset atrial fibrillation. Final data was pooled using a random-effects model. Resultados e Conclusões: There were 3 studies included, comprising 2,276 patients (1,116 early surgery; 1,160 conservative management), with a mean follow-up of 10–12 years. The mean age of the intervention and control group were 57.2 and 59.5 years, respectively, with 67.0% being males in the intervention arm and 69.1% in the control arm. Smoking prevalence was similar, with 23.6% in the intervention group and 25.0% in the control group. Early surgery was associated with a significant reduction in all-cause mortality (HR = 0.53; 95% CI: 0.41–0.67; p < 0.00001) and cardiac mortality (HR = 0.19; 95% CI: 0.10–0.37; p < 0.00001). Hospitalization for heart failure was also significantly lower in the early surgery group (HR = 0.38; 95% CI: 0.25–0.57; p < 0.00001). No significant difference was observed in the incidence of new-onset atrial fibrillation (HR = 1.07; 95% CI: 0.83–1.37; p = 0.59). In patients already with atrial fibrillation or pulmonary hypertension, early surgery conferred additional survival benefit (RR = 0.36; 95% CI: 0.24–0.56; p < 0.00001). The meta-analysis supports that early surgical intervention in patients with severe asymptomatic mitral regurgitation significantly improves long-term outcomes, reducing all-cause and cardiac mortality as well as heart failure hospitalizations compared with conservative management. However, further prospective and randomized studies are warranted to confirm these benefits and to refine patient selection criteria and timing of intervention.











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NEUTROPHIL-LYMPHOCYTE-PLATELET RATIO AS A PREDICTOR OF ACUTE KIDNEY INJURY AFTER CORONARY ARTERY BYPASS GRAFTING

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Variables	Overall		Renal Injury				p-valor
			Absent		Present		
	N	%	N	%	N	%	
Sex							0,609[Q]
Female	34	34,69	25	33,33	9	39,13	
Male	64	65,31	50	66,67	14	60,87	
Skin Color							0,661[Q]
White	32	32,65	23	30,67	9	39,13	
Mixed/Black	66	67,35	52	69,33	14	60,87	0,290*
Age group							
41-50 years	9	9,18	9	12,00	0	-	
51-60 years	25	25,51	20	26,67	5	21,74	
61-70 years	41	41,84	30	40,00	11	47,83	
≥ 70 years	23	23,47	16	21,33	7	30,43	
Diabetes Mellitus	with						0,042[Q]
Absent	48	48,98	41	54,67	7	30,43	
Present	50	51,02	34	45,33	16	69,57	
Systemic Arterial Hypertension							0,552*
Absent	18	18,37	15	20,00	3	13,04	
Present	80	81,63	60	80,00	20	86,96	
Dyslipidemia							0,536[Q]
Absent	73	74,49	57	76,00	16	69,57	
Present	25	25,51	18	24,00	7	30,43	
Alcohol consumption							0,795[Q]
Absent	66	67,35	50	66,67	16	69,57	
Present	32	32,65	25	33,33	7	30,43	
Smoking							0,764[Q]
Absent	57	58,16	43	57,33	14	60,87	
Present	41	41,84	32	42,67	9	39,13	
Acute Myocardial Infarction							0,207[Q]
Absent	62	63,27	50	66,67	12	52,17	
Present	36	36,73	25	33,33	11	47,83	
Revascularization							0,379[Q]
Complete	33	33,67	27	36,00	6	26,09	
Incomplete	65	66,33	48	64,00	17	73,91	
Preoperative NLPR*							0,903[Q]
≤ 3	30	30,61	23	30,67	7	30,43	
> 3	68	69,39	52	69,33	16	69,57	
Median (Interquatile range)	4,27 (6,70 - 2,69)		4,07 (2,93 - 6,81)		5,4 (7,7 - 2,6)		0,249[M]
Postoperative NLPR							0,001[Q]
≤ 3	79	80,61	66	88,00	13	56,52	
> 3	19	19,39	9	12,00	10	43,48	
Median (Interquatile range)	1,39 (2,4 - 0,9)		1,3 (2,03 - 0,81)		2,20 (6,7 - 1,16)		0,001[M]
Cardiopulmonary Bypass Time (Min.)							
Mean ± Standard Deviation	93,46 ± 29,31		94,32 ± 29,12		90,69 ± 30,40		0,695[T]
Anoxia time (Min.)							
Mean ± Standard Deviation	67,32 ± 24,42		69,21 ± 25,27		61,17 ± 20,75		0,168[T]

Introdução/Fundamentos: Acute kidney injury (AKI) is a frequent and clinically significant complication after coronary artery bypass grafting (CABG), associated with increased morbidity and mortality. Its pathophysiology is multifactorial and strongly related to the systemic inflammatory response triggered by cardiopulmonary bypass (CPB). However, early identification of patients at higher risk remains a major challenge in clinical practice. The neutrophil-lymphocyte-platelet ratio (N/LPR) has emerged as a simple and accessible inflammatory marker, potentially useful for risk stratification, although its role in predicting AKI in this setting remains incompletely established. Objetivos: To evaluate the association between N/LPR and the occurrence of AKI in patients undergoing CABG with CPB. Métodos: A retrospective convenience cohort was conducted including 98 adult patients submitted to CABG with CPB between January 2022 and July 2023. Quantitative variables were expressed as mean ± standard deviation or median and interquartile range according to data distribution, assessed by the Shapiro-Wilk test. Comparisons were performed using Chi-square or Fisher's exact tests, and Student's t-test or Mann-Whitney test, as appropriate. Variables associated with AKI in univariate analysis were further evaluated in multivariate logistic regression models to identify independent predictors (p < 0.05). Resultados e Conclusões: AKI occurred in 23.47% of patients, most frequently in early stages (13 cases in KDIGO stage 1, 7 in stage 2, and 3 in stage 3). Among 13 recorded deaths, 9 occurred in patients who developed AKI, reinforcing its clinical impact. In univariate analysis, both diabetes mellitus (p = 0.042) and N/LPR (p = 0.001) were significantly associated with AKI, and N/LPR remained independently associated in adjusted models. These findings suggest that N/LPR may serve as a practical and low-cost biomarker for early identification of patients at increased risk of AKI after CABG, supporting its potential role in perioperative risk stratification and timely implementation of nephroprotective strategies.

Variables	Univariate Analysis OR (95% CI)			Multivariate Analysis*		
	OR	IC 95%	p-value	OR	IC 95%	p-value
Sex						
Male vs Female	0,77	0,29 - 2,04	0,610	-	-	-
Skin color						
Mixed/Black vs White	0,68	0,26 - 1,81	0,450	-	-	-
Age						
Years	1,05	0,99 - 1,11	0,066	1,04	0,97 - 1,12	0,184
Diabetes Mellitus						
Present vs Absent	2,75	1,01 - 7,45	**0,046**	3,21	0,96 - 10,67	0,057
Systemic Arterial Hypertension						
Present vs Absent	1,66	0,43 - 6,35	0,455	-	-	-
Dyslipidemia						
Present vs Absent	1,38	0,49 - 3,89	0,537	-	-	-
Alcohol Consumption						
Present vs Absent	0,87	0,31 - 2,40	0,795	-	-	-
Smoking						
Present vs Absent	0,86	0,33 - 2,24	0,764	-	-	-
Acute Myocardial Infarction						
Present vs Absent	1,83	0,71 - 4,73	0,210	3,21	0,97 - 10,57	0,055
Revascularization						
Complete vs Incomplete	0,62	0,22 - 1,78	0,381	-	-	-
NPRL before surgery						
Numerical value	1,09	0,99 - 1,21	0,074	1,08	0,95 - 1,22	0,217
NPRL after surgery						
Numerical value	1,35	1,02 - 1,78	**0,031**	1,34	1,01 - 1,81	**0,048**
Extracorporeal Circ. Time						
Minutes	0,99	0,97 - 1,01	0,603	-	-	
Anoxia time						
Minutes	0,98	0,96 - 1,00	0,171	0,98	0,96 - 1,00	0,21

21093

OFF-PUMP VS ON-PUMP CORONARY ARTERY BYPASS GRAFTING IN ISCHEMIC CARDIOMYOPATHY WITH REDUCED EJECTION FRACTION: SYSTEMATIC REVIEW AND META-ANALYSIS OF SHORT- AND LONG-TERM MORTALITY

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Introdução/Fundamentos: Although landmark trials such as ROOBY and CORONARY compared off-pump coronary artery bypass grafting (OPCABG) and on-pump coronary artery bypass grafting (ONCABG), evidence remains limited in higher-risk patients, particularly those with ischemic cardiomyopathy and heart failure with reduced ejection fraction (HFrEF), in whom the prognostic impact of surgical strategy is still unclear. Objetivos: To compare short- and long-term mortality between OPCABG and ONCABG in patients with ischemic cardiomyopathy and HFrEF. Métodos: We conducted a systematic review and meta-analysis according to PRISMA 2020 and Cochrane guidelines, with protocol registration in PROSPERO (CRD420261324102). PubMed, Embase, CENTRAL, and LILACS were searched for studies published from January 2010 onward. Randomized controlled trials and propensity-score matched cohort studies including adults with left ventricular ejection fraction <40%, undergoing isolated OPCABG or ONCABG, and reporting outcomes up to 30 days or up to 10 years were eligible. Two reviewers independently screened studies and extracted data. Methodological quality was assessed using RoB 2 and the Newcastle-Ottawa Scale. Random-effects models were used to estimate risk ratios (RR) and hazard ratios (HR) with 95% confidence intervals. Heterogeneity was assessed using Cochran's Q and I^2 statistics, and robustness was examined by leave-one-out sensitivity analysis. Resultados e Conclusões: Twelve studies were included, totaling 18,113 patients (OPCABG n = 9,700; ONCABG n = 8,413). For short-term mortality, based on 9 studies, OPCABG was associated with a 33% lower risk of death compared with ONCABG (RR = 0.67; 95% CI 0.58–0.77; p < 0.00001), with no significant heterogeneity (I^2 = 0%). Funnel plot inspection did not suggest publication bias. For long-term survival, 7 studies showed no statistically significant difference between techniques (HR = 0.97; 95% CI 0.82–1.14; p = 0.70), with moderate heterogeneity (I^2 = 56%), mainly attributable to between-study variability and one lower-precision study. Overall, in patients with ischemic cardiomyopathy and HFrEF, OPCABG was associated with lower early mortality without compromising long-term survival, supporting it as a potentially preferred strategy in this high-risk subgroup.

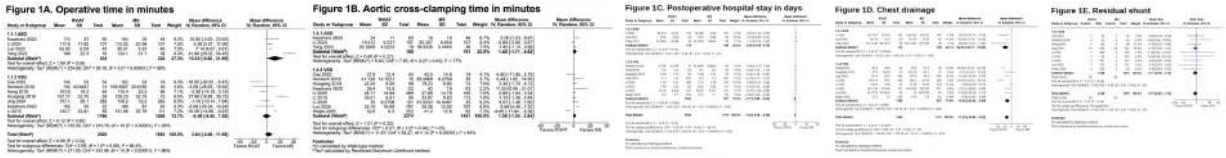
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RIGHT VERTICAL INFRA-AXILLARY THORACOTOMY VERSUS MEDIAN STERNOTOMY IN PEDIATRIC PATIENTS WITH CONGENITAL HEART DEFECTS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Median sternotomy (MS) remains the standard approach for congenital heart defect repair, however, minimally invasive techniques, such as right vertical infra-axillary thoracotomy (RVIAT), are increasingly used for simple lesions, including atrial septal defect (ASD) and ventricular septal defect (VSD), despite still limited comparative perioperative evidence in this population. Objetivos: To compare clinical and perioperative outcomes between the RVIAT approach and MS for ASD and VSD repair. Métodos: PubMed, Embase and Cochrane database were searched for randomized and nonrandomized studies comparing thoracotomy with sternotomy in pediatric patients with ASD or VSD. Cochrane's Review Manager Version 7.2.0 (RevMan, 2024) was used for all statistical analyses. Heterogeneity was examined with I² statistics. Mean differences (MD) and risk ratios (RR) with 95% confidence intervals (CIs) were pooled under a random-effects model. Resultados e Conclusões: 14 studies were included, totaling 4,585 pediatric patients (mean age 2.32 ± 2.29 years) undergoing ASD/VSD correction. Of these, 2,508 underwent RVIAT and 2,077 underwent MS. There was no statistically significant difference between RVIAT and sternotomy regarding operative time (MD 3.84 minutes; 95% CI -4.00 to 11.68; p = 0.34; I²=96%; Figure 1A) and aortic cross-clamp time (MD 1.36 minutes; 95% CI -1.24 to 3.84; p = 0.32; I²=84%; Figure 1B), findings corroborated by tests of differences between ASD and VSD subgroups (p = 0.08 and p = 0.94, respectively). On the other hand, RVIAT was associated with shorter hospital length of stay (MD -1.24 days; 95% CI -2.28 to -0.20; p = 0.02; I²=97%; Figure 1C) and lower chest drainage volume (MD -17.20 mL; 95% CI -24.88 to -9.52; p < 0.0001; I²=97%; Figure 1D), compared with MS, with a significant difference in the analysis between subgroups (ASD and VSD). Additionally, in patients undergoing VSD correction, there was no statistically significant difference in the risk of residual shunt between approaches (RR = 0.77, 95% CI 0.50 to 1.19; p = 0.24; I²=0%; Figure 1E). This meta-analysis demonstrated that RVIAT is a safe, effective alternative to MS for ASD and VSD repair. Operative and aortic cross-clamp times were comparable, while RVIAT was associated with shorter hospital stay and lower postoperative chest tube drainage, without increased residual shunt risk. These findings support RVIAT as a safe approach with aesthetic advantages, although randomized studies are still needed for definitive confirmation.



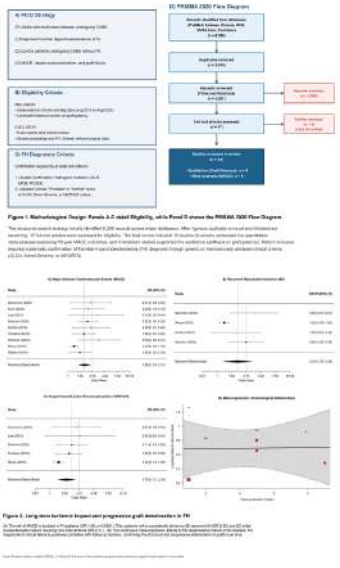
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SAPHENOUS VEIN GRAFT FAILURE IN FAMILIAL HYPERCHOLESTEROLEMIA: A SYSTEMATIC REVIEW AND META-ANALYSIS SUPPORTING ARTERIAL REVASCULARIZATION STRATEGIES

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Introdução/Fundamentos: Familial hypercholesterolemia (FH) exposes the cardiovascular bed to lifetime elevations of LDL-cholesterol, accelerating atherosclerosis. In patients undergoing coronary artery bypass grafting (CABG), the aggressive metabolic environment of FH drastically compromises saphenous vein graft patency, increasing the risk of structural graft failure and recurrent ischemic events in the long term. Objetivos: To analyze the long-term clinical impact of FH and evaluate coronary graft integrity following CABG. Métodos: A systematic review structured according to the PICO strategy, eligibility criteria, and PRISMA 2020 flowchart (Figure 1). A systematic search was performed across PubMed, Embase, Scopus, Web of Science, BVS/Lilacs, and Cochrane Library databases, including 13 studies (9 cohorts in the meta-analysis). Risk of bias was assessed using the Newcastle Ottawa Scale. A random-efects model (REML, I²=52.35%, p=0.013) and Inverse Variance method were applied, with funnel plot symmetry and absence of publication bias confirmed by Egger and Begg tests (p>0.05). Study registered under the OSF platform. Resultados e Conclusões: The Forest Plot (Figure 2) demonstrates that FH doubles the risk of post-CABG MACE (OR 1.96; 95% CI: 1.53–2.51; p<0.0001), driven by recurrent myocardial infarction (OR 2.05; 95% CI: 1.40–3.00) and the need for repeat revascularization (OR 2.11; 95% CI: 1.45–3.08). Meta-regression signaled a trend of positive association between follow-up time and clinical failure (beta=0.0035; p=0.9397), suggesting progressive graft deterioration under cumulative lipid exposure ("cholesterol-years"), though formal mathematical significance is attenuated by the high weight of contemporary short-term cohorts. This biological vulnerability corroborates landmark findings by Kawasuji (2000), which documented saphenous vein patency of only 35% at 8 years in FH (vs. 87% for internal mammary arteries), demonstrating that arterialized hemodynamic stress triggers intimal hyperplasia and accelerated atherosclerosis specifically in venous conduits. These findings align with contemporary evidence from Deconinck (2025) showing persistent high residual risk despite intensive lipid-lowering therapies (OR 2.52). Big Data registries (NIS-USA, n>3.7 million) confirm that FH imposes widespread multivessel disease and highly complex surgeries. In conclusion, FH is a strong predictor of long-term vein graft failure. Multiarterial grafting and aggressive lipid control prevent structural failure and genetic risk.



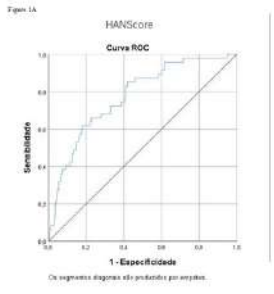
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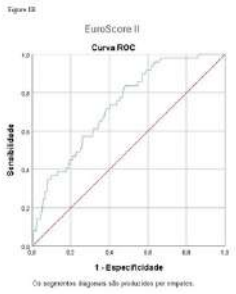
SCORE FOR PREDICTING POSTOPERATIVE MORTALITY IN CARDIAC SURGERY DEVELOPED WITH THE AID OF ARTIFICIAL INTELLIGENCE

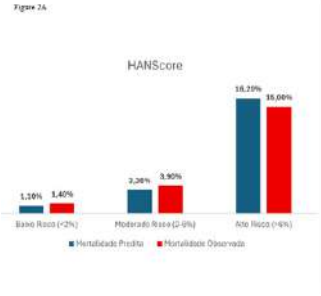
MATEUS GOMES DA SILVA SERRA1; JULIA REBECA MENDES VIEIRA1; ANA BEATRIZ GABRIE SILVA RODRIGUES1; GUSTAVO PINHEIRO SANTANA1; CLARA SALES FIGUEIREDO1; CAIO REBOUCAS FONSECA CAFEZEIRO1; LUIZ CARLOS PASSOS1; OSVALDEMAR REGIS DO NASCIMENTO JUNIOR1; JACKSON BRANDÃO LOPES1; RAFAEL FERNANDES ALMEIDA1; EDUARDO LUIZ MATOS FERNANDES1; RODRIGO MOREL VIEIRA MELO1;

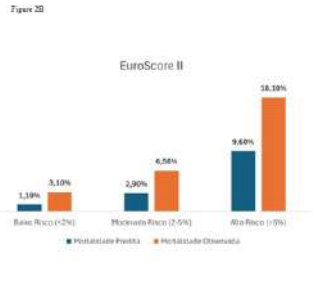
(1) HOSPITAL ANA NERY - SALVADOR - BA - BRASIL;

Introdução/Fundamentos: Cardiac surgery is an essential therapeutic strategy for several cardiovascular diseases and is widely performed in Brazil. Risk prediction models such as EuroSCORE and STS Score are used to estimate mortality and complications; however, they show limited performance in the Brazilian population due to epidemiological and socioeconomic differences. Objetivos: In this context, the present study aimed to develop a local predictive model for in-hospital mortality in cardiac surgery, named HANScore, using artificial intelligence tools. Métodos: This is an observational, single-center, ambispective study conducted at a tertiary hospital in Northeastern Brazil. A total of 2,768 adult patients who underwent cardiovascular surgery between January 2022 and July 2025 were included. The development cohort consisted of prospective data (2023–2025), while validation was performed using retrospective data from 2022. The primary outcome was in-hospital mortality. The model was built using multivariable logistic regression, with variable selection assisted by artificial intelligence, and validated through calibration (Hosmer-Lemeshow test) and discrimination (AUC-ROC), being compared with EuroSCORE Resultados e Conclusões: The sample had a median age of 58 years, with a predominance of females (53.9%) and a high prevalence of hypertension (64.5%) and diabetes (24.2%). Valve surgeries were the most frequent procedures (57%). Factors associated with higher mortality included renal dysfunction, anemia, advanced age, previous surgery, and complex procedures. The HANScore, composed of 11 variables and stratified into three risk levels, demonstrated superior performance compared to EuroSCORE, with better discriminative ability (AUC 0.774 vs. 0.732) and improved calibration (p=0.250 vs. 0.032). The HANScore demonstrated good accuracy and superiority over EuroSCORE in the studied population, highlighting the importance of local predictive models. Despite limitations such as its single-center design and the relatively low number of events, the model proved adequate in reflecting regional characteristics. Future multicenter studies are required for external validation and to expand its applicability.









Doença Coronária Aguda e Crônica / Trombólise



81º CONGRESSO BRASILEIRO DE CARDIOLOGIA together with WORLD CONGRESS OF CARDIOLOGY





18447

ACUTE MYOCARDIAL INFARCTION IN YOUNG ADULTS: ANALYSIS OF IN-HOSPITAL MORTALITY IN BRAZIL (2015–2025)

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Introdução/Fundamentos: Lower in-hospital mortality from acute myocardial infarction (AMI) in young adults is often attributed to a lower burden of comorbidities. However, reduced prior exposure to ischemic episodes, related to the hypothesis of ischemic preconditioning described in the literature, raises questions about the mechanisms underlying these more favorable outcomes. Objetivos: To analyze the profile of hospitalizations and in-hospital mortality due to AMI in Brazil from 2015 to 2025, comparing young adults (20–49 years) and individuals aged ≥50 years. Métodos: Ecological, retrospective study using data from the Brazilian Hospital Information System (SIH/SUS), obtained via DATASUS. Hospitalizations due to AMI (ICD-10: I21) under urgent admission were included. Variables analyzed included hospitalizations, in-hospital deaths, and age group. Chi-square test and logistic regression were used, with calculation of odds ratios (OR) and 95% confidence intervals (95% CI). Resultados e Conclusões: Between 2015 and 2025, in-hospital mortality due to acute myocardial infarction (AMI) decreased from 12.27% to 7.53%, with a transient increase in 2020 (10.04%), possibly associated with the COVID-19 pandemic. Hospitalizations totaled 1,396,316, with a decrease in 2020 and subsequent increase. Individuals aged ≥80 years presented the highest mortality rates, although declining over the period. Young adults presented lower mortality (4.40%) compared to those aged ≥50 years (10.62%) (p<0.001). Age ≥50 years was associated with a higher chance of in-hospital death (OR=2.56; 95% CI: 2.50–2.62; p<0.001), with a narrow interval, indicating high precision of the estimate and low influence of random error. A global reduction in mortality is observed, with maintenance of advanced age as the main prognostic factor. The findings suggest that the superiority of cardiovascular reserve and the lower burden of comorbidities prevail over the lack of ischemic preconditioning in young individuals, acting as the main mechanisms for the maintenance of favorable outcomes. The evidence reinforces the need for differentiated healthcare strategies according to age profile. Limitations include the use of secondary data.

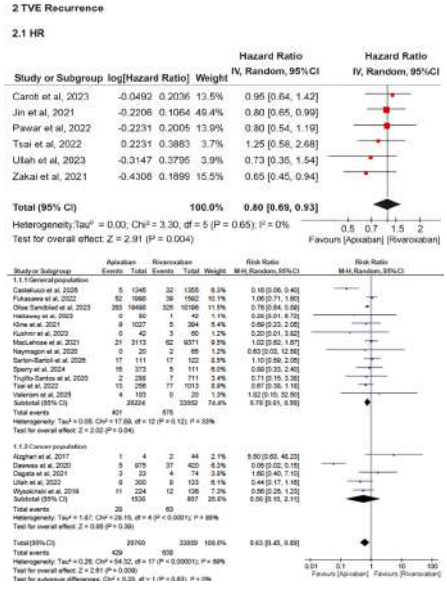
17915

APIXABAN VS RIVAROXABAN FOR VENOUS THROMBOEMBOLISM TREATMENT: A SYSTEMATIC REVIEW AND META-ANALYSIS OF SAFETY AND EFFICACY.

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Introdução/Fundamentos: Rivaroxaban and apixaban are direct oral anticoagulants (DOACS) with the function of inhibiting the factor Xa on coagulation cascade. Both drugs have been widely used in treatment of Venous Thromboembolism (VTE). However, direct comparative evidence between these modalities remains conflicting regarding efficacy and safety, with divergent findings regarding bleeding and Thromboembolism recurrency. Objetivos: To conduct a systematic review with meta-analysis to compare the efficacy and safety of apixaban versus rivaroxaban, in the treatment of VTE evaluating critical outcomes such as mortality, bleeding complications, and recurrence on overall population and subgroups. Métodos: A systematic review was conducted, with searches performed in the PubMed, Embase and Cochrane Library (February/2026). Randomized clinical trials and cohort studies were included. In the comparison between rivaroxaban and apixaban on patients diagnosed with VTE, the following outcomes were evaluated: (1) Major Bleeding (MB), (2) VTE recurrence, (3) all case mortality. The meta-analysis was performed using RevMan (v5.4.1) software, study heterogeneity was assessed using Cochran's Q test and I² statistic. Resultados e Conclusões: 40 studies were included, totaling 346.909 patients. VTE had less recurrence on apixaban when compared to rivaroxaban (HR 0.80; 95% CI 0.69-0.93; P<0.05; Fig. 1). Major blending was significantly lower on the apixaban group (RR 0.63; 95% CI 0.45-0.89; P<0.05; Fig. 2). On subgroup analyses, the cancer only population showed no statistical differences on MB between apixaban and rivaroxaban (RR 0.56; 95% CI 0.45-0.89; P=0.39; Fig. 2) however, in the non-cancer subgroup the incidence of MB was significantly lower in apixaban group (RR 0.78; 95% CI 0.61-0.99; P<0.05; Fig. 2); The Overweight subgroup showed no statistical differences (RR 0.71; 95% CI 0.29-1.74; P=0.45) Also, subgroup analyses according to follow-up duration showed no significant differences in studies with follow-up > 6 months (RR 1.10; 95% CI 0.87–1.39; P=0.41) or ≤ 6 months (RR 0.66; 95% CI 0.36–1.22; P=0.18); All case mortality showed no statistical differences between apixaban and rivaroxaban (RR 1.05; 95% CI 0.93–1.19; P=0.42). Conclusion: Apixaban was associated with a lower risk of major bleeding and VTE recurrence compared to rivaroxaban, with no difference in all-cause mortality. The bleeding benefit was more evident in non-cancer patients, with no significant differences across other subgroups.



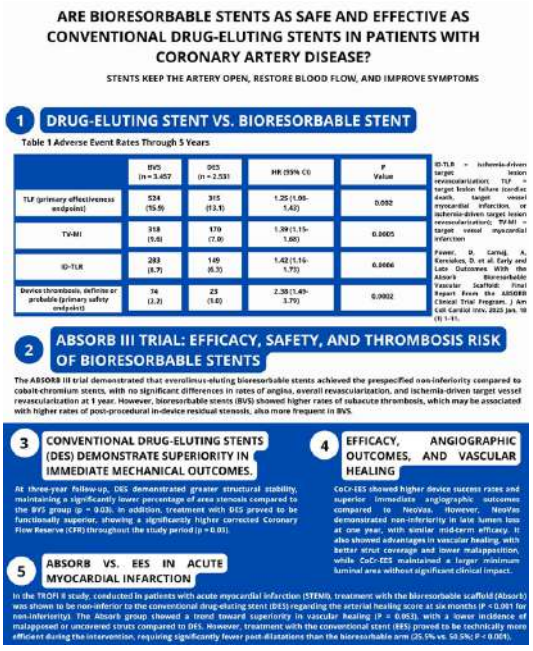
18134

ARE BIORESORBABLE STENTS AS SAFE AND EFFECTIVE AS CONVENTIONAL DRUG-ELUTING STENTS IN PATIENTS WITH CORONARY ARTERY DISEASE?

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Introdução/Fundamentos: Chronic stable coronary artery disease (CAD) results from a transient imbalance between myocardial oxygen supply and demand, leading to reversible ischemia. Management is based on comorbidity control, lifestyle modifications, optimized medical therapy, and, when indicated, myocardial revascularization. In this context, percutaneous coronary intervention (PCI) with stent implantation, particularly drug-eluting stents (DES), plays a central role in restoring coronary flow and relieving symptoms. Objetivos: The objective of this systematic review was to synthesize the scientific evidence from studies that compared the efficacy of drug-eluting stents and bioresorbable stents in patients with coronary artery disease. Métodos: A systematic review was conducted based on the PubMed, Cochrane and BVS databases in March 2026. The following descriptors were used: ("Bioresorbable Vascular Scaffold" OR "bioabsorbable stent" OR "bioresorbable scaffold") AND ("Drug-Eluting Stent" OR "everolimus stent") AND ("coronary artery disease" OR "percutaneous coronary intervention"). A total of 231 studies were identified, of which 56 were included in this review. Resultados e Conclusões: It was observed that, over a five-year follow-up period, the use of bioresorbable vascular scaffolds (BVS) was associated with worse outcomes compared to drug-eluting stents (DES), with a higher incidence of target lesion failure and device thrombosis. BVS showed higher rates of subacute thrombosis, which may be associated with a higher rate of residual intra-device stenosis after the procedure. BVS implantation was associated with a significant reduction in intra-arterial myocardial necrosis (cIMR) compared to DES implantation. Both BVS and DES implantation showed comparable rates of target lesion revascularization at 1 year. BVS demonstrated frequent vascular remodeling, with an increase in mean lumen and vessel area compared to DES. Although a slightly greater lumen loss was observed in segments treated with BVS, this difference did not translate into worse clinical outcomes, as no significant differences were found in major adverse cardiovascular events, revascularization, or stent thrombosis in the short term. Both devices demonstrated comparable long-term clinical safety and perfusion efficacy. There was no significant difference between the BVS and metallic stent groups regarding target vessel failure or mortality rates.



17640

ARMENIAN NATIONAL REGISTRY OF MYOCARDIAL INFARCTION (ARMI): FIRST NATIONAL BENCHMARK FOR STEMI CARE, REPERFUSION PRACTICES, AND ONE-YEAR OUTCOMES

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(1) EREBUNI MC - ARMENIA; (2) - ARMENIA; (3) ARMENIAN REPUBLICANS MC - ARMENIA; (4) NORK MARASH MC - ARMENIA; (5) ASTGHIK MC - ARMENIA; (6) SHENGAVIT MC - ARMENIA; (7) BEST LIFE MC - ARMENIA; (8) YEREVAN SCIENTIFIC MC - ARMENIA; (9) YEREVAN STATE MEDICAL UNIVERSITY - ARMENIA; (10) GYUMRI MC - ARMENIA;

Introdução/Fundamentos: Coronary artery disease remains the primary driver of mortality in Armenia. Prior to December 2023, no national prospective data existed on reperfusion strategies or STEMI outcomes. The ARMI registry was launched to address this critical evidence gap and establish a foundation for quality benchmarking and improvement. Objetivos: The primary aim was to determine in-hospital mortality across all national STEMI centers. Secondary objectives included evaluating cardiovascular and all-cause mortality, rehospitalization at 30 days and 12 months, the prognostic influence of time-to-treatment delays, and adherence to guideline-recommended reperfusion therapy. Métodos: ARMI is a prospective nationwide registry enrolling consecutive adults (18–93 years) presenting with STEMI within 48 hours of symptom onset across 13 specialized centers. Clinical, procedural, and outcome data were captured using a standardized REDCap platform. All patients underwent structured follow-up at 30 days and 12 months. Enrollment spanned December 2023 through July 2025. Resultados e Conclusões: Results A total of 2,222 patients were enrolled; 1,392 with complete follow-up data were included in this analysis. The cohort was predominantly male (81.1%). Primary PCI was performed in 99.6% of revascularized patients, reflecting near-universal guideline adherence. Overall in-hospital mortality was 3.1%, with cardiovascular etiology accounting for 91% of deaths. LVEF ≤40% was present in nearly two-thirds of in-hospital deaths, underscoring its prognostic significance. Acute heart failure (Killip class 3–4) at presentation was observed in 8.0% of patients and carried substantially worse outcomes: in-hospital mortality of 9.0% and a 12-month all-cause mortality rate of 32%, compared to 8% in the overall cohort. HF-related rehospitalization affected 13% of Killip class 3–4 patients versus 36% overall, reflecting a sustained morbidity burden. Conclusions ARMI provides the first national benchmark for STEMI management in Armenia, demonstrating primary PCI rates and in-hospital mortality comparable to European registries. Acute heart failure at presentation and depressed LV systolic function identify a high-risk population with disproportionately poor short- and long-term outcomes. These data support targeted quality improvement initiatives and lay the groundwork for translational cardiovascular research at the national level.

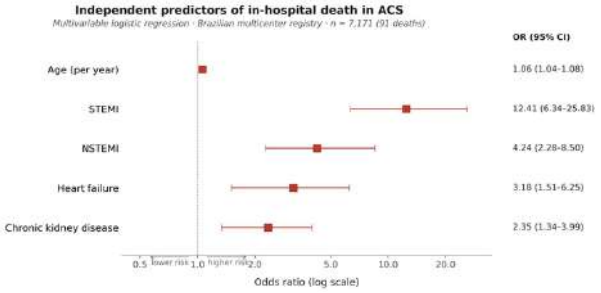
18625

ASSOCIATED FACTORS OF IN-HOSPITAL DEATH AND PROLONGED STAY IN ACS: A MULTICENTER BRAZILIAN REGISTRY ANALYSIS STRATIFIED BY SUBTYPE

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Introdução/Fundamentos: Acute coronary syndrome (ACS) remains a leading cause of in-hospital mortality and healthcare resource use worldwide. In middle-income countries, real-world data on factors associated with adverse outcomes across ACS subtypes are scarce. Identifying factors independently associated with in-hospital death and prolonged length of stay (LOS >7 days), overall and by subtype, may refine risk stratification and guide resource allocation. Objetivos: To identify clinical and demographic factors independently associated with in-hospital death and prolonged hospitalization (>7 days) in patients with ACS, both overall and stratified by subdiagnosis (STEMI, NSTEMI, unstable angina [UA]). Métodos: Multicenter retrospective study using a national registry from the largest private hospital network in Brazil, covering 14 states between January 2020 and June 2024. A total of 7,171 ACS patients were analyzed overall and stratified as STEMI, NSTEMI and UA. Multivariable logistic regression models identified factors independently associated with each outcome. Analyses were performed in RStudio. Resultados e Conclusões: Overall, 91 in-hospital deaths and 649 prolonged hospitalizations occurred. Independent factors associated with were age (OR 1.06, 95%CI 1.04–1.08), STEMI (OR 12.41, 95% CI 6.34–25.83), NSTEMI (OR 4.24, 95% 2.28–8.50), heart failure (HF; OR 3.18, 95% CI 1.51–6.25) and chronic kidney disease (CKD; OR 2.35, 95% CI 1.34–3.99). Factors associated with LOS >7d were age (OR 1.02), STEMI (OR 2.06), NSTEMI (OR 1.52), HF (OR 1.55) and CKD (OR 2.38), all p<0.05. By subtype: in STEMI, age was associated with both outcomes. In NSTEMI, age and smoking (OR 1.96, 95% CI 1.00–3.70) were associated with death, while age, CKD (OR 2.31) and HF (OR 1.90) were associated with prolonged LOS. In UA, GRACE score was the sole predictor of death (OR 1.04, 95% CI 1.02–1.05); age, hypertension (OR 1.67) and CKD (OR 2.68) predicted LOS >7d. Taken together, in this large-scale, real-world registry, clinical profiles and factors associated with severity diverged significantly across ACS subtypes. While traditional risk factors like CKD and HF were consistent across the board, the specific impact of smoking in NSTEMI and the GRACE score in UA highlights the need for personalized risk assessment.

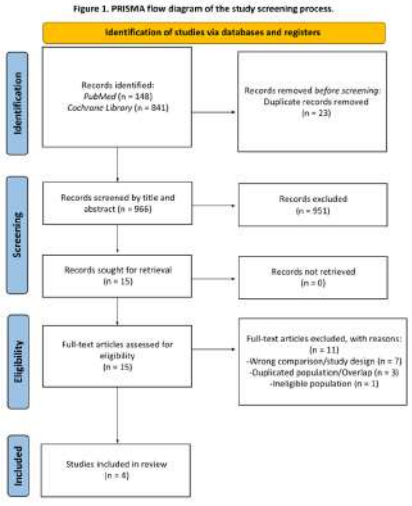


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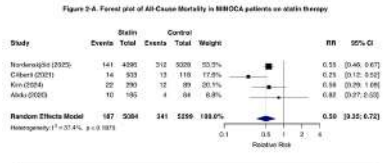
ASSOCIATION BETWEEN STATIN THERAPY AND CLINICAL OUTCOMES IN MINOCA: A SYSTEMATIC REVIEW AND META-ANALYSIS

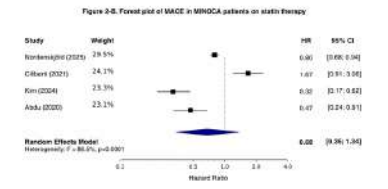
LEONARDO VILLATORE1; LUIGI AZEVEDO1; FELIPE QUADROS1; PIETRO SANT'ANA1; NICOLE BRANCO1; HELOISA BORAZO1; DANIELA TENIUS1; IASMIM LEMOS1; ALINE BRANCO1; VINICIUS DA SILVEIRA1; LUCAS AZEVEDO2; MARCO AURELIO BORAZO3;

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Introdução/Fundamentos: Myocardial infarction with non-obstructive coronary arteries (MINOCA) is a complex syndrome affecting 5–10% of acute myocardial infarction patients. Despite lacking obstructive lesions, MINOCA carries a substantial risk of all-cause mortality and major adverse cardiovascular events (MACE). Currently, specific randomized trials are lacking, and secondary prevention relies on empirical observational data, such as the SWEDEHEART registry. However, the efficacy of statins remains debated due to MINOCA's heterogeneous etiology, highlighting the need to quantify their impact on clinical outcomes. Objetivos: To evaluate the impact of statin therapy in patients with MINOCA, focusing on all-cause mortality as the primary outcome and MACE as the secondary outcome. Métodos: This systematic review and meta-analysis was conducted in accordance with PRISMA and prospectively registered in an international database (PROSPERO). A systematic search was conducted in PubMed/MEDLINE and Cochrane CENTRAL to identify observational and randomized studies comparing statin users versus non-users with confirmed MINOCA. Methodological quality was assessed using the Newcastle-Ottawa Scale (NOS). Outcomes were analyzed using Relative Risk (RR) for mortality and Log Hazard Ratios (Log HR) for MACE, with 95% Confidence Intervals (95% CI), employing a random-effects model. Statistical heterogeneity was assessed using the I^2 statistic, and certainty of evidence via the GRADE approach. Resultados e Conclusões: Four studies were included, encompassing 10,383 patients (5,084 in the statin group and 5,299 in the control group). Statin therapy was associated with a statistically significant 50% reduction in the relative risk of all-cause mortality (RR 0.50; 95% CI 0.35–0.72; I^2 = 37.4%; moderate certainty of evidence). Conversely, the numerical benefit of statins in reducing MACE did not reach statistical significance (HR 0.68; 95% CI 0.35–1.34), accompanied by profound heterogeneity (I^2 = 86.5%; very-low-certainty evidence) likely stemming from varied operational definitions across studies. In conclusion, statin therapy is associated with a significant reduction in all-cause mortality in MINOCA patients. Despite the inconclusive data regarding MACE, the overall survival benefit supports the routine use of statins in this population.





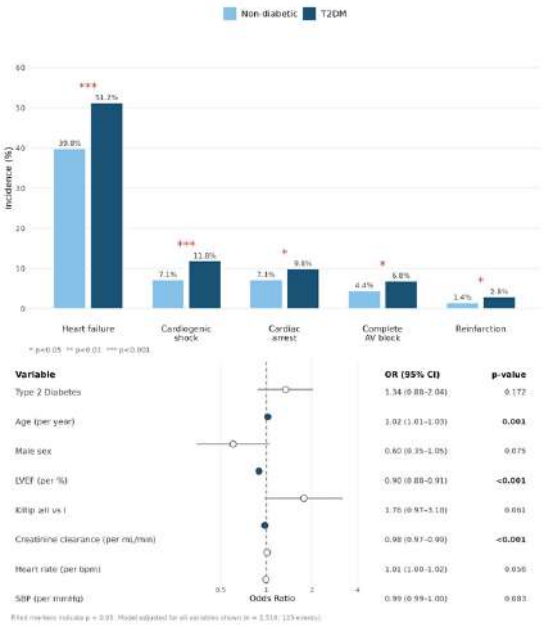
17502

ATTENUATION OF THE ASSOCIATION BETWEEN DIABETES AND IN-HOSPITAL MORTALITY IN STEMI AFTER ADJUSTMENT FOR BASELINE CLINICAL SEVERITY

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Introdução/Fundamentos: Type 2 diabetes is associated with higher in-hospital mortality in ST-elevation myocardial infarction. However, diabetic patients often present with worse clinical status at admission, and it remains unclear whether this association reflects an independent effect or greater baseline severity. Objetivos: To evaluate whether the association between T2DM and in-hospital mortality in STEMI is attenuated after sequential adjustment for baseline clinical severity and to assess its association with in-hospital cardiac complications. Métodos: This retrospective cohort included 2,510 consecutive STEMI patients from two tertiary centers. The association between T2DM and in-hospital mortality was assessed using multivariable logistic regression in three models: Model 1 (diabetes alone), Model 2 (age and sex), and Model 3 (additionally adjusted for LVEF, Killip class, creatinine clearance, heart rate, and SBP at admission). Attenuation across models was quantified on the log-odds scale using the change-in-estimate approach. Model discrimination and calibration were assessed by AUC and Hosmer-Lemeshow test. As a secondary analysis, the association between diabetes and a composite of in-hospital cardiac complications (heart failure, cardiogenic shock, cardiac arrest) was evaluated using similarly adjusted models. Resultados e Conclusões: Among 2,510 patients, 763 (30.4%) had T2DM. In-hospital mortality was higher in diabetics (7.99% vs. 3.66%; p<0.001). The OR for mortality was 2.29 (95% CI 1.59 to 3.28) in Model 1, 2.03 (95% CI 1.40 to 2.93) in Model 2, and 1.34 (95% CI 0.88 to 2.04; p=0.172) in Model 3, corresponding to a 64.7% attenuation. In the fully adjusted model, independent predictors of mortality were LVEF (OR 0.895 per %; 95% CI 0.877 to 0.913; p<0.001), creatinine clearance (OR 0.978 per mL/min; 95% CI 0.970 to 0.986; p<0.001), and age (OR 1.022 per year; 95% CI 1.009 to 1.035; p=0.001). The model showed good discrimination with an AUC of 0.882 and adequate calibration (Hosmer-Lemeshow p=0.109). Composite complications were more frequent in diabetics (51.9% vs 40.9%; OR 1.56; 1.31–1.85; p<0.001), but not after adjustment (OR 1.20; 0.96–1.51; p=0.116). In STEMI, higher in-hospital mortality in patients with diabetes is attenuated after adjustment for baseline clinical severity, particularly ventricular and renal function. A similar pattern is observed for in-hospital cardiac complications, suggesting these differences are explained by baseline clinical severity rather than an independent effect of diabetes.



20730

BETA-BLOCKER THERAPY AFTER ACUTE MYOCARDIAL INFARCTION IN PATIENTS WITH PRESERVED OR MILDLY REDUCED LEFT VENTRICULAR EJECTION FRACTION: AN UPDATED META-ANALYSIS

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Introdução/Fundamentos: Beta-blockers (BBs) have historically been recommended following acute myocardial infarction (AMI), including in patients with preserved left ventricular ejection fraction (LVEF), based largely on pre-reperfusion era evidence. However, in the contemporary reperfusion era, with widespread adoption of early percutaneous coronary intervention and modern antithrombotic therapies, the incremental benefit of routine long-term BB therapy in patients with preserved or mildly reduced LVEF has become increasingly uncertain. Objetivos: To evaluate the impact of beta-blocker therapy on all-cause mortality and recurrent myocardial infarction in post-AMI patients with preserved or mildly reduced LVEF. Métodos: A systematic review was performed according to PRISMA criteria in the PubMed, Embase, and Cochrane databases. Search strategy included terms “beta blocker therapy,” “myocardial infarction”, “Preserved Ejection Fraction” and “mildly reduced left ventricular ejection fraction”. Studies enrolling post-AMI patients with LVEF ≥40% comparing long-term BB therapy versus standard care were included; studies with reduced LVEF or non-randomized designs were excluded. A total of 442 articles were identified; 19 studies underwent full-text review and 5 were selected. Resultados e Conclusões: The pooled analysis included 5 RCTs comprising 23,531 post-AMI patients with preserved or mildly reduced LVEF, with median follow-up ranging from 3.0 to 3.8 years. Among them, 11,749 received beta-blockers and 11,782 received standard care. All-cause mortality occurred in 477 patients (4.06%) in the beta-blocker group versus 482 (4.09%) in controls, showing no significant difference between groups (RR 0.99; 95% CI 0.87–1.12; p=0.90). Recurrent MI occurred in 468 patients (3.98%) receiving beta-blockers compared with 524 patients (4.45%) in the control group, without statistically significant reduction in risk. Overall, long-term beta-blocker therapy demonstrated neutral clinical outcomes in this population. In post-AMI patients with preserved or mildly reduced LVEF, long-term beta-blocker therapy was not associated with significant reductions in all-cause mortality or recurrent MI, questioning the routine long-term use of beta-blockers in contemporary clinical practice.

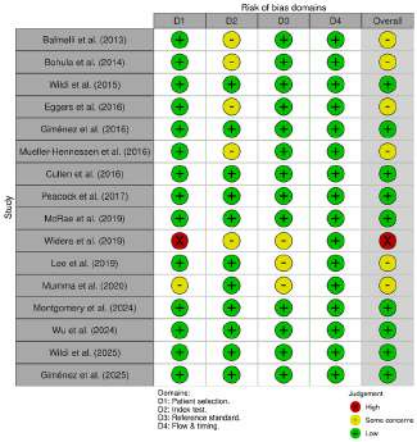
21243

CLINICAL IMPACT OF SEX-SPECIFIC HIGH-SENSITIVITY TROPONIN THRESHOLDS IN SUSPECTED ACUTE CORONARY SYNDROME: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Women presenting with suspected acute coronary syndrome (ACS) typically exhibit lower cardiac troponin concentrations than men, leading to underdiagnosis when universal high-sensitivity cardiac troponin (hs-cTn) thresholds are applied. Sex-specific thresholds have been proposed to improve diagnostic accuracy in women, however, their use remains controversial in current guidelines. Objetivos: To systematically evaluate the impact of sex-specific versus universal hs-cTn thresholds in adults presenting to the emergency department with suspected ACS regarding diagnostic reclassification, diagnostic accuracy (sensitivity and specificity), one-year prognosis and treatment disparities. Métodos: A systematic review was conducted according to PRISMA guidelines. PubMed/MEDLINE was searched for studies comparing universal versus sex-specific hs-cTn thresholds in adults with suspected acute coronary syndrome. Screening involved a blinded dual-review process with a third reviewer for consensus, followed by full-text assessment based on a predefined PICO question. Risk of bias was assessed using the QUADAS-2 tool (Figure 1). Resultados e Conclusões: Sixteen observational studies involving 95,897 patients, including 38,988 women (40.7%), were included (6 hs-cTnI, 8 hs-cTnT, and 2 comparative studies) (Figure 2). Sex-specific thresholds for women increased diagnostic sensitivity, with values ranging from 3.2% to 9.1% across studies, but reduced specificity, with reported values ranging from 3.3% to 17.2%, demonstrating a trade-off between improved detection and reduced specificity. Diagnostic reclassification among women was consistently higher than in men, although most studies reported small absolute changes. Despite increased diagnostic detection, one-year cardiovascular outcomes remained largely unchanged. Overall, evidence supporting routine implementation remained inconclusive. Notably, several studies reported that sex-related disparities in invasive management and evidence-based therapies persisted despite increased ACS detection in women. Sex-specific hs-cTn thresholds increase diagnostic sensitivity and reclassification among women with suspected ACS. However, current evidence does not consistently demonstrate improved clinical outcomes. Routine implementation remains uncertain due to limited clinical benefits, reduced specificity, and persistent sex-related disparities in downstream cardiovascular care.



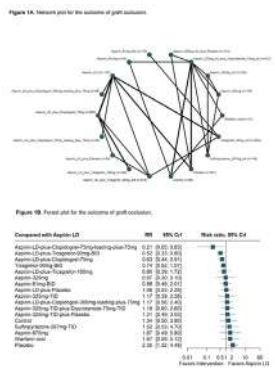
18973

COMPARATIVE EFFICACY AND SAFETY OF ANTIPLATELET STRATEGIES AFTER CORONARY ARTERY BYPASS GRAFTING: A BAYESIAN NETWORK META-ANALYSIS

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Introdução/Fundamentos: Antiplatelet therapy after coronary artery bypass grafting (CABG) is essential to prevent graft failure and adverse cardiovascular events. However, the optimal regimen remains uncertain, particularly regarding the balance between ischemic protection and bleeding risk. Objetivos: To compare the efficacy and safety of different antiplatelet strategies following CABG using a bayesian network meta-analysis of randomized controlled trials (RCTs). Métodos: PubMed, Embase, and Cochrane databases were systematically searched from inception to March 31, 2026, for RCTs comparing antiplatelet strategies after CABG. This systematic review and network meta-analysis followed PRISMA guidelines. The outcomes assessed were graft occlusion, major adverse cardiovascular events (MACE; composite of cardiovascular death, myocardial infarction, stroke, or repeat revascularization), and major bleeding. Risk ratios (RRs) with 95% credible intervals (CrIs) were estimated using a Bayesian random-effects model. Treatments were ranked using the surface under the cumulative ranking curve (SUCRA). Resultados e Conclusões: A total of 31 RCTs including 10,460 patients (mean age, 62.7 years; 87.5% male; 27.5% with diabetes; 64.4% hypertensive) who underwent CABG were included, with a mean follow-up of 14,7 months. Compared with low-dose (LD, 75–100 mg) aspirin, aspirin LD plus clopidogrel loading dose followed by 75 mg daily (RR 0.21; 95% CrI 0.03–0.83; SUCRA 0.97), aspirin LD plus ticagrelor 90 mg twice daily (RR 0.52; 95% CrI 0.33–0.80; SUCRA 0.89), and ticagrelor 90 mg twice daily monotherapy (RR 0.63; 95% CrI 0.44–0.91; SUCRA 0.72) significantly reduced graft occlusion (Figure 1). No strategy demonstrated statistical superiority over aspirin LD for MACE; however, SUCRA rankings favored aspirin LD plus ticagrelor 90 mg twice daily, aspirin LD plus clopidogrel, and aspirin 75–160 mg daily (all SUCRA ≈0.74). For major bleeding, aspirin 81 mg twice daily ranked as the safest strategy (SUCRA 0.97), followed by aspirin LD plus ticagrelor 180 mg (SUCRA 0.57) and aspirin LD monotherapy (SUCRA 0.55). In conclusion, dual antiplatelet therapy reduced graft occlusion without improving MACE compared with aspirin alone. Aspirin-based regimens showed the best safety profile for major bleeding (Figure 2).



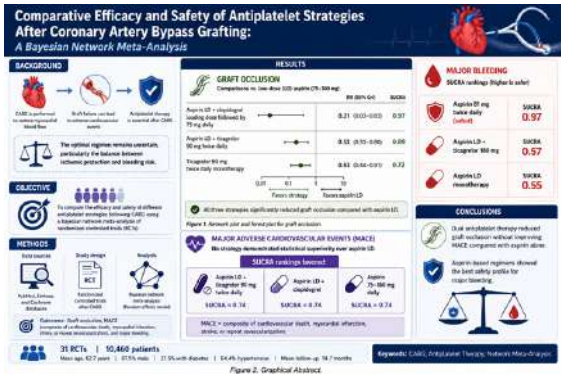


Figure 2. Graphical Abstract.

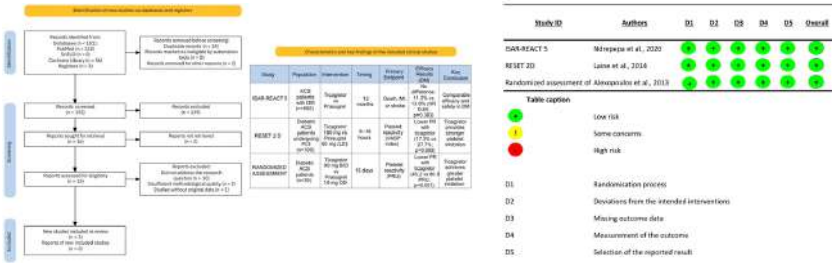
16404

COMPARATIVE EFFICACY AND SAFETY OF TICAGRELOR VERSUS PRASUGREL IN PATIENTS WITH ACUTE CORONARY SYNDROME AND TYPE 2 DIABETES: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Acute coronary syndrome (ACS) in patients with type 2 diabetes mellitus (T2DM) is associated with a higher risk of ischemic events. Platelet hyperreactivity and reduced responsiveness to antiplatelet therapy contribute to this high-risk profile. In this context, P2Y12 receptor inhibitors, such as ticagrelor and prasugrel, represent the cornerstone of antiplatelet therapy, with distinct efficacy and safety profiles. However, the optimal strategy balancing major adverse cardiovascular events (MACE), platelet function, and bleeding risk remains uncertain. Objetivos: To evaluate the comparative efficacy and safety of ticagrelor versus prasugrel in reducing MACE and modulating platelet function in patients with ACS and T2DM, based on evidence from randomized controlled trials (RCTs). Métodos: A systematic review was conducted in accordance with PRISMA 2020 guidelines. Searches were performed in PubMed, SciELO, and the Cochrane Library using DeCS/MeSH descriptors. RCTs assessing the comparative efficacy of these therapies in patients with ACS and T2DM were included. Studies that did not address the research question, were preclinical, conducted in animals, incomplete, or lacked original data were excluded. Study selection was performed independently by three reviewers. Risk of bias was assessed using the RoB 2 tool. Due to heterogeneity, data synthesis was qualitative. Resultados e Conclusões: A total of 181 records were identified, of which three RCTs were included after screening. No significant difference in MACE was observed between ticagrelor and prasugrel in patients with T2DM (HR up to 0.84; 95% CI, 0.58–1.24), with no difference in bleeding risk. In contrast, among patients without T2DM, prasugrel was associated with a lower incidence of MACE (HR 1.70; 95% CI, 1.29–2.24; p<0.001), with a significant interaction according to diabetic status (p=0.0035). Ticagrelor was associated with greater inhibition of platelet reactivity following loading dose compared with prasugrel (p=0.009), without significant differences in high on-treatment platelet reactivity. No consistent superiority was observed in T2DM. The heterogeneity of outcomes and the limited number of studies restrict the generalizability of these findings. The findings do not demonstrate consistent superiority between ticagrelor and prasugrel in patients with T2DM, contrasting with the benefit observed with prasugrel in the overall population. Despite greater platelet inhibition with ticagrelor, its clinical impact remains uncertain.



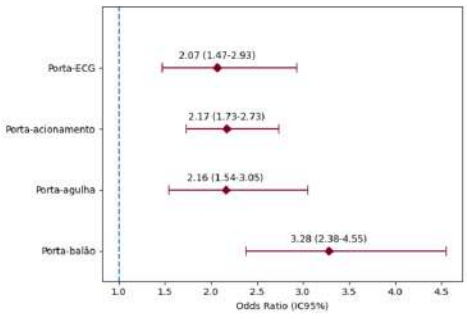
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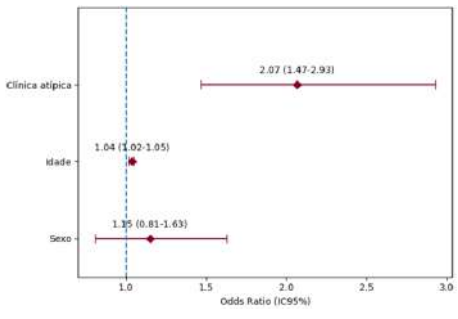
COMPARISON BETWEEN TYPICAL AND ATYPICAL CLINICAL PRESENTATIONS IN THE JOURNEY OF STEMI PATIENTS: A RETROSPECTIVE COHORT STUDY

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Introdução/Fundamentos: Although certain guidelines discourage the dichotomization between typical and atypical clinical presentations, non-classic manifestations of ST-segment elevation myocardial infarction (STEMI) still lead to delays in patient management and mortality repercussions. Objetivos: This study evaluates the impact of atypical presentation on care timelines and outcomes within a regional STEMI assistance network in Salvador, Brazil. Métodos: The analyzed data includes 1360 STEMI patients enrolled in the regional STEMI care database between May 2021 and March 2026. Patients were scanned for typical pain, described as retrosternal or central chest, tightening, dull, crushing, or heavy. Outcomes include door-to-electrocardiogram (ECG), door-to-activation, door-to-needle, and door-to-balloon times, and mortality rates. Patients assisted outside Salvador, previously hospitalized, or with incomplete data were excluded. Continuous variables were expressed as median [interquartile range] and compared using the Mann–Whitney test; categorical variables were analyzed using the chi-square test. Multivariable logistic regression was used to assess associations, adjusted for age and sex. Resultados e Conclusões: Patients with atypical symptoms are older (64 [57–71] versus(vs.) 61 [53–68] years; p<0.001) and more frequently female (46.4% vs. 35.5%; p<0.001). Significant delay was observed when compared to the typical presentation, with higher door-to-ECG (24.5 [12-62] vs. 14 [8-27] minutes (min); p<0.001), door-to-activation (54 [27.25-121.5] vs 33 [19-59] min; p<0.001), door-to-needle (139 [95-207] vs 110.5 [77.59-159] min; p<0.001) and door-to-balloon times (227.5 [175.25-347] vs 173 [143-224.5] min; p<0.001). In multivariable analysis, atypical presentations remain independently associated with a higher chance of delay in door-to-ECG (OR=2.07; 95% CI: 1.47-2.93; p<0.001), door-to-activation (OR=2.17; 95% CI: 1.73-2.73; p<0.001), door-to-needle (OR=2.16; 95% CI: 1.54-3.05; p<0.001), and door-to-balloon times (OR=3.28; 95% CI: 2.38-4.55; p<0.001). Mortality rates relate to atypical presentations (OR=2.07; 95% CI: 1.47–2.93; p < 0.001) and age (OR=1.04; 95% CI: 1.02–1.05; p < 0.001), but not sex (OR=1.15; 95% CI: 0.81–1.63; p = 0.42). Atypical symptoms in STEMI patients are associated with significant delays in every step of assistance and a marked increase in mortality, reinforcing the need for earlier recognition strategies and sustained clinical vigilance.





18476

CORONARY PLAQUE INSTABILITY: ARE NON-SIGNIFICANT LESIONS THE REAL CULPRIT OF ACUTE CORONARY SYNDROMES?

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Introdução/Fundamentos: Patients with acute coronary syndromes (ACS) may present with obstructive coronary artery disease (CAD) or non-obstructive coronary artery disease (NOCAD). Although obstructive CAD predominates, a consistent proportion of ACS occurs without significant stenosis. Thus, evaluating the incidence and outcomes according to lesion type is essential. Objetivos: To evaluate the incidence and clinical outcomes of ACS according to the presence or absence of obstructive CAD. Métodos: A systematic review was conducted in accordance with PRISMA guidelines. Searches were performed in PubMed, Embase, and Cochrane using predefined descriptors and free-text terms. Eligibility criteria were defined according to the PICO framework. Studies including adult patients with ACS, comparing outcomes between obstructive CAD and NOCAD, were included. Screening was conducted by two reviewers, with discrepancies resolved by consensus. Data extraction focused on ACS incidence and presentation, followed by qualitative synthesis. Resultados e Conclusões: Four studies including 10,200 patients were analyzed. Obstructive CAD accounted for most ACS presentations, while NOCAD was identified in 5–10% of myocardial infarctions and up to 10% of NSTEMI, representing a clinically relevant subgroup despite lower prevalence compared with obstructive CAD. In NSTEMI, mortality was similar at 30 days (1.3% vs 1.0%) and 1 year (2.4% vs 2.6%). However, obstructive CAD showed higher rates of recurrent myocardial infarction (7.6% vs 0.9% at 30 days; 9.8% vs 3.6% at 1 year; HR 0.35, 95% CI 0.12–0.98; p=0.04). Conversely, 1-year mortality was higher in NOCAD (5.2% vs 1.6%; HR 3.44, 95% CI 1.05–11.28; p=0.04). In STEMI, NOCAD was associated with lower mortality (0.8% vs 2.4% at 30 days; 0.8% vs 4.0% at 3 years) and lower major adverse cardiovascular event (MACE) rates (1.6% vs 5.7%; 7.7% vs 22.2%). High-risk plaques were associated with increased event rates (6.4% vs 2.4%), enhancing their prognostic relevance even in absence of significant stenosis. Although obstructive CAD accounts for most ACS presentations, NOCAD represents a clinically relevant subgroup. In NSTEMI, NOCAD is associated with lower rates of recurrent ischemic events but similar all-cause mortality, suggesting a distinct risk profile not driven by coronary events alone. In STEMI, NOCAD is consistently associated with lower mortality and MACE. Additionally, high-risk plaque features are linked to increased adverse events, underscoring the role of plaque vulnerability beyond stenosis severity.

21784

CRITICAL LATE-NIGHT WINDOW IN STEMI CARE: A 3,704-PATIENT ANALYSIS OF MORTALITY AND REPERFUSION DELAYS

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(1) SERVIÇO DE ATENDIMENTO MÓVEL DE URGÊNCIA (SAMU) - SALVADOR - BA - BRASIL;

Introdução/Fundamentos: In ST-segment elevation myocardial infarction (STEMI), timely diagnosis and rapid reperfusion are essential determinants of prognosis. However, care processes may be affected by the time of hospital admission. Objetivos: To evaluate whether a critical late-night admission window, identified through hourly mortality distribution, was associated with higher mortality and delays in STEMI care within a regional public reperfusion network. Métodos: Cross-sectional study using a regional STEMI care database (January 2017–April 2026). Patients with STEMI admitted to public healthcare units in Salvador, Bahia, and its metropolitan region were included. Suspected STEMI cases are reported to a multidisciplinary STEMI response team for ECG review, cardiology supervision, and reperfusion guidance. An exploratory hour-by-hour mortality analysis suggested concentration of deaths after midnight; therefore, the 00:00–02:59 window was compared with all other admission times. Hospital mortality, age, sex, Killip class, GRACE score, and care-time intervals were analyzed, including ECG-to-team activation, door-to-needle, door-to-balloon, and total ischemic time. Chi-square, Mann-Whitney, and logistic regression were used, controlling for clinical variables. Resultados e Conclusões: Among 3,704 patients with valid admission-time data, 401 were admitted between 00:00 and 02:59. Groups had similar age (62.7 vs. 62.2 years), male sex distribution (62.6% vs. 60.1%; p=0.344), and mean GRACE score (108.9 vs. 108.0), while Killip III–IV was more frequent in the 00:00–02:59 group (5.5% vs. 3.0%; p=0.011). Mortality was higher during this period (19.4% vs. 13.0%; OR 1.60; 95%CI 1.23–2.10; p=0.001). In logistic regression, the association remained significant after adjustment for age, sex, and Killip class (OR 1.59; 95%CI 1.19–2.11; p=0.001), and after adjustment for GRACE score (OR 1.77; 95%CI 1.17–2.68; p=0.007). The 00:00–02:59 group also had longer ECG-to-team activation time (19 vs. 15 min; p=0.005), door-to-team activation time (80 vs. 46 min; p<0.001), door-to-balloon time (p=0.002), and total ischemic time (198 vs. 182 min; p=0.011). Admission between 00:00 and 02:59 was associated with higher mortality and delays in team activation and reperfusion-related care, suggesting a critical operational vulnerability window in the regional STEMI network.

Table 1. Baseline characteristics, outcomes, and care-time intervals according to admission time

Variable	Other admission times	00:00-02:59	p-value
Patients, n	3303	401	
Age, years, mean ± SD	62.2 ± 12.3	62.7 ± 12.3	0.382
Male sex, n (%)	1 986 (60.1)	251 (62.6)	0.344
GRACE score, mean +/- SD	108.0 ± 28.3	108.9 ± 28.3	0.441
Killip III-IV, n (%)	97 (3.0)	21 (5.5)	0.011
Hospital mortality, n (%)	427 (13.0)	77 (19.4)	0.001
ECG-to-team activation time, min, median [Q1-Q3]	15 [7-33]	19 [8-40.5]	0.005
Door-to-team activation time, min, median [Q1-Q3]	46 [25-99.8]	80 [27.5-667.5]	<0.001
Door-to-needle time, min, median [Q1-Q3]	131 [97-209]	144 [99-227.5]	0.094
Door-to-balloon time, min, median [Q1-Q3]	217 [153-338]	257 [180-386]	0.002
Total ischemic time, min, median [Q1-Q3]	182 [129-260]	198 [122.3-364]	0.011

Note: Care-time intervals are reported as median [Q1-Q3] minutes. ECG, electrocardiogram; GRACE, Global Registry of Acute Coronary Events; SD, standard deviation.

Table 2. Logistic regression for hospital mortality associated with 00:00-02:59 admission

Model	OR	95% CI	p-value
Unadjusted	1.60	1.23-2.10	0.001
Adjusted for age, sex, and Killip class	1.59	1.19-2.11	0.001
Adjusted for GRACE score	1.77	1.17-2.68	0.007

Note: CI, confidence interval; GRACE, Global Registry of Acute Coronary Events; OR, odds ratio.

19355

CULPRIT-ONLY VERSUS COMPLETE REVASCULARIZATION IN NSTEMI WITH MULTIVESSEL DISEASE: A BAYESIAN NETWORK META-ANALYSIS

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Introdução/Fundamentos: Complete revascularization may improve outcomes in non–ST-segment elevation myocardial infarction (NSTEMI) patients with multivessel disease. However, the optimal timing and comparative effectiveness among available strategies remain uncertain. Objetivos: To compare the efficacy of culprit-only versus different complete revascularization strategies in NSTEMI patients with multivessel disease. Métodos: PubMed, Embase, and Cochrane databases were systematically searched from inception to March 31, 2026, for randomized controlled trials (RCTs) and observational studies. This systematic review and Bayesian network meta-analysis followed PRISMA guidelines. The interventions included culprit-only revascularization (COR), immediate complete revascularization (ICR), staged complete revascularization (SCR), and multivessel percutaneous coronary intervention (MV-PCI). The outcomes were: all-cause mortality, myocardial infarction, unplanned revascularization, and major adverse cardiovascular events (MACE). Risk ratios (RRs) with 95% credible intervals (CrIs) were estimated using a Bayesian random-effects model. Treatments were ranked using the surface under the cumulative ranking curve (SUCRA). Resultados e Conclusões: A total of 18 studies (2 RCTs, 16 observational) including 71,033 patients (mean age 71.2 years; 60.5% male; 34.2% diabetes; 59.8% hypertension) were included. No strategy significantly reduced all-cause mortality compared with COR (Figure 1); however, ranking analysis favored ICR as the most effective (RR 0.66; 95% CrI 0.41–1.09; SUCRA 0.77), followed by MV-PCI and SCR, while COR ranked lowest. For MACE, no statistically significant differences were observed; nevertheless, MV-PCI ranked highest (SUCRA 0.64), followed by ICR, COR, and SCR. Regarding unplanned revascularization, MV-PCI showed the greatest probability of benefit (RR 0.21; 95% CrI 0.05–1.04; SUCRA 0.95), followed by ICR, whereas COR consistently ranked worst. For myocardial infarction, ICR was the only strategy associated with a significant reduction compared with COR (RR 0.60; 95% CrI 0.40–0.89), with SUCRA ranking favoring MV-PCI first (SUCRA 0.92), followed by ICR, SCR, and COR. In conclusion, although most pairwise comparisons were not statistically significant, ranking analyses consistently suggest that complete revascularization strategies, particularly ICR and MV-PCI, are associated with more favorable outcomes across clinically relevant endpoints, whereas COR showed the lowest performance (Figure 2).

Figure 1A. Network plot for the outcome of all-cause mortality.

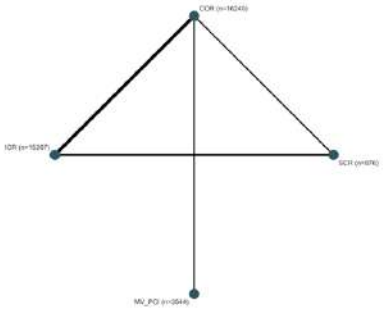
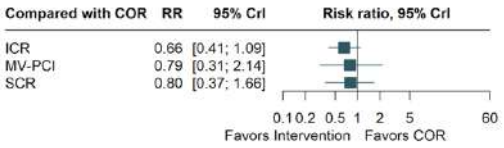


Figure 1B. Forest plot for the outcome of all-cause mortality.



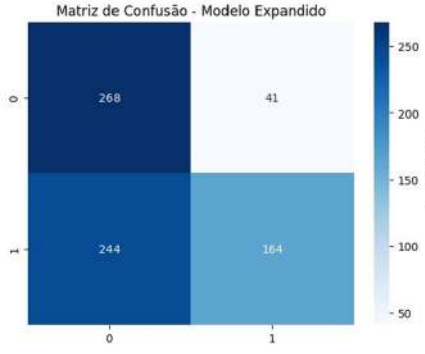
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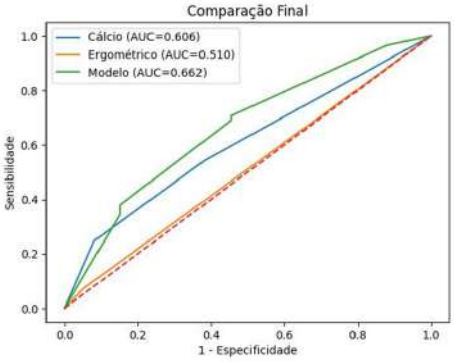
DIAGNOSTIC PERFORMANCE OF CORONARY CALCIUM SCORE AND EXERCISE STRESS TEST COMPARED WITH CORONARY CORONARY COMPUTED TOMOGRAPHY ANGIOGRAPHY IN THE DETECTION OF CORONARY ARTERY DISEASE.

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Introdução/Fundamentos: Cardiovascular diseases account for approximately 32% of global deaths, with Coronary Artery Disease (CAD) being the leading cause, often silent and difficult to detect early. Exercise stress testing (EST), widely used due to its low cost, demonstrates sensitivity ranging from 50–72% and specificity from 69–74%. The 2025 Brazilian Guideline for Chronic Coronary Syndrome downgraded EST to a class IIb/B recommendation for CAD investigation, restricting its use to settings without imaging methods. Coronary computed tomography angiography (CCTA) demonstrates sensitivity of 97.8% and specificity of 95.6%, while coronary artery calcium (CAC) scoring is an independent marker of cardiovascular risk. Objetivos: To evaluate the diagnostic accuracy of EST and CAC scoring in identifying CAD using CCTA as the gold standard and analyze the incremental value of combining these methods. Métodos: This observational, cross-sectional, retrospective study was approved by the corresponding Research Ethics Committee. A total of 1,897 patients who underwent CCTA were assessed, with final analysis including 1,550 individuals (764 with CAD and 786 without CAD). CAC was analyzed as a binary variable (≥100 considered positive) and ordinally, while EST was classified as positive or negative for ischemia. Sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and area under the curve (AUC) from ROC curves were calculated. Initially, isolated analyses of EST and CAC were performed. Subsequently, the model was expanded to include clinical and laboratory variables (age, sex, BMI, HbA1c, lipid profile, hs-CRP, and creatinine), using 5-fold cross-validation and 95% confidence intervals. Resultados e Conclusões: EST (n=204) demonstrated sensitivity of 7.3%, specificity of 94.7%, PPV of 61.5%, NPV of 47.1%, and AUC of 0.51. CAC (n=211) showed sensitivity of 25%, specificity of 85%, PPV of 67.3%, NPV of 48.2%, and AUC of 0.61. The combined model (n=91) demonstrated sensitivity of 70.7%, specificity of 54.5%, PPV of 73.2%, NPV of 51.4%, and AUC of 0.66. The expanded model achieved a mean AUC of 0.66, sensitivity of 40%, and specificity of 87%, showing improvement over isolated tests. In multivariate analysis, hs-CRP was the strongest predictor of CAD, followed by age and CAC, whereas EST contributed minimally. EST demonstrated poor performance for CAD screening, CAC showed a confirmatory role, and inclusion of clinical variables improved risk stratification without replacing anatomical imaging methods.





21228

DOES CT-DERIVED FRACTIONAL FLOW RESERVE REDUCE UNNECESSARY INVASIVE CORONARY ANGIOGRAPHY IN PATIENTS WITH SUSPECTED CORONARY ARTERY DISEASE? A SYSTEMATIC REVIEW OF RANDOMIZED CONTROLLED TRIALS

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Introdução/Fundamentos: Coronary artery disease (CAD) is the leading global cause of death, affecting 197 million people worldwide. Coronary computed tomography angiography (CCTA) is a first-line diagnostic test, but its moderate specificity leads to high rates of invasive coronary angiography (ICA) without functionally significant obstructive disease, accounting for up to 45% of elective catheterizations. CT-derived fractional flow reserve (CT-FFR) was developed to overcome this limitation by noninvasively estimating the hemodynamic significance of coronary stenosis. However, evidence supporting its clinical impact is limited to a few randomized controlled trials (RCTs). This systematic review aimed to synthesize these findings. Objetivos: To qualitatively assess the effectiveness of CT-FFR combined with CCTA versus standard care in adult patients with suspected CAD. Métodos: This study is a systematic review of RCTs conducted in accordance with PRISMA guidelines. Searches were performed in the PubMed, Cochrane, and Embase databases. Of the 187 records identified, 4 RCTs were included, comparing CT-FFR combined with CCTA versus isolated CCTA or standard care in adult patients with suspected CAD. The outcomes assessed were the reduction of unnecessary referrals for ICA and the safety of the method based on rates of Major Adverse Cardiovascular Events (MACE) and mortality. Risk of bias assessment was performed using the Cochrane RoB2 tool. Resultados e Conclusões: The 4 RCTs included 9,261 participants: FORECAST (UK, n=1,400, 2021), PRECISE (international, n=2,103, 2023), Guo et al. (China, n=5,297, 2024), and Qian et al. (China, n=461, 2025). Significant reductions in ICA rates were observed in the CT-FFR groups across all studies evaluating this outcome, with absolute reductions ranging from 2.4% to 19.3%. In PRECISE, the CT-FFR-based strategy reduced catheterizations without obstructive CAD by 76% (HR 0.24; 95% CI 0.16–0.36). No statistically significant differences in MACE rates were observed between groups, suggesting the strategy's safety. Limitations included heterogeneity among comparators and a maximum follow-up of 2 years. Overall, CT-FFR combined with CCTA consistently reduced unnecessary ICA while maintaining clinical safety by not increasing adverse events. Further studies with longer follow-up and cost-effectiveness analyses across healthcare systems are needed to strengthen these findings.

17135

EARLY ADMINISTRATION OF PCSK9 INHIBITORS COMBINED WITH HIGH-INTENSITY STATINS VERSUS HIGH-INTENSITY STATINS ALONE IN PATIENTS WITH ACS: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Reducing low-density lipoprotein cholesterol (LDL-C) in patients with acute coronary syndromes (ACS) is directly associated with a lower incidence of ischemic events. Currently, the earliest possible administration of high-intensity statin therapy is the gold standard for ACS treatment. However, achieving therapeutic LDL-C targets remains challenging in this population. In this clinical setting, proprotein convertase subtilisin/kexin type 9 (PCSK9) inhibitors have emerged as a potential adjunct to high-intensity statins to reduce LDL-C levels more rapidly and effectively. Objetivos: To evaluate the clinical benefit of in-hospital administration (within 24–72 hours of presentation) of PCSK9 inhibitors combined with high-intensity statin therapy in ACS patients, focusing on LDL-C level assessment and the impact during the post-ACS vulnerable period. Métodos: A systematic review was conducted following the PRISMA guidelines, based on searches in PubMed, Embase, and Cochrane databases. The MeSH terms used were: "Acute Coronary Syndrome", "PCSK9 Inhibitors", "Standard of Care", "Cholesterol, LDL", and "Myocardial Infarction/prevention and control", covering the period from 2019 to April 2026. Only randomized clinical trials (RCTs) were included. Eleven articles were screened, of which three met the inclusion criteria, the most recent being from February 2026. Inclusion was based on a rigorous assessment of eligibility criteria and methodological quality certification using the RoB 2 tool. Resultados e Conclusões: All evaluated studies demonstrated that early administration of PCSK9 inhibitors, alongside high-intensity statins, resulted in a sustained and more efficient reduction of LDL-C levels compared to high-intensity statin monotherapy, enabling up to 95% of patients to reach recommended therapeutic targets. Consequently, LDL-C reduction promotes vulnerable plaque stabilization and reduces total atheroma volume, decreasing the likelihood of major adverse cardiovascular events (MACE), such as acute myocardial infarction. Despite promising data, further large-scale, long-term randomized clinical trials are essential to confirm these findings.

21111

EARLY INITIATION OF PCSK9 INHIBITORS AFTER ACUTE CORONARY SYNDROME: EFFECTS ON LDL REDUCTION AND CLINICAL OUTCOMES – A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Patients with Acute Coronary Syndrome are at high risk for recurrent cardiovascular events, especially in the early phase after the initial event. Although intensive statin therapy is the standard treatment, many patients do not achieve the recommended LDL levels. Early initiation of PCSK9 inhibitors may provide rapid LDL reduction and potential clinical benefits; however, evidence regarding their impact on cardiovascular outcomes in this setting remains limited. Objetivos: To evaluate the efficacy and safety of the early initiation of PCSK9 inhibitors in patients with Acute Coronary Syndrome, focusing on LDL reduction and cardiovascular outcomes. Métodos: The proposed study is a systematic review whose searches were conducted in the PubMed scientific database, including articles published within the last 10 years. The search was carried out using the descriptors: “acute coronary syndrome” OR “myocardial infarction” AND “PCSK9 inhibitors” OR “evolocumab” OR “alirocumab” AND “early” OR “acute phase”. Studies without theoretical reflection, theses, dissertations, and review articles were excluded. Selection was performed through titles, abstracts, and full-text reading. In the end, eleven studies were analyzed. Resultados e Conclusões: Early administration of PCSK9 inhibitors after Acute Coronary Syndrome is associated with rapid and significant reductions in LDL-C and other atherogenic markers, including lipoprotein(a) and apolipoprotein B, allowing most patients to achieve recommended lipid targets early. This strategy also appears to reduce major adverse cardiovascular events in the short term without increasing adverse effects, suggesting a favorable safety and efficacy profile. However, further large-scale randomized studies are needed to confirm their impact on long-term clinical outcomes.

20934

EARLY RISK STRATIFICATION IN ACUTE CORONARY SYNDROME: PERSPECTIVES FROM EMERGING BIOMARKERS

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Introdução/Fundamentos: Acute Coronary Syndrome (ACS), caused by a marked reduction or interruption of cardiac blood flow—as seen in Myocardial Infarction (MI) and Unstable Angina—represents the leading cause of global mortality and disability, requiring precision diagnostic strategies to mitigate fatal outcomes. Currently, markers such as troponin T and B-type natriuretic peptide (BNP), associated with the GRACE score, are used for diagnosis and risk stratification. However, some biomarkers exhibit low specificity or delayed release, hindering early management. Thus, the investigation of new markers represents a significant advancement in cardiology. Objetivos: To analyze the efficiency of new cardiac biomarkers in the diagnosis and early risk stratification of ACS. Métodos: Qualitative systematic review conducted according to PRISMA guidelines. The search was performed in the Scopus (n=10), Embase (n=73), and PubMed (n=184) databases between 2021 and 2026, using the descriptors “Acute Coronary Syndrome” AND Biomarkers AND Troponin AND “Risk Score”. Reviews and research focused exclusively on troponin, isolated diagnosis, or non-laboratory markers were excluded. Selection, performed by two independent reviewers using Rayyan, resulted in the inclusion of 9 studies. Resultados e Conclusões: Urea-to-creatinine ratio, albumin-to-creatinine ratio, albumin activity index, NT-proBNP, Apo AI, KIM-1, and DPP3 were identified as predictors of in-hospital mortality in ACS. Growth Differentiation Factor-15 (GDF-15) stood out among inflammatory cytokines as an independent predictor of MI and death, surpassing BNP with accuracy comparable to high-sensitivity troponin T (hs-cTnT). The association of hs-cTnT with cMyBP-C or copeptin showed high reliability for diagnostic rule-out, especially in patients with chronically elevated troponin. The marker S100A8/A9 stood out for directly assisting in therapeutic guidance. Furthermore, factors such as sex, age, and comorbidities influence biomarker cutoff values. Unlike other markers, the reduction of miR-30c-5p presented diagnostic and prognostic value in ACS. Combining multiple biomarkers with the GRACE score improved risk discrimination, reinforcing ACS as a multi-organ stress condition and allowing the incorporation of inflammatory, hepatic, renal, cardiac, and hematologic markers into early stratification, favoring clinical decisions and better outcomes.

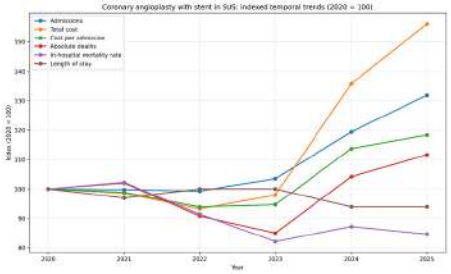
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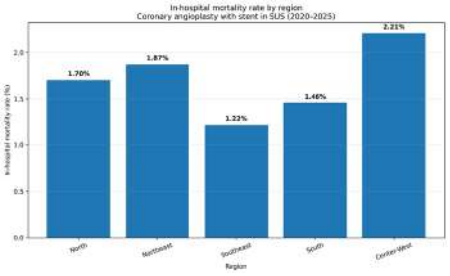
ECONOMIC AND CLINICAL BURDEN OF CORONARY ANGIOPLASTY WITH STENT IN THE BRAZILIAN PUBLIC HEALTH SYSTEM: A NATIONWIDE ANALYSIS FROM 2020 TO 2025

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Introdução/Fundamentos: Coronary angioplasty with stent is a cornerstone of contemporary management of coronary artery disease, especially in acute and high-risk ischemic settings. In publicly funded health systems, understanding its temporal and regional burden is essential to guide resource allocation and cardiovascular care planning. Objetivos: To analyze temporal trends and regional disparities in hospital admissions, costs, in-hospital mortality, and length of stay related to coronary angioplasty with stent in the Brazilian Unified Health System (SUS) from 2020 to 2025. Métodos: This was an ecological, retrospective, nationwide study based on secondary data from the Hospital Information System of SUS. The procedure analyzed was coronary angioplasty with stent implantation. Approved hospital admission authorizations, total reimbursed values, in-hospital deaths, and mean length of stay were assessed by year and region. Descriptive analysis was performed, including temporal variation and proportional in-hospital mortality. Resultados e Conclusões: From 2020 to 2025, 299,192 hospital admissions for coronary angioplasty with stent were approved in SUS, totaling R$1,757,816,033.27, with 4,393 in-hospital deaths and an overall mean length of stay of 3.2 days. Admissions increased from 45,758 in 2020 to 60,349 in 2025 (+31.9%), while total costs rose from R$257,849,156.55 to R$402,537,005.65 (+56.1%), indicating growth disproportionate to procedural volume. Mean cost per admission also increased from R$5,635.06 to R$6,670.15 (+18.4%). Absolute in-hospital deaths increased from 740 to 826 (+11.6%), although proportional mortality fell from 1.62% to 1.37%, alongside a slight reduction in mean length of stay from 3.3 to 3.1 days. Across the 2020–2025 period, the Southeast concentrated the greatest burden, accounting for 48.7% of admissions and 48.7% of total expenditure, whereas the Midwest showed the highest cumulative proportional mortality (2.21%) and the Northeast the longest cumulative mean stay (3.8 days). These findings suggest increasing financial pressure of interventional cardiology on SUS, with persistent regional inequalities. Although selected performance indicators modestly improved over time, these findings highlight the growing procedural and economic burden of coronary angioplasty with stent in SUS and support further planning strategies to reduce regional inequalities and optimize high-complexity cardiovascular care.





20295

EFFICACY AND SAFETY OF SECONDARY PREVENTION IN MINOCA: A MECHANISM-ORIENTED SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Myocardial infarction with non-obstructive coronary arteries (MINOCA) accounts for 6–15% of myocardial infarctions and is associated with substantial risk of major adverse cardiovascular events (MACE) and mortality. The role of standard secondary prevention therapies remains uncertain, as these patients were largely excluded from randomized trials. Objetivos: To evaluate the efficacy (mortality and MACE) and safety (etiology-specific adverse events) of statins, ACE inhibitors/angiotensin receptor blockers (ACEi/ARB), beta-blockers, dual antiplatelet therapy (DAPT), and aspirin in MINOCA patients. Métodos: This systematic review and meta-analysis followed PRISMA guidelines. A structured PubMed search identified observational cohorts and post-hoc analyses of randomized trials. Studies were screened independently using predefined criteria: (1) clear MINOCA definition, (2) follow-up ≥1 year, and (3) reporting adjusted hazard ratios (HR) for mortality or MACE and/or safety outcomes. Extracted data included HRs with 95% confidence intervals and adverse events stratified by mechanisms (e.g., vasospasm, Takotsubo syndrome, microvascular dysfunction). Heterogeneity was assessed using I^2, and pooled estimates calculated with a random-effects model. Resultados e Conclusões: Seven studies (n = 39,273) were included. Statins showed the most consistent benefit, reducing mortality (HR 0.60–0.71) and MACE (HR 0.77). ACEi/ARB were associated with reduced MACE (HR 0.65–0.82), without significant mortality benefit. Beta-blockers showed benefit in subgroups, especially Takotsubo syndrome, but borderline overall effects. Antiplatelet strategies raised concerns: although DAPT reduced mortality in pooled analyses, intensified regimens increased adverse events, and aspirin was associated with increased MACE and potential harm in vasospastic mechanisms. Treatment effects varied by etiology. Statins provide the most consistent mortality benefit in MINOCA, while ACEi/ARB reduce MACE. Beta-blockers may benefit selected subgroups. Routine antiplatelet strategies—especially aspirin and intensified DAPT—may be harmful in non-atherosclerotic mechanisms. These findings challenge uniform secondary prevention and support a mechanism-guided approach. Results should be interpreted considering heterogeneity and predominance of observational data.

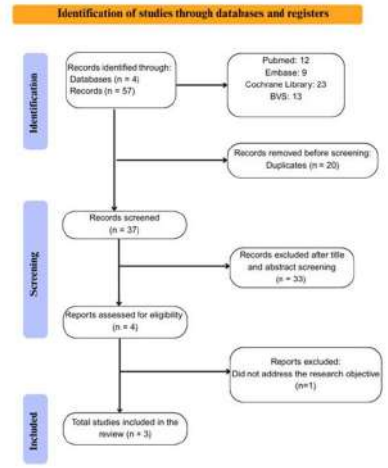
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EFFICACY OF EZETIMIBE COMBINED WITH ATORVASTATIN COMPARED TO ATORVASTATIN MONOTHERAPY IN PATIENTS WITH CORONARY ARTERY DISEASE AND TYPE 2 DIABETES MELLITUS: A SYSTEMATIC REVIEW OF RANDOMIZED CONTROLLED TRIALS.

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Figure 1. PRISMA flow diagram



Introdução/Fundamentos: Coronary artery disease (CAD) is frequently associated with type 2 diabetes mellitus (T2DM) and may lead to serious complications. Traditionally, treatment involves statins, particularly atorvastatin. However, this population has greater difficulty achieving LDL targets due to the limited reduction provided by these drugs. In this context, the combination of atorvastatin and ezetimibe emerges as an alternative therapeutic strategy. Objetivos: To evaluate the efficacy of ezetimibe added to atorvastatin compared with atorvastatin monotherapy in patients with coronary artery disease (CAD) and type 2 diabetes mellitus (T2DM). Métodos: Systematic review conducted in accordance with PRISMA guidelines. Searches were performed in April 2026 in PubMed, Cochrane Library, Embase, and BVS using the descriptors (DeCS/MeSH) “Coronary Artery Disease,” “Diabetes Mellitus,” “Atorvastatin,” and “Ezetimibe,” combined with the Boolean operator AND. Only randomized controlled trials (RCT) were included. The primary outcome was LDL reduction; outcomes related to atherosclerotic plaque and inflammatory markers were also assessed. Study selection was performed by two independent reviewers, and risk of bias was assessed using the RoB 2 tool. Resultados e Conclusões: A total of 57 articles were identified, of which three comprised the final sample (Figure 1). All studies demonstrated a reduction in LDL levels in both groups, as summarized in Table 1. In the study by Wang et al., the reduction was significantly greater in the intervention group ($p < 0.05$), as was the case for high-sensitivity C-reactive protein (hs-CRP) and atherosclerotic plaque area ($p < 0.05$). Similarly, Uemura et al. observed a greater reduction in LDL in the intervention group, with no assessment of inflammatory or plaque-related outcomes. In contrast, Koshelskaya et al. reported reductions in LDL and inflammatory markers in both groups, with no significant difference between them. A non-significant increase in endothelin-1 was observed in the control group, and no plaque-related outcomes were assessed. Risk of bias analysis indicated high risk in two studies (Uemura et al. and Koshelskaya et al.) and some concerns in Wang et al. Therefore, combination therapy appears to promote greater LDL reduction compared with monotherapy, particularly in this population. However, these findings should be interpreted with caution due to the risk of bias, and larger studies with quantitative analyses are needed for confirmation.

Table 1. Data presented as reported in the original studies. # Uemura et al. corresponds to a crossover RCT; follow-up duration is presented per intervention period. *Baseline value of the sample. Note: Data were presented as reported in the original studies, without standardization or additional statistical analyses.

Author, Year, and Country of Publication	Intervention	Control	Sample characteristics	Follow-up duration	LDL (Intervention)	LDL (Control)	Secondary outcomes	Statistical significance intergroup
Wang *et al.*, 2017; China	Ezetimibe 10 mg/day + atorvastatin 20 mg/day	Atorvastatin 20 mg/day	n = 100; age: 57.2 ± 16.6 years; men: 61%	12 months	LDL reduction : 3.53 → 1.67 mmol/L ($p < 0.05$)	LDL reduction : 3.45 → 2.04 mmol/L ($p < 0.05$)	Reduction in hs-CRP and atherosclerotic plaque area in both groups, more pronounced in the intervention group ($p < 0.05$).	$P < 0,05$
Uemura *et al.*#; 2012; Japan	Ezetimibe 10 mg/day + atorvastatin 10 mg/day	atorvastatin 20 mg/day	n = 39; age: 67.8 ± 9.7 years; men: 76.9%	crossover RCT: 12 weeks per period (total: 24 weeks)	LDL reduction : 111.6* → 82.9 mg/dL ($p < 0.05$)	LDL reduction : 111.6* → 98.4 mg/dL ($p < 0.05$)	Inflammatory or atherosclerotic plaque-related outcomes were not assessed.	$P < 0,05$
Koshelskaya *et al.*, 2014; Russia	Ezetimibe 10 mg/day + atorvastatin 10–20 mg/day	atorvastatin 10–40 mg/day	n = 60; age (range): 43–78 years; men: not reported	6 months	LDL reduction : 4.09 → 2.30 mmol/L ($p \leq 0.01$; 49.2% reduction)	LDL reduction : 4.24 → 2.42 mmol/L ($p \leq 0.001$; 42.5% reduction)	hs-CRP, TNF-α, and IL-1β decreased significantly in both groups; endothelin-1 showed a non-significant increase only in the control group (0.31 → 0.42; $p = 0.06$).	Between-group comparison not reported.

17173

EFFICACY OF PATHOPHYSIOLOGICAL MECHANISM-GUIDED PHARMACOLOGICAL TREATMENT IN PATIENTS WITH MYOCARDIAL ISCHEMIA WITH NON-OBSTRUCTIVE CORONARY ARTERIES: A SYSTEMATIC REVIEW.

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Introdução/Fundamentos: Myocardial ischemia without coronary obstruction (INOCA) affects up to 50% of patients with angina who undergo coronary angiography, impacting quality of life and the use of healthcare services. Its heterogeneous pathophysiology requires mechanism-specific therapeutic approaches; however, the available evidence remains fragmented, hindering the guidance of individualized management and reinforcing the need for a systematic synthesis. Objetivos: To evaluate the efficacy of pharmacological treatment guided by pathophysiological mechanisms in patients with INOCA, focusing on symptom reduction and improvement in quality of life and cardiovascular parameters. Métodos: A systematic review conducted in accordance with the PRISMA guidelines and registered in the PROSPERO database (CRD420261359282). The search was conducted in the PubMed, Embase, and Cochrane Library databases. After removing duplicates, 222 studies were identified, of which 93 were selected for full-text review, and 19 were included in the final analysis. Resultados e Conclusões: Approximately 3,200 patients were included. Mechanism-guided treatment demonstrated an improvement of +11.7 points on the SAQ (95% CI 5.0–18.4; $p = 0.001$), with a 35.5% loss of diagnostic accuracy in the control group compared to 2.7% in the intervention group. Regarding microvascular dysfunction, ranolazine showed no benefit in the general population, but was effective in the subgroup with CFR < 2.5: improvement in MPRI ($p = 0.0137$) and angina frequency ($p = 0.027$), with symptomatic variation correlated with myocardial perfusion reserve ($r = 0.25$; $p = 0.005$). In vasospasm, fasudil resulted in the absence of ischemia in 85% of patients; cilostazol promoted an improvement of ≥ 10 points on the SAQ in 86% of patients refractory to two calcium channel blockers (CCBs), with a 54% reduction in emergency department visits. Prolonged use of nitrates was associated with a higher incidence of cardiovascular events (19.8% vs. 8.3%; HR 5.18). In conclusion, pharmacological treatment guided by pathophysiological mechanisms demonstrated greater efficacy than empirical approaches in patients with INOCA, with benefits in symptoms, quality of life, and functional parameters, particularly in subgroups with microvascular dysfunction and coronary vasospasm. Non-targeted therapies may be ineffective or associated with worse outcomes. However, the scarcity of consistent prospective studies reinforces the need for new clinical trials to consolidate this strategy.

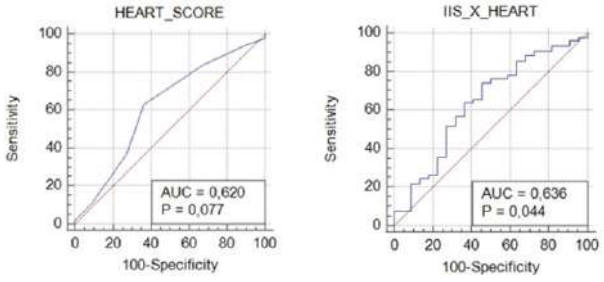
19497

EVALUATION OF THE SYSTEMIC IMMUNE-INFLAMMATORY INDEX AS AN ADDITIONAL PARAMETER TO THE HEART SCORE IN THE PREDICTION OF CARDIOVASCULAR OUTCOMES IN PATIENTS WITH NON-ST-ELEVATION ACUTE CORONARY SYNDROME.

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Introdução/Fundamentos: Chest pain requires rapid risk stratification. The HEART score is the standard tool for predicting MACE, but inflammation plays a key role in plaque pathophysiology. This study evaluates the Systemic Immune-Inflammatory Index (SII), calculated using the formula Platelets×Neutrophils/Lymphocytes, as a potential adjunct in risk stratification. Objetivos: To assess whether the addition of the SII to the HEART Score improves the predictive accuracy for 30-day MACE in patients with NSTE-ACS. Métodos: Retrospective, observational, single-center study. Patients aged >18 years with a diagnosis of NSTE-ACS who underwent cardiac catheterization and had complete clinical data were included. Exclusion criteria were stable angina, hepatic failure, hematological, oncological, inflammatory and infectious diseases, creatinine clearance <60 ml/min/m², and incomplete medical records. Of 985 patients screened, 169 met the inclusion criteria. The primary endpoint was a composite of death, new MI, PCI, CABG at 30 days, and the presence of a critical coronary lesion on clinical treatment, with individual components also analyzed separately. Statistical analysis was performed using ROC curves with AUC calculation to assess model discrimination and logistic regression, with a significance level of 5%. Artificial intelligence was used to support literature review, proofreading, and translation. Resultados e Conclusões: In the ROC analysis for the primary endpoint, the HEART Score alone yielded an AUC of 0.620 (P = 0.077), and the SII alone yielded an AUC of 0.574 (P = 0.218), both without statistical significance. The SII × HEART Score interaction product demonstrated superior and statistically significant discriminatory performance (AUC = 0.636; P = 0.044), with a sensitivity of 74.2% and specificity of 54.6% at a cutoff of >34.09. In logistic regression analysis for individual endpoints, the SII × HEART Score was an independent predictor of 30-day mortality (OR = 3.4; 95% CI 1.09–10.59; P = 0.034) and of new MI at 30 days (OR = 1.57; 95% CI 1.12–20.77; P = 0.034). The SII alone was not a significant independent predictor in any of the logistic regression analyses. In conclusion, The SII × HEART Score product outperformed either index alone, serving as an independent predictor of 30-day mortality and PCI, suggesting additional value of the SII in risk stratification.



18246

HEALTHCARE QUALITY OF ST-SEGMENT ELEVATION MYOCARDIAL INFARCTION PATIENTS IN PUBLIC VS. PRIVATE HEALTH SYSTEMS IN BRAZIL

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Introdução/Fundamentos: The Brazilian public healthcare system is free and available to all Brazilian citizens, but individuals may choose to contract private healthcare. The association between type of healthcare with clinical characteristics and outcomes in patients with ST-segment elevation myocardial infarction (STEMI) in Brazil has not been adequately investigated. Objetivos: To compare clinical characteristics and outcomes among ST-segment elevation myocardial infarction patients who received public care versus those receiving private care. Métodos: Prospective cohort with all STEMI patients submitted to primary percutaneous coronary intervention (pPCI) in a tertiary cardiology center, from January 2010 to December 2024. T-test and Chi-square were performed. A p < 0.05 was considered statistically significant. Resultados e Conclusões: 6.864 patients were included, 80% from public health care and 20% from private. Public patients were younger, more frequently female, less frequently white, and had lower educational levels and income. They presented more smoking and less hypertension, dyslipidemia and family history of CAD (Coronary Artery Disease), as demonstrated in Table 1. They presented later to the hospital (4.83 hours [3-7] vs. 3 hours [1.55-5.56]; p<0.001), but had a lower door-to-balloon time (63 minutes [46 ; 87] vs. 71 minutes [51 ; 98]; p<0.001). The total ischemic time (5.84 hours [3.98 –8.50] vs 4.33 hours [2.83–6.96]; p<0.001) was higher in patients from the public system. Baseline angiographic characteristics and success rates of pPCI were similar between groups with a 98% angiographic success rate in the public system and 97% in the private system (p = 0.232). Medications administered in the first 24 hours of hospital admission were in accordance with current CAD guidelines, and did not significantly differ between groups. At hospital discharge, patients in the public were less likely to receive prescriptions of ticagrelor, prasugrel, and angiotensin II receptor blockers than private patients. Long-term follow-up was obtained in 90% of patients, with a mean duration of 328 ± 216 days. There were no significant differences in-hospital and long-term outcomes between STEMI patients attended by public or private assistance in a reference center in Brazil (Table 2). However, clinical characteristics and medical treatment differed significantly. In conclusion, despite worse socioeconomic profile and longer total ischemic time among public patients, clinical outcomes were similar between groups.

Table 1 – Clinical characteristics of the study patients.

	Total n=6.864	Public assistance n=5.492	Private assistance n=1.372	p
Male, n (%)	4.688 (69)	3.709 (68)	979 (72)	0,003*
Age, years	60,65±12,83	60,02±12,34	63,17±13,48	<0.001**
White, n (%)	5.380 (90)	4.216 (89)	1.164 (94)	<0.001*
Years of education, years	8,42±4,38	7,42±4,22	11,79±5,09	<0.001**
Hypertension, n (%)	4.257 (62)	3.370 (62)	887 (65)	0.029*
Smoking, n (%)	2.885 (42)	2.486 (46)	399 (29)	<0.001*
Dyslipidemia, n (%)	2.099 (31)	1.796 (29)	303 (37)	<0.001*
Family history of CAD, n (%)	1.482 (22)	1.156 (21)	326 (24)	0.033*
Diabetes Mellitus, n (%)	1.831 (27)	1.486 (27)	345 (25)	0.133*
Previous medical history				
MI, n (%)	1.301 (19)	1.038 (19)	263 (17)	0.747*
Stroke, n (%)	419 (6)	339 (6)	80 (6)	0.703*
PCI, n (%)	1.073 (16)	833 (15)	240 (18)	0.017*
CHF, n (%)	402 (6)	330 (6)	72 (5)	0.364*
CABG, n (%)	218 (3)	151 (3)	67 (5)	<0.001*
CRF, n (%)	191 (3)	153 (3)	38 (3)	1.000*

*Chi-square test. **Student's t-test;

CAD, Coronary Artery Disease; MI, Myocardial Infarction; PCI, Percutaneous Coronary Intervention; CHF, Congestive Heart Failure; CABG, Coronary Artery Bypass Grafting; CRF, Chronic Renal Failure.

Table 2 - In-hospital, 30 days and 12 months follow-up adverse events.

	Public assistance			Private assistance			p*		
	In hospital	30 days	12 months	In hospital	30 days	12 months	In hospital	30 days	12 months
Death, n (%)	395 (7)	436 (8)	522 (9)	90 (6)	104 (7)	133 (10)	0.444	0.469	0.453
MI, n (%)	71 (1)	99 (2)	179 (3)	17 (1)	22 (2)	43 (3)	1.000	0.731	0.965
Stroke, n (%)	44 (1)	55 (1)	64 (1)	15 (1)	18 (1)	19 (1)	0.328	0.295	0.492
MACE, n (%)	470 (9)	547 (10)	678 (12)	113 (8)	120 (9)	169 (12)	0.628	0.613	1.000

*Chi-square test.
MI, Myocardial Infarction; MACE, Major Adverse Cardiac Events.

20401

HETEROGENEOUS OUTCOMES OF DUAL VERSUS SINGLE ANTIPLATELET THERAPY IN SPONTANEOUS CORONARY ARTERY DISSECTION: A SYSTEMATIC REVIEW

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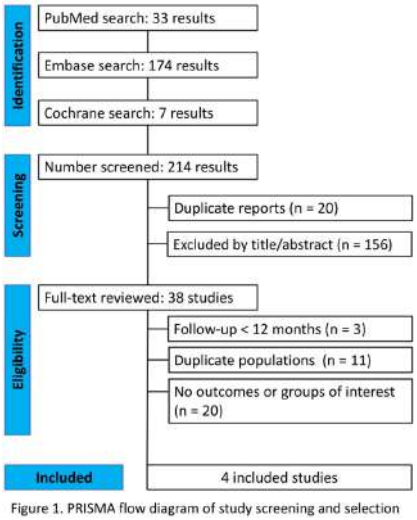


Figure 1. PRISMA flow diagram of study screening and selection

Introdução/Fundamentos: Spontaneous coronary artery dissection (SCAD) is an increasingly recognised cause of acute coronary syndrome (ACS). However, the optimal antiplatelet treatment in this scenario remains controversial. Objetivos: To synthesise the comparison between dual versus single antiplatelet therapy (DAPT vs SAPT) on major adverse cardiovascular events (MACE) in SCAD. Métodos: Systematic review conducted in accordance with PRISMA 2020 guidelines and prospectively registered in PROSPERO (Figure 1). Eligible studies included cohorts of adults with angiographically confirmed, non-iatrogenic SCAD. Four reviewers independently performed study screening. Resultados e Conclusões: Among 214 records identified, four observational cohort studies were included, comprising 1,675 patients with SCAD. The pooled weighted mean age was 52.3 (±10) years, and 88.7% were women. DAPT was used in approximately 61% of patients. The pooled MACE incidence was 12.4% across follow-up windows ranging from 12 to 36 months (study-level range 8.6%–14.6%). The association between DAPT and MACE was heterogeneous. In DISCO, DAPT was associated with a higher incidence of MACE compared with SAPT (18.9% vs 6.0%; HR 2.62, 95% CI 1.22–5.61). Similarly, in SR-SCAD, DAPT was independently associated with increased risk of adverse events (HR 2.18; p=0.042). In the CanSCAD subanalysis, 12-month MACE did not differ significantly between DAPT and SAPT (4.6% vs 3.4%, p=0.53). ANZ-SCAD suggested an increased risk specifically associated with aspirin plus ticagrelor (aHR 1.8, 95% CI 1.04–3.2). No study demonstrated a reduction in MACE with DAPT compared with SAPT. In patients with SCAD, observational evidence suggests no benefit of DAPT over SAPT, with some cohorts indicating a potential increase in MACE associated with DAPT, particularly with more potent regimens. These findings, together with SCAD pathophysiology, support the need for randomised trials, ideally with stratification by sex and antiplatelet regimen, to define the optimal antiplatelet strategy in this population.

Table 1. Baseline characteristics and outcomes of included studies

Study	Design	Population	Conservative treatment	Follow-up (median, months)	No. of patients (DAPT / SAPT / Total)	Female sex	Age	MACE/MACCE (per-study follow-up)
ANZ-SCAD, 2025	Prospective & retrospective cohort	818 y; ACS due to confirmed SCAD	88.5% (469)	21	DAPT: 64% (325) SAPT: 36% (184) Total: 505	88.7% (448)	52.2 ± 10.4 y	Aspirin + ticagrelor aHR 1.8 (1.04–3.2); p = 0.037
SR-SCAD, 2022	Prospective cohort	SCAD by Saw angiographic classification	78% (305)	29	DAPT: 58% (221) SAPT: 41.4% (161) Total: 389	88% (344)	53 y (IQR 47–60)	DAPT at discharge HR 2.18 (1.10–4.68); p = 0.042
DISCO, 2021	Retrospective cohort	Non-atherosclerotic SCAD; 918 y	100% (199)	12	DAPT: 66.3% (132) SAPT: 33.2% (67) Total: 199	88.9% (177)	52.1 ± 9.3 y	SAPT: 6.0% DAPT: 18.9% HR 2.62 [1.22–5.61]; p = 0.013
CanSCAD*, 2022	Prospective cohort	Non-atherosclerotic SCAD-confirmed angiographically; acute ACS; 918 y	100% (562)	36	DAPT: 56.6% (347) SAPT: 40.4% (235) Total: 582	88.8% (517)	51.7 ± 10.5 y	SAPT: 3.4% DAPT: 4.6% p = 0.53

DAPT, dual antiplatelet therapy; SAPT, single antiplatelet therapy; SCAD, spontaneous coronary artery dissection; ACS, acute coronary syndrome; HR, hazard ratio; aHR, adjusted hazard ratio; CI, confidence interval; IQR, interquartile range; MACE/MACCE, composite of all-cause mortality, non-fatal myocardial infarction (including SCAD-related or recurrent MI), stroke or TIA, heart failure, unplanned coronary revascularisation, and recurrent SCAD.
*CanSCAD figures refer to the RCT-MO subanalysis of conservatively managed patients (n = 562); the parent CanSCAD cohort (n = 750) had 84.1% conservatively managed.

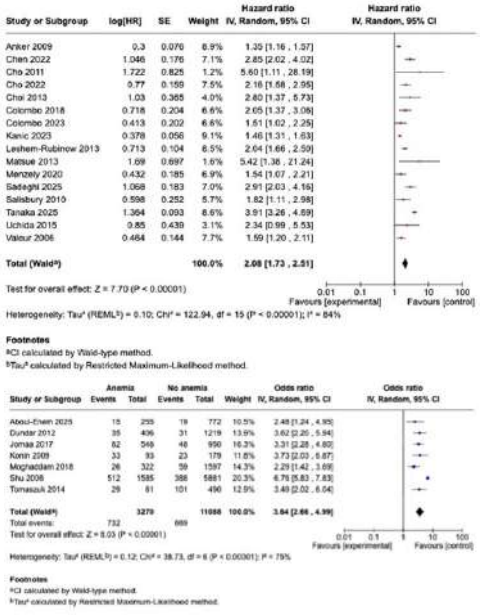
17061

IMPACT OF ANEMIA ON MORTALITY IN PATIENTS WITH MYOCARDIAL INFARCTION: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Cardiovascular diseases, including myocardial infarction (MI), remain the leading cause of mortality worldwide. Anemia is highly prevalent in this population and may impair oxygen delivery, contributing to higher mortality. However, evidence on its prognostic impact remains heterogeneous and inconsistent. This study aimed to systematically evaluate the association between anemia and mortality in patients with MI. Objetivos: To evaluate the impact of anemia on mortality in patients with myocardial infarction. Métodos: A systematic review and meta-analysis were conducted using PubMed, Google Scholar, and EBSCO, according to PRISMA guidelines. The search combined terms related to anemia and myocardial infarction with terms describing outcomes and effect estimates. Studies focused on transfusion, treatment, surgical, perioperative, anesthesia, or ICU settings were excluded. Observational studies assessing anemia and outcomes in MI were included. Two separate meta-analyses were performed: dichotomous data (OR) and adjusted hazard ratios (HR, generic inverse variance). Studies reporting only risk ratios were not included in quantitative synthesis. Analyses were conducted using RevMan with random-effects models due to expected clinical and methodological heterogeneity. Resultados e Conclusões: A total of 46 studies (n >160,161) were included. Most demonstrated worse outcomes in patients with anemia. In pooled dichotomous analysis, anemia was associated with increased mortality (OR 3.64, 95% CI 2.66–4.99; p < 0.00001; I^2 = 75%). In adjusted analysis, anemia remained significantly associated with mortality (HR 2.08, 95% CI 1.73–2.51; p < 0.00001; I^2 = 84%), although with attenuation of effect. Therefore, anemia was consistently associated with increased mortality in MI, even after adjustment for confounders, supporting anemia as an independent and clinically relevant prognostic marker for risk stratification in MI. Heterogeneity likely reflects differences in anemia definition (baseline vs hospital-acquired), patient populations (STEMI, ACS, or MI), outcome definitions, and follow-up duration. Random-effects models accounted for this expected variability. Overall, these results support incorporating anemia into clinical decision-making and risk assessment strategies in patients with MI.



21698

IMPACT OF BETA-BLOCKERS ON CLINICAL OUTCOMES IN PATIENTS WITH PRESERVED EJECTION FRACTION AFTER ACUTE MYOCARDIAL INFARCTION: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: The benefit of beta-blockers in patients after acute myocardial infarction (AMI) was widely established in the pre-reperfusion era. However, in the contemporary era of reperfusion and optimized medical therapy, their impact on patients with preserved left ventricular ejection fraction (LVEF ≥50%) remains uncertain. Objetivos: To evaluate the impact of beta-blockers on major adverse cardiovascular events (MACE) and mortality in post-AMI patients with preserved LVEF. Métodos: A systematic review was conducted in accordance with the PRISMA guidelines, structured using the PICO framework (P: post-AMI adults with LVEF ≥50%; I: beta-blockers; C: control/placebo; O: MACE and mortality) and registered in PROSPERO (No. XXXX). Searches were performed in PubMed, SciELO, LILACS, Cochrane Library, and ScienceDirect, including studies from 2022 to 2026. Randomized clinical trials and contemporary observational studies were included. Studies involving patients with prior heart failure or reduced ejection fraction were excluded. Of 275 references identified, after removal of duplicates and screening by title and abstract, 15 articles were assessed in full text, of which four were included. Resultados e Conclusões: Four contemporary multicenter clinical trials were included (ABYSS, REDUCE-AMI, BETAMI, and REBOOT), totaling 21,710 patients with AMI and preserved or mildly reduced LVEF. Most studies did not demonstrate a significant benefit of beta-blockers in reducing MACE. The REDUCE-AMI and REBOOT trials showed no significant reduction in mortality or MACE. Conversely, the BETAMI trial demonstrated a modest reduction in the composite outcome of death or MACE (14.2% vs. 16.3%; HR 0.85; 95% CI 0.75–0.98; p=0.03), primarily driven by a lower incidence of reinfarction (HR 0.73; 95% CI 0.59–0.92). The ABYSS trial evaluated therapy discontinuation and demonstrated that interruption of beta-blockers did not meet non-inferiority criteria compared with treatment continuation (HR 1.16; 95% CI 1.01–1.33), suggesting increased risk with discontinuation. There were no consistent differences in mortality, hospitalization for heart failure, or adverse events between groups. Contemporary data suggest no consistent benefit of beta-blockers in reducing mortality or MACE in post-AMI patients with preserved LVEF. However, routine discontinuation should be undertaken with caution, as it may be associated with worse outcomes, and the decision should be individualized according to the patient's clinical profile.

19135

IMPACT OF COLCHICINE USE ON THE REDUCTION OF MAJOR CARDIOVASCULAR EVENTS IN PATIENTS AFTER ACUTE MYOCARDIAL INFARCTION: A SYSTEMATIC REVIEW OF RANDOMIZED CLINICAL TRIALS.

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Introdução/Fundamentos: Acute myocardial infarction (AMI) remains an important cause of cardiovascular morbidity and mortality. After the ischemic event, the inflammatory response contributes to the progression of atherosclerosis and the occurrence of new events. In this context, colchicine, an anti-inflammatory drug, has been investigated as a strategy for secondary prevention due to its ability to modulate inflammatory pathways associated with plaque instability. Thus, it is relevant to evaluate its impact on reducing major cardiovascular events in post-AMI patients. Objetivos: To evaluate the efficacy and safety of colchicine administration in reducing major adverse cardiovascular events (MACE) in patients following AIM, through a systematic review of randomized clinical trials. Métodos: Systematic review conducted according to PRISMA 2020 guidelines, with searches in PubMed, Virtual Health Library, and Cochrane Library using DeCS/MeSH descriptors related to "colchicine", "myocardial infarction", and "cardiovascular events", combined with AND/OR operators. Randomized clinical trials published in the last 10 years, in English or Portuguese, evaluating colchicine use in patients after AIM or acute coronary syndrome were included. Preclinical studies, reviews, and those with high risk of bias were excluded. Screening was performed by independent reviewers using the Rayyan software. Outcomes included major cardiovascular events (cardiovascular death, reinfarction, and stroke), as well as hospitalization for heart failure and adverse events. Data synthesis was qualitative, with risk of bias assessed using the RoB 2 tool. Resultados e Conclusões: After screening, four randomized clinical trials were included. In post-AMI patients, colchicine reduced major cardiovascular events ($p<0.05$), suggesting benefit in secondary prevention. Similar results were observed in stable coronary artery disease, with a significant reduction in events ($p<0.01$). However, early administration in acute settings did not demonstrate benefit in ventricular remodeling or periprocedural outcomes ($p>0.05$). Overall, colchicine showed a favorable safety profile, without increased serious adverse events, although mild gastrointestinal effects were reported. These findings suggest benefit in chronic and post-infarction settings, with less consistent results in the acute phase, highlighting the need for larger studies.

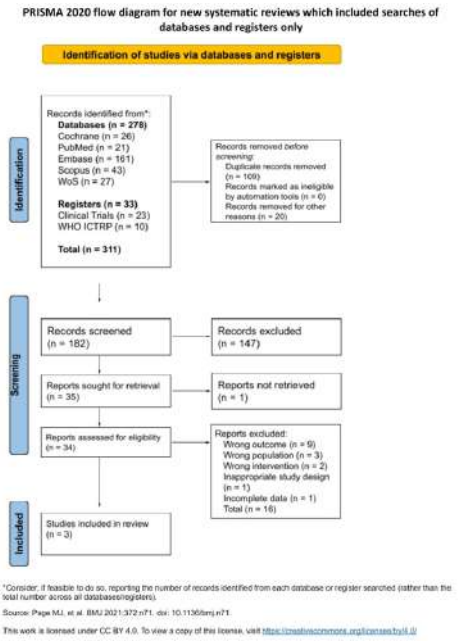
20164

INCRETIN-BASED THERAPIES PROMOTE PLAQUE STABILIZATION IN CORONARY ARTERY DISEASE: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Glucagon-like peptide-1 receptor agonists (GLP-1RAs) reduce major cardiovascular events and mortality. However, their direct mechanisms in modulating coronary plaque remain incompletely understood, representing an important knowledge gap. Objetivos: This study aims to evaluate the efficacy of incretin-based therapies (IBTs) in the compositional modulation of atherosclerotic plaques in patients with coronary artery disease (CAD). Métodos: A systematic review was conducted to address the PICO question: in patients with coronary artery disease (CAD), are IBTs, compared with standard treatment or placebo, effective in modulating coronary atherosclerotic plaques as assessed by intracoronary imaging? The search for records was performed in major databases, including studies published from 2016 onwards. Studies involving adult patients with CAD and longitudinal follow-up were included. Study selection and data extraction were performed independently by two reviewers, followed by risk of bias assessment, certainty of evidence evaluation, and qualitative synthesis. Resultados e Conclusões: A total of 311 records were initially identified, with 3 studies ultimately included. A consistent reduction in lipid content of atherosclerotic plaques was observed, with a decrease of 85.6% in maximum lipid burden in the GLP-1RA group compared to 42.0% in the control group (p=0.01), along with reductions in fibro-fatty volume and plaque thickness. These therapies were also associated with plaque stabilization, with an increase in fibrous components under liraglutide use (34±129 mm³ vs. −2±101 mm³ in the control group; p=0.04), as well as improvements in endothelial function and inflammatory modulation. In patients following acute coronary syndrome, a mean regression of 5.8% was observed compared to a progression of 1.1% in the control group (p=0.041), with a greater reduction in percent atheroma volume (PAV) (-6.1% vs. -0.7%; p=0.039). However, in the OPTIMAL study subanalysis, no significant differences in PAV reduction were observed at 48 weeks, despite consistent improvements in plaque composition. Incretin-based therapies promote stabilization of coronary atherosclerotic plaque, with improvement in composition and reduction in inflammation. Despite inconsistent effects on plaque volume, consistent benefits are observed in plaque vulnerability. These findings suggest a cardiovascular effect independent of luminal regression in patients with CAD.



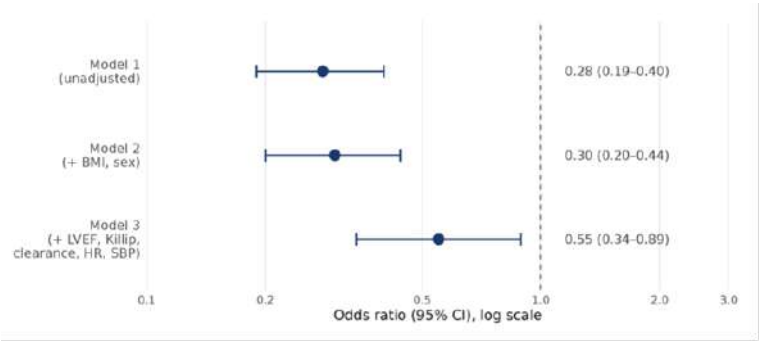
20196

LOWER IN-HOSPITAL MORTALITY IN YOUNGER STEMI PATIENTS AFTER PHARMACOINVASIVE STRATEGY: CONTRIBUTION OF BASELINE CLINICAL SEVERITY

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Introdução/Fundamentos: Younger STEMI patients have lower in-hospital mortality, but typically present with a more favorable clinical profile. The extent to which baseline severity explains this association in pharmacoinvasive cohorts remains unclear. Objetivos: To assess the association between younger age and in-hospital mortality in STEMI patients treated with a pharmacoinvasive strategy, and to evaluate how this association changes after sequential adjustment for baseline clinical severity. Métodos: This retrospective cohort study included 2,510 consecutive STEMI patients admitted to two tertiary centers. Premature STEMI was defined as age <55 years. The association with in-hospital mortality was assessed using multivariable logistic regression with a sequential adjustment approach and change-in-estimate evaluation. Model 1 included premature STEMI alone, Model 2 added BMI and sex, and Model 3 added LVEF, pre-fibrinolysis Killip class, creatinine clearance, HR and SBP. Discrimination was assessed with the area under the receiver operating characteristic curve (AUC) and calibration with the Hosmer-Lemeshow test. As a sensitivity analysis, age was modeled as a continuous variable using natural cubic splines. Resultados e Conclusões: Of the 2,510 patients, 1,587 (63.2%) had premature STEMI. In-hospital mortality was 2.6% in younger patients and 9.0% in older patients (p<0.001). In model 1, premature STEMI was associated with lower in-hospital mortality (OR 0.28; 95%CI 0.19–0.40; p<0.001), and the estimate was largely unchanged after adjustment for BMI and sex (OR 0.30; 95%CI 0.20-0.44; p<0.001). After full adjustment, the association persisted with attenuated magnitude (OR 0.55; 95%CI 0.34-0.89; p=0.015), corresponding to a 54.2% attenuation in the log-odds (Figure 1). The model showed good discrimination (AUC 0.901) and adequate calibration (Hosmer-Lemeshow p=0.875). Continuous age modeling demonstrated a linear association with mortality (p for non-linearity=0.93) and similar discrimination (AUC 0.902), supporting the dichotomized analysis. Stratified analyses suggested a stronger association in Killip I and reduced LVEF, without significant interactions. In this cohort, the lower in-hospital mortality observed in younger STEMI patients was largely attenuated after adjustment for baseline clinical severity, indicating that differences in admission profile account for a substantial portion of this association. A residual effect persisted, suggesting that age adds prognostic information beyond measured clinical variables.



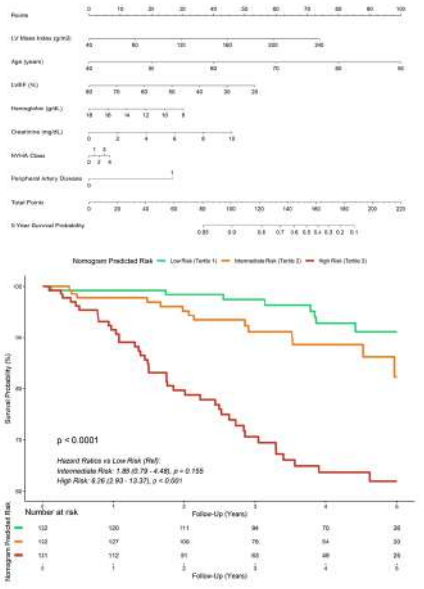
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MACHINE LEARNING MODEL TO PREDICT LONG-TERM MORTALITY IN CHRONIC CORONARY SYNDROME: AN ELASTIC NET-DERIVED CLINICAL SCORE

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Introdução/Fundamentos: Predicting long-term mortality in chronic coronary syndrome (CCS) is challenging. While machine learning (ML) offers high accuracy, its complexity often hinders clinical use. Objetivos: To compare three ML algorithms predicting 5-year mortality in a CCS cohort and translate the best-performing model into a practical clinical nomogram. Métodos: Baseline clinical, laboratory, and echocardiographic data were analyzed. The cohort was dynamically split into training (70%) and validation (30%) sets. Three algorithms—Elastic Net (Cox Penalized), Random Survival Forest (RSF), and Extreme Gradient Boosting (XGBoost)—were trained and compared using Harrell's C-index. Internal validation used 500 bootstrap resamples. Risk stratification was evaluated using Kaplan-Meier (KM) curves with Hazard Ratios (HR), and clinical utility was assessed via Decision Curve Analysis (DCA). Resultados e Conclusões: The Elastic Net model outperformed tree-based algorithms in the hold-out test set (C-index 0.759; 95% CI: 0.700-0.819), compared to RSF (0.751; 95% CI: 0.690-0.811) and XGBoost (0.731; 95% CI: 0.668-0.793). Elastic Net selected key predictors (age, left ventricle mass, ejection fraction, hemoglobin, creatinine, NYHA class, and peripheral artery disease) to build the nomogram. Bootstrapping confirmed robust internal validation (corrected C-index 0.766). KM analysis stratified the unseen validation cohort into risk cohorts; compared to the low-risk reference, mortality was significantly higher in the high-risk group (HR: 6.26; 95% CI: 2.93-13.37, p<0.001). DCA confirmed superior clinical utility: at a 20% risk threshold, the nomogram provided a higher net benefit (0.105) than the "treat-all" strategy (0.039), effectively avoiding 26.6 unnecessary interventions per 100 patients. In conclusion, among the evaluated ML models, the Elastic Net provided the best predictive performance. Its translation into a clinical nomogram successfully bridges the gap between advanced methodology and transparent risk stratification, optimizing medical decisions for patients with CCS.



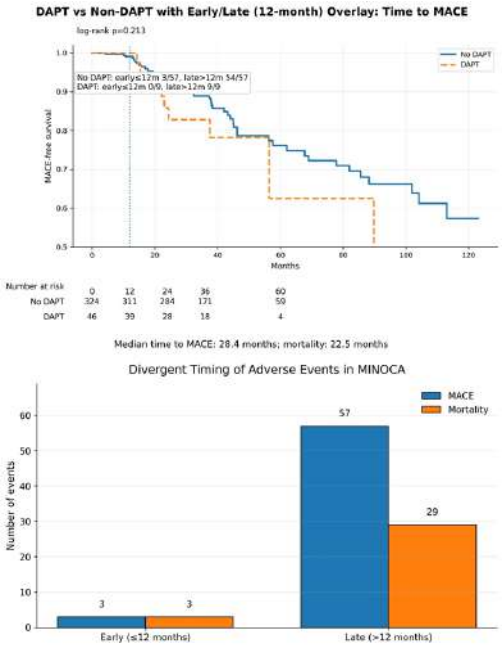
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MINOCA IS NOT BENIGN: EARLY STABILITY MASKS PROGRESSIVE RISK ACCUMULATION AND TREATMENT-RESISTANT EVENT TRAJECTORIES

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Introdução/Fundamentos: Myocardial infarction with non-obstructive coronary arteries (MINOCA) is often perceived as a relatively benign condition. However, the temporal pattern of adverse events and the impact of conventional therapies remain poorly defined. Objetivos: This study aims to define the timing of adverse events in MINOCA and to evaluate the influence of cardiovascular risk factors and treatment strategies on both the incidence and progression of MACE and mortality. Métodos: We analyzed 370 consecutive patients with MINOCA (190 men, 180 women) in a retrospective single-center cohort (2015–2025). Baseline risk factors and medical therapies were assessed at diagnosis. The primary endpoint was MACE, defined as a composite of non-fatal myocardial infarction, stroke, and cardiovascular hospitalization. All-cause mortality was analyzed separately. Time-to-event analyses were performed with a prespecified 12-month landmark to distinguish early and late events. Resultados e Conclusões: MACE occurred in 66 patients (17.8%) over a median follow-up of 36 months (IQR 30–44). Early events were uncommon but not absent, with only a small proportion occurring within the first year, whereas the vast majority occurred beyond 12 months. This pattern indicates an early phase of relative clinical stability followed by progressive accumulation of both non-fatal and fatal events over time. Median time to MACE was 28.4 months and to death 22.5 months. Risk profiles showed sex-specific patterns. In men, risk factors remained relatively stable across age strata, with smoking predominating. In contrast, women demonstrated a shift toward metabolic risk with aging, as diabetes and hyperlipidemia became more prevalent. This transition was associated with both higher incidence and earlier occurrence of MACE in women. Diabetes showed a stronger association with MACE and earlier event timing in older women, whereas no comparable effect was observed in men. Conversely, smoking showed a more pronounced, age-dependent association with MACE in men. Treatment analyses revealed no significant association between conventional therapies and outcomes. Dual antiplatelet therapy (12.4%) was not associated with differences in MACE incidence, timing, or mortality, consistent across definitions. Similarly, other standard therapies showed no significant relationship with outcomes. In contrast, colchicine use was associated with lower mortality without affecting MACE, suggesting a role in modulating disease progression rather than preventing initial events.



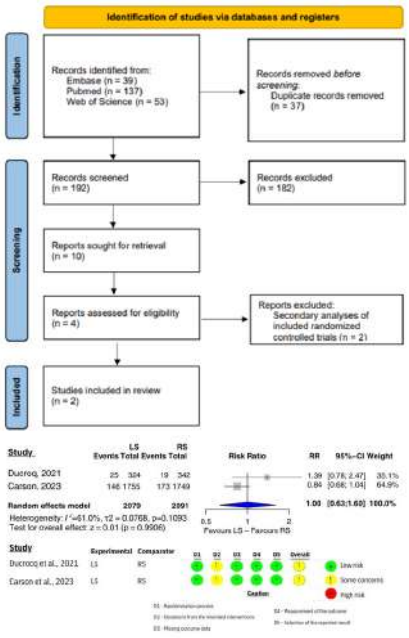
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MORTALITY OF RESTRICTIVE VERSUS LIBERAL BLOOD TRANSFUSION STRATEGIES IN ANEMIC PATIENTS WITH ACUTE CORONARY SYNDROME: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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Introdução/Fundamentos: There is limited evidence regarding blood transfusion (BT) strategies in anemic patients with acute coronary syndrome (ACS). While the myocardial injury caused by ischemia in the ACS could be mitigated by BT in anemic patients, BT may also worsen prognosis, due to adverse events such as fluid overload and thrombosis. Therefore, a synthesis of the clinical evidence is needed to support clinical decision-making. Objetivos: To compare the mortality rates associated with a liberal (LS)(Hb ≤ 10 g/dL) versus a restrictive (RS)(Hb ≤ 8 g/dL) BT strategy among anemic patients with ACS. Métodos: This systematic review and meta-analysis were conducted in accordance with PRISMA guidelines. A comprehensive search was conducted in Embase, PubMed, and Web of Science using a search strategy based on MeSH terms. Two authors independently screened the studies and any discrepancies were resolved by a third author. Reference lists of included studies were also hand-searched for eligible trials. Only original randomized controlled trials (RCTs) that investigated different strategies of BT in anemic ACS patients were included. The Cochrane Risk of Bias (RoB 2.0) tool was used to assess the included studies. Statistical analysis was performed using R Studio software. Resultados e Conclusões: A total of 229 articles were identified from Embase (39), PubMed (137), and Web of Science (53). After title and abstract screening, ten articles underwent full-text review. Two studies (REALITY, 2021, n=666; MINT, 2023, n=3504) met the eligibility criteria, totaling 4170 participants. The meta-analysis showed no significant difference in mortality between the LS and RS of BT [RR 1.00, CI 95%; 0,63-1,60]. Substantial heterogeneity was observed (I2=61%), suggesting inconsistent effects across studies. The overall certainty of evidence may be limited by concerns regarding deviations from intended interventions across included studies. These data suggest that blood transfusion decisions should not rely solely on hemoglobin thresholds but should also consider individualized clinical evaluation. There is no evidence that supports an LS of BT in ACS patients. An LS might increase unnecessary healthcare costs and adverse effects, without a benefit in mortality rates. This study shows some limitations such as the limited number of RCTs and data inconsistency. Therefore, further large-escale RCTs are needed for the optimal evidence based management for these patients.



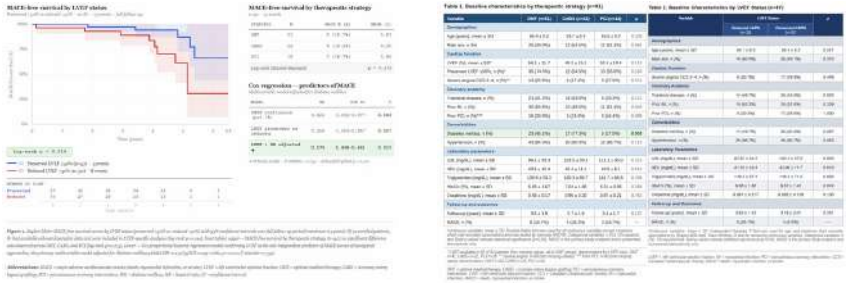
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NON-OBSTRUCTIVE LEFT MAIN CORONARY ARTERY DISEASE (<50%): LEFT VENTRICULAR EJECTION FRACTION AS THE PRIMARY PROGNOSTIC DETERMINANT - A PRELIMINARY SINGLE-CENTER ANALYSIS

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Introdução/Fundamentos: Non-obstructive left main coronary artery disease (LMCAD <50%) represents a therapeutic blind spot: excluded from landmark randomized trials and lacking evidence-based management guidance. Revascularization in this population is typically driven by concomitant multivessel disease rather than the left main lesion itself, leaving its prognostic determinants undefined. Objetivos: To identify, in a preliminary analysis, predictors of major adverse cardiovascular events (MACE) and evaluate whether therapeutic strategy influences long-term prognosis in non-obstructive LMCAD. Métodos: Retrospective single-center cohort of 91 patients with angiographically confirmed LMCAD <50% (2018-2024), managed with optimal medical therapy (OMT, n=51), coronary artery bypass grafting (CABG, n=22), or percutaneous coronary intervention (PCI, n=18); revascularization was indicated by overall coronary anatomy. MACE was defined as death, myocardial infarction, or stroke. Left ventricular ejection fraction (LVEF) was assessed continuously and dichotomized (preserved ≥50% vs. reduced <50%); LVEF analyses excluded four patients with missing data (n=87). Kaplan-Meier survival analysis, Cox proportional hazards regression, and multivariable logistic regression were performed as appropriate. Resultados e Conclusões: Over a median follow-up of 3.5 years, 15 MACE occurred (16.5%). Diabetes mellitus (DM) was the only baseline characteristic differing significantly across groups (p=0.005). On multivariable logistic regression, both DM and reduced LVEF independently predicted surgical referral (p=0.012 and p=0.048, respectively), whereas triarterial disease and severe angina showed no significant association (p>0.05). Nonetheless, no difference in MACE-free survival was observed across therapeutic strategies (log-rank p=0.275), though power was limited in this preliminary cohort. Notably, LVEF emerged as the sole independent predictor of MACE across all analytical approaches: multivariable Cox adjusted for DM (HR=0.179, 95%CI 0.049–0.661, p=0.010; C-statistic=0.734); continuous Cox (HR=0.926 per 1%, p=0.004); categorical Cox (HR=0.266, 95%CI 0.083–0.857, p=0.027); and Kaplan-Meier (log-rank p=0.019). At five years, preserved LVEF was associated with markedly higher MACE-free survival (87.0% vs. 57.1%). These hypothesis-generating findings suggest LVEF as the primary prognostic determinant in non-obstructive LMCAD, independent of therapeutic strategy, though larger prospective studies are warranted to validate this observation.



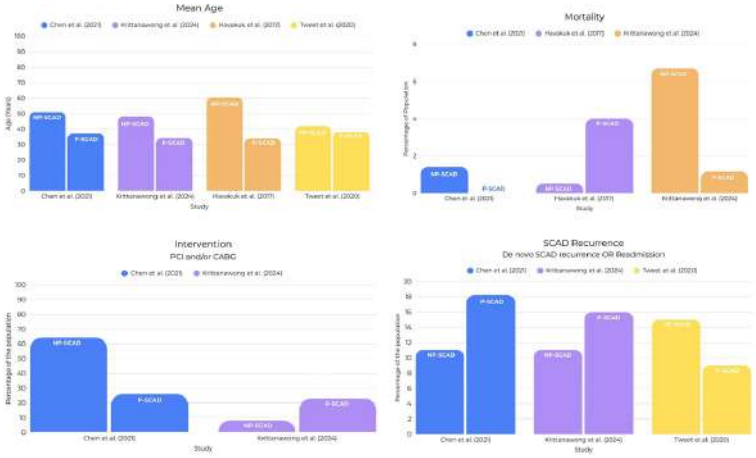
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PREGNANCY-ASSOCIATED VERSUS NONPREGNANCY SPONTANEOUS CORONARY ARTERY DISSECTION: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Spontaneous coronary artery dissection (SCAD) is a major nonatherosclerotic cause of acute coronary syndrome in young women. Pregnancy-associated SCAD (P-SCAD) has been linked to more severe presentation and greater clinical instability than nonpregnancy SCAD (NP-SCAD), but comparative evidence remains limited. Objetivos: To systematically compare the clinical presentation, management, and outcomes of P-SCAD and NP-SCAD. Métodos: PubMed, Embase, and CENTRAL were searched through November 2025. This systematic review followed PRISMA guidelines and was registered in PROSPERO (CRD420251237308). Observational studies including women aged 18 years or older with confirmed SCAD were eligible. Outcomes of interest included mortality, major adverse cardiovascular events, SCAD recurrence, left ventricular dysfunction, rehospitalization, cardiac arrest, and percutaneous coronary intervention. Resultados e Conclusões: Four observational studies including 21,672 women, of whom 824 had P-SCAD, were included. Across studies, P-SCAD was consistently associated with a more severe phenotype, characterized by clustering in late pregnancy or the early postpartum period, more extensive coronary involvement, greater left ventricular dysfunction, and higher short-term morbidity, including readmission and adverse cardiovascular events. Long-term survival appeared broadly similar where reported, although recurrence risk and markers of clinical instability were more pronounced in P-SCAD. Differences in reproductive history, hormonal exposure, and extracoronary vascular findings further supported a distinct pregnancy-associated phenotype. Available evidence supports P-SCAD as a higher-risk form of SCAD with more severe early presentation and greater short-term morbidity than NP-SCAD. These findings reinforce the likelihood of pregnancy-specific pathophysiologic mechanisms and support the need for tailored risk assessment and multidisciplinary management. Given the limited number of observational studies, further prospective comparative research is needed.



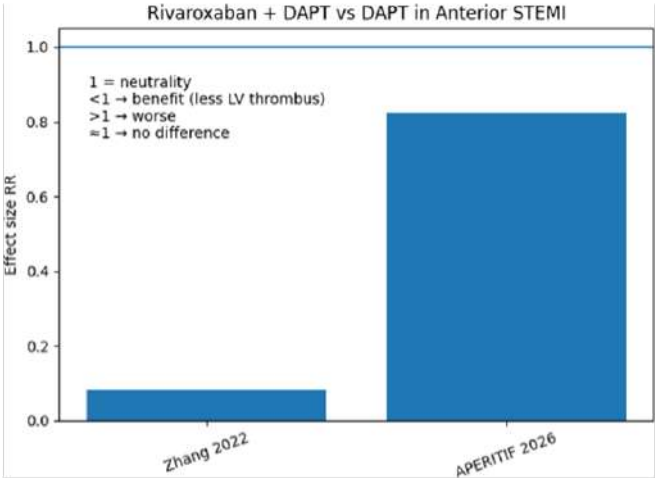
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PROPHYLACTIC LOW-DOSE RIVAROXABAN FOR PREVENTION OF LEFT VENTRICULAR THROMBUS AFTER ANTERIOR ST-ELEVATION MYOCARDIAL INFARCTION: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Left ventricular (LV) thrombus is a well-recognized complication of anterior ST-segment elevation myocardial infarction (STEMI), occurring in 12% to 25% of patients when assessed by cardiac magnetic resonance imaging (CMR). Despite this risk, the role of prophylactic anticoagulation added to dual antiplatelet therapy (DAPT) remains uncertain, with current guidelines providing only weak recommendations due to limited evidence. This systematic review aimed to systematically evaluate and qualitatively synthesize the available evidence on the efficacy and safety of adding low-dose rivaroxaban to DAPT for prevention of LV thrombus in patients with anterior STEMI. Objetivos: To evaluate whether DAPT plus rivaroxaban reduces LV thrombus formation compared with DAPT alone in patients with anterior STEMI. Métodos: A systematic review without meta-analysis was conducted following PRISMA guidelines. PubMed, Cochrane CENTRAL, and Embase were searched for randomized controlled trials (RCTs) and cohort studies comparing DAPT plus rivaroxaban versus DAPT alone in anterior STEMI patients. The primary outcome was LV thrombus detected by imaging (CMR or echocardiography). Risk of bias in randomized trials was assessed using the RoB 2 tool. Due to significant methodological heterogeneity — particularly in imaging modalities— a qualitative synthesis was performed rather than meta-analysis. Resultados e Conclusões: Two RCTs enrolling 839 patients were identified; no cohort studies met inclusion criteria. Zhang et al. (2022, n=279) used echocardiography and reported lower LV thrombus rates with rivaroxaban (0.7% vs 8.6%). The APERITIF trial (2026, n=560) used CMR and found no significant difference in LV thrombus formation (13.7% vs 16.6%, difference −2.9%, 95% CI −8.9% to 3.2%). Minor bleeding was increased with rivaroxaban in APERITIF. The discordant results may be partially explained by differences in imaging modality sensitivity, as CMR detects approximately four times more thrombi than echocardiography. Due to the availability of only two studies with significant methodological heterogeneity, no definitive conclusions can be drawn regarding the efficacy of prophylactic rivaroxaban for LV thrombus prevention after anterior STEMI. However, the statistically significant benefit observed in one study suggests a potential true effect that cannot be excluded and warrants further investigation. Larger, multicenter trials using standardized CMR-based detection are needed to clarify this association.



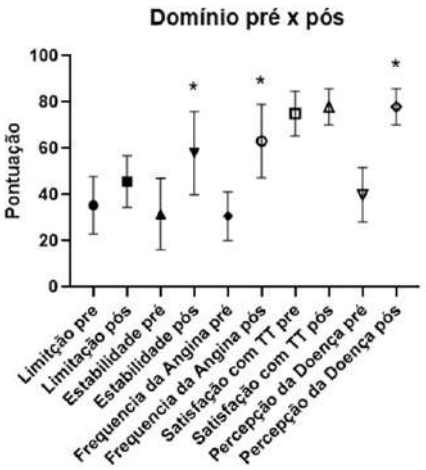
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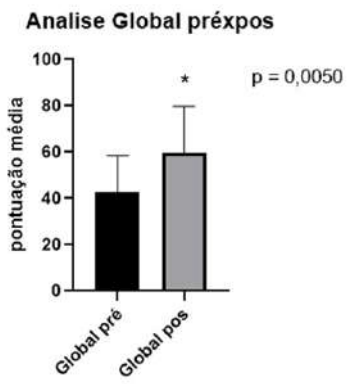
QUALITY OF LIFE AND ITS PREDICTIVE FACTORS IN PATIENTS WITH REFRACTORY ANGINA: A 10-YEAR FOLLOW-UP STUDY

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Introdução/Fundamentos: Refractory angina (RA) severely impacts quality of life (QoL). Understanding its long-term evolution and the factors that influence it is fundamental for clinical management. Objetivos: The objective of this study was to evaluate the evolution of QoL in patients with RA and to identify predictive variables for clinical improvement. Métodos: This cohort study was designed to evaluate patients with RA (CCS angina ≥2) before (pre) and after (post) an average interval of 10 years. The Seattle Angina Questionnaire (SAQ) was used to measure QoL, assessing the overall mean score and domain-specific scores (angina stability, symptom frequency, disease perception, treatment satisfaction, and physical limitation). For pre- and post-comparisons, the paired Student's t-test was applied. Multiple linear regression analysis was used to identify independent variables associated with the variation in QoL scores. Resultados e Conclusões: Thirty patients were included between 2015-2018; 9 patients died and 2 patients were lost to follow-up until the 10-year reassessment (2025-2026). Among the 19 reassessed patients, a significant improvement in overall QoL was observed (pre = 42.51± 15.88 vs. post = 59.80±19.99; p=0.0162). In the domain analysis, significant improvement was observed in angina stability (pre = 35.38 vs. post = 45.61; p=0.0002), symptom frequency (pre = 31.58 vs. post = 57.89; p=0.0002), and disease perception (pre = 39.91 vs. post = 77.96; p<0.0001). Linear regression analysis indicated that the model explained 86% of the variance in results. Among the analyzed variables, the reduction in glycated hemoglobin and fasting blood glucose were statistically significant predictors (Intercept, p=0.02; Glycated Hemoglobin, p=0.001; and Fasting Blood Glucose, p=0.03) of QoL improvement.Patients with RA presented a long-term improvement in QoL. Metabolic control, represented by glycated hemoglobin and fasting blood glucose, proved to be a predictive factor for QoL improvement.





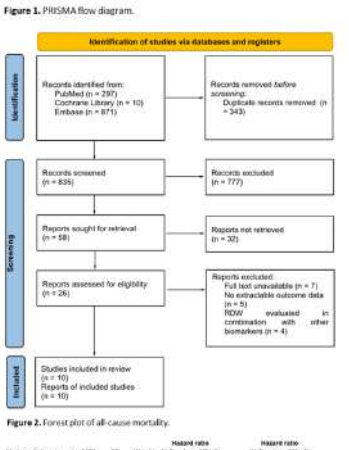
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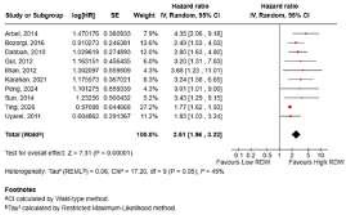
RED CELL DISTRIBUTION WIDTH AND MORTALITY IN PATIENTS WITH ACUTE CORONARY SYNDROME: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Acute coronary syndrome (ACS), including ST-segment elevation myocardial infarction (STEMI), non–ST-segment elevation myocardial infarction (NSTEMI), and unstable angina, remains a major cause of cardiovascular mortality. Red cell distribution width (RDW), derived from a routine complete blood count, has emerged as a potential prognostic biomarker in cardiovascular disease. Although prior individual studies and meta-analyses have suggested an association between elevated RDW and adverse outcomes, the evidence in patients with ACS remains heterogeneous, highlighting the need for a systematic synthesis. Objetivos: To analyze the association between elevated RDW at hospital admission and all-cause mortality in patients with ACS. Métodos: This systematic review and meta-analysis was conducted in accordance with the PRISMA guidelines. A comprehensive literature search was performed in PubMed, Embase and the Cochrane Library from inception to April 2026. The search strategy combined terms related to RDW and ACS. Data extraction was performed by two reviewers, including study characteristics and hazard ratios (HR) with 95% confidence intervals. The primary outcome was all-cause mortality. Meta-analysis was conducted using pooled hazard ratios, calculated through the inverse variance method under random-effects model. Statistical analysis were performed using Review Manager. Resultados e Conclusões: Ten observational studies comprising 70,894 patients were included. The studies enrolled heterogeneous ACS populations, including STEMI, NSTEMI, unstable angina pectoris, and broader AMI cohorts, with follow-up ranging from the in-hospital period to 5 years. Most cohorts included patients undergoing PCI or primary PCI, and the cutoff used to define elevated RDW varied between 13.0% and 14.8%. In the random-effects meta-analysis, elevated RDW was significantly associated with increased all-cause mortality (HR, 2.51 [95% CI, 1.96–3.22]; p<0.00001) (Figure 2). The direction of effect was consistent across all included studies, with individual hazard ratios ranging from 1.77 to 4.35. Moderate heterogeneity was observed among studies (Tau²=0.06; χ^2=17.20, df=9; p=0.05; I^2=45%). Elevated RDW was associated with a higher risk of all-cause mortality in patients with ACS. Although moderate heterogeneity was observed across studies, these findings support the potential role of RDW as an accessible and low-cost prognostic biomarker for risk stratification in this population.





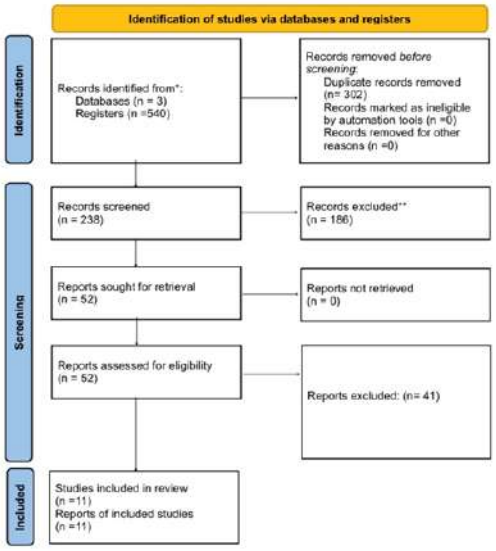
17050

RED CELL DISTRIBUTION WIDTH AS A PREDICTOR OF MORTALITY IN ACUTE MYOCARDIAL INFARCTION: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Acute myocardial infarction (AMI) is a major cause of hospitalization and death worldwide. Despite advances in treatment, mortality remains high, highlighting the need for early risk stratification. Red cell distribution width (RDW), a routine blood parameter, has been associated with worse outcomes and mortality in AMI. However, evidence remains heterogeneous, supporting the need for a comprehensive synthesis of its prognostic value. Objetivos: To evaluate the prognostic value of RDW in adults with AMI, assessing its association with mortality and major adverse cardiovascular events (MACE). Métodos: This PRISMA-based systematic review was registered in PROSPERO (CRD420261368312) and conducted using PubMed, Embase, and LILACS in April 2026, including studies published from 2020 to 2026. Randomized and observational studies assessing RDW as a prognostic marker in adults with acute myocardial infarction were included. Study selection and data extraction were performed independently by two reviewers using Rayyan, with disagreements resolved by a third reviewer. Resultados e Conclusões: Eleven studies were included, comprising more than 100,000 patients from heterogeneous adult populations with acute myocardial infarction. Across studies, elevated RDW was consistently associated with worse outcomes, especially mortality. Admission RDW was linked to higher in-hospital and 30-day mortality, with the strongest associations observed for medium- and long-term mortality. In most adjusted analyses, high RDW remained an independent predictor of death, with adjusted hazard ratios generally ranging from approximately 1.3 to 2.8 across studies, with most studies reporting statistically significant confidence intervals. Elevated RDW was also associated with major adverse cardiovascular events, including recurrent myocardial infarction, heart failure, stroke, cardiogenic shock, arrhythmias, and stent thrombosis. Studies evaluating dynamic or pre-discharge RDW suggested that persistent elevation may identify patients at higher post-discharge risk. Composite markers, such as the RDW-to-albumin ratio, may provide additional prognostic value, although performance varied across clinical settings. Overall, evidence supports RDW as an accessible and clinically useful marker for risk stratification after AMI. These findings show that RDW is a simple, inexpensive biomarker associated with increased mortality and adverse cardiovascular outcomes in AMI. It may serve as a complementary tool in medium- and long- term risk stratification.



21962

SEX DIFFERENCES IN MYOCARDIAL INJURY AFTER NON-CARDIAC SURGERY: HIGHER INCIDENCE IN MEN, OLDER AGE AT ONSET IN WOMEN, AND DIVERGENT LONG-TERM MORTALITY

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Introdução/Fundamentos: Sex differences in myocardial injury after non-cardiac surgery (MINS) remain poorly characterized in Latin American populations. Objetivos: We aimed to compare the incidence, clinical profile, in-hospital complications, and short- and long-term outcomes of MINS by sex in a Brazilian tertiary surgical intensive care unit (ICU). Métodos: Historical cohort study of consecutive patients admitted to a surgical ICU following non-cardiac surgery (2011–2016), with a median follow-up of 6.7 years (maximum 10.2 years). MINS was defined as troponin elevation exceeding the 99th-percentile upper reference limit without a non-ischemic etiology. Primary outcome was long-term all-cause mortality. Secondary outcomes included 30-day and 1-year mortality and ICU complications. Odds ratios (ORs) with 95% confidence intervals (CIs) were calculated; continuous variables were compared with the Mann-Whitney U test. Resultados e Conclusões: Results: Of 2,532 patients (male 46.4%, female 53.6%), MINS incidence was significantly higher in males (15.8%) than females (9.7%) (OR 1.74, 95%CI 1.37–2.21, p<0.001). Among the 317 patients with MINS (male n=185, female n=132), women were significantly older at the time of injury (median 73 vs 69 years, p=0.022). Males had a higher prevalence of previous myocardial infarction (30.3% vs 15.9%, OR 2.29, p=0.003) and tobacco use (16.2% vs 2.3%, OR 8.32, p<0.001). ICU severity was greater in males (SOFA 3 vs 2, p=0.010), with more frequent mechanical ventilation (44.9% vs 30.3%, OR 1.87, p=0.010); females required more transfusions (46.2% vs 32.4%, p=0.014), consistent with a predominantly orthopedic surgical profile. Thirty-day (16.0% vs 14.8%, p=0.847) and 1-year (34.0% vs 28.7%, p=0.449) mortality did not differ significantly between sexes. Long-term all-cause mortality was significantly higher in males (60.6% vs 46.3%, OR 1.79, 95%CI 1.02–3.13, p=0.048). Conclusions: Although males are 74% more susceptible to MINS, women develop injury at an older age and with a distinct comorbidity and surgical profile. The similar early mortality but significantly higher long-term mortality in males points toward a CAD-driven pathway that accelerates late cardiovascular death. These findings reinforce that MINS carries sex-specific prognostic implications extending well beyond the perioperative window.

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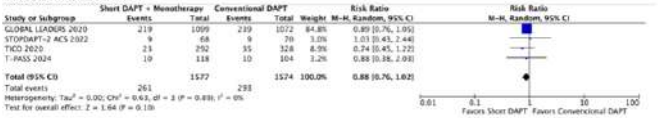
SHORT DAPT FOLLOWED BY P2Y12 INHIBITOR MONOTHERAPY IN PATIENTS WITH CHRONIC KIDNEY DISEASE: REDUCED BLEEDING WITHOUT INCREASED CARDIOVASCULAR RISK — A SYSTEMATIC REVIEW AND META-ANALYSIS

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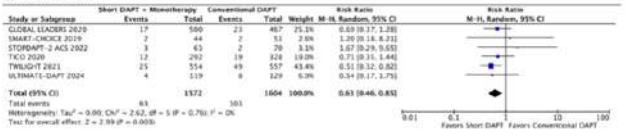
Introdução/Fundamentos: Short dual antiplatelet therapy (DAPT) followed by P2Y12 inhibitor monotherapy has emerged as an alternative to the current standard of care, prolonged DAPT, in patients with acute coronary syndrome (ACS) undergoing percutaneous coronary intervention (PCI). Patients with chronic kidney disease (CKD) represent a high-risk subgroup, with both increased ischemic and bleeding risks. However, major randomized trials comparing these strategies underrepresent this population, resulting in limited evidence regarding the safety and efficacy of P2Y12 inhibitor monotherapy in patients with CKD. Objetivos: To determine if P2Y12 inhibitors monotherapy after a short course of DAPT improves safety without losing efficacy compared to prolonged DAPT in ACS patients with CKD undergoing PCI. Métodos: This systematic review and meta-analysis of randomized clinical trials (RCT) followed the PRISMA 2020 statement, although not registered in PROSPERO. A systematic search was conducted in MEDLINE/PubMed and Embase in April 2026. Two reviewers independently screened the articles and discrepancies were resolved by a third reviewer. Eligibility criteria were RCTs comparing P2Y12 inhibitor monotherapy versus conventional DAPT in patients with ACS reporting outcomes for the CKD subgroup. The primary outcomes were cardiovascular events and bleeding, including composite endpoints. Analyses were performed using Review Manager, and risk ratios (RR) with 95% confidence intervals were calculated using a random-effects Mantel–Haenszel model. Statistical heterogeneity was assessed using the I² statistic. Resultados e Conclusões: A total of 4607 patients were included. Short dual antiplatelet therapy (DAPT) followed by P2Y12 inhibitor monotherapy was associated with a significant reduction in major bleeding compared with conventional DAPT (RR 0.63; 95% CI 0.46–0.85; p=0.003; I²=0%). A significant reduction was also observed for the broader bleeding endpoint (RR 0.65; 95% CI 0.43–0.99; p=0.04; I²=0%). No significant differences were found for cardiovascular outcomes (RR 0.89; 95% CI 0.77–1.04; p=0.15; I²=0%) or for the composite endpoint of cardiovascular events plus bleeding (RR 0.88; 95% CI 0.76–1.02; p=0.10; I²=0%). These findings suggest that short DAPT followed by P2Y12 inhibitor monotherapy reduces bleeding, including major bleeding, without increasing cardiovascular risk, supporting this strategy as a safer alternative in patients at higher bleeding risk.

Figure 1. Forest plot of cardiovascular outcomes and bleeding: short DAPT followed by P2Y12 monotherapy versus conventional DAPT



Effect estimates are presented as risk ratios (RR) with 95% confidence intervals (CI). Squares represent individual studies and horizontal lines indicate 95% CI; square size reflects study weight. The diamond represents the pooled estimate. A random-effects model was used.

Figure 2. Forest plot of clinically relevant bleeding: short DAPT followed by P2Y12 monotherapy versus conventional DAPT



Effect estimates are presented as risk ratios (RR) with 95% confidence intervals (CI). Squares represent individual studies and horizontal lines indicate 95% CI; square size reflects study weight. The diamond represents the pooled estimate. A random-effects model was used.

16071

SPATIOTEMPORAL TRENDS IN HOSPITALIZATIONS FOR ACUTE MYOCARDIAL INFARCTION IN BRAZIL, 2008–2024.

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Introdução/Fundamentos: Acute myocardial infarction (AMI) is a major cause of morbidity and mortality worldwide, resulting from myocardial ischemia and necrosis, usually after coronary plaque rupture and thrombosis. In Brazil, AMI remains a leading cause of death, with marked regional disparities in access to care. Evaluating spatiotemporal hospitalization trends may reveal inequalities and support public health planning. Objetivos: This study investigates temporal trends and spatial autocorrelation patterns of hospitalizations for acute myocardial infarction in Brazil from 2008 to 2024, identifying geographic clusters and regional disparities at the municipal level. Métodos: This ecological time-series study analyzed hospitalizations for Acute Myocardial Infarction (ICD-10 I21) in 5,570 Brazilian municipalities from 2008–2024 using SIH/SUS (Hospital Information System of the Unified Health System) data from DATASUS (Department of Informatics of the Brazilian Unified Health System) and population estimates from IBGE (Brazilian Institute of Geography and Statistics). Hospitalization rates per 100,000 inhabitants were calculated and smoothed using the Empirical Bayesian method. Data processing and geospatial integration were performed in Python with Pandas, NumPy, and GeoPandas. Temporal trends were assessed using Joinpoint Regression and piecewise linear regression, estimating APC and AAPC with 95% confidence intervals. Spatial autocorrelation was evaluated using Global Moran's I and Local Indicators of Spatial Association (LISA), classifying clusters as High-High, Low-Low, High-Low, and Low-High. Ethical approval was waived because only public aggregated data were used. Resultados e Conclusões: Between 2008 and 2024, 1,910,532 hospitalizations for AMI occurred in Brazil, with a significant upward temporal trend and positive APC. Men accounted for 63.5% of cases, predominantly among individuals aged 60–69 years. Urgent admissions represented 90.6% of all cases, reinforcing failures in prevention and early management. There were 199,967 in-hospital deaths, with a case fatality rate of 10.47%, without significant reduction over time. Total costs exceeded R$ 7.5 billion. The Southeast concentrated the highest number of hospitalizations, whereas the North and Northeast presented the highest mortality rates. Spatial analysis identified clusters of elevated mortality in these regions. These findings indicate persistent regional inequalities, highlighting the need to strengthen prevention and cardiovascular care.

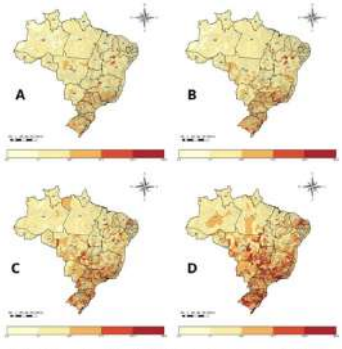


Figure 1: Spatiotemporal evolution of hospitalizations for acute myocardial infarction in Brazil, 2008–2024.

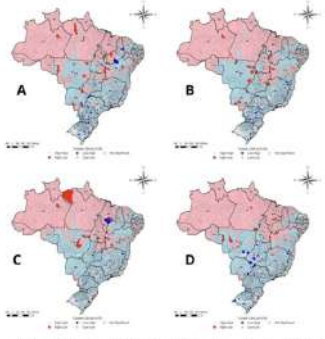


Figure 2: Local spatial clusters (LISA) of hospitalizations for acute myocardial infarction in Brazil, 2008–2024.

15998

SURVIVAL AND MAJOR ADVERSE CARDIOVASCULAR EVENTS COMPARING CORONARY ARTERY BYPASS GRAFTING VERSUS CONTEMPORARY OPTIMIZED MEDICAL THERAPY IN LEFT MAIN CORONARY ARTERY DISEASE WITH STENOSIS ≥50%: A SINGLE-CENTER COHORT STUDY

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Table 1. Baseline Characteristics

	OMT (n=54)	CABG (n=120)	p
Demographics			
Age (years), mean ± SD	67.9 ± 9.0	63.1 ± 8.8	**0.001**
Male sex, n (%)	36 (66.7%)	85 (70.8%)	0.708
Risk Factors			
Diabetes mellitus, n (%)	29 (53.7%)	55 (45.8%)	0.337
Hypertension, n (%)	44 (81.5%)	102 (85.0%)	0.559
Cardiac History & Anatomy			
Prior MI, n (%)	27 (50.0%)	58 (48.3%)	0.839
LVEF (%), mean ± SD	51.3 ± 14.3	54.8 ± 11.9	0.165
Multivessel disease, n (%)	46 (88.9%)	105 (87.5%)	0.860
LMCA stenosis ≥70%, n (%)	8 (14.8%)	41 (34.2%)	**0.009**
CCS class III–IV angina, n (%)	6 (11.1%)	43 (35.8%)	**<0.001**
Laboratory Parameters			
LDL (mg/dL)	112.2 ± 44.3	105.1 ± 36.2	0.279
HDL (mg/dL)	42.6 ± 9.8	42.2 ± 12.7	0.992
Triglycerides (mg/dL)	156.5 ± 135.4	147.1 ± 82.7	0.953
HbA1c (%)	6.9 ± 1.6	6.8 ± 1.8	0.307
Creatinine (mg/dL)	1.1 ± 0.4	1.0 ± 0.2	0.264
Hemoglobin (g/dL)	13.8 ± 1.7	13.6 ± 1.8	0.581
Glucose (mg/dL)	129.0 ± 51.9	131.8 ± 52.5	0.999
Outcomes			
Median follow-up (years)	3.2	3.6	—
All-cause mortality, n (%)	15 (27.8%)	7 (5.8%)	**<0.001**
MACE, n (%)	19 (35.2%)	12 (10.0%)	**< 0.001**

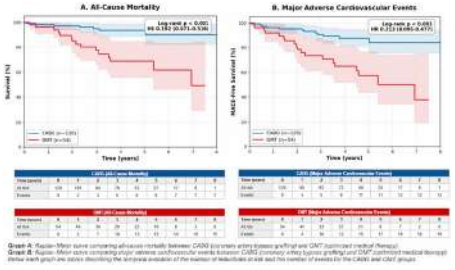
Continuous variables: mean ± SD (Welch t-test or Mann-Whitney U test, depending on the normality of the distribution). Categorical variables: n (%) (Chi-squared or Fisher exact test). Bold p-values indicate statistical significance (p<0.05). OMT = Optimized Medical Therapy; CABG = Coronary Artery Bypass Grafting; MI = myocardial infarction; LVEF = left ventricular ejection fraction; LMCA = left main coronary artery; CCS = Canadian Cardiovascular Society; MACE = major adverse cardiovascular events.

Table 2. Clinical Outcomes Stratified by LMCA Stenosis

	OMT (n=54)	CABG (n=120)	Total
LMCA stenosis			
Severe (≥70%)	8	41	49
Moderate (50 - 69%)	46	79	125
All-Cause Mortality (n=22)			
Severe (≥70%)	3	5	8
Moderate (50 - 69%)	12	4	16
MACE (n=31)			
Severe (≥70%)	3	5	8
Moderate (50 - 69%)	16	7	23

OMT = Optimized Medical Therapy; CABG = Coronary Artery Bypass Grafting; LMCA = left main coronary artery; MACE = major adverse cardiovascular events.

Introdução/Fundamentos: Left Main Coronary Artery (LMCA) disease is associated with substantial cardiovascular morbidity and mortality. Coronary Artery Bypass Grafting (CABG) is the guideline-directed revascularization strategy based on trials from the 1970s-1980s, yet no contemporary data compare CABG against current Optimized Medical Therapy (OMT) in real-world cohorts. Objetivos: To evaluate overall survival and major adverse cardiovascular events (MACE) in patients with LMCA stenosis ≥50% treated with CABG versus OMT. Métodos: Retrospective single-center cohort of patients with angiographically confirmed LMCA stenosis ≥50%. Exclusion criteria comprised chronic kidney disease, peripheral arterial disease, and prior CABG, yielding 174 patients: OMT (n=54, included from 2018) and CABG (n=120, included from 2017). Primary endpoint was all-cause mortality; secondary endpoint was MACE (death, nonfatal myocardial infarction, or stroke). Survival was estimated using Kaplan-Meier with Log-rank testing. Multivariable Cox regression adjusted for treatment, age and LMCA severity was validated by Schoenfeld residuals. Resultados e Conclusões: Median follow-up was 3.2 years (OMT) and 3.6 years (CABG). Groups were well-matched for major clinical and laboratory parameters (all p>0.05), except OMT patients were older (67.9±9.0 vs. 63.1±8.8 years; p=0.001), while CABG had more severe LMCA stenosis (≥70%:34.2% vs. 14.8%; p=0.009) and higher CCS class III-IV angina (35.8% vs. 11.1%; p<0.001), reflecting CABG selection. Primary endpoint: 22 deaths (OMT:15; CABG:7). On Kaplan-Meier analysis, median survival was 6.9 years for OMT versus not reached for CABG (Log-rank p<0.001), and Cox regression confirmed CABG as independently protective (HR 0.192; 95%CI: 0.071–0.516; p=0.001; Schoenfeld Global p=0.248). Secondary endpoint: 31 patients experienced MACE (OMT:19; CABG:12). On Kaplan-Meier analysis, MACE-free survival also favored CABG (Log-rank p<0.001), and Cox regression confirmed protection (HR 0.213; 95%CI: 0.095–0.477; p<0.001; Schoenfeld Global p=0.546). Notably, 72.7% of all deaths and 74.2% of all MACE occurred in patients with moderate LMCA stenosis; within this subgroup, 75.0% of deaths and 69.6% of MACE occurred in the OMT group. This finding challenges the perceived safety of conservative management in moderate LMCA stenosis, whose risk may be underestimated given less severe anatomy and fewer symptoms. Therefore, even in the era of contemporary pharmacotherapy, surgical revascularization remains the preferred strategy in LMCA disease.



Graph A: Kaplan-Meier curve comparing all-cause mortality between CABG (coronary artery bypass grafting) and OMT (optimized medical therapy).
Graph B: Kaplan-Meier curve comparing major adverse cardiovascular events between CABG (coronary artery bypass grafting) and OMT (optimized medical therapy). Below each graph are tables describing the number at risk and the number of events for the CABG and OMT groups.

18366

SYSTEMIC INFLAMMATION AND MICROVASCULAR DYSFUNCTION IN INOCA: A SYSTEMATIC REVIEW ON THE ROLE OF INFLAMMATORY BIOMARKERS

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Introdução/Fundamentos: INOCA is an increasingly recognized clinical condition characterized by angina and ischemia in the absence of obstructive epicardial coronary artery disease. Despite “normal” angiographic findings, patients often present with significant symptom burden, impaired quality of life, and increased risk of adverse cardiovascular outcomes. Growing evidence indicates that coronary microvascular dysfunction and endothelial dysfunction are central mechanisms in its pathophysiology, with systemic inflammation playing a key contributory role. In this context, inflammatory biomarkers, including high-sensitivity C-reactive protein (hs-CRP), interleukin-6 (IL-6), tumor necrosis factor-alpha (TNF-α), and endothelial adhesion molecules, have been investigated as potential tools for diagnosis, risk stratification, and prognostic assessment. Objetivos: To systematically evaluate the association between inflammatory biomarkers and the presence, clinical severity, and prognosis of INOCA. Métodos: A systematic review was conducted according to PRISMA guidelines. A comprehensive literature search was performed in PubMed, Scopus, Web of Science, and Cochrane Library databases, covering studies published between 2010 and 2024. The search strategy included the terms “INOCA”, “Ischemia with Non-Obstructive Coronary Arteries” , “Inflammatory biomarkers”, “C-reactive protein”, “Interleukin-6”, and “Endothelial dysfunction”, combined using Boolean operators. Eligible studies included observational studies, cohort studies, and clinical trials involving adult patients with INOCA and assessment of inflammatory biomarkers. Case reports, narrative reviews, small-sample studies, and pediatric populations were excluded. Study selection was independently performed by two reviewers. Resultados e Conclusões: Results: Included studies demonstrated a consistent association between elevated inflammatory biomarkers and INOCA. hs-CRP showed the strongest correlation with coronary microvascular dysfunction and reduced coronary flow reserve. IL-6 and TNF-α were associated with endothelial dysfunction and impaired microvascular perfusion. Higher biomarker levels were linked to increased angina burden, recurrent hospitalizations, and higher incidence of adverse cardiovascular outcomes, with stronger associations observed in women. Conclusions: Inflammatory biomarkers are significantly associated with the presence and prognosis of INOCA, reinforcing the role of systemic inflammation in coronary microvascular dysfunction.

14512

TEMPORAL EVOLUTION AND CLINICAL OUTCOMES OF PRIMARY ANGIOPLASTY: A 15-YEAR REGISTRY AT A REFERRAL CENTER

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Introdução/Fundamentos: The guidelines for the treatment of patients with ST-segment elevation myocardial infarction (STEMI) are primarily based on data from randomized clinical trials, which include selected populations and may not fully reflect real-world clinical practice. Objetivos: To evaluate temporal trends in baseline and procedural characteristics and clinical outcomes, of patients with STEMI treated at a tertiary referral cardiology center. Métodos: This prospective cohort study included all consecutive patients with STEMI undergoing primary angioplasty at a referral cardiology center in southern Brazil. For temporal analysis, patients were stratified into five-year periods (2010–2014, 2015–2019, and 2020–2024). Clinical and angiographic characteristics, treatment strategies, and 12-month Kaplan Meier survival curves were compared across periods. During follow-up, outcomes were reinfarction, stroke, and cardiovascular mortality. Resultados e Conclusões: A total of 6,686 patients who underwent primary angioplasty were included. The prevalence of diabetes (24.3% vs. 27.1% vs. 29.5%; p=0.001), chronic kidney disease (2.2% vs. 2.7% vs. 4.0%; p<0.001), and heart failure (4.9% vs. 6.7% vs. 6.9%; p<0.001) increased over time, while the TIMI risk score remained stable (3.6 vs. 3.7 vs. 3.6; p=0.638). Procedural characteristics significantly differ over time, with an improvement in door-to-balloon time (70 min vs. 67 min vs. 56 min; p<0.001), increased use of the radial approach (44.1% vs. 78.7% vs. 86.3%;), drug-eluting stents (3.0% vs. 42.4% vs. 99.8%;), treatment of longer coronary lesions (18.76 ± 8.50 vs. 24.99 ± 11.54 vs. 30.18 ± 13.12), left main interventions (3.9% vs. 3.4% vs. 6.0%), and stent post-dilation (27.2% vs. 32.5% vs. 40.4%). All comparisons showed statistical significance (all p < 0.001). The mean follow-up was 304 ± 224 days, with a 10.3% loss to follow-up. Twelve-month mortality remained stable across the study periods (10.6% vs. 9.9% vs. 10.0%; p=0.56). In contrast, MACE (composite of death, myocardial infarction, and stroke) decreased progressively over time (17.6% vs. 11.3% vs. 11.0%; p<0.001). Despite increasing clinical complexity, advances in interventional techniques and improvements in in-hospital efficiency were associated with a reduction in MACE over time, while 12-month mortality remained stable.

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THE REACT-ST STUDY: DISPARITIES IN STEMI CARE IN THE BRAZILIAN AMAZON — A PROSPECTIVE COHORT STUDY

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Introdução/Fundamentos: Timely reperfusion in ST-segment elevation myocardial infarction (STEMI) is critical. The REACT-ST study aimed to investigate treatment times and clinical outcomes at the largest public emergency hospital in the Brazilian Amazon. Objetivos: To analyze reperfusion delays and their association with mortality and functional outcomes in patients with STEMI. Métodos: Methods: REACT-ST is a prospective cohort study conducted from April to December 2024, approved by the Ethics Committee (CAAE: 6939823.9.0000.5020; No. 6.732.492). We included consecutive STEMI patients and collected clinical data, reperfusion times, and outcomes. Functional capacity was assessed 3 months post-discharge using the Duke Activity Status Index (DASI). Kaplan-Meier curves and Cox regression were used for survival analysis. Resultados e Conclusões: The sample included 99 patients (62.9 ± 12.5 years; 71.7% hypertensive; 42.4% diabetic). No patient underwent primary PCI. Fibrinolytic therapy was performed in 55.6% of cases, with a mean door-to-needle time of 5.13 ± 3.23 hours. Among those who underwent subsequent PCI, the mean waiting time was 10 days. In-hospital mortality was 27.3%, and 3-month mortality reached 30.3%. Patients receiving fibrinolysis showed higher cumulative survival probabilities compared with those without reperfusion: in-hospital survival was 74.8% vs. 53.5%, and 3-month survival was 73.2% vs. 42.1%. Although adjusted Cox regression showed a trend (HR = 0.69; 95% CI: 0.29–1.63; p = 0.402), multivariate logistic regression identified non-performance of fibrinolysis as the only significant predictor of in-hospital death (OR = 12.05; p = 0.049). Regarding functional recovery, each additional day of hospitalization was associated with a reduction of 0.84 points in the DASI score (β = −0.8428; p = 0.002) at 3 months. Clinical scores (GRACE/TIMI) were robust prognostic markers (p < 0.05), while age and sex were not statistically significant in this model. Conclusion: The study reveals a critical gap in STEMI care in the Amazon, with mortality rates nearly triple the national average (6–14%). The absence of primary PCI and delayed fibrinolysis significantly compromises survival and functional capacity. These findings highlight the urgent need for a structured regional infarct network to ensure timely reperfusion and early rehabilitation in remote areas.

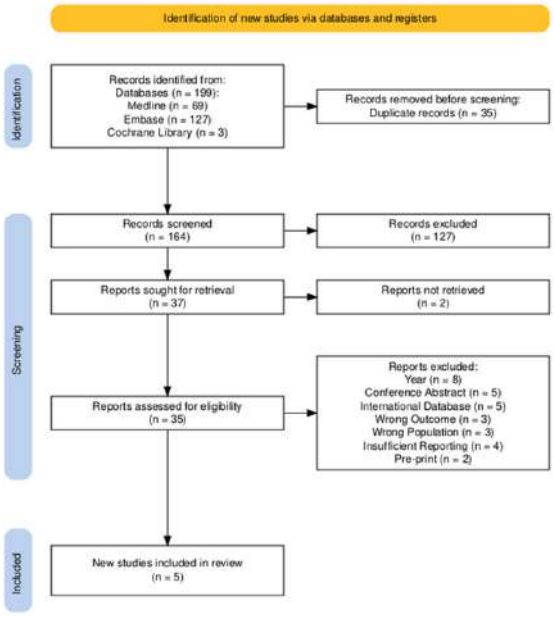
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THE USE OF ARTIFICIAL INTELLIGENCE FOR IDENTIFYING ACUTE CORONARY SYNDROME ON ELECTROCARDIOGRAM: A FIVE-YEAR SYSTEMATIC REVIEW

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Introdução/Fundamentos: Cardiovascular diseases remain the leading cause of mortality worldwide, with Acute Coronary Syndrome (ACS) accounting for a significant portion of these deaths. The 12-lead electrocardiogram (ECG) is essential for initial diagnosis, although its interpretation may be limited by interobserver variability and the subtle evolution of ischemic changes. With recent advances in artificial intelligence (AI), machine learning and deep learning models have emerged as promising tools to improve ACS detection. Objetivos: To summarize recent evidence on the diagnostic performance of AI models applied to 12-lead ECGs for identifying ACS in adult patients. Métodos: This Systematic Review followed PRISMA 2020 recommendations, PROSPERO: CRD420261368150. Searches were conducted in MEDLINE/PubMed, EMBASE, and the Cochrane Library using MeSH descriptors related to ACS, artificial intelligence, and electrocardiography. Original studies involving adults (≥18 years) that applied AI for ACS/AMI detection and reported diagnostic performance metrics were included. Risk of bias was evaluated using the QUADAS-2 tool. Resultados e Conclusões: Of the 199 records identified, 5 studies met the inclusion criteria. The studies were published between 2021 and 2025 and conducted in the United States, South Korea, and the Netherlands. The analyzed models included architectures based on deep learning (60%) and traditional machine learning (40%). Reported performance metrics ranged from AUROC 0.83 to 0.939, sensitivity 0.71 to 0.977, and specificity 0.76 to 0.898. In studies comparing AI with physicians, AI demonstrated superior sensitivity and overall discriminative ability, while clinicians occasionally achieved slightly higher specificity. Heterogeneity across studies was influenced by differences in diagnostic criteria, adjudication methods, and model structures. Overall risk of bias was low, with some concerns related to patient selection and reference standards. AI applied to 12-lead ECGs shows consistently high diagnostic performance for ACS detection, surpassing clinicians in sensitivity and global discrimination in several studies. These tools have the potential to enhance early triage, particularly in emergency and prehospital settings. However, methodological limitations, lack of broad external validation, and the scarcity of clinical outcome assessments still restrict widespread clinical adoption. Future investigations should prioritize methodological standardization, real-world validation, and evaluation of clinical impact.



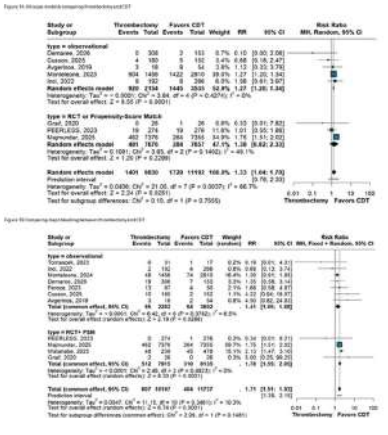
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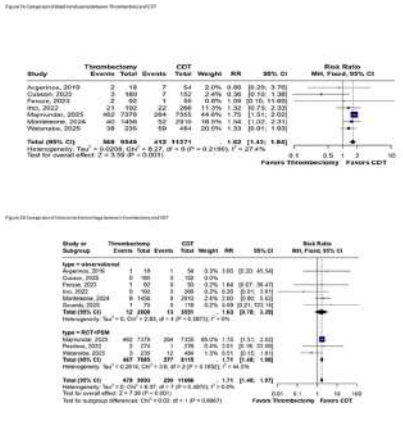
THROMBECTOMY AS AN ALTERNATIVE TO THROMBOLYSIS IN PULMONARY EMBOLISM: A SYSTEMATIC REVIEW AND META-ANALYSIS.

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Introdução/Fundamentos: Pulmonary thromboembolism (PTE) remains the third leading cause of cardiovascular death worldwide. In patients with intermediate-high or high-risk PTE, catheter-based therapies, such as catheter-directed thrombolysis (CDT) and mechanical thrombectomy, have been widely used with evidence of improved right ventricular function and hemodynamics, but with distinct bleeding risk profiles. However, direct comparative evidence between these modalities remains conflicting regarding efficacy and safety, with divergent findings regarding ICU length of stay, mortality, and bleeding. Objetivos: To conduct a systematic review with meta-analysis to compare the efficacy and safety of mechanical thrombectomy versus CDT, evaluating critical outcomes such as mortality, bleeding complications, and parameters of hemodynamic recovery in patients with acute PE Métodos: A systematic review was conducted, with searches performed in the PubMed, Embase, Cochrane Library, and Web of Science databases (February/2026). Randomized clinical trials and cohort studies were included. In the comparison between mechanical thrombectomy and catheter-directed thrombolysis, the following outcomes were evaluated: (1) all-cause mortality; (2) major bleeding; (3) Blood Transfusions; (4) Intracranial Hemorrhage; (5) Length of stay. The meta-analysis was performed using R (v4.5.1) software, study heterogeneity was assessed using Cochran's Q test and I² statistic. Resultados e Conclusões: All-cause mortality was significantly lower in the CDT group (3,4%) as compared with Thrombectomy patients (5,8%) (RR 1.33; 95% CI 1.04-1.70; P<0.05; Fig. 1A). Major bleeding was significantly reduced in the Thrombectomy group (14.25%) as compared with CDT-treated patients (15.44%) (RR 1.71; 95% CI 1.51-1.93; P<0.0001; Fig. 1B). Blood transfusions were significantly higher in the CDT group compared with the Thrombectomy group (RR 1.62; 95% CI 1.43–1.84; P<0.001; Fig. 2A). Similarly, intracranial hemorrhage (ICH) was significantly higher in the CDT group (RR 1.71; 95% CI 1.48–1.97; P<0.001; I²=0%; Fig. 2B). Patients treated with thrombectomy presented no significant differences on LOS when compared to CDT patients (MD -0.36; 95% CI -0.78-0.05; P<0.01). Mechanical thrombectomy has better outcomes on major bleeding, blood transfusions and intracranial hemorrhage, while CDT has more satisfactory outcomes on all-cause mortality.





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UNSUPERVISED MACHINE LEARNING AND CLUSTERING ANALYSIS FOR CLINICAL-METABOLIC PHENOTYPING IN CHRONIC CORONARY SYNDROME: HIGH-RISK INOCA DRIVEN BY METABOLIC DYSFUNCTION

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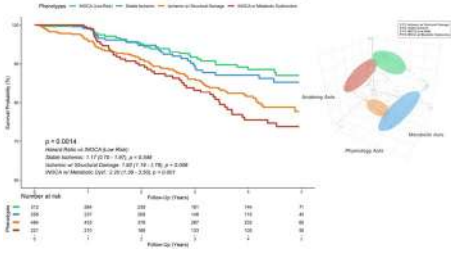
Introdução/Fundamentos: Traditional classification of chronic coronary syndrome (CCS) relies heavily on anatomical obstruction. Consequently, Ischemia with No Obstructive Coronary Artery Disease (INOCA) is often deemed uniformly benign. However, INOCA encompasses a highly heterogeneous population. We hypothesized that unsupervised machine learning could uncover hidden clinical-metabolic phenotypes and challenge this assumption. Objetivos: To identify distinct clinical-metabolic phenotypes in a CCS cohort using unsupervised machine learning and to evaluate their independent impact on 5-year all-cause mortality. Métodos: An unsupervised machine learning approach, specifically clustering analysis (Partitioning Around Medoids with Gower distance), was applied to a prospective cohort of 1,276 patients with CCS. The model used 20 demographic, clinical, echocardiographic, and laboratory variables. Survival analysis was performed using Kaplan-Meier and multivariate Cox proportional hazards models. Resultados e Conclusões: The model revealed four distinct phenotypes: P1: Ischemic with Structural Damage (n=484); P2: Stable Ischemic (n=258); P3: INOCA Low Risk (n=313); and P4: INOCA with Metabolic Dysfunction (n=221).While P1 and P2 shared high anatomical burden (median 3 obstructed territories), P1 had worse structural impairment (LVEF 50% vs. 55%). Conversely, both P3 and P4 had a median of 0 obstructed territories. Despite this anatomical similarity, P4 exhibited the highest 5-year mortality (21%), contrasting sharply with P3 (9.6%). Clinically, P4 was defined by systemic inflammation, poor glycemic control (HbA1c 6.7%), and obesity (BMI 29.1 kg/m²), translating into early myocardial remodeling (worse diastolic dysfunction and higher LV mass) and functional limitation (NYHA ≥ II in 24%). In Cox regression, using the low-risk P3 as reference, the metabolic INOCA group (P4) had a 2.20-fold increased risk of death (HR 2.20, 95% CI 1.38-3.50, p<0.001), surpassing even the severe obstructive P1 group (HR 1.82, 95% CI 1.19-2.79, p=0.006), as shown in the figure. In conclusion Clustering analysis reveals that INOCA is a highly heterogeneous condition, wherein a specific metabolic-driven phenotype carries a mortality risk higher than traditional obstructive CCS, demanding aggressive systemic risk management beyond anatomical evaluation.

Table: Clinical-Metabolic-Anatomic Phenotypes

Characteristic[1]	Overall N = 1,276	P1: Ischemic w/ Structural Damage N = 484	P2: Stable Ischemic N = 258	P3: INOCA (Low Risk) N = 313	P4: INOCA w/ Metabolic Dysfunction N = 221	p-value
Age (years)	64 ± 9	64 ± 9	64 ± 9	65 ± 10	64 ± 9	0.6
Female Sex (%)	396 (31%)	145 (30%)	61 (24%)	108 (35%)	82 (37%)	**0.005**
BMI (kg/m²)	28.1 ± 4.7	28.5 ± 4.5	27.2 ± 4.7	27.5 ± 5.0	29.1 ± 4.7	**<0.001**
Systolic BP (mmHg)	131 ± 20	132 ± 21	132 ± 18	132 ± 20	128 ± 19	**0.020**
Heart Rate (bpm)	69 ± 10	70 ± 11	68 ± 11	67 ± 10	70 ± 10	**<0.001**
Angina CCS ≥ 2 (%)						**<0.001**
CCS >= 2	292 (23%)	141 (29%)	54 (21%)	55 (18%)	42 (19%)	
CCS 0-1	981 (77%)	343 (71%)	202 (79%)	257 (82%)	179 (81%)	
NYHA Class ≥ II (%)						**0.002**
NYHA >= II	261 (21%)	120 (25%)	44 (17%)	45 (14%)	52 (24%)	
NYHA 0-I	1,008 (79%)	361 (75%)	211 (83%)	267 (86%)	169 (76%)	
Atrial Fibrillation	64 (5.0%)	20 (4.1%)	19 (7.4%)	18 (5.8%)	7 (3.2%)	0.12
Stroke	79 (6.2%)	32 (6.6%)	19 (7.4%)	17 (5.4%)	11 (5.0%)	0.7
Smoking Status						0.3
Never Smoked	464 (38%)	159 (34%)	103 (40%)	114 (39%)	88 (42%)	
Former Smoker	179 (15%)	76 (16%)	36 (14%)	36 (12%)	31 (15%)	
Current Smoker	587 (48%)	234 (50%)	117 (46%)	144 (49%)	92 (44%)	
Current Smoker (%)	587 (48%)	234 (50%)	117 (46%)	144 (49%)	92 (44%)	0.4
Creatinine (mg/dL)	1.07 (0.91 - 1.25)	1.09 (0.92 - 1.30)	1.09 (0.85 - 1.28)	1.02 (0.86 - 1.17)	1.07 (0.87 - 1.28)	**<0.001**
LDL Cholesterol (mg/dL)	85 (66 - 112)	84 (65 - 110)	87 (67 - 121)	82 (66 - 111)	92 (65 - 114)	0.3
HbA1c (%)	6.10 (5.70 - 7.20)	6.30 (5.70 - 7.40)	5.90 (5.60 - 6.50)	5.90 (5.60 - 6.40)	6.70 (5.90 - 8.20)	**<0.001**
Hemoglobin (g/dL)	13.93 ± 1.74	13.72 ± 1.79	14.21 ± 1.73	14.26 ± 1.61	13.58 ± 1.66	**<0.001**
NLR	2.11 (1.56 - 2.87)	2.18 (1.60 - 3.05)	2.20 (1.55 - 2.87)	1.94 (1.46 - 2.64)	2.19 (1.63 - 2.88)	**0.015**
LVEF (%)	53 ± 12	50 ± 12	55 ± 11	57 ± 11	52 ± 12	**<0.001**
Diastolic Dysfunction (0-3)	1.00 (0.00 - 1.00)	1.00 (1.00 - 1.00)	0.00 (0.00 - 0.00)	0.00 (0.00 - 0.00)	1.00 (1.00 - 1.00)	**<0.001**
Left Atrium (mm)	40.0 (37.0 - 44.0)	41.0 (38.0 - 45.0)	40.0 (37.0 - 43.0)	39.0 (36.0 - 42.0)	41.0 (37.5 - 44.0)	**<0.001**
LV Mass Index (g/m²)	95 (81 - 112)	98 (84 - 117)	90 (79 - 112)	88 (76 - 102)	96 (82 - 116)	**<0.001**
Obstructed Territories (0-5)	2.00 (0.00 - 3.00)	3.00 (2.00 - 4.00)	3.00 (3.00 - 4.00)	0.00 (0.00 - 0.00)	0.00 (0.00 - 1.00)	**<0.001**
5-Year Mortality (%)	187 (15%)	83 (17%)	28 (11%)	30 (9.6%)	46 (21%)	**<0.001**

Abbreviations: BMI: Body Mass Index; BP: Blood Pressure; CCS: Canadian Cardiovascular Society; HbA1c: Glycated Hemoglobin; HR: Heart Rate; LDL: Low-Density Lipoprotein; LV: Left Ventricular; LVEF: Left Ventricular Ejection Fraction; NLR: Neutrophil-to-Lymphocyte Ratio; NYHA: New York Heart Association.
Mean ± SD; n (%); Median (Q1 - Q3)
Kruskal-Wallis rank sum test; Fisher's Exact Test for Count Data with simulated p-values

Figure 1. Survival Analysis and 3D Phenotypic Mapping. > (Left) Kaplan-Meier curves for 5-year overall survival. (Right) 3D Multidimensional Scaling (MDS) plot demonstrating the spatial distribution of the four clusters.



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ANALYSIS OF INFANT MORTALITY DUE TO UNSPECIFIED CONGENITAL HEART DISEASES IN BRAZIL: A CROSS-SECTIONAL STUDY (2018–2024)

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Introdução/Fundamentos: Congenital heart diseases (CHD) rank among the leading causes of infant mortality in Brazil. However, a significant proportion of these deaths are registered under code Q24.9 (unspecified congenital malformation of the heart), which compromises epidemiological surveillance, the estimation of surgical demand, and healthcare planning. The persistence of this code can be interpreted as a sentinel indicator of diagnostic fragility, reflecting failures in access to fetal and neonatal echocardiography, particularly in socially vulnerable regions. Objetivos: To analyze the magnitude, regional distribution, and factors associated with infant mortality due to unspecified CHD in Brazil, from 2018 to 2024. Métodos: This was a cross-sectional, ecological study using secondary data from the Mortality Information System (SIM/DATASUS). Infant deaths (<1 year) with the underlying cause classified between Q20–Q28, with emphasis on code Q24.9, were included. Proportions and odds ratios (OR) were estimated for deaths recorded without a specific diagnosis, adopting the Southeast region as the reference. Ninety-five percent confidence intervals (95% CI) and a significance level of 5% (p<0.05) were used. The temporal evolution of the proportion of unspecified CHDs was assessed by linear regression, with analyses performed in R software. Resultados e Conclusões: During the analyzed period, 20,888 infant deaths due to CHD were recorded, of which 8,093 (38.7%) were nonspecific. The highest proportions occurred in the Northeast (46.9%) and North (44.0%) compared to the South (28.7%), with a higher proportion of home deaths due to unspecified CHD in the North (2.58%) (Table 1). The risk of a death being recorded as nonspecific was significantly higher in the Northeast (OR=1.67; 95% CI 1.56-1.80; p<0.001) and North (OR=1.49; 95% CI 1.36-1.63; p<0.001) compared to the Southeast. The South region showed an inverse association with the outcome (OR=0.76; 95% CI 0.69-0.84; p<0.001). Temporal analysis revealed stagnation of diagnostic quality in the North and Northeast (p>0.05), in contrast to significant improvement in the South and Southeast (Table 2). While secondary mortality data entails classification biases, the high prevalence of this code itself evidences regional inequality. The elevated risk in the North/Northeast suggests structural barriers to diagnosis and care, generating epidemiological invisibility. Strengthening neonatal screening and the regionalization of cardiology services is fundamental to reducing mortality.

Table 1: Quality of Registration and Pediatric Care for Congenital Heart Diseases: Magnitude of Unspecified Causes (Q24.9) and Occurrence of Home Deaths (2018–2024)

	Total	Unspecified Causes (Q24.9)		Critical Unassistance*	
Region	Deaths (N)	N	% (Indefiniteness)	Home Deaths	%
Northeast	5,848	2,740	**46.9%**	48	1.75%
North	2,644	1,164	44.0%	30	2.58%
Central-West	2,028	776	38.3%	12	1.55%
Southeast	7,557	2,607	34.5%	25	0.96%
South	2,811	806	28.7%	6	0.74%
Brazil	**20,888**	**8,093**	**38.7%**	**121**	**1.50%**

Source: Authors' own elaboration based on SIM/DATASUS data (2018–2024).
**Critical Unassistance: Refers to the subpopulation of deaths classified as unspecified (Q24.9) that occurred at home, indicating a critical failure in the care network.*

Table 2: Integrated Analysis of Registration Quality (Q24.9): Risk Association (Odds Ratio) and Temporal Trend (2018–2024)

	Comparative Risk (vs. Southeast)		Temporal Trend (2018–2024)	
Region	OR (95% CI)	p-value	Slope (Annual Var.)	p-value
Northeast	1.67 (1.56 – 1.80)	< 0.001	-0.64 p.p.	0.152
North	1.49 (1.36 – 1.63)	< 0.001	-0.67 p.p.	0.124
Central-West	1.18 (1.06 – 1.30)	0.002	-2.37 p.p.	0.004
Southeast	*1.00 (Reference)*	–	-1.28 p.p.	0.007
South	0.76 (0.69 – 0.84)	< 0.001	-1.46 p.p.	0.002

Source: Authors' own elaboration based on SIM/DATASUS data (2018–2024).
Legend: **OR** = Odds Ratio; **CI** = Confidence Interval; **p.p.** = percentage points.
Note: OR > 1 indicates a greater chance of diagnostic error relative to the Southeast. In the trend analysis, a negative 'Slope' indicates a reduction in error; p-value > 0.05 indicates stagnation of the metric.

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AUTOIMMUNE CONGENITAL HEART BLOCK IN FETUSES OF ANTI-SSA/RO-POSITIVE MOTHERS: IMPACT OF HYDROXYCHLOROQUINE AND INTRAUTERINE THERAPY ON CLINICAL OUTCOMES — A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Congenital atrioventricular block is a rare condition associated with maternal anti-Ro/SSA autoantibodies, which can cross the placenta and impair the fetal cardiac conduction system, particularly through calcium channel disruption and immune-mediated injury to the atrioventricular node, resulting in bradycardia and increased risk of adverse outcomes such as hydrops fetalis and intrauterine death. Early identification and appropriate management are essential to reduce complications and guide antenatal counseling. Objetivos: To evaluate the association between autoimmune fetal atrioventricular block and clinical outcomes, with emphasis on the impact of hydroxychloroquine and other intrauterine interventions. Métodos: Systematic review of clinical trials and observational studies conducted in accordance with PRISMA recommendations. The literature search was performed in Cochrane Library, PubMed, and Scopus using the descriptors "congenital heart block", "fetal heart block", "anti-Ro", "autoimmune", and "treatment", including full-text studies published within the last 10 years in English, Spanish, and Portuguese. Outcomes analyzed were progression to asystole, fetal mortality, and need for neonatal pacemaker. Study selection was performed using Rayyan software, and risk of bias was assessed using ROBINS-I tools. Resultados e Conclusões: After screening, three studies were included. A consistent association was observed between autoimmune fetal atrioventricular block and adverse outcomes, particularly persistent bradycardia and progression of conduction abnormalities. Hydroxychloroquine demonstrated a significant reduction in recurrence of congenital heart block (7.4% vs 18%), representing a reduction greater than 50%. Neonatal electrophysiological analysis showed no correlation between drug levels and QTc prolongation (R=0.02; p=0.86), with a low incidence of QTc prolongation (>2 SD) in 11% of neonates, supporting its favorable safety profile. In contrast, therapeutic apheresis showed limited evidence of efficacy, although well tolerated (2.1% adverse events), suggesting a secondary role in selected cases. Moderate risk of bias predominated, due to lack of randomization and small sample sizes. Overall, hydroxychloroquine emerges as the intervention with the strongest supporting evidence and best risk-benefit profile; however, the absence of randomized controlled trials precludes definitive conclusions, warranting prospective studies.

18655

BEYOND TRADITIONAL SCORES: ARTIFICIAL INTELLIGENCE IN SURGICAL PLANNING OF CONGENITAL HEART DISEASES

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Introdução/Fundamentos: Congenital heart diseases (CHD) are among the most common anomalies at birth and present high anatomical complexity and clinical variability, making surgical planning and outcome prediction difficult. In this context, artificial intelligence (AI) emerges as a promising tool by integrating clinical and operative data, improving risk stratification and surgical planning. Objetivos: To analyze the application of AI in the surgical planning of patients with CHD, comparing it to conventional approaches and evaluating its impacts on planning accuracy and outcomes. Métodos: This systematic review was conducted according to PRISMA guidelines, with searches in the PubMed, Scopus, Cochrane Library and Embase databases, using the descriptors “Treatment Planning”, “Surgical Procedures, Operative”, “Artificial Intelligence” and “Congenital Heart Disease”. Studies from the last 5 years, available in full text in English or Portuguese, were included, with duplicates, reviews, case reports and animal studies excluded. Selection was performed on the Rayyan® platform, resulting in 7 studies included among 12 identified. Resultados e Conclusões: AI models show high accuracy in predicting outcomes in CHD, with AUC up to 0.97 in pediatric postoperative complications and between 0.75–0.90 in adults, often outperforming traditional scores. Models such as LightGBM and XGBoost stand out in predicting adverse events, allowing identification of the occurrence and type of complication with greater precision compared to conventional approaches. The application of AI in surgical planning, through the integration of clinical and operative variables, enables more precise risk stratification, favoring early identification of high-risk patients and optimization of perioperative planning, with association in reducing complications and mortality. AI demonstrates greater accuracy in surgical planning of CHD compared to conventional approaches, with better ability to predict outcomes and risk stratification, being associated with improvement in surgical outcomes and mortality. Models such as LightGBM and XGBoost stand out for their high accuracy in identifying complications. However, its clinical application still depends on prospective validation and integration into care workflows, being configured as a promising complementary tool.

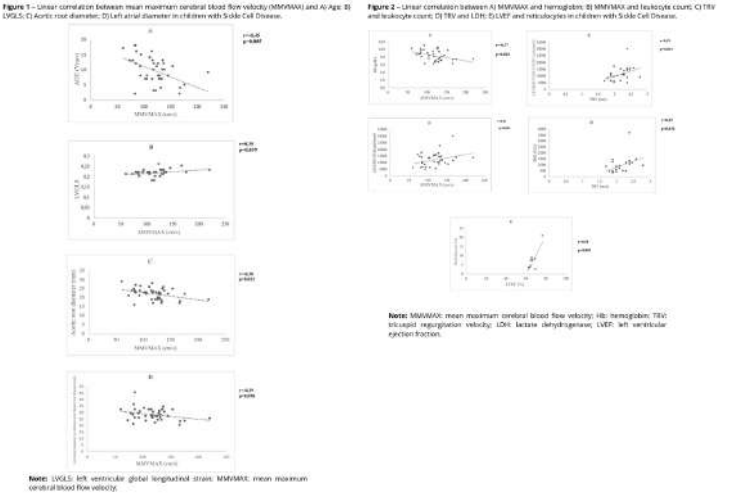
21747

ECHOCARDIOGRAPHIC ANALYSIS AND CEREBRAL BLOOD FLOW DYNAMICS IN CHILDREN AND ADOLESCENTS WITH SICKLE CELL DISEASE: A CROSS-SECTIONAL STUDY

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Introdução/Fundamentos: In sickle cell disease (SCD), cerebrovascular and cardiovascular involvement share common risk factors and significantly impact morbidity and mortality. Objetivos: This study aims to analyze associations between echocardiographic parameters and cerebral blood flow dynamics in children with SCD. Métodos: This cross-sectional study included 42 patients (aged 2–18 years) with SCD who underwent transthoracic Doppler echocardiography and transcranial Doppler ultrasonography. Echocardiographic assessment focused on cardiac chamber dimensions, aortic root diameter, left ventricular global longitudinal strain, tricuspid regurgitation velocity, and pulmonary artery systolic pressure. Transcranial Doppler evaluated the time-averaged maximum mean velocity of cerebral blood flow in the internal carotid and middle cerebral arteries, based on the Stroke Prevention Trial in Sickle Cell Anemia. Resultados e Conclusões: Left atrial dilation was the most common abnormality (N=34/81%); 83.3% (N=35) had normal transcranial Doppler findings. Cerebral blood flow velocity showed a positive correlation with left ventricular global longitudinal strain (r=0.35; p=0.039) and a negative correlation with aortic root diameter (r=−0.38; p=0.012). Higher median absolute values of left ventricular global longitudinal strain and cerebral blood flow velocity were observed in patients with genotypes associated with greater disease severity (p=0.001 and p=0.055, respectively). Higher cerebral blood flow velocity was associated with smaller aortic root diameter and increased left ventricular myocardial deformation. Genotypes associated with greater severity exhibited higher median absolute values of left ventricular global longitudinal strain and cerebral blood flow velocity. These findings reinforce the need for early evaluation of multisystem involvement, enabling identification of children at risk for progression to multiorgan disease.



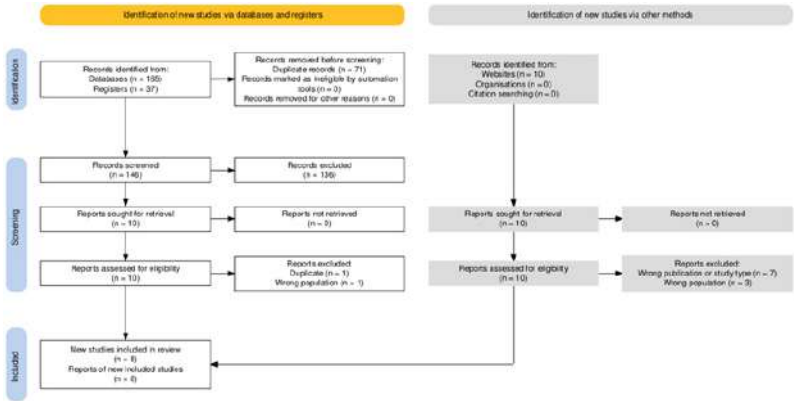
20505

EFFICACY AND SAFETY OF SODIUM-GLUCOSE COTRANSPORTER 2 (SGLT2) INHIBITORS IN PEDIATRIC CARDIORENAL SYNDROME: A SYSTEMATIC REVIEW OF PRELIMINARY EVIDENCE

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Introdução/Fundamentos: Pediatric cardiorenal syndrome (CRS), frequently associated with congenital conditions, results in high morbidity and mortality worldwide. Although the therapeutic use of SGLT2 inhibitors (SGLT2i) demonstrates consolidated cardiorenal benefits and a favorable safety profile in adults (DAPA-CKD, DAPA-HF, CREDENCE, EMPA-KIDNEY, EMPEROR-Reduced, and EMPA-REG trials), its pediatric use remains restricted to T2DM, with scarce evidence regarding the management of heart failure or kidney disease. A gap persists regarding the efficacy and safety of this class in modifying the natural history of CRS in children. Objetivos: To evaluate the clinical efficacy and safety profile of SGLT2i in modifying outcomes in pediatric patients with CRS. Métodos: A systematic review was conducted according to PRISMA 2020 guidelines. The search was performed in seven databases (PubMed, Embase, Cochrane, Web of Science, LILACS, ClinicalTrials.gov, and WHO ICTRP) and grey literature using AI tools (Open Evidence and Embase AI) until May 2026. PICO criteria were: patients <21 years with CRS (P); SGLT2i (I); placebo or standard of care (C); efficacy outcomes (GFR, UACR, LVEF, and NT-proBNP) and safety outcomes (growth and neurodevelopment) (O). Clinical trials (completed or ongoing) and cohort studies were included. Title and abstract screening was conducted by two independent blinded reviewers, with conflicts resolved by a third reviewer. Ten studies met the eligibility criteria. Resultados e Conclusões: After full-text analysis, two additional studies were excluded, and 8 studies were analyzed (n=828; 508 in completed cohorts), with a predominance of dapagliflozin use. Long-term GFR stability was observed despite an initial transient decline (month 1), along with a consistent reduction in biomarkers (BNP/NT-proBNP). There was an improvement in weight Z-score among infants. The safety profile was favorable: UTIs and transient AKIs were the most frequent events, with discontinuation rates below 12%. It is concluded that SGLT2i demonstrate a promising safety profile and preliminary evidence of clinical benefit in pediatric CRS. Future long-term and well-designed studies are needed for further knowledge regarding the clinical efficacy and safety profile of these agents in children. Given the predominantly observational nature of current data, robust ongoing clinical trials (EMPA-KIDNEY Kids and IECA-MEX trials) are essential to consolidate these therapies in pediatric practice.



17464

FUNCTIONAL CAPACITY IN CHILDREN AND ADOLESCENTS WITH CONGENITAL HEART DISEASE: A SYSTEMATIC REVIEW OF THE LITERATURE

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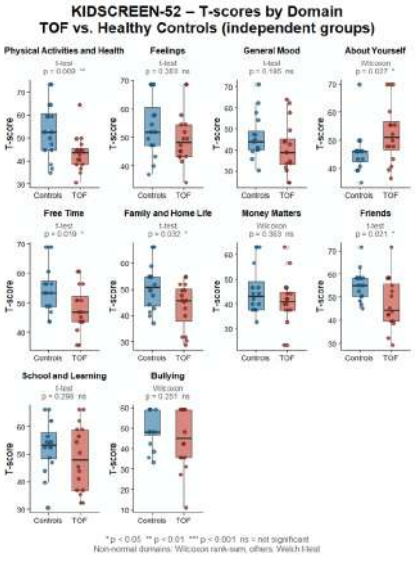
Introdução/Fundamentos: Congenital heart disease (CHD) involves structural defects of the heart and great vessels. Understanding the functional capacity of children and adolescents with CHD is important for assessing the risk of morbidity and mortality, as well as for promoting quality of life in this population. Objetivos: To review the current scientific evidence regarding the impact of CHD on the functional capacity of children and adolescents. Métodos: This is a systematic review conducted in accordance with the PRISMA guidelines, based on the selection of scientific publications from the LILACS and MEDLINE databases. The Health Sciences Descriptors used were “Congenital Heart Diseases” and “Exercise.” Inclusion criteria comprised randomized clinical trials and observational studies conducted in children and adolescents aged 6 to 18 years; use of functional capacity assessment tests; and publications written in Portuguese, English, and/or Spanish between 2014 and 2025. After applying the eligibility criteria, a final sample of 10 studies was obtained. Resultados e Conclusões: In the analysis of 1,074 children and adolescents with CHD, functional capacity, physical fitness, performance in activities of daily living, and quality of life were found to be impaired compared to healthy peers. Functional capacity was assessed using the Six-Minute Walk Test, in which individuals with CHD covered shorter distances, with a positive correlation between poorer results and the need for surgical procedures. The TGlittre-P test evaluated performance in activities of daily living, and patients with CHD showed longer completion times. Physical activity level, body mass index, flexibility, and metabolic score did not differ between the CHD and control groups. Aerobic capacity was reduced (75% of predicted). Most children were physically active (75.9% of children with CHD and 84.3% of the control group). Obesity, higher disease complexity, and total cavopulmonary connection were associated with failure to meet the recommendations for average weekly physical activity. Increased physical activity was associated with improved functional capacity and quality of life, whereas reduced functional capacity was linked to a higher likelihood of future cardiovascular events. Children and adolescents with CHD have impaired functional capacity, and regular physical activity should be encouraged in this population, as it is associated with improvements in functional capacity and quality of life.

20313

HEALTH-RELATED QUALITY OF LIFE IN BRAZILIAN CHILDREN AND ADOLESCENTS WITH REPAIRED TETRALOGY OF FALLOT: A KIDSCREEN-52 ASSESSMENT

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Introdução/Fundamentos: Advances in surgical care have markedly increased survival in Tetralogy of Fallot (TOF), the most common cyanotic congenital heart defect. This longevity has increased the burden of potential cardiac and neurodevelopmental issues that may affect quality of life. Despite advances in surgical outcomes and long-term survival in Tetralogy of Fallot in Brazil, evidence regarding quality of life remains scarce. Objetivos: To assess Health-Related Quality of Life (HRQoL) in Brazilian children and adolescents with TOF compared to healthy age- and sex-matched controls using the KIDSCREEN-52 questionnaire. Métodos: This cross-sectional study enrolled surgically repaired TOF patients aged 7–18 years who underwent surgery before three years old, referred from outpatient cardiology clinics, with healthy controls matched for sex and age. HRQoL was measured using the KIDSCREEN-52, a psychometrically validated instrument for the Brazilian population covering ten domains, with results expressed as T-scores (mean 50, SD 10). Normality of T-score distributions by domain and group was assessed with the Shapiro–Wilk test. Domains with normal distributions in both groups ($p \geq 0.05$) were compared using the independent-samples Student's t-test; otherwise, the Mann–Whitney U test was used. A two-tailed $p < 0.05$ was considered significant. Analyses were performed in R (base stats package). Resultados e Conclusões: Sixteen TOF patients and 16 controls were evaluated. Significant differences were identified in five domains. TOF patients scored lower in Physical Well-being (43.63 [38.47–45.32] vs. 52.43 [44.73–60.59]; p = 0.009), Autonomy (46.85 [43.59–52.15] vs. 53.22 [48.70–57.33]; p = 0.019), Social Support and Peers (44.34 [39.49–55.73] vs. 54.93 [50.24–58.14]; p = 0.021), and Parent Relations (45.72 [37.67–50.08] vs. 50.66 [43.70–54.65]; p = 0.032). Notably, TOF patients scored higher in Self-Perception (50.97 [46.63–56.56] vs. 46.08 [42.51–46.09]; p = 0.027). TOF patients showed impaired HRQoL across physical, social, and family domains. The higher Self-Perception scores may reflect adaptive psychological mechanisms and warrant further investigation. Multidisciplinary follow-up addressing quality of life beyond cardiac outcomes is essential in this population.

Domain	TOF — Median [IQR]	Controls — Median [IQR]	p-value
Dom 1 – Physical Activity and Health	43.63 [38.47–45.32]	52.43 [44.73–60.59]	0.009 †
Dom 2 – Feelings	48.22 [43.25–54.49]	51.78 [47.12–60.54]	0.283 †
Dom 3 – General Mood	38.86 [33.04–45.20]	43.91 [40.00–48.87]	0.195 †
Dom 4 – About Yourself	50.97 [46.63–56.56]	46.08 [42.51–46.09]	0.027 ‡
Dom 5 –Free Time	46.85 [43.59–52.15]	53.22 [48.70–57.33]	0.019 †
Dom 6 – Family and Home Life	45.72 [37.67–50.08]	50.66 [43.70–54.65]	0.032 †
Dom 7 – Money Matters	40.81 [37.47–44.78]	43.05 [37.67–49.03]	0.363 ‡
Dom 8 – Friends	44.34 [39.49–55.73]	54.93 [50.24–58.14]	0.021 †
Dom 9 – School and Learning	47.86 [36.77–58.87]	53.22 [48.19–57.77]	0.298 †
Dom 10 – Bullying	45.14 [35.44–58.85]	48.07 [46.60–58.85]	0.251 ‡

TOF, tetralogy of Fallot; IQR, interquartile range; Dom, domain
† Student's t-test (normal distribution)
‡ Wilcoxon–Mann–Whitney test (non-normal distribution)

16077

IMPACT OF PATENT DUCTUS ARTERIOSUS IN VERY AND EXTREMELY LOW BIRTH WEIGHT NEONATES: MATERNAL-FETAL RISK FACTORS AND CLINICAL OUTCOMES (2019-2023)

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(1) UFRN - NATAL - RN - BRASIL; (2) UFMA - CAMPUS SAO LUIS - SÃO LUÍS - MA - BRASIL;

Introdução/Fundamentos: Patent Ductus Arteriosus (PDA) is a frequent cardiovascular complication in the neonatal period, especially in very low birth weight (VLBW) and extremely low birth weight (ELBW) infants. Failure of ductal closure is associated with hemodynamic instability and increased mortality. While prematurity is the primary factor, the role of maternal comorbidities and the impact of therapies on outcomes require further investigation. Objetivos: To analyze the prevalence of PDA in VLBW and ELBW neonates, correlating it with neonatal anthropometric profiles, maternal pathologies, and the impact of interventions on clinical outcomes. Métodos: A retrospective cohort study analyzed data from infants born between 2019 and 2023 at a quaternary center. The sample included neonates with recorded birth weight and gestational age (GA) and a confirmed diagnosis of PDA. Variable normality was tested using the Shapiro-Wilk method. Due to the observed non-parametric distribution, the Mann-Whitney U test was used for comparing means/medians, and the Chi-Square test was applied for the analysis of categorical variables (HBP, DM, treatment, and outcomes), with a significance level of p≤0,05. Resultados e Conclusões: Data from 818 neonates were analyzed, of which 152 (18,6%) were diagnosed with PDA. Neonates with PDA had significantly lower birth weight (943,8 ± 256,8g vs. 1106,2 ± 302,9g; p < 0,0001) and gestational age (193,8 ± 19,8 days vs. 207,7 ± 21,4 days; p < 0,0001). Maternal systemic hypertension (HBP) was significantly associated with PDA (p=0,0003), presenting an inverted relation, while diabetes showed no correlation (p=0,36). Within the PDA group, pharmacological treatment - ibuprofen or paracetamol - was a key determinant for survival: treated neonates had a significantly lower mortality rate (14,8%) compared to untreated ones (38,7%) (p=0,006). It is concluded that PDA prevalence is inversely proportional to weight and GA, and early pharmacological treatment is critical for reducing neonatal mortality. The absence of maternal HBP correlated with higher PDA incidence, suggesting that maternal physiological stress may paradoxically assist in ductal maturation.

Table 1: Biometric Comparison and Maternal Factor (*N* =818)

Variable	PDA Present (*n* =152)	PDA Absent (*n* =666)	*p*-value
Mean Weight (g)	943.8 ± 256	1106.1 ± 302	**< 0.0001**
Mean GA (days)	193.8 ± 19	207.7 ± 21	**< 0.0001**
Maternal HBP (%)	35.5%	52.1%	**0.0003**

Source: Created by the Author.

Table 2: Clinical Outcomes in PDA Group by Treatment

Outcome	With Medication (*n* =54)	Without Medication (*n* =98)
Survival (Disch./Transf.)	85.2%	61.3%
Death	14.8%	38.7%
Association p-value: 0.006		

Source: Created by the Author.

21606

INFECTIVE ENDOCARDITIS AFTER TETRALOGY OF FALLOT REPAIR: A SYSTEMATIC REVIEW OF ASSOCIATED FACTORS

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Introdução/Fundamentos: Tetralogy of Fallot (TOF) is the most common cyanotic congenital heart disease, characterized by ventricular septal defect, overriding aorta, right ventricular hypertrophy, and right ventricular outflow tract obstruction. Despite surgical advances, repaired patients remain at increased risk for infective endocarditis (IE), with in-hospital mortality reaching 20% and long-term survival below 50%. Objetivos: The objective of this study was to systematically evaluate the main risk factors associated with infective endocarditis following Tetralogy of Fallot repair, with emphasis on prosthetic material, residual hemodynamic abnormalities, and previous cardiac interventions. Métodos: A systematic review was conducted according to PRISMA guidelines using PubMed, SciELO, and Lilacs databases with the descriptors: “Tetralogy of Fallot” AND “endocarditis”. Original studies, systematic reviews, and meta-analyses published within the last five years, in English or Portuguese, and with free full-text access were included, resulting in 44 studies. After excluding case reports and duplicate articles, 12 studies were selected for final analysis. Resultados e Conclusões: Comparative analysis by prosthesis type demonstrated a lower incidence of IE in homografts and bioprosthetic valves compared with mechanical prostheses. The main risk factors identified included the presence of valvular prosthetic material, previous cardiac procedures, with an 8.22-fold increased risk during the first six months, adverse residual hemodynamic abnormalities, structural heart disease present in 92.5% of IE cases, residual or late cyanosis, and previous history of endocarditis. Furthermore, persistent pulmonary regurgitation, particularly when moderate to severe, was associated with increased IE occurrence. Socioeconomic factors and limited access to specialized healthcare were also related to higher risk, contributing to delayed correction and inadequate follow-up. Overall, patients with repaired Tetralogy of Fallot remain at significant risk for infective endocarditis, especially in the presence of prosthetic valvular material, residual hemodynamic abnormalities, and prior cardiac interventions. Therefore, antibiotic prophylaxis, continuous clinical surveillance, and early diagnosis remain essential to reduce morbidity and mortality.

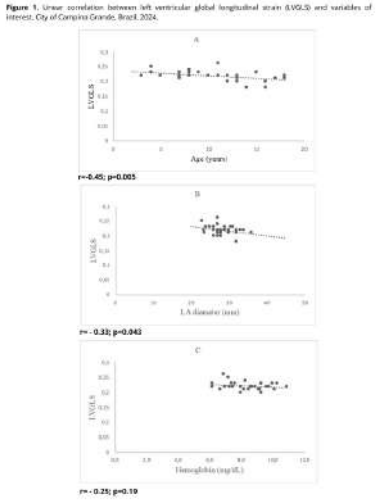
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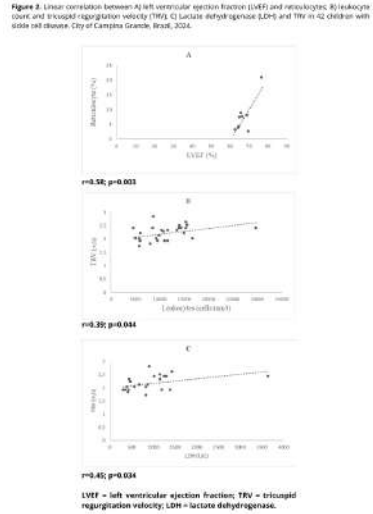
LEFT VENTRICULAR GLOBAL LONGITUDINAL STRAIN ALTERATIONS IN CHILDREN WITH SICKLE CELL DISEASE

VICENTE CASTOR BRITO1; SUELY ARRUDA VIDAL2; CANDYCE DE ANDRADE CARDOSO RAMALHO1; ARIANI IMPIERI SOUZA2; LÍVIA RAULINO DE OLIVEIRA CASTRO MARQUES3; FELIPE MARTINS DE LIMA1; CATARINA RAMALHO DOS SANTOS1; JORGIANA ESTER DE MACEDO COSTA DA SILVA1; LARISSA BARBOSA DOS SANTOS1; PEDRO ADSON DA CUNHA MEDEIROS1; TACIANA RAULINO DE OLIVEIRA CASTRO MARQUES1;

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Introdução/Fundamentos: Cardiopulmonary impairment in sickle cell disease (SCD) progresses silently and represents a leading cause of mortality in adults with the disease. Objetivos: This study aimed to describe and analyze the echocardiographic parameters of patients with SCD. Métodos: A cross-sectional study with an analytical component involving patients with SCD. Inclusion criteria considered participants aged between 2 and 18 years, without other systemic diseases causing pulmonary hypertension, who were treated at a high-complexity public healthcare service in Northeastern Brazil. Transthoracic Doppler echocardiography assessed myocardial function, including the left ventricular global longitudinal strain (LVGLS) by speckle tracking. Fisher’s exact test, Mood’s median test, the Benjamini-Hochberg method, and Pearson’s correlation coefficient were applied to explore associations between variables. Statistical significance was defined as p<0.05. Resultados e Conclusões: Among the 42 patients evaluated, the median age was 10 years (interquartile range [IQR]: 7-13), with a predominance of the HbSS genotype. The most common findings included left atrial and left ventricular (LV) dilation. LVGLS was impaired in two patients (4.7%) and was significantly associated with the genotype, with greater absolute values in SS/Sß0 genotypes (p=0.001). Tricuspid annular plane systolic excursion presented high median values in the HbSC genotype group (p=0.033). Tricuspid regurgitation velocity was increased in three patients (7.2%), with positive correlations observed for leukocyte count (r=0.39; p=0.044) and lactate dehydrogenase (LDH) (r=0.45; p=0.034). The LV deformation observed in this population suggests early-stage cardiac dysfunction in SCD. The associations between LVGLS and genotype, and between tricuspid regurgitation and laboratory parameters, support the need for individualized risk stratification and early intervention in these patients.





LVEF = left ventricular ejection fraction; TRV = tricuspid regurgitation velocity; LDH = lactate dehydrogenase.

20649

MATERNAL DISTRESS — GUILT, DEPRESSION, AND ANXIETY AMONG MOTHERS OF CHILDREN WITH AND WITHOUT CONGENITAL HEART DISEASE

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Introdução/Fundamentos: Depressive and anxiety symptoms are common among caregivers and are often linked to guilt, a multidimensional construct shaped by moral, social, and relational factors. Women, especially mothers, tend to report higher and more diverse sources of guilt, particularly in family and interpersonal contexts. In chronic pediatric conditions such as congenital heart disease (CHD), hospitalization and caregiving demands may intensify maternal distress and guilt. Excessive guilt is associated with poorer psychological well-being and may impair caregiving and family functioning. Despite its relevance, maternal guilt remains understudied in this setting, especially in low- and middle-income countries, where research has focused mainly on anxiety and depression. Moreover, comparisons between mothers of children with and without CHD are limited, restricting understanding of how caregiving contexts influence guilt. Objetivos: To investigate guilt prevalence and its association with depressive and anxiety symptoms in mothers of children with congenital heart disease (CHD) hospitalized in a referral cardiology hospital, compared with mothers of children without CHD. Métodos: This cross-sectional comparativestudy included 123 mothers of children with CHD and 123 mothers of children without CHD. Participants completed the Beck Depression Inventory-II (BDI-II), the Beck Anxiety Inventory (BAI), and the Multifactorial Guilt Scale (MGS). Crude and adjusted associations between independent variables and the presence of guilt were estimated using Poisson regression with robust variance to calculate prevalence ratios (PRs). Resultados e Conclusões: Guilt was highly prevalent, affecting 78% of the total sample. Mothers of children with CHD reported lower levels of guilt but higher levels of anxiety compared with mothers of children without CHD, while depressive symptom levels were similar between groups. Mothers of children without CHD were 35% more likely to experience guilt. The presence of depressive symptoms—mild, moderate, or severe—increased the likelihood of guilt by 21% to 29%. Anxiety was not significantly associated with guilt. Maternal guilt was frequent and strongly associated with depressive symptoms, regardless of the child's clinical condition. Differences between groups suggest that contextual and caregiving factors may influence emotional experiences. These findings highlight the need for psychological interventions tailored to the specific profiles and support needs of each group of mothers.

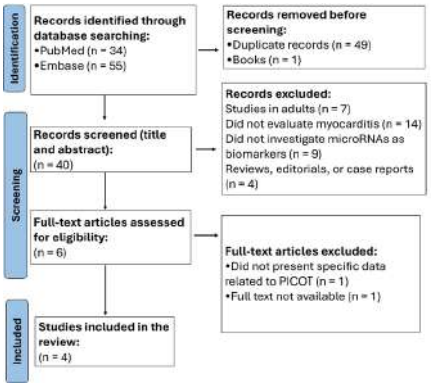
18271

MICRORNAS AS DIAGNOSTIC AND PROGNOSTIC BIOMARKERS IN PEDIATRIC MYOCARDITIS: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Pediatric myocarditis is a potentially severe inflammatory condition and an important cause of acute heart failure in children, with diagnosis often challenging due to nonspecific clinical presentation and limitations of conventional diagnostic methods. Its clinical course is highly variable, ranging from mild symptoms to fulminant disease, making early identification essential to improve outcomes. In this context, microRNAs have emerged as promising biomarkers owing to their stability in biological fluids and their role in inflammatory and myocardial remodeling pathways. Objetivos: To evaluate the diagnostic and prognostic value of microRNAs in pediatric myocarditis. Métodos: A systematic review was conducted in accordance with PRISMA guidelines, using a PICOT-based strategy, without restrictions on language or publication period. Searches were performed in PubMed and Embase using the terms "microRNAs", "Myocarditis", and "Child", combined with "Biomarkers", "Diagnosis", and "Prognosis". Observational clinical studies involving pediatric patients with myocarditis and assessment of microRNA expression were included, while studies in adults, experimental models, case reports, and reviews were excluded. After screening and full-text assessment, four studies were included, comprising 506 participants (259 with myocarditis and 247 controls). Risk of bias was assessed using the Newcastle-Ottawa Scale. Resultados e Conclusões: Across the included studies, significant alterations in microRNA expression were consistently associated with the presence of myocarditis. In fulminant cases, increased levels of exosomal microRNAs were reported, particularly hsa-miR-146a-5p, which demonstrated strong diagnostic performance and correlation with markers of myocardial injury. In non-fulminant viral myocarditis, decreased levels of miR-425-3p were associated with both diagnosis and worse clinical outcomes. Additionally, miR-146b and hsa-miR-21 were significantly elevated and correlated with disease severity, ventricular dysfunction, and adverse outcomes. MicroRNAs show considerable potential as diagnostic and prognostic biomarkers in pediatric myocarditis and may contribute to future strategies for early diagnosis and risk stratification. However, methodological heterogeneity and the limited number of studies restrict the generalizability of these findings, highlighting the need for prospective, multicenter validation, and may complement current diagnostic tools in clinical practice.



AUTHOR (YEAR)	TYPE OF MYOCARDITIS	MICRORNA	MAIN FINDING
Zhang et al., 2023	Pediatric fulminant	hsa-miR-146a-5p	Exosomal increase; high diagnostic performance
Cao et al., 2024	Pediatric viral	miR-425-3p	Serum reduction; independent predictor of prognosis
Yan et al., 2021	Pediatric viral	miR-146b	Increased levels associated with disease severity and ventricular dysfunction
Wang et al., 2025	Pediatric fulminant	hsa-miR-21	Increased expression associated with adverse outcomes

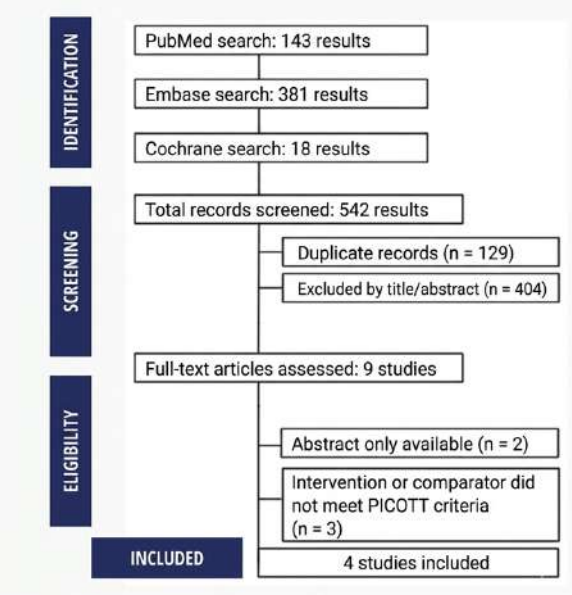
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MUSCLE STRENGTH AND FUNCTIONAL CAPACITY IN CHILDREN WITH PULMONARY ARTERIAL HYPERTENSION: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Pulmonary arterial hypertension (PAH) in children and adolescents is a rare and severe condition associated with progressive functional limitation. In addition to cardiovascular dysfunction, these patients often present reduced lean mass and muscle strength due to chronic hypoxemia, systemic inflammation, and reduced physical activity. Objective assessment of muscle strength and functional capacity, through tests such as handgrip strength, isometric contraction, and the six-minute walk test (6MWT), allows evaluation of the systemic impact of PAH and its relationship with clinical markers such as NT-proBNP. Objetivos: This study aimed to review the available evidence on muscle strength and functional capacity in children and adolescents with PAH, highlighting their main correlations and clinical implications. Métodos: Systematic review conducted according to PRISMA guidelines. PubMed, Embase, and Cochrane databases were searched without time restrictions using the descriptors “Pulmonary Arterial Hypertension”, “Child”, and “Muscle Strength”. A total of 413 studies were identified. Screening, selection, and data extraction were performed by two independent reviewers based on predefined criteria, resulting in 4 included studies. Resultados e Conclusões: Four studies published between 2021 and 2024 were included, totaling 75 pediatric patients with PAH. All studies consistently demonstrated reduced muscle strength and lean mass, with direct impact on functional capacity. Kavgaç et al. (2024) found a positive correlation between handgrip strength and 6MWT ($r = 0.586$; $p = 0.022$), and a negative correlation with pro-BNP ($r = −0.565$; $p = 0.023$). Peppinkhuijzen et al. (2023) reported mean handgrip strength of 16 ± 9 kg ($z = −2.4 \pm 1.2$; $p < 0.001$) and total MVIC $z = −2.9 \pm 1.2$ ($p < 0.001$). Avitabile et al. (2022; 2021) showed lean mass deficits (LLMZ up to $−1.40 \pm 1.12$) and a positive association between LLMZ and 6MWT performance ($R^2 = 0.39$; $p = 0.03$). Children with PAH show reduced muscle strength and lean mass across different assessments. These impairments are directly related to clinical parameters such as NT-proBNP levels and 6MWT performance, suggesting that muscle evaluation may serve as an additional prognostic marker to support clinical decision-making.



17144

NEURODEVELOPMENT AFTER THE FONTAN CIRCULATION: RISK FACTORS AND MID- TO LONG-TERM OUTCOMES IN CHILDREN

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Introdução/Fundamentos: The Fontan circulation represents the final palliative strategy for single-ventricle congenital heart disease; however, it is associated with neurodevelopmental risks due to chronic hypoxia, systemic inflammation, and perioperative surgical complications. Cognitive, motor, and executive deficits affect up to 50% of children, impacting quality of life and social adaptation in the mid-term (1–5 years) and long term (>5 years). Objetivos: To synthesize evidence from PubMed and SciELO, using PRISMA methodology, on risk factors and neuropsychological outcomes after the Fontan procedure in children, with the aim of informing neurodevelopmental interventions. Métodos: A PRISMA-guided systematic review was conducted in PubMed and SciELO (up to April 2026) using the search terms “Fontan AND (neurodevelopment OR neurodesenvolvimento) AND children.” Inclusion criteria were studies with ≥10 pediatric patients, follow-up ≥1 year, and assessment of neurocognitive domains. Case reports were excluded. The search identified 1,247 records; after removal of 156 duplicates, 842 were screened, 28 assessed for eligibility, and 12 included. Risk of bias was assessed using the Newcastle–Ottawa Scale. Resultados e Conclusões: RESULTS: Preoperative hypoxia (O□ <85%; OR 2.5 for IQ <85), prolonged cardiopulmonary bypass (>120 min), and postoperative factors (arrhythmias in 17% at 10 years; venous hypertension) were associated with worse outcomes. Mid-term findings included motor delay (40%), cognitive deficits, and reduced self-image. Long-term, up to 60% showed impairments in lexical fluency, working memory, and cognitive flexibility, with a 20–30% reduction in quality of life. Overall, neurodevelopmental impairments persist chronically after Fontan circulation, including cognitive deficits (IQ <85 in 30–50%), motor delay (40%), and executive dysfunction (up to 60%), impacting academic performance and social adaptation. CONCLUSION: Routine neuropsychological screening is recommended 12–24 months postoperatively using validated tools (Bayley-III <3y; WPPSI-IV 3–7y; WISC-V >7y), with biennial follow-up through adolescence in a multidisciplinary approach. Future protocols should prioritize neuroprotection, including NIRS monitoring, reduction of bypass time (<120 min), anti-inflammatory strategies, and optimized nutritional support.

22056

PRENATAL EXPOSURE TO ENDOCRINE-DISRUPTING CHEMICALS AND THE RISK OF STRUCTURAL CONGENITAL HEART DEFECTS: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Congenital heart disease is the most common structural malformation and a major cause of neonatal mortality. Its multifactorial etiology includes environmental influences during cardiac morphogenesis, with endocrine-disrupting chemicals potentially affecting hormonal and embryonic pathways. Although recent meta-analyses link maternal EDC exposure to CHDs, none has formally compared biomonitoring with indirect exposure assessment as a source of heterogeneity or applied GRADE across exposure classes and cardiac subtypes, limiting interpretation and prevention strategies. Objetivos: To assess the association between maternal prenatal exposure to endocrine-disrupting chemicals and structural congenital heart defects (CHDs) in offspring. Métodos: A systematic review was conducted according to PRISMA 2020, with PROSPERO registration. Observational studies evaluating maternal prenatal or periconceptional exposure to endocrine-disrupting chemicals and structural CHDs were included. Searches were performed in PubMed/MEDLINE, Embase, Web of Science, CENTRAL and Scopus, with no date restriction. Two reviewers independently conducted study selection, data extraction and risk-of-bias assessment using the Newcastle-Ottawa Scale. Evidence was qualitatively synthesized according to exposure class, exposure assessment method, cardiac subtype and study quality, prioritizing adjusted estimates and biomonitoring-based studies. Certainty of evidence was evaluated using GRADE. Resultados e Conclusões: Following screening of over 2,700 records, 59 studies comprising more than 1.3 million participants were included. Biomonitoring-based studies consistently demonstrated positive associations between maternal exposure to endocrine-disrupting chemicals and structural CHDs, particularly for heavy metals, polycyclic aromatic hydrocarbons and PFAS. Studies based on indirect exposure assessment showed more heterogeneous and less consistent findings. Subtype-specific associations were identified, with heavy metals predominantly linked to septal defects and Polycyclic Aromatic Hydrocarbons to conotruncal defects. These findings support precautionary exposure-reduction strategies during periconception and pregnancy and prospective studies with standardized biomonitoring, confounder control, and phenotype-stratified outcomes.

20158

REAL-WORLD CLINICAL PRACTICE VERSUS ESC/AHA GUIDELINE RECOMMENDATIONS IN PEDIATRIC AND ADULT CONGENITAL HEART DISEASE-ASSOCIATED PULMONARY HYPERTENSION: A POPULATION-BASED STUDY FROM SOUTHERN BRAZIL

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Introdução/Fundamentos: Pulmonary hypertension associated with congenital heart disease (PH-CHD) requires targeted pharmacological strategies. Current guidelines from the European Society of Cardiology (ESC) and American Heart Association (AHA) recommend early combination therapy, particularly in intermediate- to high-risk patients. However, real-world adherence remains uncertain, especially in middle-income settings. Objetivos: To describe pharmacological treatment patterns in PH-CHD and assess their alignment with guideline recommendations, comparing pediatric and adult populations. Métodos: This population-based, cross-sectional study included 134 patients with PH-CHD (ICD I27.8) from a regional database in Southern Brazil. Therapies were categorized into phosphodiesterase-5 inhibitors (PDE5), endothelin receptor antagonists (ERA), and prostacyclin analogues. Comparisons were performed using chi-square tests ($p<0.05$). Resultados e Conclusões: The sample was distributed between pediatric and adult patients (n=67 each). The mean age was 10.8 ± 3.6 years in the pediatric group and 38.9 ± 18.3 years in the adult group. Females comprised 46.3% of pediatric and 73.1% of adult patients. Pediatric population had higher monotherapy rates (59.7% vs. 49.3%), while adults more frequently received dual therapy (46.3% vs. 32.8%); triple therapy was similar (4.5% in both), and quadruple therapy occurred only in pediatrics (3%). No significant difference was observed in overall treatment intensity ($\chi^2=4.20$; $p=0.24$). PDE5 inhibitors were more frequently used in pediatrics (85.1% vs. 67.2%; $\chi^2=6.0$; $p=0.014$), whereas ERA use was higher in adults (59.7% vs. 41.8%; $\chi^2=4.3$; $p=0.038$). Prostacyclin analogue use was low and similar between groups ($\chi^2=0.4$; $p=0.52$). Combination therapy, particularly PDE5 plus ERA, was more common in adults. Real-world management was partially aligned with ESC/AHA recommendations regarding drug classes. However, the predominance of monotherapy and low prostacyclin use suggest a gap in implementing guideline-recommended combination strategies. These findings likely reflect structural limitations, as the studied healthcare service does not provide access to key therapies such as macitentan, riociguat, and selexipag. This highlights important barriers to optimal care and underscores the need to expand access and improve adherence to evidence-based therapies in PH-CHD.

DEMOGRAPHIC CHARACTERISTICS BY AGE GROUP

Variable	<18 years	≥ 18 years
N	67	67
Female (%)	31 (46.3)	49 (73.1%)
Male (%)	36 (53.7%)	18 (26.9%)
Age (mean ± SD)	10.8 ± 3.6 years	38.9 ± 18.3 years

Abbreviations: N, sample; SD, standard deviation.

PHARMACOLOGICAL CLASSES AND THERAPY COMPLEXITY BY AGE GROUP

Variable	< 18 years (n = 67)	≥ 18 years (n = 67)
PDE5 inhibitors	57 (85.1%)	45 (67.2%)
ERA	28 (41.8%)	40 (59.7%)
Prostacyclin analogues	6 (9.0%)	4 (6.0%)
Monotherapy	40 (59.7%)	33 (49.3%)
Dual therapy	22 (32.8%)	31 (46.3%)
Triple therapy	3 (4.5%)	3 (4.5%)
Quadruple therapy	2 (3.0%)	0 (0.0%)

Abbreviations: PDE5, phosphodiesterase-5 inhibitors; ERA, endothelin receptor antagonists

16426

RISK FACTORS ASSOCIATED WITH ADVERSE OUTCOMES IN PEDIATRIC PATIENTS WITH CONGENITAL HEART DISEASE IN A REFERRAL HOSPITAL

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Introdução/Fundamentos: Mortality in pediatric cardiac surgery has declined in recent decades but remains a major challenge, especially in children under two years of age. Identifying risk factors is essential for risk stratification, surgical planning, and perioperative management. Variables such as low body weight, younger age, and higher surgical complexity are associated with worse outcomes, reflecting the vulnerability of this population. Objetivos: To identify clinical and surgical factors associated with in-hospital mortality in children under two years undergoing cardiac surgery at a tertiary referral center in Brazil. Métodos: This retrospective observational study included children under 2 years of age who underwent congenital heart surgery between 2018 and 2024 at a tertiary referral hospital in Brazil. Demographic variables (age, weight) and surgical variables (RACHS-1 score, cardiopulmonary bypass time) were analyzed to identify factors associated with in-hospital mortality, which was defined as the primary outcome. Continuous variables were expressed as mean ± standard deviation or median (interquartile range), and categorical variables as percentages. Comparisons were performed between survivors and non-survivors. A multivariable logistic regression model was constructed including RACHS-1 score, weight, and cardiopulmonary bypass time. Results were expressed as odds ratios (OR) with 95% confidence intervals (CI), and model discrimination was assessed using the area under the receiver operating characteristic (ROC) curve. Resultados e Conclusões: A total of 1,234 patients were included. Non-survivors had lower weight (3.81±1.73kg vs. 5.48±2.58kg), younger age (median 36vs.120 days), longer cardiopulmonary bypass (CPB) time (73.7±55 vs. 60.5±49.2 minutes), and higher RACHS-1 score (3.46±1.1 vs. 2.69±0.99) compared to survivors. In multivariable analysis, RACHS-1 score (OR 1.50; 95% CI 1.24–1.82; p <0.001) and weight (OR 0.72; 95% CI 0.63–0.81; p <0.001) were independent predictors of mortality, while CPB time did not remain significant after adjustment (p=0.25). The model demonstrated good discriminatory capacity (AUC=0.74). In conclusion, lower operative weight and higher surgical complexity are independent predictors of mortality, highlighting the critical role of patient-related factors in surgical outcomes and supporting the need for early risk stratification and preoperative optimization.

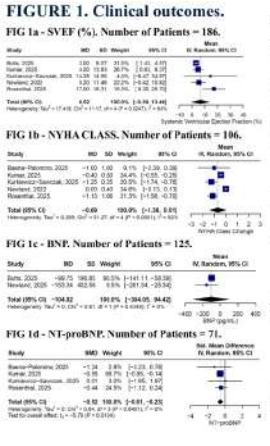
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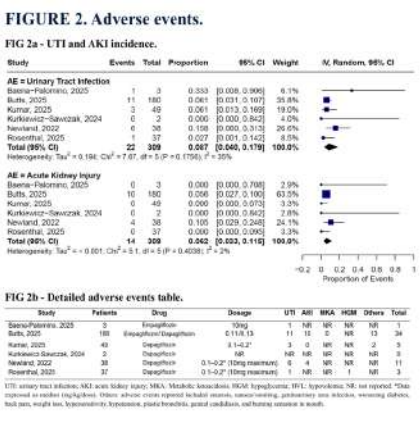
SGLT2 INHIBITORS IN PEDIATRIC HEART FAILURE: A SYSTEMATIC REVIEW AND SINGLE-ARM META-ANALYSIS

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Introdução/Fundamentos: Pediatric heart failure (PHF) remains a significant clinical burden characterized by substantial patient morbidity. While SGLT2 inhibitors have established themselves as a cornerstone of adult therapy, their application in pediatric populations is not yet well-defined. Objetivos: To synthesize the evidence regarding the structural, functional, biochemical effects, and safety profile of SGLT2 inhibitors in pediatric patients with diagnosis of Heart failure (HF). Métodos: Adhering to PRISMA guidelines, a systematic review and single-arm meta-analysis were conducted. Cochrane Library, Embase, PubMed, and Web of Science were searched in September 2025. Inclusion criteria were: HF patients aged younger than 21 years, SGLT2 inhibitor therapy, availability of pre- and post-intervention data, and studies with 2 or more patients. Exclusion criteria comprised single-patient case reports and the concurrent unstable initiation of other pharmacological agents. The analyzed variables were Systemic Ventricular Ejection Fraction (SVEF), NYHA functional class, BNP, NT-proBNP, and adverse events. Risk of bias was evaluated using the Joanna Briggs Institute and Newcastle-Ottawa Scale tools. Quantitative synthesis utilized random-effects models, with outcomes expressed as mean differences (MD) or standardized mean differences (SMD) alongside 95% confidence intervals (CI). Resultados e Conclusões: A total of seven studies involving 473 patients were included; six studies (407 patients) were suitable for quantitative analysis. Structural and functional outcomes showed non-significant favorable trends, affected by high heterogeneity: SVEF increased (MD 6.52%; 95% CI: -0.39 to 13.44) and NYHA class improved (MD -0.69; 95% CI: -1.38 to 0.01). Biochemically, NT-proBNP reduced significantly (SMD -0.52; 95% CI: -0.81 to -0.23; p=0.01), reflecting decreased cardiac filling pressures. BNP reduction was not significant (MD -104.82 pg/mL; 95% CI: -304.05 to 94.42). The safety profile was favorable; the most frequent adverse events were urinary tract infections (pooled proportion 8.7%; 95% CI: 4.0% to 17.9%) and acute kidney injury (6.2%; 95% CI: 3.3% to 11.5%), with no cases of metabolic ketoacidosis. Despite limitations such as retrospective designs, small samples, and high heterogeneity, SGLT2 inhibitors may offer promising echocardiographic, functional, and biomarker benefits with acceptable tolerability. Large-scale randomized trials are needed prior to routine clinical recommendation.





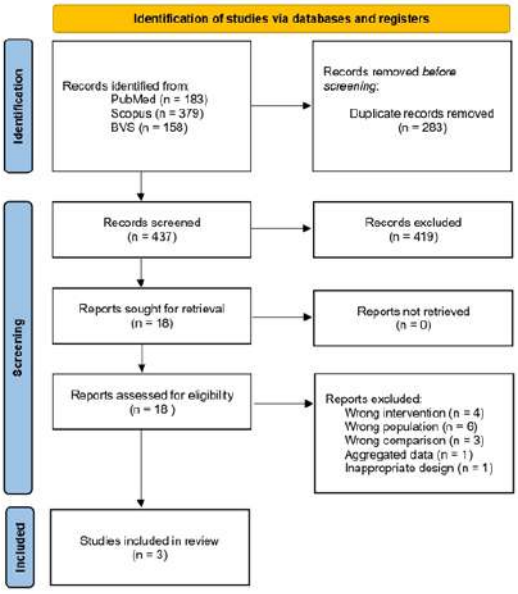
18116

SURGERY OR BALLOON ANGIOPLASTY FOR NATIVE AORTIC COARCTATION IN INFANTS: A COMPARISON OF CLINICAL OUTCOMES THROUGH A SYSTEMATIC REVIEW.

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Introdução/Fundamentos: Native aortic coarctation (CoA) is a congenital cardiovascular malformation defined by a stenosis of the descending thoracic aorta, being one of the most severe heart diseases in the neonatal period and in infants. The main therapeutic options include surgical correction or balloon angioplasty. However, the preferred modality in this age group remains controversial in the literature, with no first-line treatment choice. Objetivos: To compare the clinical outcomes of surgical approach and balloon angioplasty in the treatment of native CoA in patients under 1 year old. Métodos: A systematic review of studies published between 2016 and 2026 in the PubMed, Scopus, and BVS databases was conducted, using DeCS/MeSH descriptors according to PRISMA guidelines. Comparative studies of patients under 1 year old with native CoA who underwent surgery or balloon angioplasty were included. The primary evaluation was for reintervention and secondarily for mortality, length of stay, and complications. The risk of bias was assessed using the Newcastle-Ottawa scale. Due to the clinical and methodological heterogeneity of the studies, a meta-analysis was not conducted. Resultados e Conclusões: Three studies were included, totaling 299 patients. Heterogeneity was observed between the groups, with a predominance of critical neonates in the subgroup undergoing angioplasty, which was predominantly employed as a palliative strategy. The mortality was low in both groups, with no statistically significant difference. Regarding the outcomes, a significantly higher reintervention rate ($p<0.01$) was observed in angioplasty in one study, while surgery showed a higher event-free survival rate in another ($p=0.028$). On the other hand, in another article, angioplasty was associated with a shorter hospital stay (mean=6.7 days; $p<0.05$), a lower need for intensive post-procedure support, and a lower incidence of systemic complications, predominantly restricted to minor vascular events. In this field, data suggest that surgery may be associated with greater durability of results, while angioplasty showed lower immediate morbidity and faster clinical recovery. However, the heterogeneity between the groups limits comparability and may overestimate the reintervention rate associated with angioplasty. The scarcity of controlled prospective studies and randomized trials reflects clinical challenges and reinforces the need for individualized management, especially in critical neonates.



19038

THE EFFECTIVENESS OF IVABRADINE USE IN THE MANAGEMENT OF PEDIATRIC TACHYARRHYTHMIAS.

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Introdução/Fundamentos: Tachyarrhythmias are cardiac rhythm disorders that are difficult to manage clinically, especially in the pediatric population, since current therapies have limited effectiveness. In this context, the use of Ivabradine stands out, as it selectively inhibits the “funny” current. Thus, it is pertinent to investigate its application in this scenario, given that its use as a potential alternative or in association with conventional therapies has not yet been consolidated. Objetivos: To evaluate the effectiveness of Ivabradine in the management of pediatric tachyarrhythmias. Métodos: Systematic review conducted with articles from the PubMed and Virtual Health Library databases, obtained using the search strategy (pediatrics OR child) AND (arrhythmias OR tachyarrhythmia) AND ivabradine, totaling 50 articles. Texts in English, Portuguese, and Spanish, published between 2016 and 2026, were included. Duplicate articles, reviews or meta-analyses, incomplete and/or paid articles were excluded. After full reading, studies that did not correspond to the research proposal were excluded. Resultados e Conclusões: After applying the criteria, 14 studies were included, with a total of 246 patients evaluated. Among the selected studies, Ivabradine was analyzed regarding heart rate (HR) control, reversion to sinus rhythm, improvement of hemodynamic parameters and ventricular function, as well as its safety in pediatric patients with supraventricular tachyarrhythmias and junctional ectopic tachycardia. It demonstrated similar results to amiodarone in the reversion of sinus rhythm, with a mean difference in treatment effect of 2.3% (95% confidence interval: -6.7% to 11.5%), showing therapeutic success and significant efficacy in cases refractory to conventional interventions, both in monotherapy and combination therapy. A reduction in heart rate, improved cardiac output, tissue perfusion, and ventricular function were observed, including recovery of ejection fraction in cases of tachycardia-induced cardiomyopathy. The main adverse effect was bradycardia, which is manageable with dose adjustment. Furthermore, it was highlighted that its early use was associated with better clinical outcomes, less need for invasive therapies, and more effective control of arrhythmias Therefore, it is concluded that Ivabradine shows promising results in restoring sinus rhythm in children, especially in difficult-to-manage cases, being an alternative to traditional antiarrhythmics.

16413

THE USE OF SGLT2 INHIBITORS IN PEDIATRIC PATIENTS WITH HEART FAILURE: A SINGLE-ARM META-ANALYSIS

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Introdução/Fundamentos: Sodium-glucose cotransporter-2 inhibitors (SGLT2i), such as dapagliflozin and empagliflozin, have demonstrated significant clinical efficacy in adult cohorts with heart failure (HF). Although emerging evidence suggests that SGLT2i maintain a favorable safety and tolerability profile in younger patients, primary research evaluating their efficacy in pediatric HF is currently limited. Objetivos: This study aims to provide pooled estimates of clinical outcomes in pediatric HF patients following SGLT2i administration. Métodos: We conducted a systematic review and single-arm meta-analysis of observational and randomized clinical trial (RCT) data in accordance with PRISMA guidelines. PubMed, Embase and Cochrane databases were searched for studies that described the use of dapagliflozin or empagliflozin in pediatric patients with HF and reported the outcomes of (1) left ventricular ejection fraction (LVEF); (2) estimated glomerular filtration rate (eGFR); and (3) NT-proBNP levels. Heterogeneity was examined with I² statistics. Statistical synthesis was performed using a random-effects model with raw means as the summary measure. All analyses were conducted using R software (version 2026.1.2.418). Resultados e Conclusões: Five studies involving 411 pediatric patients were included. Across the cohorts, the mean age ranged from 4.09 to 14.73 years, and dilated cardiomyopathy was the predominant etiology of HF. At baseline, the mean LVEF ranged from 25.74% to 38.92%, eGFR from 80.53 to 116.66 mL/min/1.73 m², and NT-proBNP levels from 2476.71 to 2911.90 pg/mL. Following SGLT2i administration, the pooled mean LVEF was 41.90% (95% CI: 38.13–45.67%; I² = 51.8%), and the pooled mean NT-proBNP level was 777.66 pg/mL (95% CI: 469.57–1085.75; I² = 36%). The pooled mean eGFR was 95.96 mL/min/1.73 m² (95% CI: 79.13–112.80), though substantial heterogeneity was noted across the studies (I² = 95.1%). Notably, post-treatment values showed higher LVEF and lower NT-proBNP levels compared to baseline. While the pooled eGFR suggests well-preserved renal function, the high heterogeneity in this outcome warrants a cautious interpretation of the renal data. Despite these encouraging observations, the single-arm design and lack of a control group preclude definitive conclusions regarding the direct therapeutic impact of SGLT2i. Further RCTs are essential to establish conclusive evidence regarding the therapeutic role of SGLT2i in pediatric heart failure management.

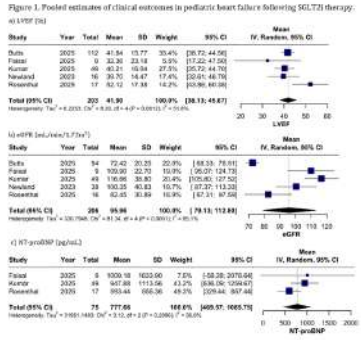


Table 1. Baseline characteristics of included studies

Study	Design	Location	Sample Size	Follow-up, mean ± SD (days)	Male, n (%)	Age, mean ± SD (years)	Weight, mean ± SD (kg)	Height, mean ± SD (cm)	iSGLT2
Butts 2025	non-RCT	USA	270	247.60 ± 269.04 (n = 189)	188 (64.7)	14.73 ± 5.59	58.17 ± 39.19	143.91 ± 34.28	Dapagliflozin or Empagliflozin
Faisal 2025	RCT	India	9	180*	N/A	4.09 ± 4.08	12.38 ± 6.43	93.83 ± 25.37	Dapagliflozin
Kumar 2025	non-RCT	India	49	247.77 ± 166.50	28 (57)	10.64 ± 6.87	29.82 ± 18.71	143.56 ± 25.74	Dapagliflozin
Newland 2023	non-RCT	USA	30	182.56 ± 197.23	19 (50)	11.95 ± 8.70	44.10 ± 45.15	136.02 ± 48.54	Dapagliflozin
Rosenthal 2025	non-RCT	Germany	37	189 (181, 596)**	19 (51.3)	8.92 ± 3.97	29.81 ± 28.30	N/A	Dapagliflozin

*as reported in the Methods section of the study
** median (Q1, Q3), as reported in the study

18355

TIMING OF EXTRACORPOREAL MEMBRANE OXYGENATION INITIATION AFTER CONGENITAL HEART SURGERY IN CHILDREN: A SYSTEMATIC REVIEW OF CARDIAC OUTCOMES

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Introdução/Fundamentos: Survival after pediatric cardiac surgery has significantly improved, yet high-risk patients often face refractory low cardiac output syndrome (LCOS) or cardiac arrest. Extracorporeal membrane oxygenation (ECMO) provides cardiorespiratory support for those failing to wean from cardiopulmonary bypass or experiencing cardiovascular collapse. Despite being life-saving, postoperative ECMO requirement is a strong independent risk factor for early mortality. Objetivos: To systematically review evidence regarding the timing of ECMO initiation post-congenital heart surgery and its correlation with cardiac outcomes and survival. Métodos: This systematic review was conducted in accordance with the PRISMA guidelines. A structured search was performed in PubMed and Scopus in April 2026, including studies published between 2020 and 2026. The search strategy combined controlled vocabulary terms (Descriptors in Health Sciences - DeCS), such as “Extracorporeal Membrane Oxygenation”, “congenital heart disease”, “pediatric”, “timing” and “cardiac outcomes”, with free-text keywords, using Boolean operators. Studies were independently selected based on predefined eligibility criteria. Study selection and data extraction were independently performed by two reviewers. A total of 68 records were identified, of which 13 were included in the final analysis. Resultados e Conclusões: Conclusão: Results: Included studies showed that early ECMO initiation, frequently within 5 hours post-surgery, is associated with survival benefits when perfusion markers like pH and serum lactate improve rapidly. Hospital survival varied between 30% and 58.3%. Specific strategies, such as shunt occlusion or PDA ligation, were vital to prevent systemic underperfusion. In complex cases like the Norwood procedure, delayed initiation or prolonged support was linked to higher mortality and neurological morbidity. Conclusion: Timing of ECMO initiation is a pivotal determinant of recovery. While early support serves as a “beacon of hope,” the need for ECMO remains a potent predictor of mortality. Standardized protocols focusing on early triggers are essential to optimize functional outcomes.

20689

WINDOW IN TETRALOGY OF FALLOT REPAIR IN BRAZIL: A REAL-WORLD EVIDENCE ANALYSIS (2008–2025)

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Introdução/Fundamentos: Background: Timely surgical repair of Tetralogy of Fallot (ToF) is the primary determinant of long-term survival and reduced morbidity. However, structural inequities within the Brazilian Public Health System (SUS) may impose critical therapeutic delays. Given the scarcity of contemporary population-based data, this study evaluates the impact of macro-regional disparities on surgical timing and hospital lethality nationwide. Objetivos: Objectives: To analyze the correlation between regional inequities, age at intervention, and hospital lethality rates for total ToF repair in Brazil between 2008 and 2025. Métodos: Methods: A population-based, analytical, ecological study was conducted using data from the Hospital Information System (SIH/SUS). All hospitalizations for total ToF repair during the period were included. Surgical timing was stratified into: early (0–3 years) and late (>= 4 years). Comparative analysis cross-referenced age stratification with the macro-region of residence and lethality rates, employing the latter as a metric for healthcare resolutivity. Resultados e Conclusões: Results: Among the 6,058 procedures identified, 77.1% (n=4,671) were performed early and 22.9% (n=1,387) were late interventions. Surgical volume was concentrated in the Southeast (41.3%) and Northeast (27.3%). A profound asymmetry in the therapeutic window was evidenced: the Northeast presented the highest prevalence of late repairs (30.1%), followed by the North (24.2%) and Center-West (23.9%) regions, while the South recorded the lowest rate (13.3%). The national mean hospital lethality was 10.02%. The Center-West recorded the highest mortality (18.56%), a rate 2.3 times higher than the Southeast (7.87%), which showed the best institutional performance. Conclusions: This real-world evidence analysis exposes critical gaps in the pediatric cardiology line of care. The high prevalence of late interventions in the Northeast and the alarming lethality in the Center-West reflect structural failures in screening and referral flows. Although the administrative nature of the data limits adjustment by clinical risk scores (such as RACHS-1), the interregional mortality discrepancy confirms the urgent need for decentralization policies and technological support to ensure timely surgical treatment and reduce preventable deaths.

Digital Health / Innovation / Artificial Intelligence



81º CONGRESSO BRASILEIRO DE CARDIOLOGIA together with WORLD CONGRESS OF CARDIOLOGY





19258

ARTIFICIAL INTELLIGENCE-ENABLED ELECTROCARDIOGRAPHY FOR THE PREDICTION OF MALIGNANT VENTRICULAR ARRHYTHMIAS AND SUDDEN CARDIAC DEATH

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Introdução/Fundamentos: Malignant ventricular arrhythmias (MVAs) and sudden cardiac death (SCD) remain leading causes of global mortality. Conventional electrocardiography (ECG) has limited sensitivity for early risk stratification. Artificial intelligence (AI)-enabled ECG has emerged as a promising tool for identifying high-risk individuals. We aimed to systematically evaluate the diagnostic accuracy of AI-based ECG models for predicting MVAs and/or SCD. Objetivos: To synthesize the diagnostic accuracy of artificial intelligence (AI)-enabled electrocardiography (ECG) for the prediction and early detection of malignant ventricular arrhythmias (MVAs) and sudden cardiac death (SCD). Métodos: This systematic review and meta-analysis followed PRISMA-DTA guidelines. PubMed, Embase, and Web of Science were searched through January 2026 for studies evaluating AI algorithms applied to 12-lead or wearable ECGs for prediction of MVAs and/or SCD. Study quality was assessed using QUADAS-2. Pooled sensitivity, specificity, likelihood ratios, and diagnostic odds ratio (DOR) were calculated using bivariate random-effects models. Heterogeneity was assessed using I^2, with subgroup analyses by ECG modality. Resultados e Conclusões: Fifteen studies (12,500 patients; 2,100 events) were included. Pooled sensitivity was 0.88 (95% CI: 0.85–0.91) and specificity 0.82 (95% CI: 0.79–0.85). The area under the curve was 0.91 (95% CI: 0.89–0.93). The DOR was 35.0 (95% CI: 28.5–43.0). Substantial heterogeneity was observed (I^2 > 75%). Higher accuracy was found in 12-lead ECG studies. AI-enabled ECG shows promising diagnostic performance for predicting malignant ventricular arrhythmias and sudden cardiac death. However, heterogeneity and potential overfitting require caution, and prospective external validation is needed before clinical implementation.

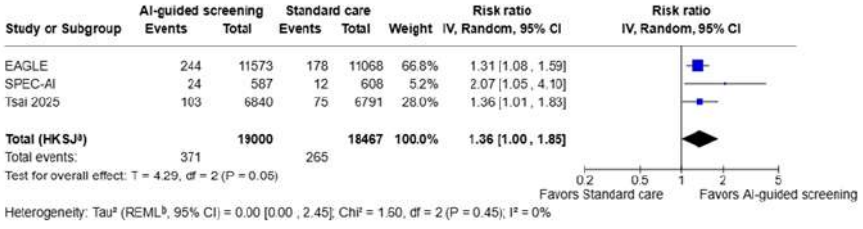
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AI-GUIDED CARDIAC SIGNAL SCREENING INCREASES DETECTION OF PREVIOUSLY UNDIAGNOSED LEFT VENTRICULAR SYSTOLIC DYSFUNCTION: A META-ANALYSIS OF RANDOMIZED TRIALS

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Introdução/Fundamentos: Left ventricular systolic dysfunction (LVSD) frequently remains underdiagnosed until advanced stages of disease and is associated with substantial morbidity and mortality. Artificial intelligence (AI)-guided analysis of cardiac signals, including electrocardiography and digital auscultation, has emerged as a scalable strategy for earlier identification of previously unrecognized LVSD in real-world clinical settings. However, randomized evidence evaluating its clinical implementation remains limited. Objetivos: To evaluate the effect of AI-guided cardiac signal screening strategies on the detection of newly diagnosed LVSD compared with standard care through a systematic review and meta-analysis of randomized controlled trials. Métodos: Following PRISMA guidelines, we performed a systematic review and meta-analysis of randomized controlled trials identified through PubMed, Embase, and Cochrane CENTRAL comparing AI-guided cardiac signal screening strategies with standard care for the detection of previously undiagnosed LVSD. Eligible studies included adult patients without prior heart failure or LVSD and evaluated AI-based analysis of cardiac signals, including 12-lead electrocardiography and digital stethoscope platforms. The primary outcome was newly diagnosed LVSD during study follow-up. Pooled risk ratios (RRs) and 95% confidence intervals (CIs) were estimated using a random-effects model with restricted maximum likelihood estimation and Hartung-Knapp adjustment. Statistical heterogeneity was assessed using the I^2 statistic. Resultados e Conclusões: Three randomized controlled trials comprising 37,467 participants were included. AI-guided cardiac signal screening was associated with a higher likelihood of newly diagnosed LVSD compared with standard care (RR 1.36, 95% CI 1.00–1.85; I^2 = 0%). The direction of effect consistently favored AI-guided screening across studies despite differences in clinical settings and screening modalities. These findings suggest that AI-guided cardiac signal analysis may improve identification of previously unrecognized LVSD in real-world practice. Larger randomized trials are warranted to confirm these findings and determine their impact on downstream clinical outcomes.



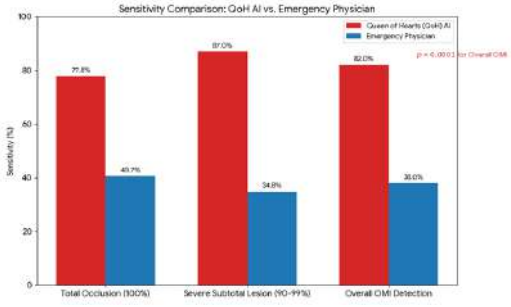
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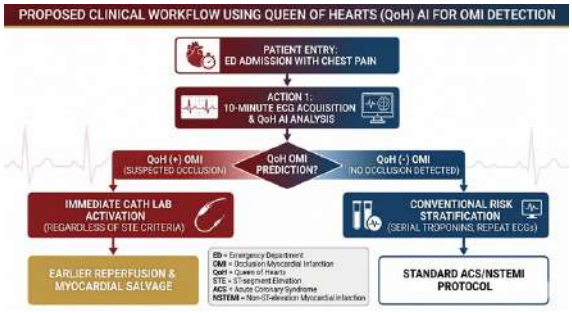
ANGIOGRAPHIC VALIDATION OF THE QUEEN OF HEARTS AI FOR DETECTION OF OCCLUSION MYOCARDIAL INFARCTION

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Introdução/Fundamentos: The traditional STEMI/NSTEMI framework has important limitations, failing to identify a substantial proportion of acute coronary occlusions at presentation. The Occlusion Myocardial Infarction (OMI) paradigm has emerged to address this gap by emphasizing electrocardiographic (ECG) features associated with acute coronary occlusion. The Queen of Hearts (QoH) is an artificial intelligence tool designed to detect subtle ECG patterns suggestive of OMI, potentially improving early diagnosis. Objetivos: To evaluate the diagnostic performance of QoH in identifying OMI in a cohort of emergency department patients, using coronary angiography as the reference standard. Métodos: This cross-sectional study included 100 patients presenting with suspected non-ST-segment elevation acute coronary syndrome (NSTEMI) and referred for an invasive strategy. Admission ECGs were analyzed using QoH and compared with the interpretation of attending physicians, both blinded to angiographic results. OMI was defined as angiographic evidence of acute coronary occlusion (TIMI 0–2 flow) or high-grade culprit lesions (≥ 90%) consistent with an occlusive mechanism. Resultados e Conclusões: The prevalence of OMI was 50% in this cohort. QoH demonstrated significantly higher sensitivity compared with physician interpretation (82.0% vs. 38.0%; p < 0.0001). Among patients with total occlusion (n=27), sensitivity was 77.8% for QoH and 40.7% for physicians. In severe subtotal lesions (90–99%; n=23), QoH sensitivity was 87.0% versus 34.8%. Specificity was lower for QoH (9.8%) compared with physicians (84.3%), reflecting a high-sensitivity detection profile optimized for emergency screening. Mean admission troponin I was 5.85 ng/mL in the OMI group. In this cohort, QoH significantly improved the sensitivity for detecting angiographically confirmed coronary occlusions compared with standard ECG interpretation. While associated with reduced specificity, this high-sensitivity profile is valuable in the emergency setting for identifying patients at risk of missed occlusion who require immediate reperfusion. These findings support the potential role of AI-assisted ECG interpretation as a vital complementary tool in the evaluation of suspected acute coronary syndromes.



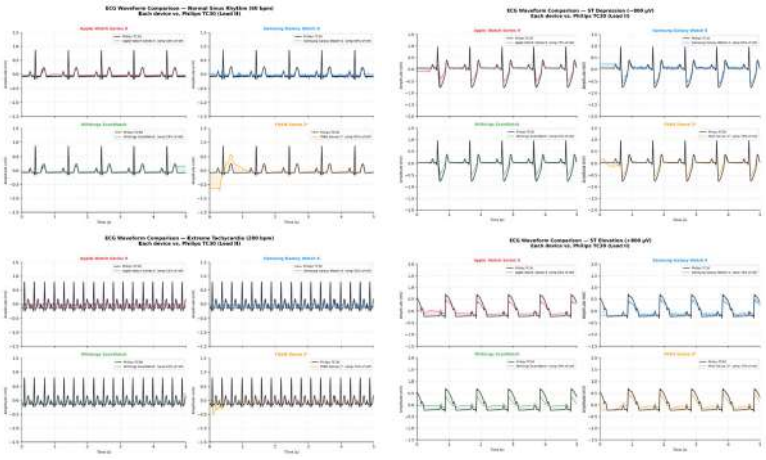


15425

ARRHYTHMIA AND CARDIAC ISCHEMIA DETECTION ACCURACY WITH ECG-CAPABLE SMARTWATCHES: COMPARATIVE STUDY

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(1) UNICEPLAC - BRASILIA - DF - BRASIL; (2) UNIVERSIDADE FEDERAL DE MATO GROSSO DO SUL - CAMPO GRANDE - MS - BRASIL;



Introdução/Fundamentos: Electrocardiogram (ECG) capable smartwatches arose as promising tools in arrhythmia detection. Systematic reviews report high sensitivity and specificity of such gadgets for detecting arrhythmias such as atrial fibrillation. However, their reliability in emergency situations remains poorly documented in literature. Objetivos: To evaluate the diagnostic accuracy of four smartwatches against a Philips TC30 reference ECG standard for detecting varied signals, including reduced R-wave amplitude, broad heart rate (HR) ranges, and ST-segment deviations. Métodos: Captured signals from each device and the reference were loaded and followed an uniform pipeline: noise removal and standardization to a 10-second timeframe. Data was sourced from the PhysioNet ECG Smartwatch Validation Database, using signals injected by a METRON PS-440 patient simulator; acquisition complied with IEC 60601-2-25:2011 standards for electrocardiographic device accuracy and calibration. As this study utilized non-human cardiac simulated signals, institutional review board approval was not required. The following metrics were computed: (1) HR; (2) R-wave amplitude in µV; (3) ST-segment deviation; and (4) waveform root mean square error (RMSE) in mV. For each test condition, five independent replicates were analyzed. HR and ST-segment errors were calculated relative to the TC30 measurements. Resultados e Conclusões: Out of 720 wearable ECG records, 719 were successfully processed and included in the analysis. Apple Watch Series 9 demonstrated optimal balance (HR error 16.2%; ST 27.6%). Samsung Galaxy Watch 6 excelled in tachycardia (99.9%) but degraded in bradycardia (72.3%), yielding mean HR/ST errors of 20.9%/17.1%. Conversely, Withings ScanWatch exhibited lowest waveform RMSE yet critical ST detection failure (57.5%) and high HR error (46.2%). Fitbit Sense 2 recorded highest errors (HR 49.5%; ST 69.9%), though data inconsistencies limited definitive assessment. Smartwatches exhibit variable accuracy. The Apple Watch Series 9 demonstrated superior overall reliability, while the Samsung Galaxy Watch 6 excelled in tachyarrhythmia detection. Notably, the Withings ScanWatch failed to detect ischemic ST-segment deviations despite the lowest waveform RMSE. Ultimately, no device matched hospital-grade 12-lead ECG accuracy. Thus, smartwatches should remain adjunctive screening tools, requiring confirmatory standard ECG for suspected ischemia or significant arrhythmias.

19228

ARTIFICIAL INTELLIGENCE AND ELECTROCARDIOGRAM: A SYSTEMATIC REVIEW AND META-ANALYSIS OF THE PREDICTIVE CAPACITY FOR HEART FAILURE

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(1) UNIVERSIDADE FEDERAL DE SERGIPE - ARACAJU - SE - BRASIL; (2) UNIVERSIDADE TIRADENTES (UNIT) - ARACAJU - SE - BRASIL;

Introdução/Fundamentos: Heart failure (HF) affects over 64 million people globally, causing high mortality and economic burden on healthcare systems. Early identification of high-risk individuals improves life expectancy and effectively changes disease trajectory. Traditional predictive strategies, based on clinical scores and invasive biomarkers, face major implementation challenges and high costs in resource-limited settings. Artificial intelligence-enabled electrocardiogram (AI-ECG) analysis offers a promising non-invasive and cost-effective alternative. Objetivos: This systematic reviews and meta-analysis aims to evaluate the performance of AI-ECG models in predicting HF by analyzing their discriminatory capability. Métodos: A systematic review was conducted by searching Pubmed/Medline, Scopus, Embase, Cochrane, IEEE Xplore and Scielo databases using DeCS/MeSH validated descriptors: Heart Failure; Electrocardiogram; Prediction; Artificial Intelligence. The review followed the PRISMA guidelines, and 11 retrospective cohort studies were selected (Figure 1). Duplicates were excluded. Exclusion criteria included: papers with objectives divergent from predicting HF, specific subgroups, such as patients with atrial fibrillation, wrong publication type (conference abstracts, systematic reviews and letters). Resultados e Conclusões: The sample totaled 883,002 participants, with a mean age ranging from 54.1 to 62.2 years, women accounted for approximately 43% of the total population. The artificial intelligence architectures evaluated comprised Convolutional Neural Networks (CNN), Graph Convolutional Networks (GCNs), and hybrid models (including integrations with Gradient Boosting). Global random-effects meta-analysis showed robust performance in event prediction, with a pooled Area Under the Curve (AUC) of 0.85 [95% CI: 0.81–0.90; I² = 100%; p < 0.0001]. Subgroup analysis revealed a statistically significant difference between model architectures (p < 0.0001). The AUC was 0.84 (95% CI: 0.79–0.88) for CNN models, 0.86 (95% CI: 0.86–0.86) for ECG2HF, and 0.83 (95% CI: 0.70–0.95) for hybrid models. The AI-ECG analysis exhibits high discriminatory accuracy in predicting HF, establishing themselves as promising, cost-effective tools for large-scale population screening, with Convolutional Neural Networks (CNN) demonstrating superior results. Despite high heterogeneity, findings suggest AI-ECG integration in practice may optimize earlier interventions.

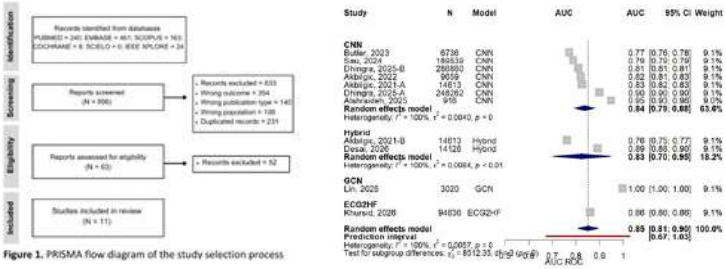


Figure 1. PRISMA flow diagram of the study selection process.

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ARTIFICIAL INTELLIGENCE FOR PREDICTING CLINICAL OUTCOMES IN HEART FAILURE: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Heart failure (HF) is a leading cause of hospitalization and mortality worldwide. Artificial intelligence (AI) and machine learning (ML) may improve outcome prediction in HF, but heterogeneity in algorithms, populations, and outcome definitions limits quantitative synthesis. Objetivos: To systematically review AI and ML models for predicting mortality and hospital readmission in adults with HF, synthesizing evidence on model types, performance, predictors, validation, and methodological quality. Métodos: We conducted a PRISMA 2020-compliant systematic review of MEDLINE, Embase, CENTRAL, Web of Science, and IEEE Xplore from January 2018 to March 2026, without language restrictions. Eligible studies developed or validated AI/ML models for mortality and/or readmission in adults with HF and reported quantitative performance metrics. Two reviewers independently screened studies, extracted data, and assessed risk of bias with PROBAST. Owing to heterogeneity in ML algorithms, heart failure populations, outcome definitions, and reported performance metrics, findings were synthesized narratively. Resultados e Conclusões: Of 3,847 records, 64 studies including 943,941 patients from 18 countries were analyzed. Most used retrospective electronic health record cohorts, and only 17% performed external validation. Ensemble methods, especially Random Forest and XGBoost, were most common, whereas deep learning was less frequent. Mortality prediction showed moderate-to-good discrimination, with AUCs of 0.71-0.91 across time horizons; readmission prediction was lower and more variable, with AUCs of 0.60-0.81. Multimodal models outperformed single-source approaches. Important predictors included age, left ventricular ejection fraction, creatinine, natriuretic peptides, sodium, hemoglobin, systolic blood pressure, functional class, and comorbidity burden. Compared with traditional risk scores, ML models usually showed better discrimination. 78% of studies had high risk of bias in at least one PROBAST domain, mainly because of limited external validation, inadequate handling of missing data, poor calibration reporting, and overfitting concerns. Overall, AI-driven prediction in HF is promising, particularly for mortality risk stratification, but clinical translation remains limited by heterogeneity, restricted generalizability, and methodological weaknesses. Future research should prioritize external and prospective validation, standardized outcomes and reporting, fairness assessment, and evaluation of clinical utility.

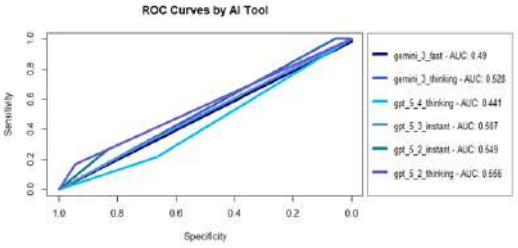
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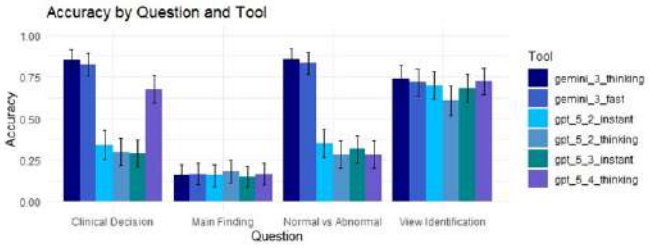
ARTIFICIAL INTELLIGENCE USE IN ECHOCARDIOGRAPHIC EVALUATION: A COMPARATIVE STUDY

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Introdução/Fundamentos: General-purpose artificial intelligence (AI) models are increasingly used in routine daily activities, including health-related decision support. However, their reliability for echocardiographic interpretation remains uncertain. Objetivos: To evaluate diagnostic agreement between AI-generated and medical reports in echocardiography. Métodos: This retrospective comparative study evaluated six general-purpose AI models for echocardiographic interpretation: ChatGPT 5.2 Instant, ChatGPT 5.2 Thinking (GPT5.2t), ChatGPT 5.3 Instant, ChatGPT 5.4 Thinking, Gemini 3 Fast (G3f), and Gemini 3 Thinking (G3t). 120 echocardiograms were independently analyzed twice by each model and compared with the corresponding medical reports used as the reference standard with minor adaptations. Analyses evaluated four domains: normal versus abnormal classification, view identification, main finding recognition, and need for additional medical support. Diagnostic performance metrics included accuracy, sensitivity, specificity, positive predictive value, and negative predictive value. Cohen's Kappa was used to assess reproducibility between repeated analyses, and Generalized Estimating Equations (GEE) were used to compare model performance while accounting for repeated analyses. Resultados e Conclusões: Analysis of 120 echocardiograms yielded 1,440 interpretations. G3t achieved the highest diagnostic accuracy (85.8%), followed by G3f (83.3%), both with high sensitivity (100.0% and 98.0%, respectively). GPT models showed lower accuracies (28.3%-35.0%). GPT5.2t demonstrated the highest specificity among GPT models (94.4%). In GEE analysis, all GPT models showed significantly lower odds of correct interpretation compared with G3t (OR 0.060–0.097; 95% CI 0.028–0.196; all p<0.001). G3f showed similar performance to G3t (OR 0.938; 95% CI 0.859–1.024; p=0.153). Subxiphoid views were associated with lower diagnostic performance (OR 0.631; 95% CI 0.411–0.969; p=0.035). Reproducibility was highest for G3f (κ=0.937; p<0.001) and G3t (κ=0.935; p<0.001), whereas GPT models demonstrated lower agreement (κ=0.429–0.628). General-purpose AI models demonstrated variable performance in echocardiographic interpretation. Gemini models achieved higher diagnostic agreement and reproducibility, whereas GPT models showed limited reliability, particularly in complex interpretative tasks. These findings highlight important limitations of current general-purpose AI systems for advanced cardiac imaging interpretation.





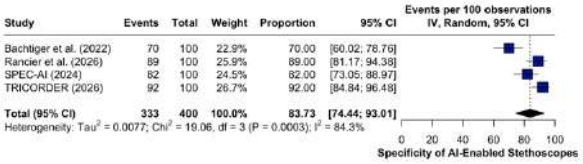
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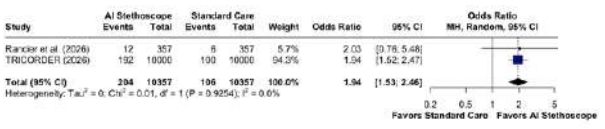
ARTIFICIAL INTELLIGENCE-ENABLED DIGITAL STETHOSCOPES FOR POINT-OF-CARE DETECTION OF STRUCTURAL HEART DISEASE: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Structural heart diseases (SHD) are frequently underdiagnosed in primary care due to the low sensitivity of standard human auscultation. Artificial intelligence (AI)-enabled digital stethoscopes offer a novel point-of-care screening solution, improving the early detection of reduced ejection fraction and valvular diseases. This meta-analysis evaluates the diagnostic accuracy and clinical efficacy of AI-augmented auscultation versus standard clinical care. Objetivos: To evaluate the diagnostic accuracy and clinical efficacy of AI-enabled digital stethoscopes compared with standard clinical auscultation for the point-of-care detection of SHD (specifically reduced ejection fraction and moderate-to-severe valvular heart disease) in adults. Métodos: A systematic review and meta-analysis was conducted, searching PubMed and Embase for studies up to March 2026. Trials evaluating adults undergoing routine cardiovascular screening or triage were included. The intervention involved point-of-care AI-enabled digital stethoscopes compared with standard acoustic auscultation. Clinical outcomes included prospective SHD detection rates and predictive performance. Analyses used the meta package in R. DerSimonian-Laird random-effects models pooled diagnostic accuracy (Sensitivity, Specificity, and Negative Predictive Value), and the Mantel-Haenszel method calculated Odds Ratios (ORs) with 95% confidence intervals to evaluate comparative detection efficacy. Resultados e Conclusões: Four studies comprising 1,555,777 patients were included. AI-enabled digital stethoscopes significantly increased the probability of detecting SHD compared with standard clinical auscultation. The intervention demonstrated superior diagnostic efficacy, with a pooled Odds Ratio of 1.94 (95% CI: 1.53 – 2.46; I^2=0%), evidencing nearly twice the chance of prospective disease identification. Pooled predictive performance yielded a sensitivity of 65.24% (95% CI: 36.01–94.47%) and specificity of 83.73% (95% CI: 74.44–93.01%). The technology demonstrated an exceptional pooled Negative Predictive Value (NPV) of 97.86% (95% CI: 94.88–100.00%). In conclusion, AI-augmented auscultation significantly outperforms the conventional standard of care in ambulatory screening. Its consistently high NPV consolidates it as a reliable point-of-care rule-out tool, capable of optimizing referral pathways and reducing the echocardiography burden on healthcare systems.





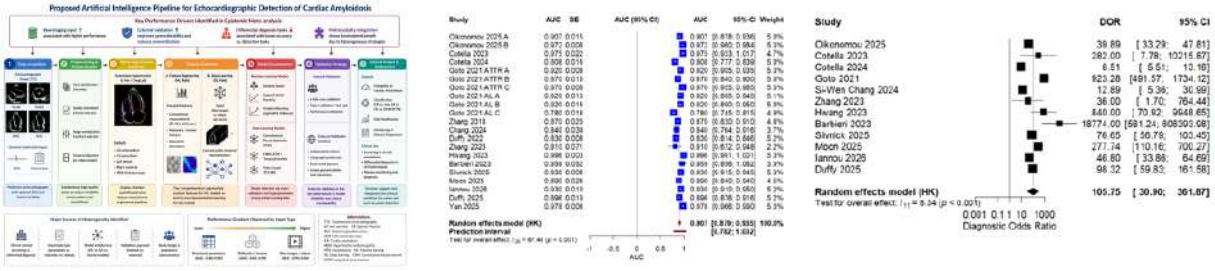
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ARTIFICIAL INTELLIGENCE–ENHANCED ECHOCARDIOGRAPHY FOR THE DETECTION OF CARDIAC AMYLOIDOSIS: A SYSTEMATIC REVIEW, DIAGNOSTIC META-ANALYSIS, AND EPISTEMIC SYNTHESIS

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Introdução/Fundamentos: Cardiac amyloidosis (CA) is an infiltrative cardiomyopathy caused by a deficiency of misfolded amyloid proteins in the myocardium, resulting in diastolic dysfunction, arrhythmias, and heart failure. While AI-enhanced echocardiography offers transformative potential for early detection, the existing literature is characterized by significant methodological heterogeneity and fragmented evidence. Objetivos: To perform a systematic review and diagnostic meta-analysis evaluating AI-enhanced echocardiography performance in CA detection, and an epistemic synthesis to characterize methodological patterns and propose a standardized framework for robust model development. Métodos: A systematic review and meta-analysis were conducted following PRISMA guidelines. PubMed, Web of Science, and Embase were searched (Feb/2026) for AI models in echocardiographic CA detection. Meta-analysis was performed in R using a general inverse variance random-effects model to pool AUC (area under the receiver operating characteristic curve) , sensitivity, specificity, and DOR (diagnostic odds ratio) with 95% CIs. Prespecified subgroup analyses included clinical context, AI architecture, and amyloid subtype. An integrative epistemic meta-analysis characterized methodological patterns across predefined domains—clinical intent, input data (radiomics vs. raw images), and validation strategies (internal vs. external)—to identify drivers of performance beyond quantitative synthesis. Resultados e Conclusões: A total of 15 studies (2018–2026) were included in the final synthesis. AI-enhanced models demonstrated high overall diagnostic accuracy for CA with a pooled AUC of 0.907 (95% CI 0.879–0.935) and a DOR of 105.75. Subgroup analyses revealed superior performance in screening/detection scenarios (AUC 0.978) compared to differential diagnosis (AUC 0.882). No significant differences were found between deep learning (AUC 0.914) and machine learning (AUC 0.901, p=0.65), or between echocardiography-only and multimodal models (p=0.50). Epistemic analysis showed that performance was primarily driven by input data representation: deep learning models using raw images/videos consistently outperformed those based on structured parameters (AUC 0.90 vs. 0.80–0.85). External validation emerged as a critical but inconsistently applied factor for generalizability. AI models for echocardiography show excellent performance for CA. Standardization and prospective validation are necessary for their integration into clinical practice.



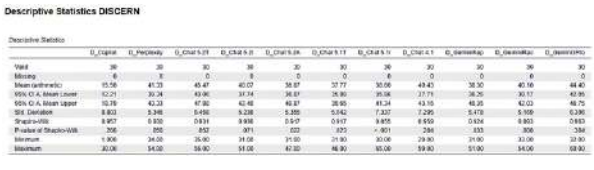
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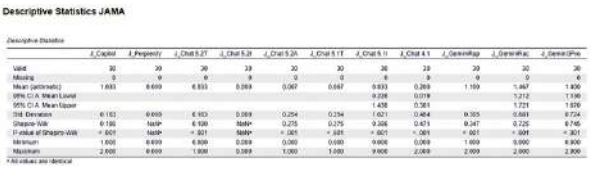
ASSESSING THE RELIABILITY OF ARTIFICIAL INTELLIGENCE GENERATED INFORMATION ON HEART FAILURE: A COMPARATIVE STUDY USING DISCERN, JAMA, AND READABILITY METRICS

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Introdução/Fundamentos: Heart Failure (HF) is a prevalent condition associated with high morbidity and mortality, requiring accurate and accessible patient education. Artificial Intelligence Models (AIMs) are increasingly used as sources of health information; however, concerns remain regarding the quality, transparency, and readability of their outputs. Evaluating these aspects is essential to determine their reliability for disseminating HF information. Objetivos: To compare the quality, transparency, and readability of HF related information generated by AIMs. Métodos: This observational cross-sectional study evaluated responses from 11 free AIMs (ChatGPT 5.1T, ChatGPT 5.1I, ChatGPT 5.2T, ChatGPT 5.2I, ChatGPT 5.2A, ChatGPT 4.1, Gemini 3 Pro, Gemini Rapid, Gemini Reasoning, Perplexity, and Copilot) to 30 HF related questions. Quality, transparency, and readability were assessed using the DISCERN instrument, JAMA criteria, and ALT software, respectively. Two blinded reviewers performed the evaluations, with inter-rater reliability assessed by ICC. Descriptive statistics, repeated-measures ANOVA (ω^2), Friedman test (Kendall's W), post hoc pairwise comparisons, and Spearman's correlation (ρ) were applied, with $p < 0.05$ considered statistically significant. The questions were adapted from a previously published study. Resultados e Conclusões: A total of 330 responses were analyzed. ChatGPT 5.2T achieved the highest DISCERN mean score, 45.47 (± 6.46), followed by Gemini 3 Pro, 44.40 (± 6.31), and Perplexity, 41.33 (± 5.35), while Copilot showed the lowest performance, 15.50 (± 8.80). Differences among AIMs were significant (repeated-measures ANOVA and Friedman test, $p < 0.001$; Kendall's W = 0.60). For the JAMA criteria, the highest scores were observed for Gemini 3 Pro, 1.30 (± 0.47), and ChatGPT 5.2T, 1.27 (± 0.45), while Copilot presented the lowest value, 1.10 (± 0.31) ($p < 0.001$). ALT readability scores were similar across AIMs, ranging from 23.50 (± 3.88) for Copilot to 24.20 (± 4.10) for Gemini 3 Pro, with no significant differences ($p > 0.05$). Significant positive correlations between DISCERN and readability were identified, with Spearman's ρ ranging from 0.51 to 0.60 (all $p < 0.001$). AIMs showed significant variability in the quality of HF related information, with low adherence to transparency criteria and similar readability across systems. These findings underscore the need for cautious use of AI in disseminating information.





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DEVELOPMENT AND EVALUATION OF A MACHINE LEARNING MODEL FOR CLASSIFICATION OF THE EVOLUTIONARY STAGES OF CHRONIC CHAGAS DISEASE

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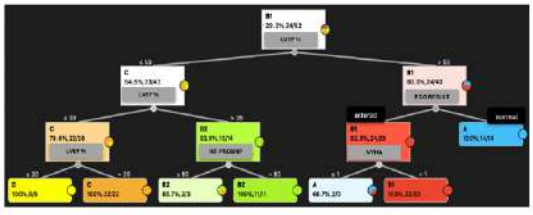
Introdução/Fundamentos: Chronic Chagasic cardiomyopathy (CCC), resulting from Chagas disease (CD), develops in approximately 30% to 40% of infected individuals and may lead to cardiac arrhythmias, dilated cardiomyopathy, and heart failure (Marin-Neto et al., 2002). The new guideline from the Brazilian Society of Cardiology (BSC) describes the classification of chronic CD into evolutionary stages: A (indeterminate form, without cardiac damage), B1 and B2 (structural cardiac damage with or without impaired ventricular function), and C and D (severe heart failure with worsening ventricular dysfunction) (Marin-Neto et al., 2023). In this context, machine learning emerges as a promising strategy to support the classification of such a neglected disease. Objetivos: This study aimed to develop and evaluate machine learning models for classifying the evolutionary stages of chronic CD. Métodos: This is an observational, analytical study based on a database of 116 patients treated at a specialized outpatient clinic in northern Minas Gerais, Brazil. Preprocessing included the selection of clinically relevant variables and random imputation of missing data. The target variable was classification into stages A, B1, B2, C, and D. Resultados e Conclusões: Three supervised algorithms were applied (kNN, Random Forest, and Decision Tree), with 20-fold cross-validation. Among the tested algorithms, the Decision Tree showed the best performance (AUC = 0.967; accuracy = 0.915; sensitivity = 0.915; specificity = 0.974) (Table 1). The confusion matrix demonstrated high agreement between predicted and actual values, with accuracy above 90% in most classes and 100% in class D (Table 2) The Decision Tree showed high interpretability, allowing patient classification based on a reduced set of clinical variables, such as ejection fraction, electrocardiographic changes, functional class (NYHA), and NT-proBNP levels. These variables were hierarchically organized, reflecting the progression of cardiac dysfunction and enabling differentiation among stages (Figure 3). Thus, the model demonstrated the ability to reproduce, in a structured manner, the clinical reasoning used in practice for this classification. As a neglected disease, this model shows potential to simplify stage classification even in the absence of specialized tests, contributing to a more accessible approach.

Table 1: Performance Metrics of the Algorithms

Model	AUC	CA	F1	PREC	RECALL	MCC	SPEC
kNN	0.679	0.512	0.493	0.485	0.512	0.352	0.836
Constant	0.173	0.134	0.086	0.064	0.134	-0.263	0.650
Random Forest	0.970	0.793	0.772	0.794	0.793	0.731	0.930
Tree	0.967	0.915	0.915	0.918	0.915	0.889	0.974

Source: Prepared by the authors.

Figure 1: Decision Tree for the Classification of the Evolutionary Stages of Chronic Chagas Disease



Source: Orange Data Mining, 2026.

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DIAGNOSTIC ACCURACY OF ARTIFICIAL INTELLIGENCE FOR ARRHYTHMIA DETECTION USING THE 12-LEAD ELECTROCARDIOGRAM: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Artificial intelligence (AI) has emerged as a promising tool for interpreting 12-lead electrocardiograms (ECGs), with the potential to enhance diagnostic accuracy for arrhythmia detection. However, published studies vary widely in methodology and validation strategy, warranting a quantitative synthesis of diagnostic performance. Objetivos: To synthesize the diagnostic test characteristics of AI for 12-lead ECG arrhythmia analysis. Métodos: A systematic review and meta-analysis were conducted in accordance with the PRISMA-DTA 2018 guidelines and registered in PROSPERO (CRD420251027264). Searches were performed in MEDLINE, Embase, and Cochrane Library through September 2025 without language restrictions. Studies evaluating AI algorithms for arrhythmia detection using 12-lead ECGs were included. Data on sensitivity, specificity, and area under the curve (AUC) were extracted. Pooled estimates were generated using a bivariate random-effects model. Risk of bias was assessed with QUADAS-2, and the certainty of evidence was quantified using GRADE. Resultados e Conclusões: 20 studies were included in the meta-analysis, encompassing over 5.5 million ECGs. The pooled sensitivity, specificity, and AUC for AI-based arrhythmia detectionwere 94.0% (95% CI 90.8–96.2; I² = 96.9%), 98.7% (95% CI 97.3–99.3; I² = 98.3%), and 0.982 (95% CI 0.965–0.986), respectively. Detection of atrial fibrillation (AF) yielded a sensitivity of 92.6% (95% CI 86.4–96), a specificity of 99.1% (95% CI 98.4–99.5), and an AUC of 0.988. Convolutional neural networks (CNNs) demonstrated a sensitivity of 97.6%, a specificity of 98.7%, and an AUC of 0.982 for overall arrhythmia detection. When limited to external validation (n=6), the sensitivity was 96.9% (95% CI89.2–99.1), specificity was 95.6% (95% CI 77.6–99.3), and AUC was 0.983. No significant publication bias was detected, and the overall certainty of evidence was rated as high. In our meta-analysis, we concluded that AI models applied to 12-lead ECGs demonstrate excellent diagnostic performance for arrhythmia detection. Findings support potential integration into clinical workflows, particularly in settings with limited cardiology expertise. Given substantial heterogeneity, standardized datasets and multicenter prospective validation are essential to ensure effective and equitable implementation.

Table 1 Baseline characteristics of the included studies

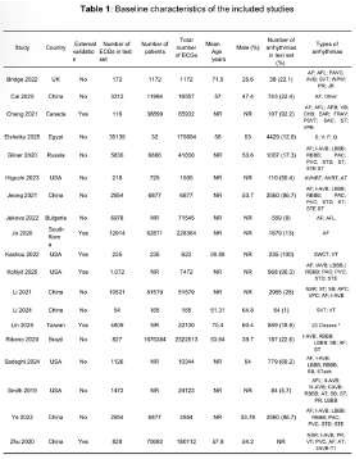
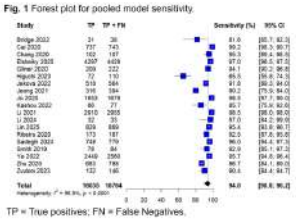
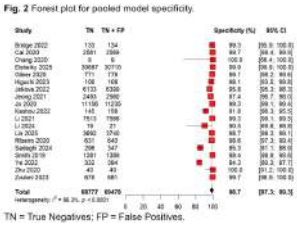


Fig. 1 Forest plot for pooled model sensitivity.



TP = True positives; FN = False Negatives.

Fig. 2 Forest plot for pooled model specificity.



TN = True Negatives; FP = False Positives.

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DOES MACHINE LEARNING OUTPERFORM CONVENTIONAL LOGISTIC REGRESSION IN PREDICTING RHYTHM CONTROL IN FUNCTIONAL MITRAL REGURGITATION AND ATRIAL FIBRILLATION?

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Introdução/Fundamentos: The management of patients with functional mitral regurgitation (MR) and atrial fibrillation (AF) involves rate or rhythm control strategies, whose indication depends on clinical and cardiac structural characteristics. However, the superiority of machine learning–based predictive models over logistic regression in this population has not yet been established. Objetivos: To compare the performance of a Random Forest model with multivariate logistic regression in predicting rhythm control in patients with functional MR and AF. Métodos: Cross-sectional study including 117 patients with functional MR. The primary outcome was the adoption of a rhythm control strategy (cardioversion or catheter ablation) within 24 months. Continuous variables were compared using the Mann–Whitney test, and categorical variables using Fisher's exact test. A Random Forest model was developed with recursive feature elimination, stratified 5-fold cross-validation, and a 70/30 train–test split. A multivariate logistic regression model was also built for comparison. Discriminative ability was assessed by AUCs and compared using the DeLong test. Resultados e Conclusões: Patients undergoing intervention had lower left atrial volume (52 [49.8–61.2] vs 64 [51–73]; p = 0.03) and higher ejection fraction (50% [35–62] vs 35% [27–56]; p = 0.05) compared to the rate control group. The final Random Forest model, with seven variables, achieved an AUC of 0.926. In the test set, it maintained high performance, with an AUC of 0.925 (95% CI: 0.832–1.000), accuracy of 91.2%, sensitivity of 91.7%, and specificity of 90.0%. The main predictors were presence of AF, heart rate, left atrial volume, and TAPSE. The multivariate logistic regression model showed an AUC of 0.896 (95% CI: 0.782–1.000), sensitivity of 70.0%, specificity of 91.7%, and accuracy of 88.0%. In logistic regression, neoplasm (p = 0.0428) and anticoagulant use (p = 0.0191) were associated with the outcome. Comparison of ROC curves using the DeLong test showed no difference between models (Z = -0.52; p = 0.60). Random Forest and logistic regression showed similar discriminative performance in predicting rhythm control in patients with functional mitral regurgitation.

19094

EVALUATION OF THE QUALITY AND READABILITY OF ECHOCARDIOGRAPHY INFORMATION PROVIDED BY GENERATIVE ARTIFICIAL INTELLIGENCE MODELS: A CROSS-SECTIONAL COMPARATIVE STUDY

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Introdução/Fundamentos: Echocardiographic complexities prompt users to seek clarification via artificial intelligence models (AIMs). Despite rapid access, establishing their clinical reliability is essential for informed decision making and patient safety. Objetivos: To evaluate and compare the quality and readability of echocardiography-related information provided by different AIMs. Métodos: This observational cross-sectional study assessed responses from free AIMs (ChatGPT 5.1, ChatGPT 5.2, Gemini 3 Fast, Gemini 3 Pro, Gemini Reasoning, and Perplexity) to 30 echocardiography-related questions. Responses were obtained in independent sessions, considering only the first output without reprompting. Quality was evaluated using the DISCERN instrument and JAMA criteria, while readability was assessed using ALT software. Two independent, blinded reviewers performed the evaluations. Descriptive analyses (mean and standard deviation) were conducted, adopting $p < 0.05$. Questions were adapted from a previously published study. Resultados e Conclusões: A total of 180 responses were analyzed. Perplexity achieved the highest DISCERN mean score, 38.47 (± 3.10), followed by ChatGPT 5.1, 38.27 (± 2.57), Gemini Reasoning, 37.17 (± 4.25), and Gemini 3 Pro, 37.10 (± 3.99). Gemini 3 Fast had a mean of 36.27 (± 3.99), while the lowest performance was observed for ChatGPT 5.2, 34.97 (± 3.22). Minimum values ranged from 33 to 35, and maximum values from 43 to 52. The Shapiro–Wilk test indicated partial violation of normality ($p < 0.05$). There was a statistically significant difference among models (repeated measures ANOVA, $p < 0.001$), confirmed by nonparametric analysis ($p < 0.001$), with moderate agreement among rankings (Kendall's W = 0.351). In the JAMA criteria, adherence was low, with mean scores near zero; Perplexity showed the highest score, 1.03 (± 0.18), with significant differences among models ($p < 0.001$). Regarding readability (ALT), mean scores ranged from 23.50 (± 3.88) to 24.07 (± 3.37), with no significant difference ($p = 0.79$). A moderate correlation between quality and readability was observed ($\rho = 0.525$), with high inter-rater agreement (ICC = 0.89). Models showed differences in the quality of echocardiography-related information, with consistent ranking and good reproducibility. These findings highlight the need for cautious use of AI models as sources of health information.

19187

INCREASING ACCESS TO THROMBOLYTIC TREATMENT FOR ST-ELEVATION MYOCARDIAL INFARCTION USING THE LOCATION-ALLOCATION MODEL IN A LOW-INCOME STATE IN BRAZIL

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Introdução/Fundamentos: Around 400,000 people die annually from cardiovascular diseases in Brazil. The state of Maranhao, which has an area of similar size to Italy, has one of the highest mortality from ST-elevation myocardial infarction (STEMI). Only the state capital offers percutaneous coronary intervention, and no other city has a thrombolysis protocol, leaving 7 million people without assistance. Objetivos: We propose a strategic model to allocate STEMI thrombolysis services in high-demand areas of Maranhao state. Métodos: Ecological study using the LAM and the following parameters: population density and distribution (demand), location of health facilities (supply), and transportation network (mobility). The demand was estimated by dasymetric gridding from WorldPop, corresponding to 5,072,506 people in Maranhao. The supply points corresponded to the coordinates of the emergency public hospitals that are candidates to implement thrombolysis services, totaling 362 services across the state. The mobility was set with the roads available on OpenStreetMap. We used ArcGIS Pro 2.9 with the Maximize Attendance algorithm to set a 30-minute cutoff time for demand to reach the facilities using the mobility network. The optimal number of chosen facilities was defined as the plateau point at which additional facilities yield no significant increase in population coverage. Resultados e Conclusões: The plateau point was 45 health facilities allocated in the regions of Maranhao with the highest population demand. Together, these hospitals could cover 94.56% of the population (about 4.8 million people) to perform thrombolysis in 30 minutes in the case of STEMI. We used the Location-Allocation Model (LAM) as an automated tool to decide the best allocation of resources and optimize the distribution of thrombolysis services for STEMI in a low-resource region with the highest mortality rate from cardiovascular diseases in Brazil. This project can support future evidence that aims to reduce the time to access treatment for cardiovascular diseases in low- and middle-income countries, where choosing the best health facilities is based on population demand using open-source data to perform the analyses. This automated, low-cost approach indicates that more strategic hospitals in low-resource settings are needed to improve timely access to acute care for STEMI, decentralize acute treatment for STEMI, and reduce cardiovascular disease mortality.

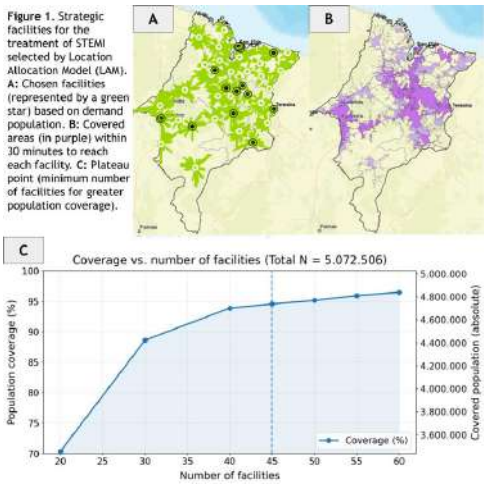


Figure 1. Strategic facilities for the treatment of STEMI selected by Location Allocation Model (LAM). **A:** Chosen facilities (represented by a green star) based on demand population. **B:** Covered areas (in purple) within 30 minutes to reach each facility. **C:** Plateau point (minimum number of facilities for greater population coverage).

16109

INTERPRETABLE DEEP LEARNING PREDICTS MORTALITY FOLLOWING ACUTE MYOCARDIAL INFARCTION USIGN SINGLE TIME-POINT ECG

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Introdução/Fundamentos: Acute myocardial infarction (AMI) is a leading cause of death and long-term morbidity, affecting the quality of life of millions of people. Despite reperfusion therapy, AMI remains associated with a one-year mortality rate of around 10%. Early identification of high-risk individuals is therefore essential to support timely intervention and management. Comorbidity-based models such as the GRACE risk score can be used to predict in-hospital mortality, but their performance in predicting long-term outcomes after AMI remains suboptimal. Integrating ECG data with deep learning, which has already shown strong performance in other cardiology applications, may improve mortality risk assessment in AMI. Objetivos: This study applies interpretable deep learning to predict mortality in AMI patients from the MIMIC-IV database using single time-point 12-lead ECG data, and to identify ECG biomarkers associated with mortality. Métodos: Twelve-lead ECG data from 8,499 AMI patients were extracted from the MIMIC-IV database. Among these patients, 3,097 died during follow-up. Single time-point ECGs recorded during the first hospitalisation were used to train a convolutional neural network (CNN) to predict all-cause mortality at different time points following AMI. The CNN model was validated using the area under the receiver operating characteristic curve (AUC) on unseen data using cross-validation, and Grad-CAM was used to highlight the ECG regions that contributed most strongly to the model's predictions. Resultados e Conclusões: The CNN accurately predicted in-hospital mortality in patients from the unseen set (AUC 0.92). The same model also predicted one-year (AUC 0.86) and long-term (AUC 0.80) all-cause mortality following AMI. Qualitative Grad-CAM results (Figure 1) showed that the ST segment and T wave, which are associated with AMI, were the most influential predictors of mortality after AMI. Thus, this study highlights the potential of deep learning to predict mortality in AMI patients using single time-point ECG data. Interpretable ECG features provide valuable insight into post-AMI risk and should therefore be considered in patient stratification.

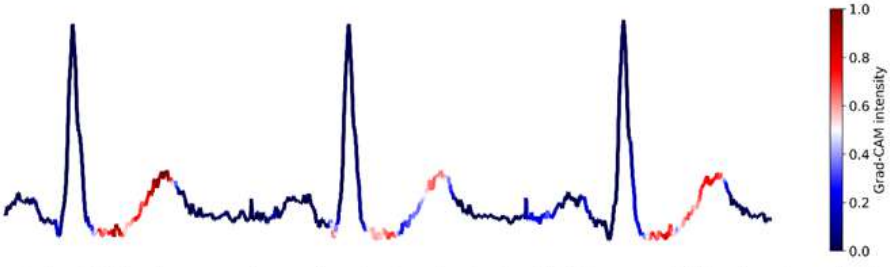


Figure 1: Grad-CAM saliency map of a sample patient overlayed on lead II ECG segment. ECG regions shown in red contributed most strongly to the model's predictions.

17531

MACHINE LEARNING AND THE PREDICTION OF ARRHYTHMOGENIC RIGHT VENTRICULAR CARDIOMYOPATHY: A SYSTEMATIC REVIEW.

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Introdução/Fundamentos: Arrhythmogenic Right Ventricular Cardiomyopathy is a genetic cardiomyopathy marked by fibrofatty myocardial changes and high arrhythmic risk. To overcome challenging, expert-dependent diagnostics, machine learning models are increasingly utilized to streamline ARVC detection and risk stratification Objetivos: To systematically evaluate the eficacy, diagnostic accuracy, and clinical utility of machine learning and transfer learning algorithms in the prediction and risk stratification of patients with ARVC. Métodos: A systematic review and meta-analysis was conducted in accordance with the PRISMA guidelines and registered in PROSPERO (CRD420261368429). The databases searched included Embase (136 results), Scopus (36 results), PubMed (16 results), and Web of Science (8 results), using search terms such as “Arrhythmogenic Right Ventricular Dysplasia,” “Arrhythmogenic Right Ventricular Cardiomyopathy,” “Machine Learning,” and “Transfer Learning.” Studies evaluating ML models for ARVC prediction and reporting outcomes on diagnostic accuracy, area under the curve (AUC), and arrhythmic risk were included. Heterogeneity was assessed using the I^2 statistic, and a random-efects model was applied to pool the performance metrics. Following the screening process, 6 studies were selected for the systematic review and meta-analysis. Resultados e Conclusões: We analyzed 6 studies on ARVC using ML algorithms like Random Survival Forests, Gradient Boosted Trees, and Neural Networks. ML models showed high diagnostic performance with a pooled Area Under the Cover (AUC) of 0.92 (95% CI 0.88–0.95; p<0.0001). Compared to traditional diagnostic pathways and clinical scoring, ML models yielded a higher pooled sensitivity of 0.86 (95% CI 0.81–0.90; p<0.01) and specificity of 0.89 (95% CI 0.84–0.93; p<0.01). For risk stratification, ML techniques utilizing multimodal data (ECG, clinical history, and cardiovascular radiomics) significantly improved the prediction of malignant ventricular arrhythmias and all-cause mortality (HR 2.45; 95% CI 1.80–3.34; p<0.001) over standard clinical risk scores alone. These findings suggest that machine learning provides a highly accurate, scalable, and standardized approach for the early prediction and risk stratification of ARVC. Ensemble methods and deep learning models efectively integrate complex multimodal data, reducing reliance on subjective expert interpretation and supporting targeted clinical decision-making.

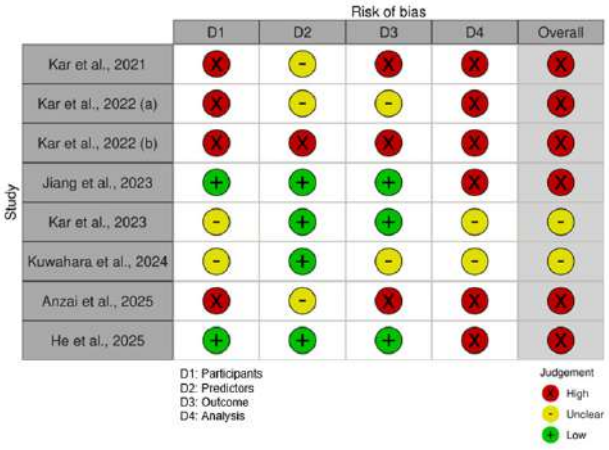
17675

MACHINE LEARNING IN MYOCARDIAL STRAIN ANALYSIS FOR EARLY DETECTION OF CARDIOTOXICITY IN ONCOLOGICAL PATIENTS: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Advancements in cancer treatment have increased cure rates significantly. Although chemotherapy plays a fundamental role in disease remission, its administration leads to side effects, including cardiotoxicity. In this scenario, the use of Artificial Intelligence (AI) through Machine Learning (ML) proves to be a game-changer in the rapid detection of patterns in imaging exams to predict the risk of specific complications early on. Objetivos: To evaluate the efficacy of ML models applied to myocardial strain analysis for the early detection of cardiotoxicity in oncological patients, comparing their diagnostic performance with conventional methods (LVEF, conventional echocardiography, and clinical assessment). Métodos: A systematic review was conducted in accordance with the PRISMA guidelines across the PubMed, Virtual Health Library, and Web of Science databases, encompassing original studies published between 2021 and 2026. Utilizing the PECO strategy, the search focused on Machine Learning (ML) and myocardial deformation in humans undergoing antineoplastic therapy. Observational studies were included and identified through independent screening, followed by a risk of bias assessment via the PROBAST tool. Analyzed outcomes included sensitivity, specificity, and AUC for the prediction of ventricular dysfunction. Resultados e Conclusões: From an initial total of 443 references, 8 original studies were included in the final analysis. Automated models demonstrated high accuracy (up to 97%) and strong correlation with reference methods (p(rho): 0.74; p-value <0.01). AI outperformed manual analysis in inter-observer reproducibility (0.82 vs. 0.68), mitigating the technical variability inherent to the method. In prospective analyses, Global Longitudinal Strain (GLS) via Cardiac Magnetic Resonance established itself as an independent predictor of cardiotoxicity (HR=2.0; p=0.01), allowing the identification of subclinical reductions weeks before the drop in Left Ventricular Ejection Fraction. However, the PROBAST tool indicated that some studies carry a high risk of bias in Statistical Analysis (D4) due to the lack of external validation and small sample sizes, suggesting potential overfitting. It is concluded that ML applied to GLS is effective and reproducible for early cardiotoxicity detection, surpassing conventional methods. Prospective, multicentric studies are required to validate the generalizability of these algorithms before their integration into cardio-oncology monitoring protocols.



19843

MACHINE LEARNING PREDICTION OF EARLY MORTALITY AFTER ACUTE MYOCARDIAL INFARCTION: AN ECOLOGICAL STUDY FROM THE SOUTHERN REGION OF BRAZIL

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Introdução/Fundamentos: Cardiovascular diseases remain the leading cause of death in Brazil, with acute myocardial infarction (AMI) standing out prominently. Recent evidence indicates an increase in the occurrence of AMI among younger age groups, resulting in a rise in premature mortality. In this context, the application of machine learning techniques to large population-based datasets enables the identification of patterns associated with early mortality, despite the limited literature on this topic. Objetivos: To develop and evaluate machine learning models for predicting early mortality due to AMI in Rio Grande do Sul. Métodos: This retrospective ecological study used secondary data from the Mortality Information System (SIM/DATASUS) from 2014 to 2024. Deaths due to AMI (ICD-10 I21/I22) were included. Early mortality was defined by sex-specific thresholds (<55 years for men, <65 for women). Sociodemographic and healthcare variables were analyzed, excluding chronological age. Data were split into training and testing sets. Supervised learning models (Random Forest, Gradient Boosting Machine, and Naive Bayes) were evaluated using AUC, sensitivity, and specificity. Resultados e Conclusões: The best performance was achieved by the GBM model, with an AUC of 0.837. After adjusting the cutoff point, the model showed an accuracy of 71.6%, sensitivity of 82.6%, and specificity of 71.0%, indicating a good balance between detecting early cases and correctly classifying non-early cases. Variable analysis demonstrated that healthcare-related and sociodemographic factors had the greatest impact on prediction. The main predictors were lack of medical assistance, occurrence of death outside the hospital setting, and lower educational level. These findings suggest that early mortality from AMI is associated with inequalities in access to and quality of healthcare. In conclusion, machine learning models showed adequate performance in predicting early mortality due to AMI, despite limitations from the restricted number of variables. Additionally, educational level does not directly influence premature deaths but reflects associated lifestyle factors. This approach may help identify vulnerable groups and guide public health policies for cardiovascular prevention, although limitations remain.

20841

REGULATORY FRAMEWORKS, GOVERNANCE, AND CLINICAL INTEGRATION STRATEGIES FOR CARDIOVASCULAR ARTIFICIAL INTELLIGENCE AND WEARABLE TECHNOLOGIES: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: The expansion of wearable devices and artificial intelligence (AI) in cardiology has occurred without standardized regulatory frameworks or validated clinical integration pathways. Heterogeneity across jurisdictions and limited clinical evidence hinder safe incorporation of these technologies into practice Objetivos: To systematically analyze the regulatory landscape for cardiovascular AI and wearables, governance frameworks proposed by scientific societies, and strategies for integration. Métodos: Systematic review according to PRISMA guidelines. Documents addressing regulation (FDA, EU AI Act/MDR, ANVISA/LGPD), scientific statements (AHA, HRS, EHRA, JACC), and implementation studies were included. After eligibility criteria were applied, 12 documents were analyzed. Data were synthesized qualitatively, focusing on jurisdictions, governance frameworks, and clinical integration models. Resultados e Conclusões: In the United States, AI devices were approved through pathways requiring limited clinical evidence, with 97% cleared via the 510(k) process among 950 approved devices. Only 3.2% of cardiovascular AI devices are supported by clinical trials. In the European Union, classification of AI-based devices as high-risk under the AI Act adds requirements to those established by the MDR, reflecting a more restrictive approach. In Brazil, no specific framework for AI/ML in healthcare has been established, with the LGPD serving as the primary data protection regulation. Governance frameworks converge on domains including accuracy, clinical benefit, interoperability, and data governance. Additional principles emphasize continuous oversight, transparency, and reduction of overdiagnosis. Regarding clinical integration, the “alert-driven” model reduced unnecessary evaluations by 75% in implantable devices, although applicability to consumer wearables remains unvalidated. Additional strategies include new professional roles to facilitate digital health integration. Findings demonstrate a misalignment between technological innovation and the maturity of regulatory and clinical validation frameworks. Persistent gaps across jurisdictions, limited requirements for high-quality evidence, and absence of standardized clinical integration pathways remain major barriers. Adoption of cardiovascular AI and wearables depends on technological advances on regulatory and healthcare structures capable of ensuring safety, effectiveness, and real-world applicability.

17535

STANDARDIZING Z-SCORE EQUATIONS IN FETAL ECHOCARDIOGRAPHY: A DIGITAL PLATFORM BASED ON BRAZILIAN POPULATION DATA

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Introdução/Fundamentos: Z-scores are a valuable tool for assessing fetal cardiac structures, enabling standardized comparisons across gestational ages. Despite their clinical utility, routine use remains inconsistent, largely because the available equations are scattered across the literature, derived from heterogeneous populations, and rarely organized in a way that makes them easy to apply at the bedside. In Brazil, population-specific reference data have been produced over the past decade across multiple centers, yet no unified resource existed to bring these equations together. Objetivos: To compile and digitize Brazilian population-based Z-score equations for fetal cardiac measurements for clinical and research use. Métodos: We reviewed Z-score equations for fetal echocardiographic measurements from Brazilian cohorts, covering biometry, myocardial thickness, function, conduction, and atrial wall volumes. Key data (structure, variables, modeling, gestational range) was extracted, standardized, and integrated into a web-based platform for automated, consistent calculation and interpretation. Resultados e Conclusões: A total of 37 equations were identified and integrated, derived from five original Brazilian studies encompassing more than 3,000 fetal echocardiograms. Structural coverage included 19 cardiac biometry parameters (mitral, tricuspid, aortic and pulmonary valve annuli; ventricular dimensions and areas; cardiac circumference and area; ascending aorta, aortic isthmus, main, right and left pulmonary arteries, and ductus arteriosus), four myocardial thickness measurements (right and left ventricular lateral walls and interventricular septum in two planes), 11 functional parameters (biventricular cardiac output, atrioventricular valve inflow, pulmonary vein and inferior vena cava flows), the atrioventricular conduction interval, and atrial wall volumes by 3D ultrasound. Source studies varied significantly in gestational age ranges, independent variable selection, and modeling. The resulting digital platform standardizes these Z-score equations with consistent inputs and automated outputs, simplifying calculations and enabling direct measurement comparison. This platform unifies Brazilian Z-score equations for fetal echocardiography, spanning structural, functional, and electromechanical parameters into a one accessible tool, streamlining clinical application of reference data. It aims to improve measurement consistency, support research, and promote population-appropriate fetal cardiology care in Brazil.

20847

UNINTENDED CONSEQUENCES OF CONSUMER CARDIAC WEARABLES: A SYSTEMATIC REVIEW OF PSYCHOLOGICAL, CLINICAL, DERMATOLOGICAL, AND PRIVACY-RELATED HARMS

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Introdução/Fundamentos: Cardiac monitoring wearable devices have been increasingly incorporated into preventive care; however, their large-scale adoption is associated with potential adverse effects that remain insufficiently systematized. Emerging evidence indicates psychological, clinical, dermatological, sleep-related, and data privacy impacts. Objetivos: To systematically identify categories of adverse effects associated with prolonged use of cardiac monitoring wearables and estimate the magnitude of these outcomes when possible. Métodos: A systematic review was conducted in accordance with PRISMA guidelines. A structured search was performed in PubMed, Embase, and Scopus, including studies reporting psychological, clinical, dermatological, sleep-related, privacy-related, or operational adverse effects associated with cardiac monitoring wearable devices. Fifteen studies were included, comprising clinical cohorts, qualitative studies, systematic reviews, and scientif society reports. Data were synthesized qualitatively due to heterogeneity across study designs. Resultados e Conclusões: Five main categories of adverse effects were identified. Psychological: compulsive monitoring and responses to device alerts were associated with increased anxiety, particularly in low-risk individuals. Diagnostic cascade: among 264 patients seeking care after device alerts, 11.4% had actionable diagnoses, while 59.8% underwent ECG and 29.2% Holter monitoring. Dermatological: contact dermatitis related to metals and occlusive materials, with nickel sensitization prevalence up to 16.2%. Sleep: device-emitted light exposure was associated with melatonin suppression and impaired sleep quality in part of the studies. Privacy: substantial variability in data transparency, with a significant proportion of manufacturers classified as high risk. Additionally, device abandonment rates reached up to 71% within 90 days. The use of cardiac monitoring wearable devices is associated with measurable and multidimensional adverse effects, including psychological, clinical, dermatological, sleep-related, and data privacy impacts. These findings highlight the need for stricter criteria for indication, alert interpretation, and user guidance, particularly in low-risk populations.

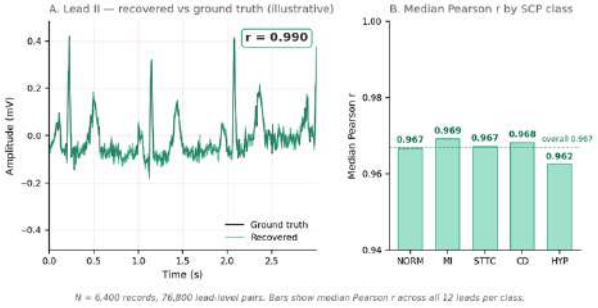
21577

Unlocking legacy ECG archives for AI-based reanalysis: class-stratified validation of an image-to-signal pipeline (N=6,400)

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Introdução/Fundamentos: Many institutions retain large archives of paper or scanned 12-lead electrocardiograms (ECGs). These records cannot be processed by signal-based artificial intelligence (AI) tools used for cardiac diagnosis support. Reliable image-to-signal digitisation could open these archives for retrospective screening, rare-event research, and AI triage. Published validations have been limited to small samples and to overall figures that do not separate diagnostic classes. Objetivos: To quantify the accuracy of a new developed image-to-signal ECG pipeline against a reproducible digital ground truth, with results stratified by diagnostic class. Métodos: A stratified sample of 6,400 records (1,280 per class) was drawn from a large-scale, publicly available 12-lead ECGs dataset covering five diagnostic categories: normal, myocardial infarction, ST/T changes, conduction disturbance, and hypertrophy. Each record was rendered as a 12-lead image at 16 px/mm and processed through the pipeline at 1 kHz, without manual correction. The recovered signal was compared with the original waveform using Pearson correlation, root mean square error (RMSE), and morphological metrics (heart rate, PR, QRS, QT). The same delineator was applied to both signals, so the comparison reflects digitisation error in isolation. Bland-Altman analysis used signed differences. Resultados e Conclusões: Across 76,800 lead-level pairs, median Pearson r was 0.967, with median absolute differences of 8 ms in QRS, 8 ms in QT and 1.9 bpm in heart rate. Performance was consistent across the five classes (median Pearson 0.958-0.976). Signed Bland-Altman analysis disclosed a small positive QRS bias of +8.4 ms, reproducible across classes and lead groups; this offset is a property of the delineation algorithm rather than of the digitisation step. 1.84% (118 of 6,400) of records had at least one failed lead, predominantly in the hypertrophy class (61% of failures); the failure mode traces to layout detection, not amplitude clipping. Throughput on a single workstation was 0.66 s/record for the pipeline core and 2.51 s end-to-end. Across all five classes, the pipeline reproduces 12-lead ECG morphology at error magnitudes comparable to inter-reader variability, with a small bounded QRS offset attributable to the delineation algorithm. At this throughput, archives of tens of thousands of records can be digitised in hours on a single machine. This may enable retrospective deployment of modern AI models in hospitals where only paper ECG archives are available.



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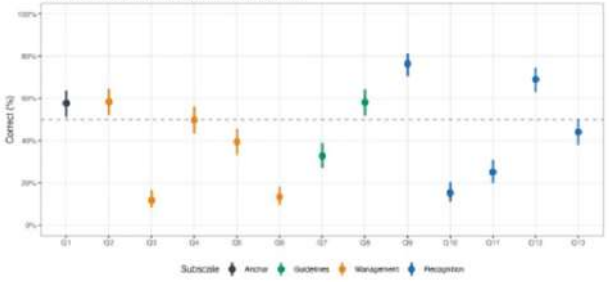
RECOGNITION AND MANAGEMENT OF OCCLUSION MI AMONG STUDENTS AND YOUNG PHYSICIANS: A CROSS-SECTIONAL STUDY FROM BRAZIL

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Introdução/Fundamentos: Acute coronary occlusion (ACO) triage remains anchored to ST-elevation (STE) criteria, although a substantial fraction of acute occlusions present without classical STE. Objetivos: We quantified recognition and management of occlusion-myocardial-infarction (OMI) ECG patterns among Brazilian medical students and early-career physicians, and evaluated the psychometric properties of a 13-item instrument. Métodos: Cross-sectional assessment of 406 consenting students and physicians in São Paulo, Brazil. The 13-item instrument comprised an anchor on ST measurement (Q1), five immediate-management vignettes (Q2–Q6), two guideline statements (Q7–Q8), and five ECG recognition items (Q9–Q13: classical STE, Aslanger, de Winter, normal, hyperacute T). The primary outcome was per-response accuracy on OMI-recognition items (Q10, Q11, Q13), analyzed by mixed-effects logistic regression with random intercepts for participant and item, and fixed effects for training level, sex, age band, and routine ACS care. Secondary outcomes were subscale accuracies and a pre-specified safety-critical composite (failed OMI-management AND failed serial ECG). Psychometrics included per-subscale KR-20 with bootstrap 95% CI, 2-parameter-logistic IRT (2PL vs. Rasch by LRT), and Mantel–Haenszel / logistic DIF. Four sensitivity filters were applied. Resultados e Conclusões: STEMI recognition was 76.4% (95% CI 72.0–80.2), but mean OMI-equivalent recognition was 28.2% — Aslanger 15.3%, de Winter 25.1%, hyperacute T 44.1%. The adjusted OR for students vs. physicians on OMI recognition was 1.05 (99% CI 0.64–1.72); sex, age band, and ACS exposure were likewise non-significant, and estimates were stable across all four sensitivity scenarios (OR 0.95–1.20). Serial-ECG behavior was near-floor (Q3 correct 11.8%, Q6 13.3%), with “troponin” the modal distractor in both. The pre-specified safety-critical composite (missed OMI-management AND failed serial ECG) occurred in 74.6% (99% CI 68.7–79.8). Internal consistency was low per-subscale (Recognition KR-20 = 0.37, 95% CI 0.26–0.46; Management 0.07) and the 13-item total (KR-20 = 0.30) did not behave as a unidimensional construct. A 2PL IRT model outperformed Rasch (p = 0.049); Q13 was the most discriminating item (a = 1.30). Students and early-career physicians recognize classical STEMI, yet most OMI-equivalents are missed, and a troponin-first heuristic replaces serial ECG monitoring. Training should emphasize OMI patterns and structured serial ECG protocols for early recognition and reperfusion

Figure S1. Per-item accuracy with 99% Wilson CI



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21611

ABBREVIATED ANTITHROMBOTIC STRATEGIES IN ELDERLY PATIENTS AFTER PCI: A SYSTEMATIC REVIEW OF RCTS

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Introdução/Fundamentos: Elderly patients undergoing percutaneous coronary intervention (PCI) face a high concomitant risk of bleeding and ischemic events, making it challenging to define the optimal antithrombotic strategy. Abbreviated dual antiplatelet therapy (DAPT) strategies have emerged as alternatives to conventional prolonged therapy. However, their clinical impacts remain uncertain. Objetivos: To analyze the efficacy and safety of standard antiplatelet therapy compared to abbreviated therapy in the elderly population undergoing PCI. Métodos: published between 2021 and 2026 were included, featuring patients who underwent PCI with stenting, comparing standard DAPT with abbreviated strategies in predominantly older populations (>60 years). Searches were performed in PubMed, Embase, Cochrane, MEDLINE, and Scopus. After removing duplicates, 335 articles were screened; 19 underwent full-text review by two independent reviewers. Risk of bias was assessed using RoB 2. Protocol registered in PROSPERO prior to data collection. Resultados e Conclusões: Fourteen studies were included, comprising 10 RCTs and 4 sub-analyses. Regarding risk of bias, 12 studies presented 'some concerns' and 2 were classified as 'low risk.' Abbreviated strategies involving P2Y12 inhibitor monotherapy reduced bleeding events compared to conventional DAPT, without a significant increase in ischemic events. However, early aspirin withdrawal (<30 days) was associated with a higher risk of stent thrombosis. Abbreviated antiplatelet therapies may benefit elderly patients undergoing PCI, provided they are individualized according to age, bleeding risk, and ischemic risk.

15935

CARDIAC RESYNCHRONIZATION THERAPY AS A MARKER OF IMPROVED QUALITY OF LIFE IN OLDER ADULTS WITH HEART FAILURE WITH REDUCED EJECTION FRACTION: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Heart failure with reduced ejection fraction (HFrEF) is a syndrome that significantly impairs quality of life, especially in older adults, due to the higher prevalence of comorbidities, lower functional performance and greater management complexity. Cardiac resynchronization therapy (CRT) has emerged as an important therapeutic strategy, potentially improving cardiac function and symptoms. However, its impact on quality of life in older adults remains incompletely understood. Objetivos: To evaluate the impact of CRT on quality of life in older adults with HFrEF. Métodos: A systematic review was conducted using PubMed, Cochrane Library, BVS and LILACS databases with the descriptors "Cardiac Resynchronization Therapy", "Heart Failure", "Quality of Life", and "Aged". Data collection occurred from January to March 2026. Articles in Portuguese and English from the last 5 years were included. 209 studies were identified according to the PRISMA flow diagram. Ultimately, 4 studies met inclusion criteria: original studies of patients over 60 years with HFrEF undergoing CRT and quality of life outcomes. Resultados e Conclusões: The studies included 2,607 participants with a mean age of 65-72 years and minimum follow-up of 6 months. Quality of life was assessed using validated instruments with similar core domains, such as symptoms, functional status and psychosocial aspects, allowing an integrated analysis. Findings demonstrated an improvement in quality of life after CRT, reflected by patient-reported outcomes, such as EQ-5D-3L (0.685 to 0.837) and KCCQ-12 (43.4 to 57.5), and by objective functional measures, including the 6-minute walk test (269.7 to 312.1 meters). Some studies suggest that benefits vary according to clinical profile, with greater results in patients over 75 years old and those with BMI <30 kg/m². Although CRT improves ventricular function, the association between left ventricular ejection fraction (LVEF) and quality of life does not appear to be linear. Initially, baseline LVEF ranged between 23.8% and 31.1%. After CRT, there was an absolute increase of 8.6% to 9.5%. The NYHA functional class, used to assess the impact of symptoms on daily activities and considered an indirect marker of quality of life, showed consistent improvement across studies. Overall, CRT is associated with consistent improvements in quality of life and functional capacity in older adults with HFrEF, however, the response varies according to the clinical profile.

Figure 1 - PRISMA flow diagram

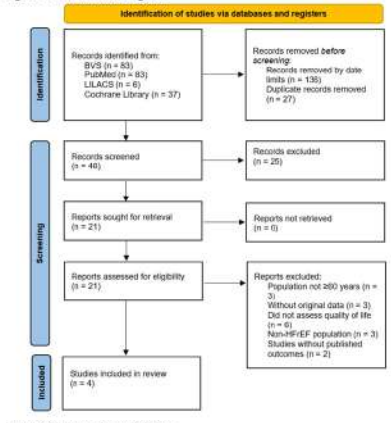


Figure 2 - Systematic review overview



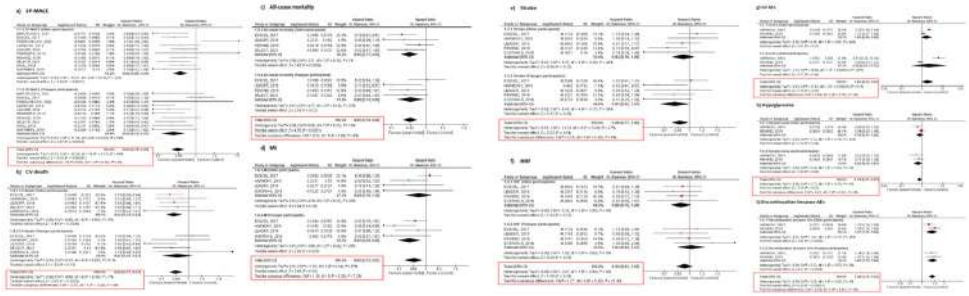
17421

CARDIOVASCULAR OUTCOMES OF GLP-1 RECEPTOR AGONISTS IN OLDER ADULTS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Aging is accompanied by progressive physiological changes in body characterized by sarcopenia, as well as by metabolic and inflammatory mechanisms that increase the clinical vulnerability of older adults. In this context, a comprehensive synthesis of the use of glucagon-like peptide-1 (GLP-1) receptor agonists in elderly adults remains lacking beyond the pivotal clinical studies. Objetivos: To assess the use of GLP-1 receptor agonists in older populations compared with younger adults in terms of cardiovascular (CV) and safety outcomes. Métodos: PubMed, Embase, and Cochrane databases were searched through December 2025. Hazard ratios (HRs) and 95% confidence intervals (CIs) were extracted. The generic inverse variance method was applied, incorporating the standard errors of the HRs. Primary outcomes included 3-point major adverse CV events (3P-MACE: CV death, non-fatal myocardial infarction, and non-fatal stroke), CV death, all-cause mortality, myocardial infarction (MI), stroke, and hospitalization for heart failure (HHF). Secondary outcomes comprised adverse events (AEs), including gastrointestinal, hypoglycemia, and treatment discontinuation due to AEs. Subgroup analysis was performed to compare outcomes between older adults (≥60 years) and younger adults (≤66 years). Resultados e Conclusões: Ten randomized controlled trials, comprising 82.239 participants (68.3% male), were included. GLP-1 receptor agonists reduced the risk of 3P-MACE events (HR 0.84; 95% CI 0.79–0.90; p < 0.00001; I^2 = 46%), CV death (HR 0.85; 95% CI 0.77–0.93; p < 0.0003; I^2 = 7%), all-cause mortality (HR 0.85; 95% CI 0.79–0.92; p < 0.00001; I^2 = 13%), MI (HR 0.85; 95% CI 0.75–0.97; p = 0.01; I^2 = 37%), and stroke (HR 0.88; 95% CI 0.77–1.00; p = 0.04; I^2 = 27%), with no significant differences between age groups, as indicated by non-significant tests for subgroup differences. HHF (HR 0.94; 95% CI 0.83–1.06; p = 0.29; I^2 = 0%) and gastrointestinal AEs (HR 1.85; 95% CI 0.93–3.67; p = 0.08; I^2 = 91%) did not reach statistical significance. Hypoglycemia was less frequent among GLP-1 users (HR 0.74; 95% CI 0.57–0.97; p = 0.03; I^2 = 0%), with no statistically significant difference between older and younger adults. GLP-1 users had a 38% higher risk of treatment discontinuation due to AEs (HR 1.38; 95% CI 1.25–1.53; p < 0.00001; I^2 = 0%), with a consistent, but not statistically significant, effect across subgroups. GLP-1 reduced the risk of CV outcomes, and increased the risk of some AEs, without significant differences between the ages.



19568

CARDIOVASCULAR PROFILE ANALYSIS OF OLDER ADULTS FROM AN COGNITION AND AGING BRAZILIAN COHORT WITH LOW EDUCATIONAL ATTAINMENT

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Introdução/Fundamentos: Cardiovascular diseases and dementia are among the leading global causes of mortality and impose a substantial economic burden worldwide. Objetivos: The present study aimed to characterize the cardiovascular profile and electrocardiographic (EKG) findings of a Brazilian cognitive aging cohort followed longitudinally over 12 years. Métodos: We analyzed 122 participants from a Brazilian cognitive aging cohort. All participants underwent a comprehensive geriatric and neuropsychological protocol to determine cognitive diagnosis. Additionally, they underwent specialized clinical evaluation for the assessment of hypertension (HTN), orthostatic hypotension (OH), diabetes mellitus (DM), dyslipidemia, coronary artery disease (CAD), metabolic syndrome (MS), cardiovascular risk, and polypharmacy (>5). Evaluated EKG variables included baseline rhythm, corrected QT interval (QTc), QRS voltage abnormalities, right and left bundle branch blocks (RBBB and LBBB), atrioventricular block (AVB), cardiac axis deviation, heart rate (HR), and signs of left ventricular hypertrophy (LVH). Resultados e Conclusões: The mean age of participants was 76.8 years, and 75.4% were female. Overall, 22.13% were classified as cognitively unimpaired , 45.90% as having mild cognitive impairment , and 30.32% as having dementia. Notably, 61.47% of participants were classified as having high cardiovascular risk. The most prevalent cardiovascular comorbidities were HTN (66.39%), dyslipidemia (48.36%), DM (28.68%), and CAD (17.21%). Polypharmacy was observed in 39.34% of participants, while OH was identified in 6.55%. EKG abnormalities included cardiac axis deviation (18.03%), RBBB (11.47%), AVB (9.83%), LVH (9.83%), low QRS voltage (5.73%), non-sinus rhythm (5.73%), LBBB (4.09%), and prolonged corrected QT interval (QTc) (3.27%). Additionally, the Mann-Whitney test revealed no statistically significant differences between patients with and without dementia regarding PR interval, QRS duration, QTc interval, HR, polypharmacy , systolic and diastolic blood pressure, as shown in table 2. In contrast, chi-square analysis identified significant differences between the groups only for ventricular overload (p=0.035) and CAD (p=0.019). This sample exhibited a high prevalence of cardiovascular risk factors and ECG abnormalities. These findings highlight the importance of comprehensive cardiovascular assessment in this population to improve risk stratification and guide preventive strategies.

Table 1: Demografic and Clinical Characteristics

	Overall (N=122)
Female, n (%)	92 (75.4%)
Age (years), mean (SD)	76.80 (7.07)
Education (years), mean (SD)	7.45 (5.43)
Race	
White, n (%)	106 (86.88%)
Non-white, n (%)	12 (9.83 %)
Missing, n (%)	4 (3.27 %)
HTN, n (%)	81 (66.39%)
DM, n (%)	35 (28.68%)
Dyslipidemia, n (%)	59 (48.36%)
CAD, n (%)	21 (17.21%)
MS, n (%)	36 (29.50%)
High CVR, n (%)	75 (61.47%)
Polypharmacy	48 (39.34%)
Orthostatic Hypotension	8 (6.55%)
Diagnosis	
Cognitively Unimpaired, n (%)	27 (22.13%)
Mild Cognitive Impairment, n (%)	56 (45.90%)
Dementia, n (%)	37 (30.32%)
MMSE, mean (SD)	24.86 (8.51)
ECG	
Non-sinus rhythm, n (%)	7 (5.73%)
Prolonged QTc interval, n (%)	4 (3.27%)
Low QRS voltage, n (%)	7 (5.73%)
LBBB, n (%)	5 (4.09%)
RBBB, n (%)	14 (11.47%)
AVB, n (%)	12 (9.83%)
Axis Deviation, n (%)	22 (18.03%)
LVH, n (%)	12 (9.83%)
PRI, mean (SD)	165.86 (29.46)
QRS, mean (SD)	88.27 (20.09)
QTc, mean (SD)	401.87 (27.01)
HR, mean (SD)	69.41 (9.66)

Legend: HTN: hypertension; DM: diabetes mellitus; CAD: coronary artery disease; MS: metabolic syndrome; MMSE: Mini-Mental State Examination; EKG: Electrocardiographic; LBBB: Left Bundle Branch Blocks; RBBB: Right Bundle Branch Blocks; AVB: Atrioventricular Block; LVH: Left Ventricular Hypertrophy; HR: Heart Rate.

Table 2: Mann-Whitney Test

	U	p
Age	1143	0.026
Education	1854	0.037
PR interval	1419	0.821
QRS	1.154	0.071
QTc interval	1305	0.060
HR	1402	0.575
Polipharmacy	860.5	0.814
SBP	717.5	0.220
DBP	848.5	0.957

Legend: HR: Heart Rate; SBP: Systolic Blood Pressure; DBP: Diastolic Blood Pressure.

20927

CHRONIC PAIN AND CARDIOVASCULAR RISK IN OLDER ADULTS: A SYSTEMATIC REVIEW OF EPIDEMIOLOGICAL AND TREATMENT-RELATED EVIDENCE

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Introdução/Fundamentos: Chronic pain is highly prevalent in older adults and may increase cardiovascular risk through autonomic, inflammatory, behavioral, and treatment-related pathways. However, evidence linking pain, analgesic exposure, and cardiovascular outcomes remains fragmented. Objetivos: To review epidemiological and treatment-related evidence on chronic pain and cardiovascular risk in older adults. Métodos: We conducted a PRISMA 2020-compliant systematic review of PubMed/MEDLINE, Embase, Cochrane CENTRAL, and Scopus from January 2015 to March 2026, without language restrictions. Eligible studies included adults aged ≥60 years, studies with mean or median age ≥60 years, or age-stratified older-adult data, assessing chronic pain or pain treatments in relation to cardiovascular outcomes. Two reviewers independently screened studies, extracted data, and assessed risk of bias. Owing to heterogeneity in definitions, exposures, endpoints, and designs, findings were synthesized narratively. Resultados e Conclusões: Of 5,412 records, 20 primary studies were included, covering epidemiological, pharmacological, non-pharmacological, genetic, and mechanistic evidence. Older-adult cohorts showed consistent associations between chronic pain and cardiovascular risk: chronic pain was associated with acute coronary syndrome in a nationwide Taiwanese cohort (adjusted sHR 1.18; 95% CI 1.07-1.30), and each 1-point increase in a composite pain scale was associated with higher incident CVD (HR 1.21; 95% CI 1.03-1.42). Increasing or persistent pain trajectories were linked to higher CVD risk, whereas decreasing trajectories were not. Treatment-related evidence indicated that systemic NSAIDs increased blood pressure and heart failure risk, with approximately 41% of the osteoarthritis-CVD association mediated by NSAID use. Opioids, gabapentinoids, and corticosteroids were associated with higher cardiovascular or thrombotic risk in observational studies; pregabalin showed higher heart failure incidence than gabapentin in Medicare beneficiaries aged 65-89 years. Acetaminophen appeared safer for short-term use, although chronic use may affect blood pressure. Evidence for non-pharmacological strategies was limited but favored exercise interventions. Overall, chronic pain appears to be an underrecognized cardiovascular risk marker, while several analgesic strategies may compound this risk. Prospective studies should disentangle pain-related from treatment-related cardiovascular risk.

14321

COMPARATIVE ANALYSIS OF QUALITY OF LIFE IN ELDERLY PATIENTS UNDERGOING MYOCARDIAL REVASCULARIZATION PROCEDURES IN SECONDARY CARE

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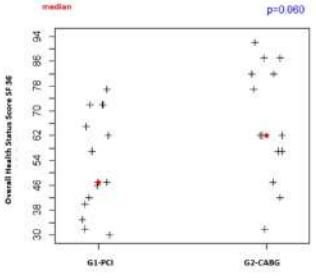
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Introdução/Fundamentos: Coronary Artery Disease (CAD) may be associated with several unfavorable outcomes, including angina, reduced exercise capacity, depression, rehospitalizations, recurrent myocardial infarction, and stroke, significantly impacting patients' quality of life. Several studies have demonstrated that myocardial revascularization, whether through percutaneous coronary angioplasty (PCI) or coronary artery bypass grafting (CABG), is effective in relieving symptoms, reducing the need for antianginal medications, and improving patients' quality of life. A valuable instrument for assessing quality of life is the SF-36 questionnaire. Objetivos: To compare the quality of life of elderly patients with CAD who underwent myocardial revascularization procedures in secondary care using the SF-36 questionnaire. Métodos: It was a cross-sectional study combining qualitative and quantitative elements.The SF-36 questionnaire was applied, which evaluates eight domains (ranging from functional capacity to mental health) and establishes a score ranging from 0 to 100 points; the higher the score, the better the quality of life. Inferential analyses were performed to further examine these data, including Fisher's exact test or its extension, the Mann–Whitney test, and Student's t-test for independent samples, as well as the nonparametric Mann–Whitney and Kruskal–Wallis tests, according to the variables analyzed. A significance level (alpha) of 5% was adopted for all inferential analyses. Resultados e Conclusões: A total of 29 patients were evaluated and distributed into two groups: coronary angioplasty (G1–PCI; n=15) and coronary artery bypass grafting (G2–CABG; n=14). The mean age was 69.7 years, with 69% of the participants being male; 55% of the sample had Diabetes Mellitus. Regarding echocardiographic data, a difference was observed in the left ventricular end-diastolic diameter: G1 :50.53 ± 2.23 mm vs. G2 :53.00 ± 3.01 mm (p = 0.02). In the social functioning domain, no significant difference was found: G1 : 83.3 ± 18.1 vs. G2 : 80.4 ± 22.8 (p = 0.855). The overall SF-36 assessment did not reveal significant differences, with similar mean scores: G1 : 62.9 ± 16.7 vs. G2 : 68.6 ± 16.6 (p = 0.315). The SF-36 questionnaire domains and the overall mean score also did not show significant differences. These patients presented a reasonable quality of life in the late evaluation after revascularization procedures.

Table 1. SF-36 questionnaire domains and mean score between groups G1-PCI and G2-CABG.

		G1-PCI (n=15)	G2-CABG (n=14)	Total (n=29)	p
PC	mean	66,3	68,2	67,2	0,983*
	median	65,0	75,0	70,0	
	minimum-maximum	25,0-100,0	10,0-100,0	10,0-100,0	
	standard deviation	17,0	26,5	21,8	
LIM	mean	61,7	70,5	65,9	0,497*
	median	75,0	81,3	75,0	
	minimum-maximum	0,0-100,0	0,0-100,0	0,0-100,0	
	standard deviation	37,6	37,2	37,0	
PAIN	mean	59,1	59,4	59,2	0,894*
	median	52,0	57,0	52,0	
	minimum-maximum	20,0-100,0	10,0-100,0	10,0-100,0	
	standard deviation	31,0	33,3	31,9	
GENERAL	mean	53,1	66,3	59,4	0,060*
	median	47,0	62,0	62,0	
	minimum-maximum	30,0-77,0	32,0-92,0	30,0-92,0	
	standard deviation	16,0	18,6	18,3	
VITAL	mean	56,7	62,9	59,7	0,525*
	median	50,0	65,0	65,0	
	minimum-maximum	5,0-100,0	30,0-100,0	5,0-100,0	
	standard deviation	28,7	20,0	24,7	
SOCIAL	mean	83,3	80,4	81,9	0,855*
	median	87,5	81,3	87,5	
	minimum-maximum	50,0-100,0-100,0	25,0	25,0-100,0	
	standard deviation	18,1	22,8	20,2	
EMOT.	mean	62,0	80,0	71,1	0,140*
	median	66,0	100,0	100,0	
	minimum-maximum	0,0-100,0	0,0-100,0	0,0-100,0	
	standard deviation	37,6	31,4	35,4	
MENTAL	mean	65,1	74,3	69,5	0,180*
	median	64,0	76,0	76,0	
	minimum-maximum	32,0-100,0	28,0-100,0	28,0-100,0	
	standard deviation	18,5	19,5	19,1	
MEDIA	mean	62,9	68,6	65,6	0,315*
	median	65,7	71,6	68,6	
	minimum-maximum	30,4-90,2	31,8-91,0	30,4-91,0	
	standard deviation	16,7	16,7	16,4	

PCAFunctional capacity, LIMAlimitation due to physical aspects, PAINpain, GENERALgeneral state of health, VITALvitality, SOCIALsocial aspects, MENTALmental health, EMOTIemotional aspects, MEDIAaverage score
* - SCORE SF36 fMann-Whitney

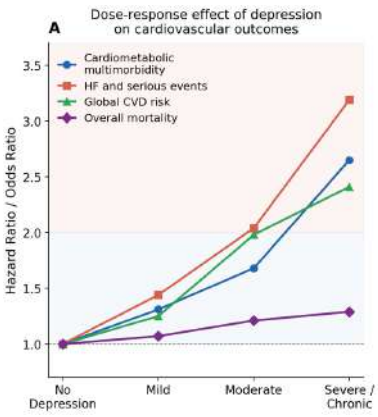


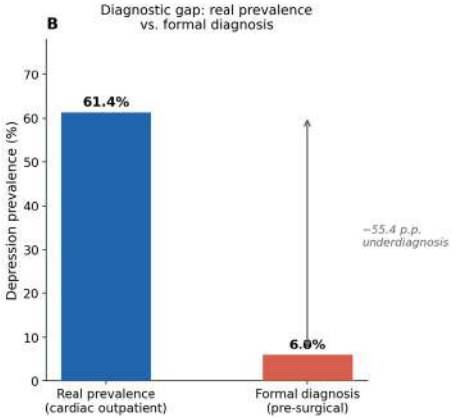
15703

DEPRESSION AND CARDIOVASCULAR DISEASES IN OLDER ADULTS: A SYSTEMATIC REVIEW OF THE BIDIRECTIONAL RELATIONSHIP AND ITS PROGNOSTIC IMPACTS

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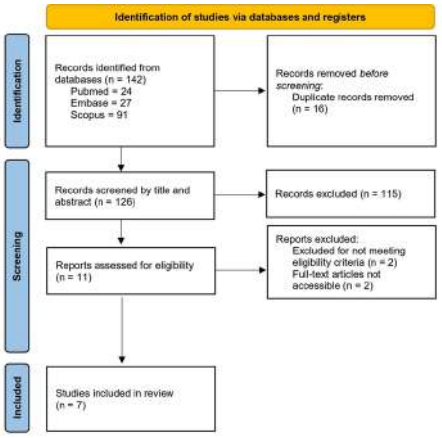
Introdução/Fundamentos: The coexistence of Depression and Cardiovascular Diseases (CVD) in aging constitutes a bidirectional pathway integrated with biological, clinical, and social factors. Moreover, persistent psychiatric underdiagnosis limits the available evidence, highlighting a gap in understanding the mind–body axis in cardiovascular prognosis. Objetivos: To analyze the bidirectional relationship between Depression and CVD in older adults, characterizing associated risk factors, pathophysiological mechanisms, and impacts on clinical outcomes. Métodos: A systematic review (2020–2025) was conducted using PubMed, BVS, and Scopus databases. The search strategy included the terms: "Depression" AND "Cardiovascular Diseases" AND "Aged" AND "Risk Factors." Inclusion criteria comprised human studies published in English and Spanish, followed by duplicate removal and screening for qualitative analysis. Resultados e Conclusões: A total of 32 studies were included, encompassing 2,051,683 individuals (predominantly middle-aged and older adults). The analysis demonstrated directional consistency of the association, identifying depression as an independent predictive risk factor for cardiometabolic multimorbidity (HR = 1.64). Additionally, a dose–response effect was observed, with risk increasing to HR = 2.65 in more severe clinical presentations. Within this framework, severe depression increased the likelihood of heart failure by 3.19-fold, while chronicity of the disorder raised CVD risk by 65%. The mind–heart axis was further supported by evidence of coronary anatomical damage (Gensini score, p = 0.01) and systemic inflammation (RDW-CV OR = 2.16) across most studies. Notably, a critical vulnerability was observed among women, who—even in the absence of traditional risk factors (SMuRF-less)—had a doubled risk of stroke (HR = 2.08). Furthermore, social determinants and physical frailty increased mortality by up to 2.31-fold, according to the reviewed literature. Therefore, this study demonstrates that depression acts as a potent modulator of cardiovascular morbidity in older adults. However, a significant clinical challenge remains: although the true prevalence in cardiology outpatient settings reaches 61.4%, formal diagnosis occurs in only 6% (notably among very high-risk preoperative patients), underscoring the need for systematic psychiatric screening within cardiology to improve cardiovascular survival.

15838

EFFICACY OF HOME-BASED CARDIAC REHABILITATION IN THE TREATMENT OF HEART FAILURE IN OLDER ADULTS: A SYSTEMATIC REVIEW

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Study	Sample	Home-Based Cardiac Rehabilitation Protocol	Outcomes
Lundgren et al. (2025)	n = 61	High-intensity interval training (60-min sessions), with intervals at 85–95% of HRmax, targeting large muscle groups	Physical function and quality of life: no statistically significant difference between groups
Rawstorn et al. (2022)	n = 30	Aerobic, resistance, and flexibility exercises (30–40 min/session, 2–5×/week) at moderate intensity	Physical function: significant improvement in the intervention group (6MWT, p < 0.001). Quality of life: no statistically significant difference between groups
Anderson et al. (2017)	n = 50	Progressive aerobic exercise (~3×/week) with individualized intensity and gradual progression	Physical function: no statistically significant difference between groups. Quality of life: trend toward improvement in the intervention group (−11.5 points; 95% CI −22.8 to 0.3)
Taylor et al. (2019)	n = 216	Progressive aerobic exercise (~3×/week) with individualized intensity and gradual progression	Physical function: no statistically significant difference between groups. Quality of life: significant improvement in the intervention group (−5.7 points; 95% CI −10.6 to −0.7; p = 0.025)
Huang et al. (2018)	n = 75	Aerobic exercise (30 min/session, ≥3×/week) at moderate intensity	Physical function: significant improvement in the intervention group (VO_2peak, p = 0.02; 6MWT, p = 0.03). Quality of life: significant improvement in the intervention group (MLHFQ, p < 0.01)
Maddison et al. (2017)	53	Aerobic and resistance exercises (60 min/session, 2×/week), at light-to-moderate intensity with individualized progression	Physical function and quality of life: no statistically significant difference between groups.
Chen Y, et al. (2018)	n = 98	Aerobic and resistance exercises (20–30 min/session, 3–5×/week), combined with educational and psychological support	Physical function and quality of life: significant improvement in the intervention group (p < 0.05)

Introdução/Fundamentos: Heart Failure (HF) represents one of the leading causes of morbidity and hospitalization among the aging population. In this context, there is an intensified search for strategies that expand access and adherence to therapies such as exercise-based cardiac rehabilitation, given its role in improving cardiovascular function and functional capacity.T herefore, investigating the efficacy of home-based cardiac rehabilitation is particularly relevant, especially considering its potential to improve functional autonomy and quality of life in older and vulnerable populations. Objetivos: To evaluate the efficacy of home-based cardiac rehabilitation on the physical function and quality of life of patients with HF, focusing on the older adult population. Métodos: A systematic review of randomized controlled trials (RCTs) published between 2016 and 2026 was conducted. These trials investigated the efficacy of home-based cardiac rehabilitation on physical function and quality of life in HF patients compared to standard care. Only studies with a mean sample age of ≥60 years were included, characterizing a population of older adults and the elderly. The search was performed across PubMed, Embase, and Scopus databases using DeCS/MeSH descriptors and free-text terms, such as "Home Care Services", "Aged", "Cardiac Rehabilitation", and "Heart Failure". Resultados e Conclusões: From 142 studies identified in the databases, seven RCTs were included (n = 583), in which home-based rehabilitation was primarily conducted through telerehabilitation strategies, such as videoconference monitoring, wearable devices, and telephone contact. Regarding physical function, three out of the seven studies demonstrated significant improvement in the intervention group (6MWT, p < 0.05). Concerning quality of life, four RCTs showed significant improvement in scores assessed by validated instruments (KCCQ or MLHFQ, p < 0.05). Therefore, home-based rehabilitation was not inferior to standard care and yielded favorable results in quality of life. These findings indicate that this modality can expand access to rehabilitation for older adults with HF, especially given the limitations in adherence to center-based programs.

21739

FRAILTY AND RISK OF MAJOR CARDIOVASCULAR EVENTS IN OLDER ADULTS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Frailty is a geriatric syndrome characterized by reduced physiological reserve and increased vulnerability to stressors, being associated with worse clinical outcomes. Evidence suggests its relationship with increased cardiovascular risk; however, the magnitude of this association still requires consolidation through systematic analysis. Objetivos: To evaluate the association between frailty and the risk of major cardiovascular events in older adults. Métodos: A systematic review was conducted in accordance with PRISMA guidelines, with a structured search in PubMed, Embase, and the Cochrane Library up to January 2026. Prospective studies assessing frailty using validated scales (such as Fried or the Clinical Frailty Scale) and its relationship with cardiovascular events were included. The primary outcome was major adverse cardiovascular events (MACE). The meta-analysis was performed using a random-effects model, with calculation of relative risk (RR) and 95% confidence intervals (95% CI). Heterogeneity was assessed using the I^2 statistic. Resultados e Conclusões: A total of 11 studies were included, comprising 62,418 participants. Frailty was associated with a significant increase in the risk of major cardiovascular events (RR = 1.69; 95% CI: 1.48–1.93; $p < 0.001$). An increase in mortality was also observed. Heterogeneity was moderate ($I^2 = 36\%$). Frailty is associated with a significant increase in cardiovascular risk in older adults, reinforcing the importance of its assessment in clinical practice and risk stratification

20995

FRAILTY IN HEART FAILURE AND ITS IMPACT ON LIFE EXPECTANCY

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Introdução/Fundamentos: Frailty has emerged as a relevant prognostic marker in heart failure, being associated with higher mortality, rehospitalization, and functional decline. Characterized by reduced physiological reserve and lower capacity to respond to stressors, this syndrome directly affects clinical outcomes, therapeutic tolerance, and medical decision-making, making its identification essential in heart failure management. Objetivos: To evaluate, through a systematic literature review, the impact of frailty on mortality and life expectancy in patients with heart failure. Métodos: A systematic review was conducted according to PRISMA recommendations. The search in the PubMed database, using MeSH descriptors and Boolean operators, identified 1,256 studies, of which 93 were screened after application of the eligibility criteria. Original studies published within the last 10 years, with validated frailty assessment and analysis of prognostic outcomes, were included. After analysis of titles, abstracts, and full texts, 8 studies composed the final qualitative synthesis. Resultados e Conclusões: The studies demonstrated a high prevalence of frailty in patients with heart failure, ranging between 30% and 50%, depending on the population and assessment tool used. Frail patients presented a significantly higher risk of mortality, with an increase of approximately 1.5 to 2.5 times compared to non-frail patients, in addition to higher hospitalization and rehospitalization rates. Worse functional capacity was also observed, evidenced by reduced gait speed and handgrip strength, as well as longer hospital stays. Frailty was also associated with a higher prevalence of comorbidities, especially chronic kidney disease and diabetes mellitus. Beyond the prognostic impact, greater therapeutic complexity and lower utilization of guideline-recommended therapies were observed, reinforcing the influence of frailty on treatment individualization. Frailty is associated with worse prognosis in heart failure, including higher mortality, hospitalization, and therapeutic complexity. Early identification may contribute to better risk stratification and treatment individualization.

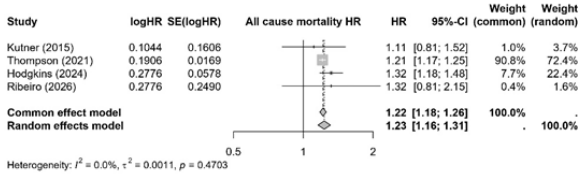
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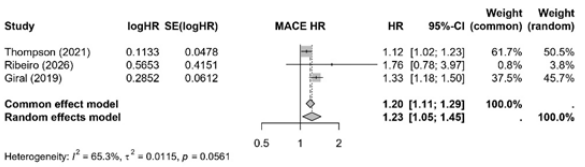
IMPACT OF STATIN DISCONTINUATION ON LONG-TERM MORTALITY AND CARDIOVASCULAR EVENTS IN PATIENTS AGED 70 YEARS AND OLDER: A META-ANALYSIS OF ADJUSTED DATA

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Introdução/Fundamentos: The clinical benefit of continuing statin therapy in the elderly remains a subject of intense debate, particularly in primary prevention. As life expectancy increases, understanding the risks associated with statin deprescribing in patients aged 70 years and older is essential for clinical decision-making. Objetivos: To evaluate the impact of statin discontinuation on all-cause mortality (ACM) and major adverse cardiovascular events (MACE) in individuals aged ≥ 70 years using adjusted effect estimates. Métodos: Systematic review and meta-analysis conducted following PRISMA guidelines. The study included observational registries providing adjusted Hazard Ratios (HR) for ACM and MACE following statin discontinuation. Statistical analysis was performed using the natural logarithm of the HR (logHR) and its corresponding Standard Error (SE). Random-effects models (REML) were used to synthesize results, and heterogeneity was assessed by I². Resultados e Conclusões: Seven study estimates were analyzed (k=4 for ACM; k =3 for MACE), including registries such as Thompson (2021) and Ribeiro (2026). Statin discontinuation was associated with a significant increase in all-cause mortality in the random-effects model (HR 1.23; 95% CI: 1.16-1.31; p < 0.0001$), with negligible heterogeneity (I² = 0.0%). Regarding MACE, discontinuation also presented a significant risk (HR 1.23; 95% CI: 1.05-1.45; p = 0.012), with moderate heterogeneity (I² = 65.3%). In conclusion, statin discontinuation in patients aged 70 and older is associated with a 23% increase in the risk of death and major cardiovascular events. These findings suggest that statin therapy should not be routinely discontinued based solely on age, reinforcing the importance of individualized cardiovascular prevention in the elderly population.





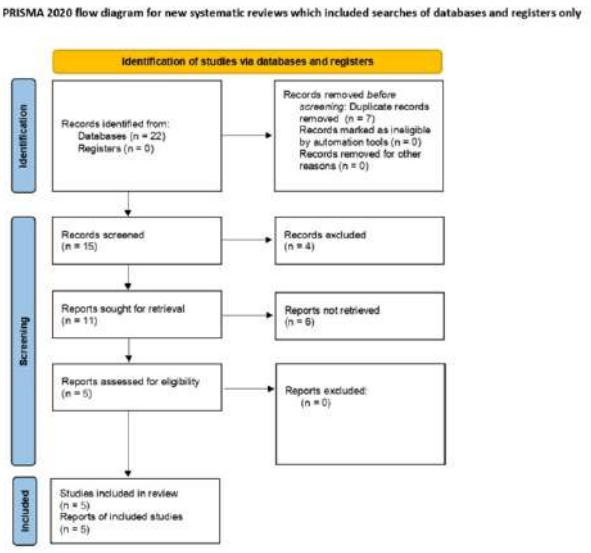
19976

IMPACT OF TRANSCATHETER IMPLANTATION ON MITRAL ANNULUS CALCIFICATION IN HIGH-RISK ELDERLY PATIENTS: A SYSTEMATIC REVIEW.

MARIA EDUARDA VIANA RIBEIRO1; ISABELLA FERNANDES BELLISSIMO1; CAMILA LOPES CARREIRO MACHADO DA SILVA1; CARLA FABIANA BATISTA1; PEDRO HENRIQUE NOVOA FERREIRA1; GUSTAVO MARTINS JATUBA1; MANUELA RODRIGUES DE LIMA1; IRVING GABRIEL ARAUJO BISPO1; GIOVANNA HONORIO1;

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Introdução/Fundamentos: Mitral annular calcification (MAC) is a prevalent degenerative condition in the elderly and is frequently associated with mitral stenosis or insufficiency in patients at high surgical risk. Conventional mitral valve replacement is technically complex and has high morbidity and mortality, mainly due to the risk of complications such as atrioventricular dissociation and paravalvular leaks. Therefore, transcatheter implantation in the mitral position in the presence of significant annular calcification (TVMR) has become established as a therapeutic alternative for elderly patients at very high risk. Objetivos: A systematic review was conducted to analyze the most recent studies on the impact of transcatheter implantation on mitral annular calcification in elderly patients. Métodos: The review followed the PRISMA flowchart recommendations, encompassing the steps of study identification, screening, eligibility, and inclusion. The search was performed in the PubMed and LILACS databases using the descriptors: “transcatheter valve”, “mitral annular calcification”, “outcomes”, and “elderly” combined using the Boolean operators AND and OR. Inclusion criteria were articles in English and Portuguese published in the last 5 years. Exclusion criteria were case reports, narrative reviews, and studies that did not analyze major cardiovascular outcomes. Resultados e Conclusões: Twenty-two articles were found in the databases; after analysis, five articles were included in this review. The number of patients per study varied widely, from series with 15 to 30 individuals to multicenter registries with more than 300 patients. The analyzed population was mostly composed of elderly patients (mean age between 72 and 82 years), with high surgical risk.Praz et al. studied transatrial TMVR in 26 patients with MAC and reported 100% technical success.37 Furthermore, there was considerable improvement in NYHA functional class. It was found that valve-in-MAC is possible in selected patients, with higher technical success rates when performed with strategies to prevent paravalvular leak, prosthetic migration, and, mainly, left ventricular outflow tract (LVOT) obstruction. TMVR is a promising strategy, even though the progress in this field has been slow. Careful and thorough imaging is essential to identify the risk of LVOT obstruction and other procedural complications.



21472

TRENDS IN HOSPITALIZATION AND IN-HOSPITAL MORTALITY DUE TO HEART FAILURE IN BRAZIL AMONG PATIENTS AGED 80 YEARS OR OLDER: ANALYSIS OF THE LAST 15 YEARS WITH EMPHASIS ON REGIONAL DISPARITIES (2011–2025)

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Introdução/Fundamentos: Heart failure (HF) is a major public health problem, associated with reduced quality of life and a significant impact on hospital expenditures. The occurrence of the disease increases substantially with advancing age and, in octogenarians, represents a growing clinical challenge due to a higher burden of comorbidities, worse outcomes, and undertreatment compared to younger patients. In Brazil, population aging and regional inequalities further amplify this challenge. Objetivos: To analyze temporal trends in hospitalization and in-hospital mortality due to HF in the population aged ≥ 80 years in Brazil between 2011 and 2025, with emphasis on disparities among geographic regions. Métodos: This was a descriptive, retrospective ecological study using data from the Hospital Information System of the Brazilian Unified Health System (SIH/SUS). All hospitalizations due to HF in individuals aged 80 years or older were included and stratified by region of residence from 2011 to 2025. Variables of interest included volume of hospitalizations, in-hospital deaths, case-fatality rate, and annual distribution. Data were tabulated and analyzed using Microsoft Excel. As the study utilized publicly available secondary data, review by the Research Ethics Committee was waived. Resultados e Conclusões: During the study period, there were 702.315 hospitalizations for HF in individuals aged ≥ 80 years, 116.776 in-hospital deaths, and an overall case-fatality rate of 16.63%. There was a 10.32% reduction in hospitalizations (from 55.027 in 2011 to 49.348 in 2025). However, there was a 12.99% increase in deaths (from 7.739 to 8.744) and in case-fatality rate (from 14.06% to 17.72%). The Southeast region accounted for 42.5% of cases, followed by the South (24.1%) and the Northeast (22.5%). The highest case-fatality rates were observed in the Southeast (18.56%), followed by the North (15.98%) and Northeast (15.58%). The Midwest and South regions presented the lowest rates, with mean case-fatality rates of 15.03% and 14.73%, respectively. Despite a modest reduction in hospitalizations, the increase in deaths and case-fatality rate reveals regional inequalities in HF care among octogenarians, particularly in the North and Northeast regions, underscoring the need to improve care for this population. These findings should be interpreted with caution, considering possible underreporting, absence of detailed clinical data, and the impossibility of inferring individual causality in an ecological study based on aggregated data.

20892

VASCULAR AGING AND INTRINSIC CAPACITY: ANALYSIS OF ELDERLY PATIENTS STRATIFIED BY PULSE WAVE VELOCITY QUARTILES.

MIRIAN PEREIRA DE OLIVEIRA1; JACK EDUARDA ANTUNES BATISTA1; MAELLY GIL PEREIRA1; IZABEL SOUZA SILVA1; IGOR ANTONIO CARVALHO-RIBEIRO1; DANIEL HENRIQUE MOREIRA QUIRINO2; KAMILA ANDRADE DE SOUSA2; ANA KAROLINA LIMA SOUZA1; ISIDORO JOSÉ DE SOUTO DANTAS3; TIAGO ABREU VELLOSO1; MARIA DA GLORIA RODRIGUES MACHADO1; LEANI SOUZA MÁXIMO PEREIRA1;

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Introdução/Fundamentos: Pulse wave velocity (PWV), considered a biomarker of vascular aging and an independent predictor of major cardiovascular events, has been associated with functional decline in older adults. However, the relationship between different PWV quartis and the domains of Intrinsic Capacity (IC) remains poorly explored. IC is defined as the composite of all physical and mental capacities of an individual. Objetivos: To compare the demographic, cardiovascular, and IC characteristics, specifically the locomotion and cognition domains, among older adults classified according to different PWV quartis. Métodos: A cross-sectional analytical study was conducted using a randomized sample of 115 older adults enrolled in the Integrated Care for Older People (ICOPE Brazil/Feasibility) study. Participants were stratified into three groups according to PWV quartis: PWV<25% (n=28), PWV25-75% (n=59), and PWV>75% (n=28). Sociodemographic data and cardiovascular parameters were assessed using the oscillometric brachial device Mobil-O-Graph. Comorbidity burden was evaluated using the Charlson Comorbidity Index (CCI). Locomotion was assessed by 4-meter gait speed using the Short Physical Performance Battery (SPPB). Cognition was assessed using the Mini-Mental State Examination (MMSE). Resultados e Conclusões: The PWV >75% group was significantly older (77.25±4.80 years) than the PWV 25-75% and PWV<25% groups (67.02±3.48 and 63.36±2.46 years, respectively). The CCI score in the PWV>75% group (5.0±1.8) was significantly higher than in the PWV24-75% and PWV<25% groups (3.78±2.02 and 3.07±1.18, respectively). Educational level was lower in the group with greater arterial stiffness (5.42±5.27 years) compared with the PWV<25% group. The 4-meter gait speed of the SPPB was significantly lower in the PWV >75% group (0.87±0.36 m/s) compared with the PWV 50% group (1.12±0.57 m/s). MMSE scores in the PWV >75% group did not differ from the PWV25-75% group but were significantly higher than in the PWV<25% group. Hypertension was the most prevalent comorbidity across all groups. CONCLUSION: Older individuals with a higher burden of comorbidities and poorer cognitive and 4-meter gait speed performance exhibited higher PWV levels, demonstrating the applicability of PWV as a noninvasive tool for the early identification of vascular aging. These data contribute to screening strategies, functional monitoring, and prevention of cardiovascular and functional outcomes in clinical and geriatric practice.

Interventional Cardiology



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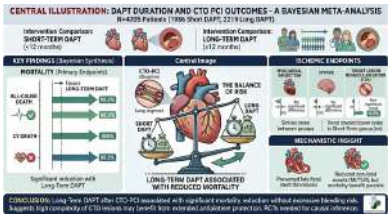
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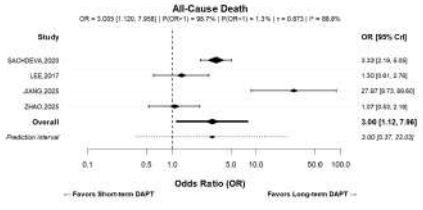
A BAYESIAN EVIDENCE OF THE OPTIMAL DURATION OF DUAL ANTIPLATELET THERAPY AFTER CTO-PCI

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Introdução/Fundamentos: Optimal dual antiplatelet therapy (DAPT) duration after complex percutaneous coronary intervention (PCI) remains controversial. Chronic total occlusions (CTO) represent the most complex lesion subset, characterized by high atherosclerotic burden and long stent lengths, potentially requiring extended DAPT. We sought to synthesize evidence comparing short-term (≤12 months) vs. long-term (>12 months) DAPT specifically in the CTO-PCI population. Objetivos: We sought to synthesize evidence comparing short-term vs. long-term DAPT specifically in the CTO-PCI population Métodos: Following PRISMA guidelines, we systematically searched PubMed, Scopus, Embase, and Web of Science through August 2025. We included studies comparing DAPT durations in CTO-PCI using contemporary drug-eluting stents. The primary outcome was all-cause death. Secondary outcomes included cardiovascular (CV) death, MI, stroke, target lesion revascularization (TLR), and bleeding (BARC ≥2). Bayesian random-effects meta-analyses were performed to estimate pooled odds ratios (OR) and 95% credible intervals (CrI). We calculated the posterior probability (P) of one strategy being superior to the other. Resultados e Conclusões: Results: Four observational studies (n=4,205; Short-DAPT: 1,986; Long-DAPT: 2,219) were included. The weighted mean follow-up was 45.5 months. Bayesian analysis revealed that long-term DAPT was associated with significantly lower odds of all-cause mortality (OR 2.83 for short-DAPT; 95% CrI 1.07–7.36; P[Long-DAPT < Short-DAPT] = 98.3%) and CV death (OR 5.38; 95% CrI 2.00–14.28; P[Long-DAPT < Short-DAPT] = 100%). No significant differences were observed for MI (OR 1.14; 95% CrI 0.65–2.00), stroke (OR 1.00; 95% CrI 0.49–2.03), or TLR (OR 0.94; 95% CrI 0.57–1.56). Bleeding rates were lower in the short-term group but did not reach statistical significance in the primary analysis (OR 0.55; 95% CrI 0.28–1.08; P[Short-DAPT < Long-DAPT] = 95.8%). Sensitivity analysis confirmed the robustness of the mortality benefit. Conclusion: In patients undergoing CTO-PCI, long-term DAPT is associated with a significant reduction in all-cause and cardiovascular mortality compared to short-term DAPT, without a statistically significant increase in major bleeding. These findings suggest that the high-complexity nature of CTO lesions may benefit from prolonged antiplatelet protection. Final confirmation through randomized controlled trials is warranted.





17516

ASPIRIN DISCONTINUATION WITHIN ONE MONTH IN PATIENTS WITH ACUTE CORONARY SYNDROME FOLLOWING PERCUTANEOUS CORONARY INTERVENTION: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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Introdução/Fundamentos: Dual antiplatelet therapy (DAPT) with aspirin and a P2Y12 inhibitor for 12 months is the standard antithrombotic treatment for patients with acute coronary syndromes undergoing percutaneous coronary intervention (PCI). Recent randomized controlled trials (RCTs) support the ultrashort (≤1 month) withdrawal of aspirin, showing non-inferiority in ischemic events and reduction in bleeding, which can improve patient prognosis. Objetivos: This study aims to evaluate the security and benefit of the discontinuation of aspirin within one month, followed by P2Y12 inhibitor monotherapy. Métodos: A systematic review and meta-analysis were conducted in accordance with PRISMA guidelines. 277 records were screened. We included RCTs enrolling patients with acute coronary syndrome undergoing PCI. The RCTs compared early aspirin discontinuation within one month followed by P2Y12 inhibitor monotherapy with 12-month DAPT. Data were synthesized using random-effects models. Risk of bias was assessed through ROBINS-2. The study is registered in PROSPERO under the protocol CRD420261355098. Resultados e Conclusões: A total of 6 randomized controlled trials were included, comprising 19,745 patients, with 9877 in the 1 month DAPT group and 9868 in the 12 month DAPT group. The mean age was approximately 62 years, and 76% were male. 59% of the patients had hypertension, 27% diabetes mellitus and 61% had dyslipidemia. Current smoking was present in 35%. Previous MI occurred in 11%, previous PCI in 15%, and previous CABG in 2%. Prior stroke was observed in 4%, and CKD in 9%. STEMI accounted for 41% of the cases, NSTEMI for 38%, and unstable angina for 21%. Multivessel disease was present in 53% of patients. The overall publication bias was low. There was no statistically significant difference between groups in all-cause mortality (HR 1.02, 95% CI 0.89–1.17; p = 0.78), myocardial infarction (HR 0.98, 95% CI 0.87–1.11; p = 0.74), stent thrombosis (HR 1.05, 95% CI 0.78–1.41; p = 0.74), stroke (HR 0.95, 95% CI 0.78–1.16; p = 0.62), and target vessel revascularization (HR 1.01, 95% CI 0.91–1.13; p = 0.79). However, major bleeding (BARC 3–5) was significantly reduced with early aspirin withdrawal (HR 0.68, 95% CI 0.55–0.83; p < 0.001). This reduction remained consistent across analyses stratified by P2Y12 inhibitor type. We concluded that the ultrashort discontinuation of aspirin is non-inferior to 12-month DAPT in mortality and ischemic outcomes, while showing significant benefit in the reduction of major bleeding.

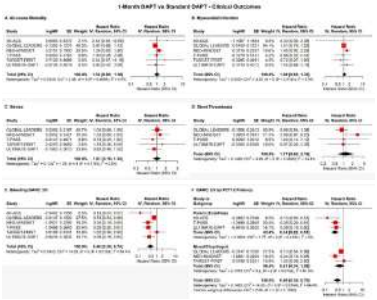


Table 01: Baseline characteristics of the included studies

Study	N (I/C)	Age (years)	Female (%)	BMI (kg/m²)	Hypertension (%)	Diabetes (%)	Dyslipidemia (%)	Current smoker (%)	Median duration of DAPT (days)	STEMI (%)	Previous PCI (%)	Multivessel disease (%)
T-PASS	1426 / 1424	61 / 61	16 / 17	25.1 / 25.0	47 / 48	30 / 29	74 / 74	39 / 38	16	40 / 41	7 / 7	53 / 52
TARGET-FIRST	961 / 981	61 / 61	23.2 / 20.1	26.7 / 27.4	38.2 / 39.1	14.0 / 14.9	28.2 / 27.4	41.9 / 41.8	37	50.2 / 50.7	NA	NA
NEO-MINDSET	1712 / 1698	59.5 / 59.8	29.3 / 29.3	27.6 / 27.5	63.8 / 64.2	26.8 / 28.1	27.1 / 26.6	36.1 / 36.0	4	61.8 / 62.5	8.3 / 8.4	45.4 / 42.3
4D-ACS	328/328	61.3 / 60.4	16.8 / 18	25 / 25.2	60.1 / 54.6	31.7 / 31.7	84.8 / 82.3	42.1 / 36.6	30	30.2/35.4	7/7	61/56.7
ULTIMATE-DAPT	1700/1700	62 / 63	25.7 / 26.1	NA	62.2 / 62.5	31.8 / 31.5	69.3 / 68.1	28.6 / 28.4	30	28.7/27.1	10.1/10.2	NA
GLOBAL LEADERS	3750/3737	63.2 / 63.3	23.2 / 22.9	28.0 / 28.1	68.6 / 67.9	21.6/21.3	60.8 / 62.0	34.3 / 33.3	30	28.3/27.5	22.8/23.4	NA

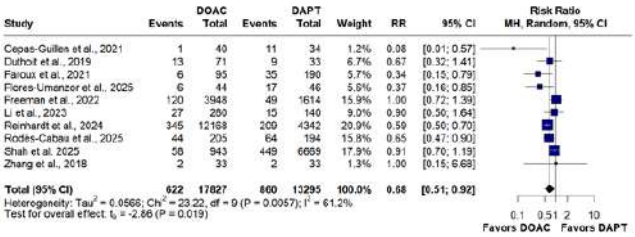
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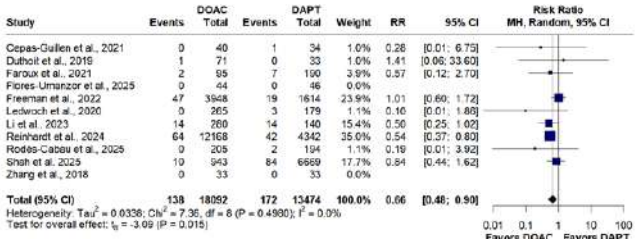
DOACS VERSUS DAPT AFTER LAAO: LOWER THROMBOTIC AND BLEEDING EVENTS IN AN UPDATED META-ANALYSIS

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Introdução/Fundamentos: Left atrial appendage occlusion (LAAO) reduces thromboembolic risk in patients with atrial fibrillation who are unsuitable for long-term anticoagulation. However, the early post-implantation period remains highly thrombogenic due to incomplete endothelialization, increasing the risk of device-related thrombosis (DRT). Despite widespread use of dual antiplatelet therapy (DAPT), its effectiveness in preventing DRT remains debated. Objetivos: To compare the efficacy and safety of direct oral anticoagulants (DOACs) versus DAPT following LAAO. Métodos: A systematic review and meta-analysis were conducted according to PRISMA guidelines. PubMed, Embase, and Scopus were searched through April 2026 for randomized and comparative observational studies evaluating DOACs versus DAPT after LAAO. Given the limited number of randomized trials, high-quality observational studies were included to enhance external validity. Primary efficacy outcomes included DRT and thromboembolic events (stroke, transient ischemic attack, and systemic embolism). Major bleeding was the primary safety outcome. Pooled relative risks (RR) and 95% confidence intervals (CI) were estimated using a random-effects model. Heterogeneity was assessed using the I² statistic. Resultados e Conclusões: Eleven studies including 34,499 patients (mean age 69–78 years) were analyzed. DOAC therapy was associated with a lower risk of DRT compared with DAPT (RR 0.53, 95% CI 0.35–0.82; I²=28%). Thromboembolic events were also reduced (RR 0.66, 95% CI 0.48–0.90; I²=0%), with consistent findings across thrombotic endpoints. No significant difference was observed in all-cause mortality (RR 0.94, 95% CI 0.56–1.57; I²=5.6%). DOACs were associated with a lower risk of major bleeding compared with DAPT (RR 0.68, 95% CI 0.51-0.92), despite moderate heterogeneity (I²=61.2%). Collectively, these findings support reconsideration of routine antiplatelet-based strategies after LAAO, favoring anticoagulation-based approaches during the early post-implantation period. While the predominance of observational data and residual heterogeneity warrant cautious interpretation, these results reinforce DOACs as a consistent and clinically relevant alternative in this setting.





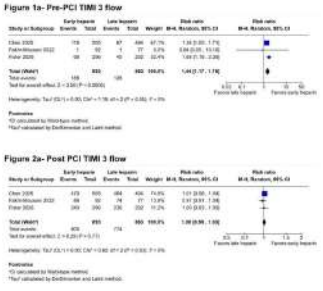
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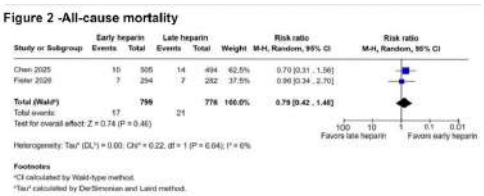
EARLY VERSUS PERIPROCEDURAL HEPARIN ADMINISTRATION IN ST-ELEVATION MYOCARDIAL INFARCTION REGARDING INFARCT-RELATED ARTERY OUTCOMES: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Intravenous administration of unfractionated heparin (UFH) in patients with ST-elevation myocardial infarction (STEMI) referred to primary percutaneous coronary intervention (PPCI) is well-established clinically. However, the benefits and safety of the pretreatment with UFH at the first medical contact in patients with STEMI is still contentious. Therefore, we aimed to perform a meta-analysis to determine the optimal timing of UFH administration in patients with STEMI undergoing PPCI regarding infarct- related artery (IRA) outcomes. Objetivos: We analyzed reperfusion of the IRA, measured by TIMI 3 flow (complete coronary perfusion), from randomized controlled trials comparing UFH at first medical contact versus administration at the catheterization laboratory for STEMI patients undergoing PPCI. Métodos: This systematic review and meta-analysis was performed in accordance with the PRISMA guidelines. We searched PubMed, Embase and Cochrane databases for randomized controlled trials that investigated the impact of UFH administration timing on reperfusion and all-cause mortality outcomes. Statistical analysis was executed using Review Manager (Cochrane Collaboration). Heterogeneity was assessed with i2 statistics. Resultados e Conclusões: We included 3 RCTs with 1.761patients from Slovenia, China and Iran. UFH administration at the first medical contact was used to increase IRA patency in 895 (50.1%) patients. Follow-up ranged from 40 days to 12 months. The mean age was 60.1±2,9 years, with 79% male patients and 20.1% patients with diabetes mellitus. The rate of pre-PCI time on TIMI 3 flow in the IRA (RR 1.44; 95% CI 1.17-1.76; p= 0.0005; i2= 0%) was significantly higher in patients with STEMI who received UFH at the FMC compared with those receiving only in the catheterization laboratory . There were no statistically significant differences in all-cause mortality at 30 days (RR 0.79; 95% CI 0.42-1.48; p=0.46; i2= 0%) or in the rate of post-PCI TIMI 3 flow in the IRA (RR 1.00; 95% CI 0.98- 1.03; p=0.29; i2= 0%). These findings suggest that early administration of UFH at the first medical contact is associated with improved reperfusion of the IRA with no differences in all-cause mortality in patients with STEMI assigned to PPCI.



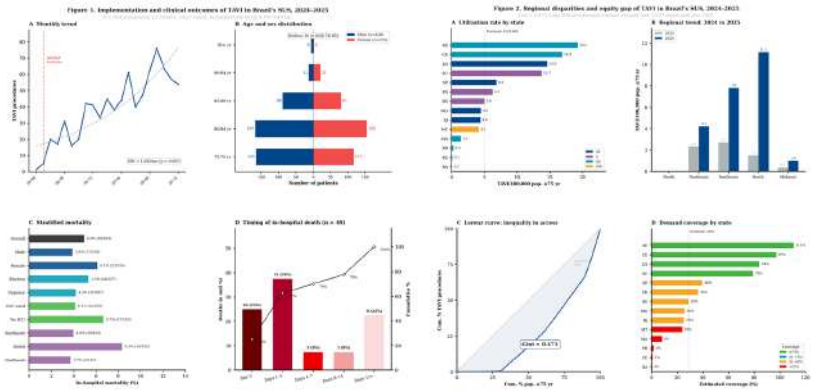


15317

FIRST 814 TAVI PROCEDURES IN BRAZIL'S UNIFIED HEALTH SYSTEM: FAVORABLE MORTALITY BUT MARKED REGIONAL DISPARITIES AND 71% UNMET DEMAND (2024–2025)

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Introdução/Fundamentos: Aortic stenosis (AS) is highly prevalent among older adults and is associated with high morbidity and mortality, as well as increased surgical risk in this population. Current Brazilian guidelines recommend Transcatheter Aortic Valve Implantation (TAVI) as a Class I indication for patients aged ≥75 years across all surgical risk profiles. However, Brazil's public health system (SUS) restricts TAVI to high or prohibitive surgical risk, aged ≥75, via transfemoral access only, following its operational inclusion in 2024. However, gaps remain regarding its implementation and equity of access. Objetivos: To analyze the patient profile, in-hospital mortality, temporal trends, regional disparities, and estimated unmet demand for TAVI during the first 21 months of implementation in the SUS. Métodos: Ecological population-based study using Hospital Information System (SIH-SUS) microdata for all TAVI admissions from April 2024 to December 2025. Population estimates (≥75 years) were obtained from the national statistics agency (IBGE) projections. Inequality in access was assessed using the Gini index and Lorenz curve. Survival was analyzed via Kaplan-Meier curves and Cox regression. Unmet demand was estimated based on international incidence benchmarks. Data were publicly available and de-identified, ethics approval was waived per Resolution CNS 510/2016. Resultados e Conclusões: A total of 814 TAVI procedures were performed in 23 centers across 14 of 27 states (48% of states had zero procedures, including the entire North region - 7 states). Patients were 53.8% male, median age 81 years (IQR 78–85), and 94.3% had isolated AS. In-hospital mortality was 4.9% (40/814), with 70% of deaths occurring within the first 7 days. Monthly volume increased 8.2%/month (IRR= 1.082; 95%CI 1.069–1.095). The Gini index for access was 0.473, reflecting significant inequality. The national utilization rate was 5.0/100,000 inhabitants ≥75 years, ranging from 0.1 (1 state) to 19.2 (2 states). Only 29% of estimated demand was met nationally. Specialized post-procedure care was associated with lower mortality risk (HR= 0.22; 95%CI 0.11–0.44; p< 0.001). Initial TAVI implementation in Brazil's SUS demonstrated clinical safety, with mortality rates comparable to international registries. However, the program covers less than one-third of the estimated demand and is marked by severe geographic concentration. The complete absence in the North region highlights a critical equity gap that necessitates the urgent expansion of accredited centers.

21722

HIGH THROMBUS BURDEN IS ASSOCIATED WITH WORSE INITIAL ANGIOGRAPHIC PROFILE IN PRIMARY PCI: A SINGLE-CENTER REGISTRY OF 379 PATIENTS

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Introdução/Fundamentos: High intracoronary thrombus burden is associated with greater angiographic complexity and worse outcomes in patients undergoing primary percutaneous coronary intervention (PCI) in the setting of ST-segment elevation myocardial infarction (STEMI). Studies demonstrate an association between high thrombus burden, increased distal embolization, no-reflow phenomenon, lower myocardial reperfusion, and worse clinical outcomes. Despite advances in antithrombotic strategies and reperfusion techniques, contemporary data regarding the impact of high thrombus burden on immediate primary PCI outcomes in high-complexity Brazilian centers remain limited. Objetivos: To evaluate the association between high thrombus burden and angiographic success of primary PCI in patients with STEMI undergoing angioplasty at a Brazilian tertiary center. Métodos: Retrospective observational study based on an institutional registry of patients with STEMI undergoing primary PCI at a tertiary cardiology center in Salvador, Bahia, from March 2020 to August 2023. Patients with complete data regarding thrombus burden, angiographic success, and in-hospital outcomes were included. Thrombus burden was classified according to the TIMI thrombus grade scale and categorized as low/intermediate (grades 0–3) or high (grades 4–5). The primary endpoint was PCI success, defined as final TIMI 3 flow associated with residual stenosis <20%. Initial coronary flow TIMI 0–1 and final TIMI 0–2 flow were evaluated as secondary endpoints. Resultados e Conclusões: A total of 379 patients were included, of whom 291 (76.8%) presented high thrombus burden. PCI success occurred in 90.7% of patients with high thrombus burden compared with 94.3% in the low/intermediate burden group (p=0.208). Initial TIMI 0–1 coronary flow was more frequent in the high-burden group (81.8% vs 14.8%; p<0.001), and a higher frequency of final TIMI flow 0–2 was also observed in these patients (12.0% versus 5.7%; p=0.145). In this consecutive cohort of patients undergoing primary PCI, high thrombus burden was associated with worse final coronary flow, characterized by a higher frequency of post-procedural TIMI flow 0–2, in addition to lower absolute rates of angiographic success. These findings reinforce the role of high thrombus burden as a marker of potentially worse coronary reperfusion in the setting of STEMI.

16880

In-hospital outcomes after TAVI: a multicenter analysis in two tertiary centers in Southern Brazil.

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(1) UNIVERSIDADE DO SUL DE SANTA CATARINA - PALHOÇA - SC - Brasil; (2) HOSPITAL SOS CARDIO + INSTITUTO DE CARDIOLOGIA DE SANTA CATARINA - FLORIANÓPOLIS - SC - Brasil;

Introdução/Fundamentos: Aortic stenosis is the most clinically significant valvular heart disease, particularly in the elderly. Transcatheter aortic valve implantation (TAVI) has emerged as a less invasive alternative to surgical aortic valve replacement (SAVR), with expanding indications. Studies show that TAVI is associated with reductions in all-cause mortality and stroke, regardless of baseline surgical risk or prosthesis type. Furthermore, technique refinement, driven by technological advances and greater operator experience, has contributed to improved survival and lower long-term complication rates. Evaluation of real-world in-hospital outcomes is essential for monitoring safety and effectiveness. Objetivos: This study aims to evaluate the in-hospital outcomes of patients undergoing TAVI in two tertiary centers in Southern Brazil. Métodos: This is a multicenter, retrospective observational study including 319 patients who underwent TAVI between 2018 and 2026 in two tertiary centers in Southern Brazil. Having a mean age of 81.82 years and 54.24% of the patients were male. Data were extracted from institutional databases. The following endpoints were assessed up to hospital discharge: procedural success, in-hospital mortality, stroke and new permanent pacemaker (PPM) implantation after TAVI. Resultados e Conclusões: Discussion: TAVI demonstrated high post-procedural success rates (97.20%), associated with low in-hospital mortality (2.5%), similar to values reported in the literature, reinforcing the short-term safety of the procedure. The incidence of stroke was 1.57%, comparable to studies reporting rates around 3% at 30 days, with higher occurrence within the first 48 hours after the procedure. The need for PPM implantation remained one of the main complications associated with the procedure, with a rate of 9.72%, similar to that reported in the literature (approximately 10.8%), which has not shown significant reduction over time. Conclusion: The results were consistent with the literature, showing high success rates and low mortality, likely associated with advancements in TAVI. Stroke and the need for permanent pacemaker implantation were the most frequent complications, highlighting the need for further studies. Nevertheless, the findings support the safety and effectiveness of TAVI in real-world clinical practice.

Outcomes after TAVI

OUTCOME	NUMBER	PERCENTAGE
Procedure success	310	97,20%
Death	8	2,50%
New permanent pacemaker after TAVI	31	9,72%
Stroke	5	1,57%

Source: prepared by the authors

Temporal analysis

YEAR	NUMBER OF TAVI	DEATH	PROCEDURE SUCCESS	STROKE	NEW PERMANENT PACEMAKER
2018	21	0	21	0	1
2019	50	2	47	1	3
2020	44	3	41	0	6
2021	39	1	38	0	4
2022	53	2	51	1	6
2023	36	0	36	1	2
2024	20	0	20	1	3
2025	45	0	45	1	3
2026	11	0	11	0	3
TOTAL	**319**	**8**	**310**	**5**	**31**

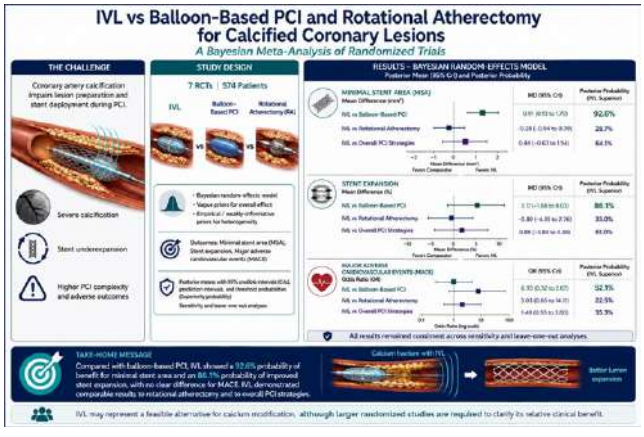
Source: prepared by the authors

16674

INTRAVASCULAR LITHOTRIPSY VERSUS BALLOON-BASED AND ATHERECTOMY LESION PREPARATION FOR CALCIFIED CORONARY PCI: A BAYESIAN META-ANALYSIS OF RANDOMIZED TRIALS

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Introdução/Fundamentos: Coronary artery calcification impairs lesion preparation and stent deployment during percutaneous coronary intervention (PCI). Intravascular lithotripsy (IVL) has emerged as a novel calcium-modifying strategy and represents a less aggressive alternative to balloon-based preparation and rotational atherectomy (RA), although comparative randomized evidence remains limited. Objetivos: To compare IVL with balloon-based preparation and RA for calcified coronary PCI using Bayesian meta-analysis, providing posterior probability estimates for clinically relevant thresholds. Métodos: A systematic search of PubMed, Embase, and Cochrane databases identified randomized trials (RCTs) comparing IVL with balloon-based strategies or RA before drug-eluting stent implantation in calcified coronary lesions. Bayesian random-effects models were fitted using vague priors for the overall effect and empirical or weakly-informative priors for between-study heterogeneity. Outcomes included minimal stent area (MSA), stent expansion, and major adverse cardiovascular events (MACE). Effect sizes were reported as mean differences (MD) or odds ratios (OR). Posterior means with 95% credible intervals (CrIs), prediction intervals, and threshold probabilities were computed. Sensitivity and leave-one-out analyses assessed robustness. Resultados e Conclusões: Compared with balloon-based PCI, IVL demonstrated a 92.6% posterior probability of benefit for MSA (MD, 0.91 mm²; 95% CrI, 0.13 to 1.70) and an 86.1% probability of improved stent expansion (MD, 3.17%; 95% CrI, −1.68 to 8.03), although no clear difference was observed for MACE (OR, 0.93; 95% CrI, 0.32 to 2.67). Compared with RA, IVL yielded comparable results across MSA (MD, -0.28 mm²; 95% CrI, -0.94 to 0.39), stent expansion (MD, -0.89%; 95% CrI, -4.55 to 2.76), and MACE (OR, 3.03; 95% CrI, 0.65 to 14.11). Likewise, no credible superiority was observed versus pooled PCI strategies. Findings remained robust across sensitivity and leave-one-out analyses. Conclusions: In patients undergoing PCI for calcified coronary lesions, IVL was associated with a favorable posterior estimate for MSA compared with balloon-based strategies, while showing broadly comparable results to RA across procedural and clinical outcomes. These probabilistic findings suggest that IVL may represent a feasible alternative for calcium modification, although larger randomized studies are required to clarify its relative clinical benefit.

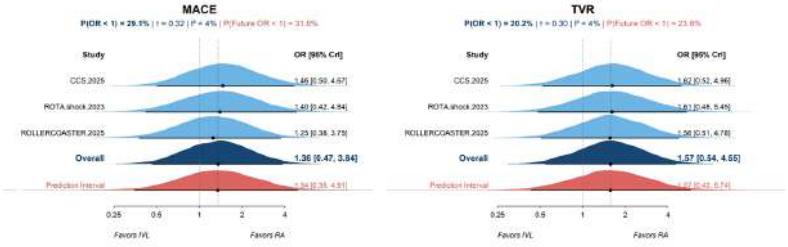
19358

INTRAVASCULAR LITHOTRIPSY VERSUS ROTATIONAL ATHERECTOMY IN SEVERELY CALCIFIED CORONARY LESIONS: A BAYESIAN META-ANALYSIS OF RANDOMIZED TRIALS

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Introdução/Fundamentos: Percutaneous coronary intervention of severely calcified lesions remains technically demanding due to the high risk of stent underexpansion. While rotational atherectomy (RA) is an established strategy for robust plaque modification, intravascular lithotripsy (IVL) has emerged as a modern alternative utilizing acoustic waves to fracture calcium. Objetivos: To evaluate the anatomical efficacy and clinical outcomes of IVL compared with RA in patients with severely calcified coronary lesions undergoing Randomized Controlled Trials (RCTs). Métodos: We systematically searched Pubmed, Embase, Cochrane, and ClinicalTrials.gov through March 2026 for Randomized Controlled Trials (RCTs). A Bayesian hierarchical model was fitted in Stan using Hamiltonian Monte Carlo with the No-U-Turn Sampler. Treatment effects were expressed as mean differences (MD) for continuous anatomical outcomes and odds ratios (OR) for clinical endpoints, alongside 95% credible intervals (CrI). We calculated the posterior probability of IVL superiority for anatomical [Pr(MD>0)] and clinical [Pr(OR<1)] outcomes, along with predictive probabilities for future studies. Statistical analysis was performed using the brms package in R. Resultados e Conclusões: We included 372 patients across 4 RCTs. For minimum stent area (MSA), IVL and RA demonstrated strict equivalence (MD 0.00; 95% CrI -1.88–1.77), with a coin-flip 50.2% posterior probability of favoring IVL [Pr(MD>0)] and only a 14.3% probability of achieving a more substantial anatomical benefit (MD > 0.5). For clinical endpoints, IVL was associated with a trend toward higher adverse events, albeit with wide uncertainty. TVR (OR 1.57; 95% CrI 0.54–4.55) demonstrated only a 20.2% probability of IVL superiority [Pr(OR<1)], with a 23.6% predictive probability that a future study will demonstrate clinical benefit. Similarly, MACE (OR 1.36; 95% CrI 0.47–3.84) showed only a 29.1% probability of IVL superiority, and a 31.6% predictive probability of future benefit. In conclusion, while IVL provides anatomical stent expansion strictly comparable to RA, its clinical profile shows no advantage, with posterior probabilities suggesting a trend toward higher MACE and TVR, ultimately favoring RA as the strategy with a better prognostic clinical profile.

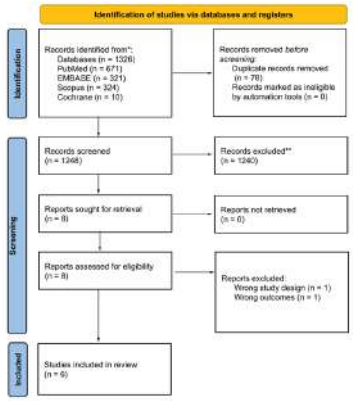


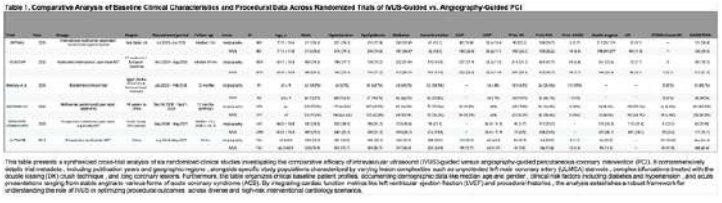
21896

INTRAVASCULAR ULTRASOUND-GUIDED VERSUS ANGIOGRAPHY-GUIDED PERCUTANEOUS CORONARY INTERVENTION IN ADVANCED CORONARY LESION SUBSETS: AN UPDATED SYSTEMATIC REVIEW OF RANDOMIZED CONTROLLED TRIALS

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Introdução/Fundamentos: Coronary Artery Disease is a major cause of cardiovascular morbidity and mortality worldwide. In complex coronary lesions, intravascular ultrasound (IVUS)-guided percutaneous coronary intervention (PCI) may optimize stent implantation and improve clinical outcomes compared with conventional angiography-guided PCI. Although IVUS-guided PCI has emerged as an important strategy, its impact on clinical outcomes in advanced coronary lesions remains uncertain. Objetivos: This systematic review aims to synthesize the evidences from randomized controlled trials (RCT) comparing intravascular ultrasound (IVUS)-guided versus angiography-guided percutaneous coronary intervention (PCI) in patients with advanced coronary lesion subsets, focusing on cardiovascular and clinical outcomes. Métodos: This review was conducted following the PRISMA 2020 guidelines, using a strategy based on the PICOTT model. The study protocol was registered in the PROSPERO database under the number CRD420261388792. The search was conducted in PubMed, Embase, Scopus and Cochrane using search terms related to “Intravascular Ultrasound-Guided”, “IVUS”, “Angiography-Guided”, “Coronary Lesion”, and “PCI”. Studies included were published in English between 2018 and 2026 that compared IVUS-guided versus angiography-guided PCI in patients with advanced coronary lesions. Two independent reviewers, in a double-blind process, screened 1248 records imported from title/abstract and full-text sources; a third reviewer resolved disagreements. After applying the inclusion and exclusion criteria, 6 RCTs were selected for this systematic review. Resultados e Conclusões: Across six randomized controlled trials comprising 6,649 patients, IVUS/imaging-guided PCI was associated with lower rates of adverse cardiovascular outcomes compared with angiography-guided PCI, particularly for composite ischemic endpoints and repeat revascularization. Significant reductions in target vessel failure or major adverse cardiovascular events were observed in DKCRUSH VIII (6.1% vs. 14.7%; HR 0.40, 95% CI 0.23–0.71), RENOVATE-COMPLEX-PCI (10.5% vs. 14.9%; HR 0.68, 95% CI 0.51–0.91), and ULTIMATE (2.9% vs. 5.4%; HR 0.53, 95% CI 0.31–0.90). IVUS guidance also reduced clinically driven revascularization and stent thrombosis in several studies. However, OPTIMAL and IVUS-CHIP did not demonstrate superiority of IVUS guidance for their primary endpoints. Overall, benefits were more pronounced in anatomically complex and high-risk PCI lesions,

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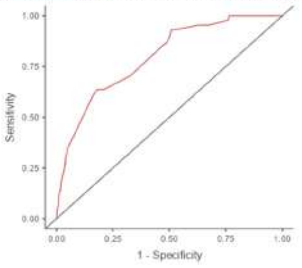
KIDNEY INJURY RISK IN INTERVENTIONAL CARDIOLOGY (KIRIC) SCORE: DEVELOPMENT OF A PREDICTION MODEL FOR CONTRAST-ASSOCIATED ACUTE KIDNEY INJURY

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Introdução/Fundamentos: Contrast-associated acute kidney injury (CA-AKI) remains a relevant complication after interventional cardiology procedures, particularly in structural settings such as transcatheter aortic valve implantation (TAVI), in which traditional risk scores have limited applicability. This study aimed to develop a risk score to predict CA-AKI in patients undergoing interventional cardiovascular procedures and to assess its performance. Objetivos: To develop and evaluate the Kidney Injury Risk in Interventional Cardiology (KIRIC) Score. Métodos: This retrospective observational cohort included 1,191 adult patients undergoing TAVI, percutaneous coronary intervention, or diagnostic coronary procedures with iodinated contrast. The primary outcome was CA-AKI, defined according to KDIGO criteria as an absolute increase in serum creatinine ≥0.5 mg/dL within 24–48 hours after the procedure or a relative increase ≥25% from baseline. Binary logistic regression was used to estimate odds ratios and ln(OR). Variables with p<0.05 were retained in the final model, and coefficients were rounded to the nearest 0.5 to generate a cumulative point score. This study complied with Resolution No. 466/2012 for research involving human subjects and was approved by the Research Ethics Committee, Fortaleza, Ceará, Brazil, under opinion No. 6,298,583. Resultados e Conclusões: The final model included seven predictors: TAVI, age >65 years, hypertension, female sex, diabetes mellitus, estimated glomerular filtration rate <30 mL/min/1.73 m², and contrast volume >300 mL. The KIRIC Score ranged from 0 to 9.5 points and stratified patients into low- (0–2.5), intermediate- (3.0–5.5), and high-risk (6.0–9.5) groups. Discriminatory performance was good, with an AUC of 0.796. Among the evaluated cutoff points, the threshold of 0.15 provided the best clinical balance, with a sensitivity of 61.4%, specificity of 83.3%, and overall accuracy of 81.6%. The KIRIC Score showed good predictive performance and may support renal risk stratification and clinical decision-making in interventional cardiology.

Figure 1 – Receiver Operating Characteristic (ROC) curve of the predictive model for identifying the risk of Contrast-Induced Nephropathy (CIN) in patients undergoing interventional cardiology procedures (n = 1,191). Fortaleza, Brazil, 2026.



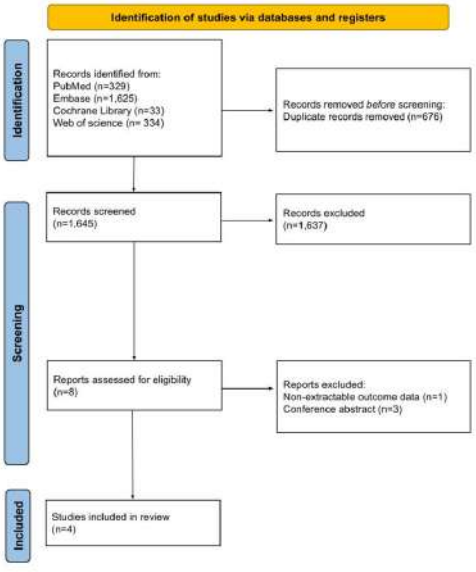
16484

LEFT ATRIAL APPENDAGE CLOSURE VS ORAL ANTICOAGULATION IN PATIENTS WITH ATRIAL FIBRILLATION AND END-STAGE RENAL DISEASE: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Atrial fibrillation (AF) is common in patients with end-stage renal disease (ESRD) on dialysis and carries a high risk of stroke and thromboembolism. Oral anticoagulation (OAC) is challenging due to increased bleeding risk. Percutaneous left atrial appendage occlusion (LAAO) offers a non-pharmacological option by permanently sealing the left atrial appendage,the primary site of thrombus formation in AF, potentially reducing thromboembolic events while minimizing long-term anticoagulation needs. Objetivos: This study aimed to evaluate the efficacy and safety of percutaneous LAAO compared with anticoagulation in patients with AF and ESRD undergoing hemodialysis or peritoneal dialysis. Métodos: PubMed, Embase, Cochrane Library and Web of Science were systematically searched up to February 2026 following PRISMA guidelines. It was included observational studies comparing percutaneous left atrial appendage occlusion (LAAO) versus oral anticoagulation in patients with atrial fibrillation (AF) and end-stage renal disease (ESRD) undergoing hemodialysis or peritoneal dialysis. The primary outcomes were Major Bleeding, Mortality, Systemic Embolism, Intracranial hemorrhage and gastrointestinal bleeding. Resultados e Conclusões: Across 3 included studies, a total of 8,497 patients were analyzed. The CHA2DS2-VASc score ranged from 3.94 to 4, and age ranged from 65 to 76 years. Overall, 5,075 participants were male. Hypertension was reported in 8,016 patients, while heart failure was present in 4,849 patients. Prior ischemic stroke or TIA was observed in 2,612 individuals. For gastrointestinal bleeding, pooling of two studies demonstrated a significantly higher risk associated with OAC compared to LAOO (pooled HR = 2.61; 95% CI: 2.18–3.13; p < 0.01; I² = 22.3%). Regarding major bleeding, three studies were included, and the effect remained significant (pooled HR = 1.61; 95% CI: 1.36–1.90; p < 0.01; I² = 53.3%) favoring LAOO. Exclusion of Genovesi 2021 reduced heterogeneity (I² = 21.7%) without materially changing the effect estimate. For intracranial hemorrhage, mortality, and systemic embolism, no significant differences were observed between groups.In patients with atrial fibrillation and ESRD on dialysis, OAC was associated with higher rates of gastrointestinal and major bleeding compared with LAAO. These findings suggest that LAAO may be associated with bleeding events and should be considered after careful patient selection and further investigation.

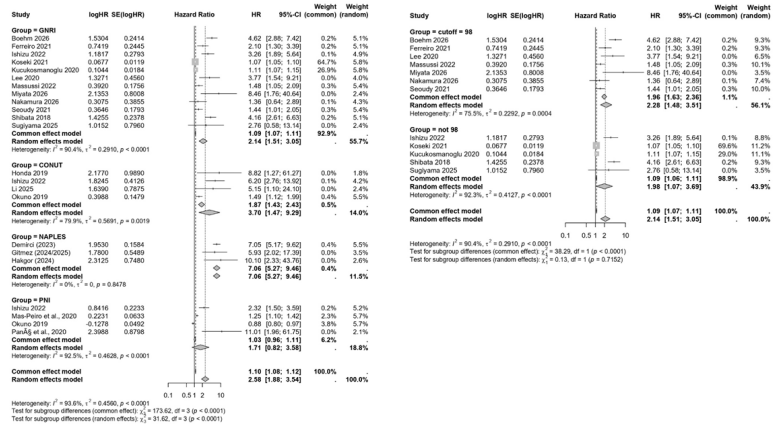


17870

PROGNOSTIC IMPACT OF NUTRITIONAL INDICES ON MORTALITY AFTER TRANSCATHETER AORTIC VALVE REPLACEMENT: A TIME-TO-EVENT META-ANALYSIS

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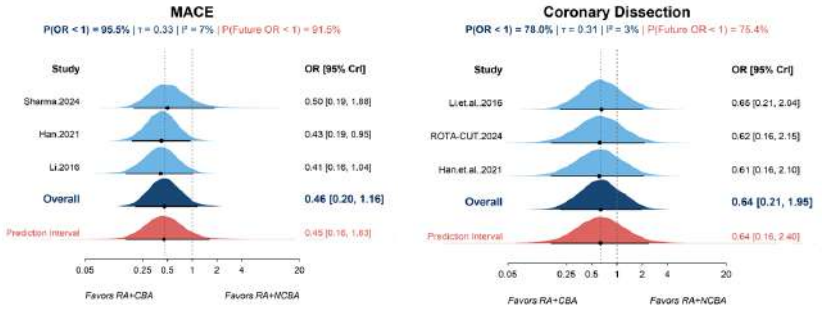
Introdução/Fundamentos: Aortic stenosis is among the most prevalent cardiovascular disorders in the aging population. Over years, transcatheter aortic valve replacement (TAVR) has become a widely accepted standard therapy for elderly patients with severe disease. In this setting, frailty is a key determinant of prognosis, and within its spectrum, nutritional status has emerged as a crucial tool for risk stratification. These considerations highlight the need for improved identification and assessment of factors that may influence long-term clinical outcomes. Objetivos: To evaluate the prognostic value of nutritional indices in predicting all-cause mortality in patients undergoing TAVR. Métodos: A systematic review was conducted following PRISMA guidelines, we searched in PubMed, Embase, Web of Science, and Cochrane Library using descriptors and variations for the terms: TAVR, nutritional status, and mortality. Study selection was performed independently by two reviewers using the Rayyan platform. Studies that evaluated nutritional indices for predicting mortality were included. Hazard ratios (HR) were standardized to ensure consistency in the direction of effect. Statistical analysis was performed at RStudio. A random-effects meta-analysis was conducted based on log(HR) and standard errors. Resultados e Conclusões: A total of 20 studies including 14,121 patients were analyzed. GNRI was reported in 12 studies (n = 11,714) and was associated with increased mortality (HR 2.14, 95% CI 1.51–3.05). CONUT was evaluated in 4 studies (n = 2,066) and showed a higher risk (HR 3.70, 95% CI 1.47–9.29). The Naples score, reported in 3 studies (n = 965), demonstrated a strong association with mortality (HR 7.06, 95% CI 5.27–9.46). In contrast, PNI, evaluated in 4 studies (n = 1,551), did not show a statistically significant association (HR 1.71, 95% CI 0.82–3.58). Subgroup analyses were performed for GNRI, studies using a cutoff of 98 showed a HR of 2.28 (95% CI 1.48–3.51), while those using others demonstrated HR of 1.98 (95% CI 1.07–3.69). Stratified by geographic region, GNRI was associated with mortality in Western (HR 1.80, 95% CI 1.11–2.93) and Eastern populations (HR 2.57, 95% CI 1.52–4.36). Malnutrition is significantly associated with increased mortality after TAVR, particularly when assessed using comprehensive indices such as CONUT and the Naples. GNRI demonstrated consistent prognostic role. These findings support the role of nutritional assessment as an important component of risk stratification in patients undergoing TAVR

18683

ROTATIONAL ATHERECTOMY FOLLOWED BY CUTTING VERSUS NON-CUTTING BALLOON ANGIOPLASTY IN SEVERELY CALCIFIED CORONARY LESIONS: A BAYESIAN META-ANALYSIS OF RANDOMIZED TRIALS

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Introdução/Fundamentos: Percutaneous coronary intervention of severely calcified lesions often requires aggressive lesion preparation. While rotational atherectomy (RA) effectively ablates superficial calcium, subsequent balloon dilation is crucial to facilitate optimal stent delivery and expansion. The adjunctive use of cutting balloon angioplasty (CBA) following RA has emerged as a promising strategy to further modify calcific plaques compared to standard non-cutting balloon angioplasty (NCBA). Objetivos: To evaluate the periprocedural safety and long-term clinical outcomes of RA+CBA compared with RA+NCBA in patients with severely calcified coronary lesions undergoing Randomized Controlled Trials (RCTs). Métodos: We systematically searched Pubmed, Embase, and Cochrane through March 2026 for Randomized Controlled Trials (RCTs). A Bayesian hierarchical model was fitted in Stan using Hamiltonian Monte Carlo with the No-U-Turn Sampler. Treatment effects were expressed as odds ratios (OR) for clinical and safety endpoints, alongside 95% credible intervals (CrI). We calculated the posterior probability of RA+CBA superiority [Pr(OR<1)], along with predictive probabilities for future studies. Statistical analysis was performed using the brms package in R. Resultados e Conclusões: We included 251 patients across 3 RCTs. For periprocedural safety, RA+CBA demonstrated a protective trend against coronary dissection (OR 0.64; 95% CrI 0.21–1.95), with a 78.0% posterior probability of benefit [Pr(OR<1)] and a 75.4% predictive probability that a future study will demonstrate benefit. For long-term efficacy, the use of CBA indicated a strong trend toward reducing target vessel revascularization (TVR) (OR 0.48; 95% CrI 0.15–1.57), driven by an 89.2% probability of superiority and an 86.2% predictive probability of future benefit. For major adverse cardiovascular events (MACE), RA+CBA was associated with a high probable risk reduction (OR 0.46; 95% CrI 0.20–1.16) with a 95.5% posterior probability favoring RA+CBA, alongside a 91.5% predictive probability of future clinical benefit. In conclusion, the adjunctive use of cutting balloons following rotational atherectomy provides a highly probable clinical advantage over non-cutting balloons, suggesting reduction in MACE and a trend toward lower TVR and dissection rates, ultimately favoring RA+CBA with a better prognostic clinical profile.

18427

ROUTINE PERCUTANEOUS CORONARY INTERVENTION PRIOR TO TRANSCATHETER AORTIC VALVE IMPLANTATION: A BAYESIAN META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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(1) UNIVERSIDADE FEDERAL DA PARAIBA - JOÃO PESSOA - PB - BRASIL; (2) UNIVERSIDADE FEDERAL DO CEARA - FORTALEZA - CE - BRASIL; (3) BETH ISRAEL DEACONESS MEDICAL CENTER - UNITED STATES; (4) PONTIFICIA UNIVERSIDADE CATOLICA PUC - CURITIBA - PR - BRASIL; (5) UNIVERSIDADE DE PERNAMBUCO - RECIFE - PE - BRASIL; (6) CENTRO UNIVERSITARIO PARA O DESENVOLVIMENTO DO ALTO VALE DO ITAJAI - RIO DO SUL - SC - BRASIL; (7) HOSPITAL SIRIO-LIBANES - SÃO PAULO - SP - BRASIL;

Introdução/Fundamentos: The optimal management of concomitant coronary artery disease (CAD) during transcatheter aortic valve implantation (TAVI) remains controversial due to conflicting data from randomized controlled trials (RCTs). Objetivos: To evaluate routine percutaneous coronary intervention (PCI) versus conservative management in TAVI patients with CAD using a Bayesian meta-analysis. Métodos: A systematic review and Bayesian meta-analysis of RCTs (through April 2026) compared routine percutaneous coronary intervention (PCI) versus conservative management in TAVI patients with CAD. Treatment effects were estimated as risk ratios (RRs) with 95% credible intervals (CrIs) using a Bayesian random-effects model, with posterior probabilities calculated to assess the likelihood of a protective effect (RR ≤ 1.00), a substantial reduction in risk (RR ≤ 0.75), or harm (RR > 1.00). Resultados e Conclusões: Three RCTs (N = 1,156) were included, of whom 579 patients (50%) underwent prior PCI. Routine PCI significantly reduced the risk of subsequent revascularization (RR, 0.27; 95% CrI, 0.11 to 0.66; 99.3% probability of benefit). Point estimates favored PCI for cardiovascular death (RR, 0.74; 95% CrI, 0.44 to 1.24), stroke (RR, 0.71; 95% CrI, 0.42 to 1.20), myocardial infarction (RR, 0.83; 95% CrI, 0.44 to 1.60), and all-cause mortality (RR, 0.92; 95% CrI, 0.62 to 1.35); however, a substantial proportion of the posterior distribution lay above RR = 1, indicating a meaningful probability of harm and overall uncertainty. Conversely, PCI was associated with an increased risk of major bleeding (RR, 1.57; 95% CrI, 0.96 to 2.57; 96.8% probability of harm). Routine PCI before TAVI in patients with concomitant CAD reduces subsequent revascularization and may lower cardiovascular death and stroke, but increases bleeding without clear benefit for all-cause mortality. These findings support an individualized, patient-centered balance between ischemic and bleeding risks.

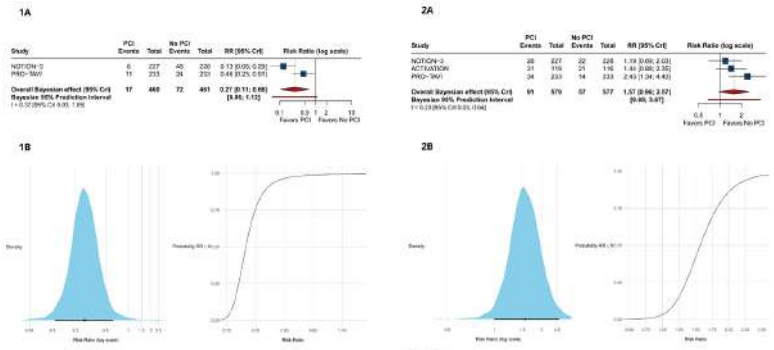


Figure 1.
(A) Bayesian forest plots showing the relative risk (RR) of routine percutaneous coronary intervention (PCI) versus conservative management prior to transcatheter aortic valve implantation (TAVI) for any revascularization outcome. (B) Marginal posterior density distribution of the overall RR, along with the corresponding cumulative probability curve.

Figure 2.
(A) Bayesian forest plots showing the relative risk (RR) of routine percutaneous coronary intervention (PCI) versus conservative management prior to transcatheter aortic valve implantation (TAVI) for major bleeding outcome. (B) Marginal posterior density distribution of the overall RR, along with the corresponding cumulative probability curve.

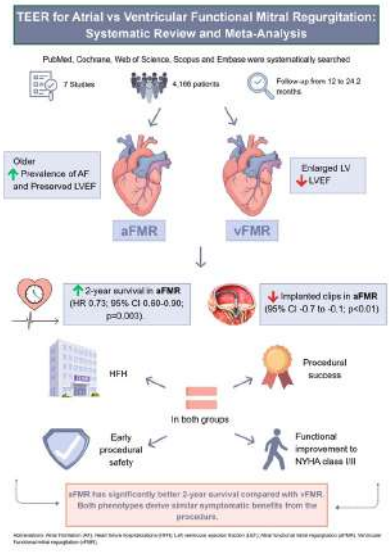
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TRANSCATHETER EDGE-TO-EDGE REPAIR FOR ATRIAL VS VENTRICULAR FUNCTIONAL MITRAL REGURGITATION: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Functional mitral regurgitation (FMR) may be categorized into atrial (aFMR) and ventricular (vFMR) phenotypes. While transcatheter edge-to-edge repair (TEER) is established for vFMR, whether clinical outcomes are as favorable for aFMR remains unclear. Objetivos: This systematic review and meta-analysis aims to compare the long-term clinical efficacy of transcatheter edge-to-edge repair (TEER) in patients with atrial functional mitral regurgitation (aFMR) versus ventricular functional mitral regurgitation (vFMR). Métodos: We systematically searched PubMed, Cochrane, Web of Science, Scopus, and Embase through November 2025 for studies comparing outcomes of TEER after treatment in patients with aFMR versus vFMR. The primary endpoints of interest were 2-year all-cause mortality and heart failure hospitalizations (HFH), analyzed using reconstructed individual patient data (IPD) from Kaplan–Meier curves in mixed-effects Cox proportional hazards models. Secondary outcomes included procedural success in reducing MR, early procedural safety, follow-up MR grade, and mid-term functional status (NYHA class I/II), analyzed using random-effects meta-analysis. Resultados e Conclusões: Seven studies involving 4,166 patients (aFMR: 662; vFMR: 3,504) were included. aFMR patients were older, had a higher prevalence of atrial fibrillation and preserved left ventricular ejection fraction (LVEF), whereas vFMR patients had larger ventricular diameters and lower LVEF. IPD meta-analysis (n=4,124) demonstrated lower 2-year mortality in TEER-treated aFMR compared with vFMR patients (HR 0.73; 95% CI 0.59–0.90; p=0.003). Procedural success, early procedural complications (mortality, stroke, bleeding), MR grade during follow-up, mid-term functional improvement to NYHA class I/II and rates of HFH after TEER were comparable between groups. In patients undergoing TEER, the aFMR phenotype is associated with better 2-year survival compared with vFMR. Both groups derive similar symptomatic benefits from the procedure, supporting TEER as an effective therapy for aFMR as well as vFMR.



Neglected Cardiovascular Diseases



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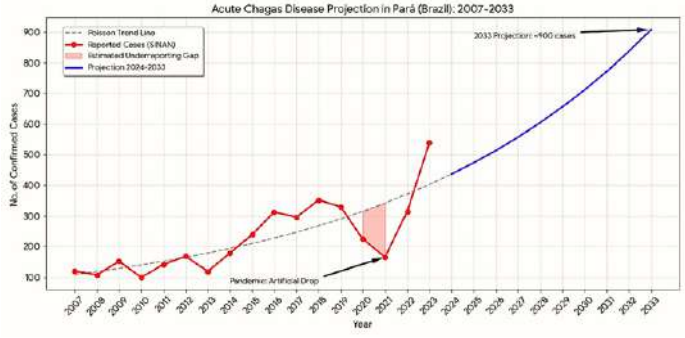
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A SILENT CARDIOVASCULAR WAVE: FORECASTING THE BURDEN AND ECONOMIC IMPACT OF CHAGAS CARDIOMYOPATHY IN THE BRAZILIAN AMAZON (2007–2033)

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(1) IDOR - RIO DE JANEIRO - RJ - BRASIL;

Introdução/Fundamentos: The Brazilian Amazon, particularly Pará, concentrates most acute Chagas disease notifications in the country, accounting for over 80% of reported cases. Sustained transmission, largely driven by oral outbreaks, is generating cohorts at risk of chronic disease. Around 30% of infected individuals may develop cardiomyopathy, creating a silent and cumulative cardiovascular burden with potential impact on heart failure, arrhythmias, and premature mortality. Objetivos: To estimate the expected burden of chronic Chagas disease and cardiomyopathy and its economic impact in Pará from 2007 to 2033. Métodos: Retrospective and predictive study using SINAN data on acute cases. Projections were performed using Poisson regression, assuming a 4.6% annual transition rate from acute infection to chronic disease (MARTINS-MELO et al., 2014). The expected burden of chronic disease and cardiomyopathy was estimated using established progression rates. Economic impact was calculated using lifetime societal cost parameters from The Lancet Regional Health – Americas (2025). Resultados e Conclusões: Between 2007 and 2023, 3,858 acute cases were reported in Pará, indicating sustained transmission. Projections estimate 3,030 cumulative chronic cases by 2033. Applying known progression rates, a substantial proportion is expected to develop cardiomyopathy, contributing to future heart failure and other cardiovascular complications. In settings with limited diagnostic capacity, part of this burden may remain unrecognized within routine cardiovascular care. Considering a lifetime societal cost of R$ 225,270 per chronic patient (THE LANCET, 2025), the economic impact is estimated to exceed R$ 682 million over the next decade, with the most significant part of the costs attributable to cardiomyopathy (60.3 million yearly). These findings indicate an epidemiological transition toward a growing cardiovascular burden. If unaddressed, today's acute infections will become tomorrow's heart failure cases, silently reshaping the cardiovascular landscape of the Amazon.



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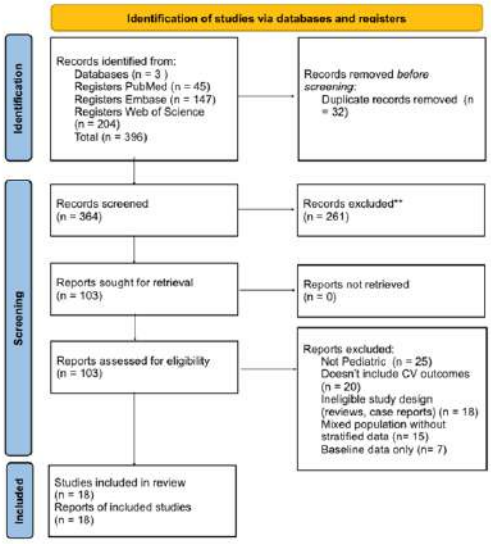
CARDIOVASCULAR OUTCOMES IN PEDIATRIC RHEUMATIC HEART DISEASE: A PRISMA-BASED SYSTEMATIC REVIEW

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Introdução/Fundamentos: Rheumatic heart disease (RHD) remains a major cause of cardiovascular morbidity and mortality in children, particularly in low- and middle-income countries, with significant long-term clinical impact. Objetivos: To evaluate the main cardiovascular outcomes associated with pediatric RHD, focusing on clinical severity, progression, and major complications. Métodos: A systematic review was conducted according to PRISMA guidelines. A total of 396 records were identified, with 32 duplicates removed and 364 studies screened. After title/abstract and full-text assessment, 18 studies were included. Eligible studies involved pediatric populations with RHD and reported cardiovascular outcomes. A qualitative synthesis was performed. Resultados e Conclusões: Data from clinical trials, observational cohorts, and screening programs conducted in endemic regions—including Ethiopia, Egypt, India, and Thailand—involving over 20,000 children across 18 publications were analyzed. RHD predominantly affected late childhood and early adolescence (mean 11–15 years), a peak that reflects a pattern of cumulative valvular damage resulting from recurrent streptococcal infections and failures in secondary prophylaxis. Valvular dysfunction was the most frequent manifestation, particularly mitral regurgitation, reported in up to 93.8% of cases. A high burden of severe disease at diagnosis was observed, with heart failure present in up to 61.4% of patients in low-resource settings. Pulmonary hypertension (up to 59.3%) and atrial fibrillation (up to 9.1%) were also reported. Long-term outcomes revealed substantial morbidity, including a significant decline in survival rates over time (up to 40% mortality at 8 years in high-risk groups) and a frequent need for valve surgery, reported in approximately 13.8% of cases in middle-income cohorts. Screening studies identified subclinical disease with progression rates of 12.5% within 2 years. Overall, pediatric RHD is associated with early-onset, severe cardiovascular complications and significant long-term burden. These findings highlight critical gaps in early diagnosis, implementation of secondary prevention, and access to specialized care in high-burden regions.

PRISMA 2020- Flow diagram: Cardiovascular Outcomes in Pediatric Rheumatic Heart Disease: A PRISMA-Based Systematic Review



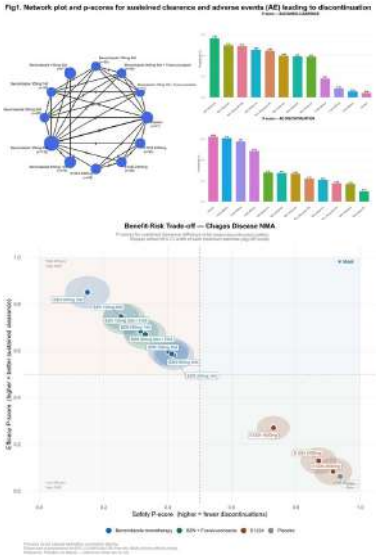
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COMPARATIVE EFFICACY AND TOLERABILITY OF BENZNIDAZOLE REGIMENS AND NEW THERAPEUTIC OPTIONS FOR CHRONIC CHAGAS DISEASE: A NETWORK META-ANALYSIS

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Introdução/Fundamentos: Sustained parasitological clearance is the primary objective of chronic Chagas disease treatment. However, the standard 60-day benznidazole regimen is limited by high toxicity and treatment discontinuation rates. Objetivos: We aimed to evaluate the comparative efficacy and safety profile of different antitrypanosomal drugs and reduced-duration dosage regimens in adult patients with chronic Chagas disease. Métodos: We systematically searched PubMed, Embase, and Cochrane to identify randomized clinical trials (RCTs) evaluating antitrypanosomal therapy in chronic Chagas disease. The primary efficacy endpoint was sustained parasitological clearance (negative qPCR at 12 months). Safety endpoints included treatment discontinuation due to adverse events (AE) and serious adverse events (SAE). A frequentist network meta-analysis was performed using a random-effects model to synthesize direct and indirect evidence. Treatment effects were estimated as odds ratios (OR) with 95% confidence intervals (CI). Treatment hierarchy was established utilizing P-scores. A bivariate scatter plot was generated to analyze the benefit-risk trade-off between efficacy and safety endpoints. Resultados e Conclusões: We included 3 RCTs comprising 675 patients. We evaluated diverse regimens of benznidazole, E1224, and fosravuconazole combinations. For sustained parasitological clearance (negative qPCR at 12 months), all benznidazole-containing regimens were superior to placebo. Benznidazole 300 mg/30 days ranked highest for efficacy (P-score = 0.85; OR vs. placebo = 129.23, 95% CI 22.92-728.73), followed by benznidazole 150 mg/60 days (P-score = 0.75; OR = 86.36, 95% CI 24.06-309.99). The standard regimen (benznidazole 300 mg/60 days) ranked seventh (P-score = 0.59). However, safety analysis demonstrated an inverse relationship between efficacy and tolerability. Placebo (P-score=0.94) and all E1224 dosages (P-scores > 0.70) had the lowest rates of adverse event-related discontinuation, whereas Benznidazole 300 mg/30 days presented the highest rate of AE-related discontinuation (P-score = 0.15). Benefit-risk trade-off analysis indicated that the short-course regimen of benznidazole 300 mg/14 days provided comparable efficacy (P-score = 0.58) and safety (P-score = 0.42) to the standard 60-day regimen (P-scores = 0.59 and 0.41, respectively). E1224 regimens demonstrated high safety profiles but lacked sustained parasitological efficacy.



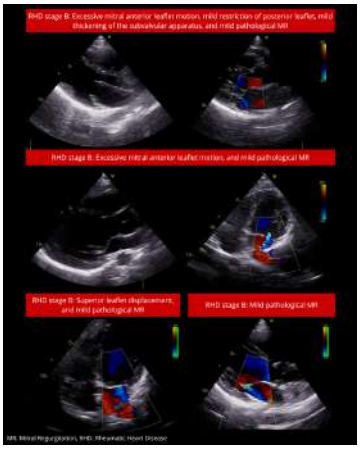
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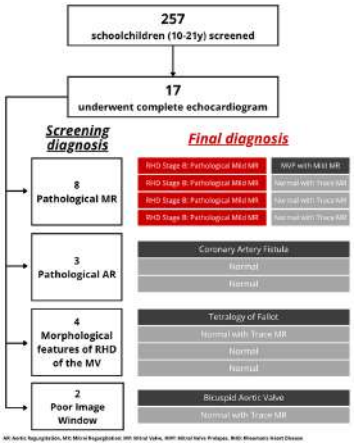
ECHOCARDIOGRAPHIC SCREENING PERFORMED BY MEDICAL STUDENTS TO DETECT RHEUMATIC HEART DISEASE: A STUDY OF 257 RURAL BRAZILIAN SCHOOLCHILDREN

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Introdução/Fundamentos: Rheumatic heart disease (RHD) remains a major health concern affecting over 55 million people and causing 590,000 deaths annually, primarily in developing countries. Echocardiographic screening for RHD allows early detection of subclinical cases and timely initiation of antibiotic prophylaxis. Training medical students may help scale up screening strategies of RHD in endemic regions. Objetivos: To evaluate the prevalence of subclinical RHD in rural Brazilian schoolchildren through an echocardiographic screening performed by medical students. Métodos: Four final-year medical students doing their primary care rotation in a rural Brazilian town were trained using a hybrid strategy (8-hour online course and a 3-day in-person immersion). Screening was conducted in a public school for students aged 10 to 21 years old, and parental informed consent was obtained. Two handheld Phillips Lumify® machines were used for image acquisition, including the parasternal long-axis, short-axis of the aortic valve and apical four-chamber views. All screening images were analyzed by an experienced cardiologist, and those with limited echocardiographic window or abnormal findings according to the 2023 World Heart Federation (WHF) RHD diagnostic criteria were referred for a complete echocardiogram for definitive diagnosis. Resultados e Conclusões: In total, 257 students from one public school were screened over an 8-day period. The mean age was 14.5 ± 2.2 years old, 61% were female, and mean height and weight were 1.63 ± 0.1 m and 56.9 ± 13.3 kg, respectively. Regarding housing, the mean household occupancy was 4.2 ± 1.3 residents (1.2 ± 1.0 children under 15), and 21% of patients lived in non-owned houses. Among the 257 screened students, 17 underwent a complete echocardiogram (15 due to suspected RHD and 2 due to limited echocardiographic window). Of those, after the formal echocardiogram, 9 patients had normal findings, 4 patients (1.6%) were diagnosed with other congenital abnormalities, and 4 patients (1.6%) fulfilled the 2023 WHF criteria for RHD diagnosis, all of them as stage B involving pathological mitral regurgitation. The prevalence of subclinical RHD in schoolchildren from a rural Brazilian town was 1.6% (95% CI 0.6 - 3.9%). Training medical students to acquire images for echocardiographic screening is a valuable tool to scale up RHD detection in endemic areas, enabling early diagnosis and timely secondary prophylaxis.





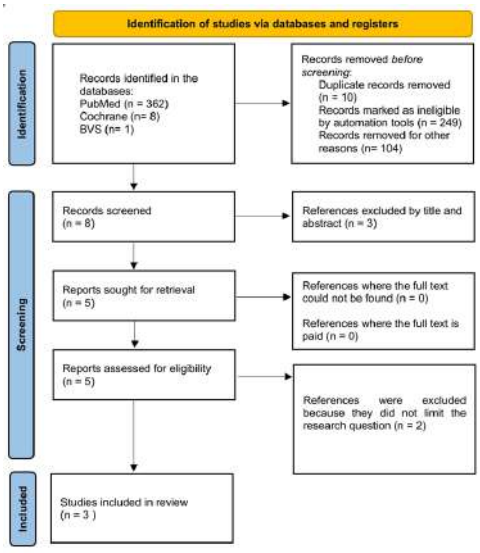
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EFFICACY AND SAFETY OF ANGIOTENSIN RECEPTOR-NEPRILYSIN INHIBITORS IN IMPROVING CARDIAC FUNCTION IN CHAGAS CARDIOMYOPATHY: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Chronic Chagas cardiomyopathy (CCC) is the most severe manifestation of Chagas disease, a neglected and endemic tropical zoonosis, particularly in Latin America. Characterized by fibrosis, arrhythmias, and cardiomyocyte destruction, its progression to heart failure represents the poorest prognosis of the pathology. Sacubitril/valsartan has demonstrated benefits in HFrEF of other etiologies, but little is known about its effects specifically on CCC. Objetivos: To evaluate the clinical efficacy and safety profile of angiotensin receptor-neprilysin inhibitors (ARNI) in improving cardiac function parameters in patients with chronic Chagas cardiomyopathy. Métodos: A systematic review of randomized clinical trials (RCTs) was conducted according to PRISMA 2020 guidelines and the PICO strategy. The search was performed across PubMed, Cochrane, and BVS databases between 2016 and 2026, using the descriptors “Chagas Cardiomyopathy” and “Angiotensin Receptor-Neprilysin Inhibitors,” and their synonyms, combined with Boolean operators. RCTs investigating the efficacy and safety of ARNI compared to placebo or standard of care on the cardiac function of Chagas cardiomyopathy patients were included. Research involving heterogeneous heart failure etiologies that did not present stratified analysis for Chagas was excluded. Resultados e Conclusões: Three RCTs were included (n= 1,112), with a target ARNI dose of 200 mg twice daily. Although one study did not demonstrate a significant reduction in cardiovascular deaths or heart failure (HF) hospitalizations over 25 months, the intervention outperforms standard treatment by reducing biomarkers of myocardial stress and injury. There was a robust and superior reduction in NT-proBNP levels in the ARNI group (30.6% reduction vs. 5.5% with enalapril; Win Ratio 1.52; 95% CI 1.28–1.82; p < 0.001). Other data corroborate these findings, showing no additional improvement in left ventricular ejection fraction (LVEF) at 6 months (difference of 0.9%; p = 0.36), but confirming the sharp reduction of the biomarker (ratio 0.68; 95% CI: 0.57-0.68; p < 0.001). These findings, combined with improved quality of life and a similar safety profile regarding hypotension and renal dysfunction, position ARNI as fundamental in curbing HF progression in CCC. However, further studies are required to consolidate long-term benefits across different disease phenotypes.



18597

EFFICACY OF GLP-1 RECEPTOR AGONISTS ON WEIGHT REDUCTION AND CARDIOMETABOLIC OUTCOMES IN ANTIPSYCHOTIC-TREATED PATIENTS: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Antipsychotics, particularly second-generation agents, are associated with weight gain and metabolic disturbances, increasing cardiovascular risk. Although strategies such as off-label metformin are used, more effective approaches are needed. GLP-1 receptor agonists (GLP-1 RAs) have emerged as a promising option due to their effects on weight and cardiometabolic parameters. Objetivos: To evaluate the effects of GLP-1 RAs on weight reduction and cardiometabolic outcomes in patients receiving antipsychotics. Métodos: A systematic review was conducted per PRISMA guidelines. MEDLINE and SciELO were searched for clinical trials published in the last 10 years using the MeSH terms: “GLP-1 receptor agonist” , “antipsychotics” and “weight gain”. Eligible studies included randomized controlled trials (RCTs) in overweight or obese patients using antipsychotics, undergoing long-acting GLP-1 RA therapy, with ≥16 weeks of follow-up. Studies without relevant cardiometabolic outcomes were excluded. Resultados e Conclusões: Three RCTs met inclusion criteria (four articles, including one long-term follow-up), comprising a total of 288 patients with schizophrenia or related disorders. Interventions involved semaglutide (N=92) and liraglutide (N=52). Semaglutide significantly reduced weight (−9.21 kg; 95% CI: −11.68 to −6.75) and increased HDL (+10.81 mg/dL; 95% CI: 2.70–18.53; p=0.007). Compared to placebo, semaglutide and liraglutide reduced body weight (respectively: −13.46 kg and −5.3 kg; p<0.01) and improved waist circumference, systolic blood pressure, and LDL (p<0.05). At one-year follow-up after liraglutide discontinuation, partial weight regain (−3.8 kg; 95% CI: −7.3 to −0.2; p=0.04) and loss of cardiometabolic benefits were observed. Regarding safety, both drugs were well-tolerated; the most frequent side effects were mild gastrointestinal symptoms (e.g., nausea and constipation), which in general did not lead to significant treatment discontinuation. GLP-1 RAs are associated with significant weight loss and cardiometabolic improvement in antipsychotic-treated patients, presenting a tolerable profile. However, evidence is limited by small samples and short follow-up, with uncertain long-term sustainability. Larger trials are needed.

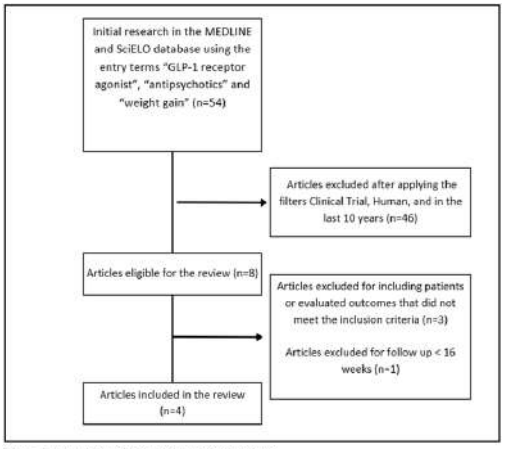


Figure 1. Flowchart of the study selection process

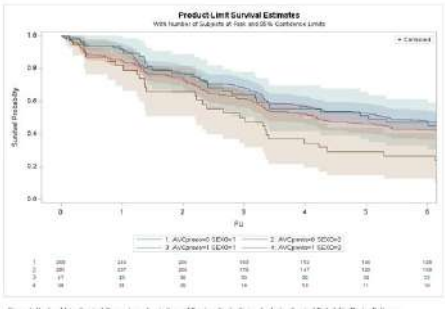
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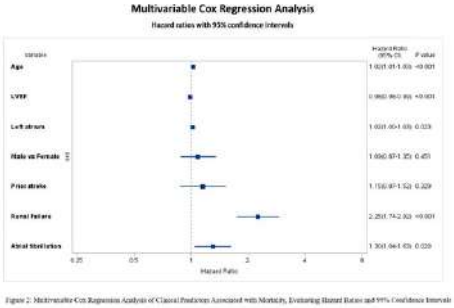
GENDER DISPARITIES IN MORTALITY FROM CHAGAS CARDIOMYOPATHY WITH HEART FAILURE AND STROKE.

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Introdução/Fundamentos: Cardiovascular diseases (CVD) are the leading cause of death in Brazil and worldwide. Heart failure (HF) has high mortality, reaching 39% in women and 72% in men over 15 years. The risk of stroke is slightly higher in men, while left ventricular dysfunction has a greater impact on women. In Chagas disease (CD), HF is commonly associated with systolic dysfunction and reduced ejection fraction. CD is a major cause of HF in Latin America, and understanding this relationship is essential to improve prognosis. Objetivos: To identify sex-specific risk factors for all-cause mortality and assess the impact of heart failure phenotypes and etiologies on overall and cardiovascular mortality in women and men. Métodos: This retrospective study included 634 patients with Chagas-related heart failure between 2017 and 2024, including stroke cases. Clinical characteristics, diagnostic data, and outcomes were analyzed according to HF etiologies and phenotypes defined by left ventricular ejection fraction (LVEF). The primary outcome was all-cause mortality; secondary outcomes included cardiovascular mortality, hospitalizations, and comorbidities. Statistical analysis comprised comparative tests, regression, Kaplan–Meier curves, and Cox proportional hazards models, with a 5% significance level. Resultados e Conclusões: The study included 634 patients with Chagas cardiomyopathy, with a high mortality rate (59.6%) during follow-up. Patients who died were older (65.8 vs. 61.5 years; p<0.001) and had worse ventricular function, evidenced by lower left ventricular ejection fraction both at baseline and at final evaluation (39.0% vs. 44.0% and 36.9% vs. 49.1%, respectively; p<0.001), in addition to larger cardiac dimensions and greater remodeling. Kaplan–Meier analysis showed lower survival in patients with prior stroke compared to those without. Increasing age was independently associated with higher mortality risk (HR = 1.02; 95% CI: 1.01–1.03; p < 0.001), corresponding to an approximate 2% increase per additional year of life. Clinically, there was a higher prevalence of dyspnea, atrial fibrillation, and comorbidities such as renal failure, anemia, and stroke, as well as a higher burden of risk factors and presence of intracardiac thrombus. Sex-stratified analysis showed similar findings, with anemia more strongly associated in men and diabetes in women, while renal failure predicted mortality in both groups. Therefore, Prior stroke was not an independent predictor; mortality was mainly driven by heart failure severity.





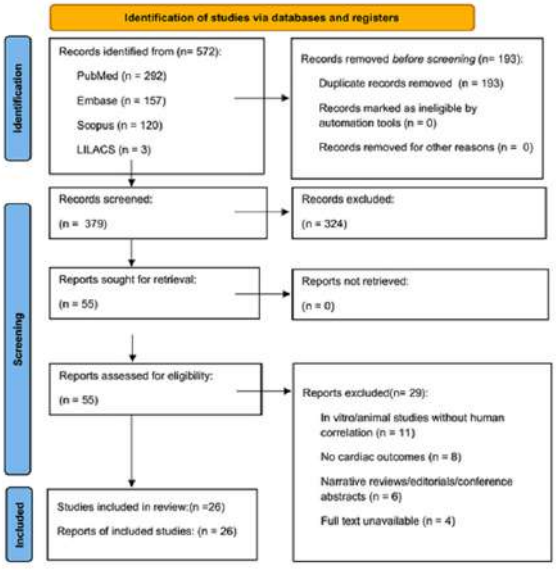
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IMPAIRMENT OF INNATE IMMUNITY AND EXACERBATED INFLAMMATION AS DETERMINANTS OF CARDIAC INVOLVEMENT IN CHAGAS DISEASE: A SYSTEMATIC REVIEW.

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Introdução/Fundamentos: Trypanosoma cruzi affects 6-8 million people across the Americas, and 30-40% develop chronic Chagas cardiomyopathy (CCC), with an annual mortality rate of 7.9%. Pathogenesis involves impaired innate immunity, sustained inflammation, and mitochondrial dysfunction, leading to myocardial damage. Objetivos: To evaluate the role of innate immunity and exacerbated inflammation in the pathophysiology of Chagas disease and their contribution to CCC development and progression. Métodos: A systematic review was conducted according to PRISMA guidelines using PubMed, EMBASE, SCOPUS, and LILACS (2021-2025). Search terms included: Trypanosoma cruzi, Chagas disease, innate immunity, immune response, cardiac involvement, cardiomyopathy, and myocarditis. Human studies with confirmed Chagas disease and cardiac outcomes were included; in vitro/animal studies, narrative reviews, and editorials were excluded. Of 572 records, 379 remained after deduplication; 55 were assessed for eligibility and 26 included. Resultados e Conclusões: Cardiac involvement results from a dysregulated immune response, insufficient to eradicate the parasite yet capable of sustaining chronic inflammation. The cardiac form was associated with activation of monocytes, cytotoxic T cells, and antigen-presenting pathways, with increased TNF-α, IFN-γ, IL-6, IL-1β, IL-17, IL-12, IL-15, and chemokines (CXCL10, CCL5, CCL2, CXCL9), alongside reduced IL-10. Lymphocyte analysis showed reduced regulatory CD4+ phenotypes and increased cytotoxic profiles expressing granzymes and perforin; CD4-CD8- and gamma delta T cells were also associated with the cardiac form. Histopathology demonstrated persistent myocarditis, CD8+ infiltrate, fibrosis, and myocardial remodeling. Preliminary genomic evidence identified the rs34238187/C18orf42 locus associated with cardiomyopathy susceptibility through immune pathways. In advanced stages, BNP and troponin T, together with reduced ejection fraction, showed greater prognostic value than inflammatory cytokines, while galectin-3, NT-proBNP, and LOXL2 emerged as progression markers. No study evaluated therapies directly targeting innate immunity. Progression to the cardiac form depends on parasite burden, genetic susceptibility, inflammation, and loss of regulatory mechanisms. Integrated biomarker panels may improve risk stratification, and immunomodulatory clinical trials are warranted.



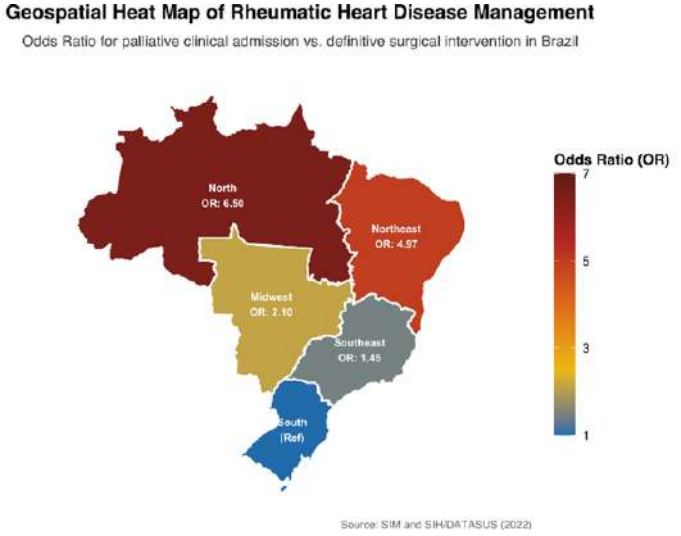
19418

REGIONAL DISPARITIES IN RHEUMATIC HEART DISEASE MANAGEMENT: A NATIONWIDE STUDY IN BRAZIL

LUCAS BASTOS CARVALHO1; ANA LUÍSA ABREU LESSA RIBEIRO1; CATHARINA RIBEIRO LYRA1; EDUARDO FAGUNDES MURICY1; ALEXSANDRO FAGUNDES MURICY2;

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Introdução/Fundamentos: Clinical guidelines recommend definitive surgical or percutaneous valve interventions to prevent mortality in advanced Rheumatic Heart Disease (RHD). However, structural inequities in healthcare infrastructure may promote a reliance on palliative clinical management in vulnerable regions. This chronic allostatic burden, driven by delayed access to high-complexity cardiovascular care, potentially erodes survival outcomes among underserved populations. Objetivos: To assess regional disparities in the provision of definitive surgical treatment versus palliative clinical management for RHD in Brazil, and test whether geographic vulnerability modifies the standard of care. Métodos: We performed a population-based analytical study using individual microdata from the Brazilian Mortality Information System and Hospital Information System, extracted in R with the microdatasus package. RHD deaths (ICD-10 I05-I09) and hospital admissions for the entire population in Brazil in 2022 were analyzed. Admissions were categorized into clinical management (SIGTAP 0303060115) or definitive valve interventions (SIGTAP 0406010692, 0406010803, 0406010820, 0406030120). Differences in treatment modality across macro-regions were evaluated using Pearson's Chi-squared test. Effect modification by region was assessed using Odds Ratios (OR) and 95% confidence intervals (CI) via Fisher's Exact Test, using the South region as the reference. Resultados e Conclusões: In 2022, 2,505 deaths from rheumatic heart disease (RHD) were recorded in Brazil. Treatment patterns differed significantly across regions (p<0.001). The South showed a resolutive model, with 4.96 surgical procedures per death and low hospitalization burden. In contrast, underserved regions showed care substitution. Compared with the South, patients in the Northeast had higher odds of receiving clinical palliative care instead of surgery (OR 4.97; 95% CI 4.08–6.07; p<0.001), indicating limited surgical access. In the North, deaths occurred without corresponding surgical procedures, suggesting critical service gaps. These findings show that structural inequities modify RHD care delivery in Brazil, overriding guideline-based management. They highlight the need to decentralize high-complexity cardiovascular services and reduce reliance on clinical management when surgical treatment is indicated.



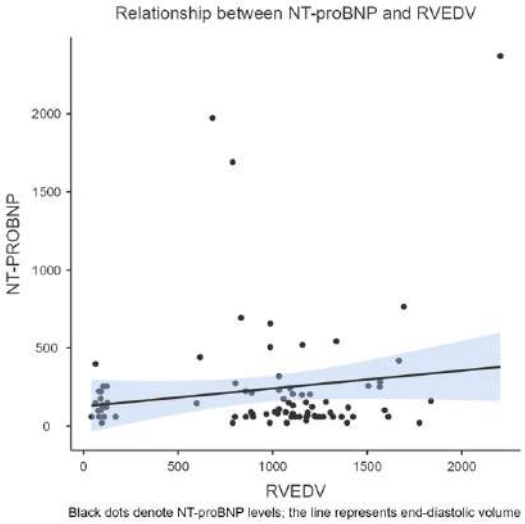
17787

RELATIONSHIP BETWEEN NT-PROBNP AND RIGHT VENTRICULAR FUNCTION: EVIDENCE OF EARLY REMODELING IN CHRONIC CHAGAS DISEASE

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Introdução/Fundamentos: Chagas cardiomyopathy (CC) is characterized by intense inflammatory tropism and interstitial fibrosis, which frequently affect the right ventricle (RV) early and independently of left ventricular (LV) function. In stage B1, despite a preserved LV ejection fraction (LVEF), the loss of RV geometry and subclinical remodeling emerge as critical determinants of a worse prognosis. NT-proBNP measurement may be useful as a marker of RV wall stress in this scenario, suggesting a potential role in early risk stratification. Objetivos: To verify the association of NT-proBNP levels with the remodeling pattern and right ventricular function in chronic CC. Métodos: This is a sub-study of the PITCH trial with cardiac magnetic resonance (CMR) and laboratory (NT-proBNP) data. Clinical stratification followed the Brazilian Guideline on Chagas Heart Disease (SBC). From the initial cohort of 228 patients, those in stages B2 and C were excluded. From the initial 125 patients in stage B1, individuals with BMI≥30 kg/m² (n=40) and GFR < 60 mL/min/1.73m² (n=1), totaling 84 patients (pts). CMR was performed using late gadolinium enhancement (LGE) with normality parameters according to Kawel-Boehm et al. (JCMR 2025). Analysis was conducted via SPSS 29.0 (p<0.05). Resultados e Conclusões: The sample included 84 patients (66.7% women; 48.2 ±12.6 years), with a high prevalence of hypertension (73.80%), diabetes mellitus (20.2%), and overweight (BMI 26.4 ±4.1 kg/m²). On CMR, the mean right ventricular ejection fraction (RVEF) was 69.8% ± 7.3%. The mean right ventricular end-diastolic volume (RVEDV) was 112.5 ±18.4 mL (female) and 145.2 ± 22.6 mL (male). NT-proBNP showed a mean of 207.6 ±372.4 pg/mL (median: 105; interquartile range [IQR]: 60.0–210.0; minimum: 20; maximum: 2370). RV dysfunction was identified in 3.57% (3 pts: 2 mild, 1 moderate). There was no severe dysfunction. The groups differed significantly regarding NT-proBNP values, with a median of 2,171.5 pg/mL in the dilated RV group and 92.0 pg/mL in the group without dilation (p < 0.05). No significant correlation was found between NT-proBNP and global RVEF (r = -0.10; p = 0.34). Based on these findings, in stage B1 of CC, NT-proBNP did not correlate with RVEF, contrary to the literature, which associates a decline in systolic function with elevated levels of this biomarker. However, the peptide level increased in response to the rise in RVEDV, suggesting a potential application of NT-proBNP as a sensitive marker of volume overload and cardiac remodeling.



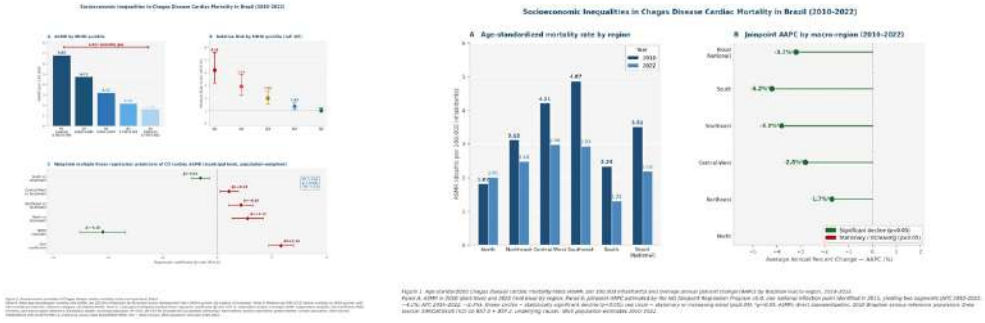
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SOCIOECONOMIC INEQUALITIES IN CHAGAS DISEASE CARDIAC MORTALITY IN BRAZIL: A NATIONWIDE ECOLOGICAL STUDY WITH JOINPOINT AND SPATIAL ANALYSIS (2010–2022)

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Introdução/Fundamentos: Chagas disease (CD), caused by Trypanosoma cruzi, is the leading non-ischemic cardiomyopathy in Latin America. Brazil concentrates the largest chronic CD burden worldwide, yet the relationship between socioeconomic determinants and subnational cardiac mortality trends in the post-2010 period remains poorly characterized. Objetivos: To analyze temporal trends in age-adjusted CD cardiac mortality across Brazilian states (2010–2022), stratified by sex and age group; assess municipal-level socioeconomic correlates; and identify spatial clustering of high-burden territories. Métodos: Nationwide ecological study using SIM/DATASUS (ICD-10 B57.0+B57.2, underlying cause; cardiac forms only). Age-standardized mortality rates (ASMR) were computed using direct standardization (2010 census reference). Temporal trends were assessed by joinpoint regression (NCI v5.0), stratified by sex and age group. Spatial clustering was evaluated by global Moran's I and LISA maps. Socioeconomic association was examined by weighted multiple linear regression (Gini + MHDI + macro-region; VIF<3.0 for all predictors). Resultados e Conclusões: Between 2010 and 2022, 78,431 CD cardiac deaths were recorded (B57.0+B57.2, underlying cause). Men accounted for 58.1% (ASMR 1.6× higher than women); 88.6% occurred in individuals ≥50 years. Brown/Black populations represented 64.8% of deaths; 61.2% had low educational attainment. National ASMR declined significantly (AAPC: −3.2%; 95% CI: −3.9 to −2.5; p<0.001), with deceleration after 2015 (APC: −4.1% vs −2.3%), consistent with aging of the infected cohort. Men declined faster (AAPC −3.6%) than women (−2.7%). The North showed no significant decline (AAPC: +0.9%; p=0.14). Spatial clustering was confirmed (Moran's I=0.48; p<0.001), with hotspots in Minas Gerais, Bahia, and Piauí overlapping almost entirely with lowest-MHDI municipalities. The lowest MHDI quintile showed 4.21-fold higher ASMR (RR=4.21; 95% CI: 3.18–5.58). Gini remained independently associated with ASMR after multivariable adjustment (β=2.34; p<0.001; R^2=0.61). National decline masks profound structural inequalities. Failure to address them risks compromising heart failure outcomes in Brazil's most vulnerable populations. Mandatory CD screening, universal ICD/CRT access, and race-conscious primary care are urgently needed — priorities aligned with the World Heart Federation's global equity agenda.



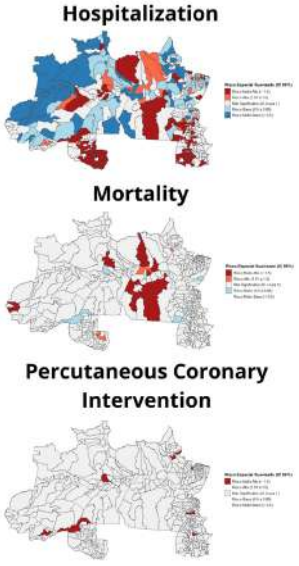
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SPATIOTEMPORAL DYNAMICS OF ACUTE MYOCARDIAL INFARCTION AND PRIMARY PERCUTANEOUS CORONARY INTERVENTION IN BRAZILIAN NORTHERN REGION: A RETROSPECTIVE ECOLOGICAL ANALYSIS

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Introdução/Fundamentos: Primary Percutaneous Coronary Intervention (PCI) is the gold standard for Acute Myocardial Infarction (AMI) treatment. However, in the Brazilian northern region, vast distances and logistical constraints within the Unified Health System pose significant challenges to timely reperfusion. Objetivos: This study aims to analyze the geospatial mismatch between AMI morbidity/mortality and PCI availability across northern Brazil. Métodos: A population-based, cross-sectional, ecological study was conducted to evaluate the distribution of AMI hospitalizations, mortality, and PCI procedures across Brazil's North region from 2015 to 2025. Data were obtained from the Informatics Department of the Brazilian Unified Health System and analyzed at the city level. Spatial risk clusters were identified using Integrated Nested Laplace Approximation (INLA). This Bayesian approach was applied to provide robust relative risk (RR) estimates by smoothing fluctuations in small populations and accounting for spatial dependence. Resultados e Conclusões: Hospitalizations exhibited greater spatial dispersion, with elevated risk along the Amazon River axis, particularly in the Manaus region (RR > 1.5), and secondary concentrations in the central-southern portion of Pará (RR > 1.5). Low hospitalization risk was concentrated in cities distant from state capitals (RR < 0.5). Mortality showed a more spatially constrained pattern, with statistically significant spatial clusters concentrated along a central axis, predominantly in Pará (RR > 2.0), and a marked concentration in Manaus (RR > 2.0). PCI procedures demonstrated a highly aggregated distribution, with statistically significant spatial clusters predominantly located in state capitals (RR > 2.0), including Manaus, Porto Velho, Rio Branco, Belém, Macapá, and Palmas. Territorial disparities reflect a deficient public health structure in Brazil's North Region. The concentration of AMI morbidity and mortality in specific areas, alongside the restriction of PCI services to state capitals, highlights major barriers to timely and specialized care. While spatial patterns identify priority areas, limitations regarding the ecological nature of the data and potential underreporting in remote Amazonian cities must be considered. These results underscore the need for public health policies to expand and regionalize AMI care, especially in hard-to-reach areas.



NURSING

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19363

ASSOCIATION BETWEEN ANEMIA AND CARDIOVASCULAR RISK AMONG BRAZILIAN ADULTS

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Introdução/Fundamentos: Anemia is a disease characterized by a decrease in hemoglobin (Hb) in red blood cells, which causes a reduction in oxygen (O2) transport to tissues. In this sense, there may be an association between individuals with anemia and increased cardiovascular risk (CVR), because inadequate oxygen transport triggers the use of compensatory mechanisms that overload the cardiovascular system. The Framingham Score is widely used to estimate CVR. In Brazil, there is a scarcity of studies that have investigated the association between anemia and CVR using this calculator. Objetivos: To analyze the association between anemia and cardiovascular risk in Brazilian adults Métodos: A cross-sectional study was conducted using data from the National Health Survey (Pesquisa Nacional de Saúde – PNS), between 2014 and 2015, with 8,952 adults. Prevalences and confidence intervals (95% CI) for anemia were estimated, stratified by sex, according to the Framingham risk score. Anemia was defined as hemoglobin levels below 13.0 g/dL in men and below 12.0 g/dL in women. CVR was classified as low, intermediate, and high. Differences were evaluated using Pearson's χ2 test (p≤0.05). To verify associations, logistic regression models were used, and Odds Ratios (OR) adjusted for race/skin color and 95% CI were estimated. Resultados e Conclusões: Among women, the prevalence of anemia was 12.0% (95% CI: 11.0–13.4), being higher in the low CVR group (7.5%; 95% CI: 6.6–8.6), followed by intermediate CVR (2.8%; 95% CI: 2.3–3.4) and high CVR (1.8%; 95% CI: 1.4–2.3) (p<0.05). Among men, the prevalence of anemia was 7.0% (95% CI: 6.0–8.1), being higher in the high CVR group (2.7%; 95% CI: 2.1–3.3), followed by intermediate CVR (2.4%; 95% CI: 1.8–3.3) and low CVR (1.9%; 95% CI: 1.3–2.6) (p<0.05). Women with high CVR (OR 1.43; 95% CI: 1.02–1.98) had a higher chance of anemia when compared to those at low risk. Men with intermediate CVR (OR 1.9; 95% CI: 1.2–3.1) and high CVR (OR 3.5; 95% CI: 2.2–5.3) had a higher chance of anemia when compared to those at low risk. Therefore, anemia was associated with CVR in Brazilian adults. Among women, high CVR was associated with a greater chance of anemia, while among men, both intermediate and high risk increased this chance. The findings highlight the relevance of fostering debates on this scenario and considering actions and policies for the prevention of cardiovascular diseases.

20435

LATE CARDIAC REMODELING FOLLOWING HYPERTENSIVE DISORDERS OF PREGNANCY: ECHOCARDIOGRAPHIC EVIDENCE OF PERSISTENT STRUCTURAL CHANGES

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Introdução/Fundamentos: Hypertensive disorders of pregnancy, especially pre-eclampsia, are associated with higher future cardiovascular risk. However, the long-term cardiac structural effects are not yet completely clarified. Objetivos: To evaluate cardiac structural changes through echocardiography in women 2 to 5 years after a pregnancy complicated by hypertensive disease. Métodos: Cross-sectional study conducted at a tertiary hospital in São Paulo that included 120 women divided into three groups: normal pregnancy (NP=30), isolated pre-eclampsia (iPE=30), and pre-eclampsia superimposed on chronic hypertension (sPE/CH=60). Echocardiographic parameters were analyzed, in addition to clinical, anthropometric, and pressure data. Analyzes were adjusted for age. The study was approved by the institutional ethics committee. Resultados e Conclusões: Participants with sPE/CH were older (38±5 years) and presented higher BMI (32.6±6 kg/m²) compared to NP (34.6±6 years; 27.1±6 kg/m²). Higher systolic and diastolic blood pressure were observed in the groups with a history of pre-eclampsia. In the echocardiographic evaluation, the sPE/CH group presented greater septal thickness (9.7±1 vs. 8.4±1 mm) and larger left atrial diameter (38±4 vs. 34±4 mm) compared to NP. The left ventricular mass index was significantly higher in iPE (77±13 g/m²) and sPE/CH (81±17 g/m²) compared to NP (66±11 g/m²), characterizing persistent cardiac remodeling. Women with a history of pre-eclampsia present lasting cardiac structural changes, even years after pregnancy. These findings reinforce the role of pre-eclampsia as an early marker of cardiovascular risk and the need for long-term cardiological follow-up.

20441

PERSISTENT ARTERIAL STIFFNESS AND ENDOTHELIAL DYSFUNCTION AFTER HYPERTENSIVE DISORDERS OF PREGNANCY

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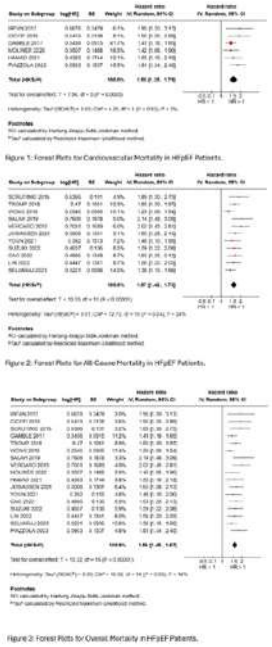
Introdução/Fundamentos: Pre-eclampsia is associated with higher future cardiovascular risk, possibly mediated by persistent vascular changes, such as arterial stiffness and endothelial dysfunction. Objetivos: To evaluate vascular function and structure parameters in women 2–5 years after pregnancy complicated by hypertensive disease. Métodos: Cross-sectional study conducted at a tertiary hospital in São Paulo that included 120 women divided into three groups: normal pregnancy (NP=30), isolated pre-eclampsia (iPE=30), and pre-eclampsia superimposed on chronic hypertension (sPE/CH=60). Pulse wave velocity (PWV), flow-mediated dilation (FMD), carotid intima-media thickness (cIMT), and pressure parameters were evaluated. Models adjusted for age, BMI, and blood pressure. Resultados e Conclusões: The sPE/CH group presented higher age (38±5 vs. 34.6±6 years in NP; p<0.05), BMI (32.6±6 vs. 27.1±6 kg/m²; p<0.05), and higher pressure levels. PWV was higher in sPE/CH (8.1±2 m/s) compared to NP (6.8±1 m/s) and iPE (7.0±1 m/s) (p<0.05). FMD was lower in the groups with hypertensive disease, with no significant difference after adjustment. A negative correlation was observed between PWV and FMD (p<0.05) and a positive correlation of PWV with age, BMI, and blood pressure, while FMD correlated inversely with these variables (p<0.05). In multivariate analysis, age, BMI, and blood pressure maintained an independent association with increased PWV, while FMD presented an inverse association (p<0.05). There was no difference between groups for cIMT. Women with a history of hypertensive disease of pregnancy present increased arterial stiffness and persistent endothelial dysfunction, especially in the presence of chronic hypertension. Functional changes appear to precede structural changes, contributing to greater long-term cardiovascular risk.

19987

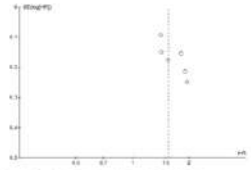
PROGNOSTIC VALUE OF NT-PROBNP IN HEART FAILURE WITH PRESERVED EJECTION FRACTION (HFPEF)

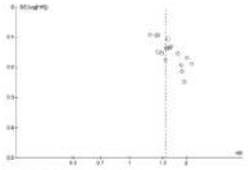
LUCAS MATEUS VERAS CARNEIRO1; ANA KELVIA OLIVEIRA RODRIGUES PONTES2;

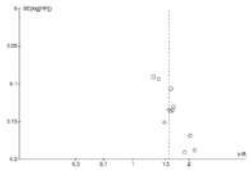
(1) UNIVERSIDADE CHRISTUS - FORTAZLEZA - CE - BRASIL; (2) UNIVERSIDADE CHRISTUS - FORTALEZA - CE - BRASIL;



Introdução/Fundamentos: HFpEF is a prevalent, heterogeneous condition, complicating therapeutic identification. Although NT-proBNP marks hemodynamic stress, its prognostic specificity is limited by age, atrial fibrillation, and renal dysfunction. This leads to uncertainties in current guidelines regarding its isolated value for this population. Objetivos: To evaluate the prognostic value of NT-proBNP in HFpEF patients by analyzing its association with cardiovascular mortality, all-cause mortality, and overall mortality. Métodos: A systematic review and meta-analysis were conducted according to PRISMA guidelines and registered in PROSPERO. Seventeen studies were included (11 cohorts and 6 sub-analyses of randomized clinical trials) involving adult patients (EF ≥ 50%). Mathematical harmonization was used to standardize cutoff points, and the inverse variance method with a random-effects model was applied using RevMan software. Resultados e Conclusões: The global analysis (17 studies) revealed that elevated NT-proBNP increases the risk of overall mortality in HFpEF patients by 56% (HR 1.56; 95% CI 1.45–1.67; I²=14%). For cardiovascular mortality (n=6), the risk was 1.55 (95% CI 1.35–1.79; I²=3%), while for all-cause mortality (n=11), it was 1.57 (95% CI 1.43–1.71; I²=24%). The consistency across sub-analyses and low heterogeneity reinforce the robustness of these estimates and validate the mathematical harmonization of cutoff points. Funnel Plot analysis suggested no significant publication bias. The parity between cardiovascular and all-cause mortality risks suggests NT-proBNP acts as an integrator of systemic biological vulnerability in HFpEF. It reflects myocardial stress and the global impact of comorbidities like renal dysfunction and atrial fibrillation. However, the lack of standardized cutoffs and failure to integrate confounding variables in practice can lead to stratification errors. From a public health perspective, the underutilization of NT-proBNP hinders efficient care, resulting in inadequate resource allocation and neglect of high-risk populations. In summary, NT-proBNP is a robust, versatile predictor of death in HFpEF. Public health policies must promote its individualized and democratized interpretation. To ensure equity, NT-proBNP should be a central tool in multiparametric models, translating scientific evidence into cost-effective benefits for population health.









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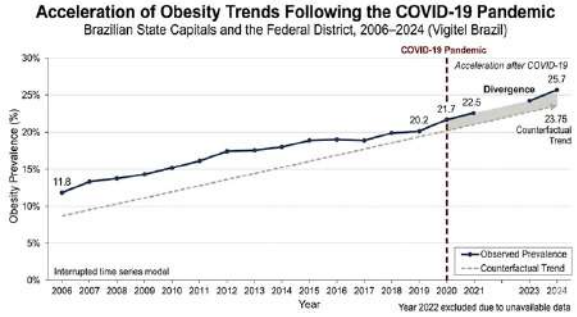
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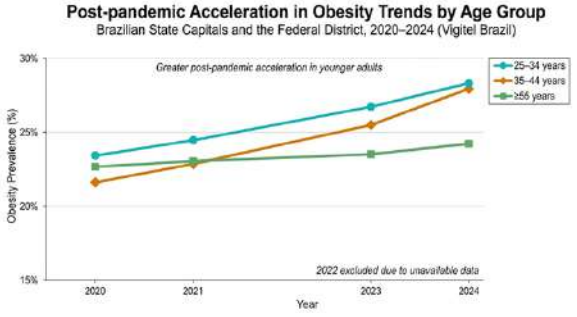
ACCELERATION OF OBESITY TRENDS FOLLOWING THE COVID-19 PANDEMIC IN BRAZIL: AN INTERRUPTED TIME-SERIES ANALYSIS (2006–2024)

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Introdução/Fundamentos: Obesity is a major determinant of cardiovascular risk and is associated with a higher burden of atherosclerotic disease. The COVID-19 pandemic may have exacerbated obesogenic factors, thereby altering population-level obesity trajectories. However, the pandemic's impact on these temporal trends in middle-income countries remains poorly characterized. Objetivos: To assess the COVID-19 pandemic's impact on obesity prevalence trends among Brazilian adults. Métodos: This analytical ecological interrupted time-series study used Vigitel Brazil data (2006–2024, excluding 2022 due to data unavailability). Adults (≥18 years) from Brazilian state capitals and the Federal District were included. Obesity was defined as BMI ≥30 kg/m². Using 2020 as the interruption point, the study period was divided into pre-pandemic (2006–2019) and post-pandemic (2020–2024) phases. Trends were analyzed using segmented linear regression models to evaluate baseline trends, level changes, and slope changes (Δβ). A counterfactual analysis extrapolated pre-pandemic trends to 2024. Analyses were stratified by sex and age using R version 4.3. Resultados e Conclusões: Over 700,000 adults were included in the analysis. Between 2006 and 2024, obesity prevalence increased from 11.8% to 25.7%, demonstrating sustained growth. During the pre-pandemic period (2006–2019), the annual increment was 0.71 percentage points (95% CI: 0.62–0.81). After 2020, the slope increased to 1.01 percentage points/year (95% CI: 0.78–1.24), corresponding to a Δβ of +0.30 percentage points/year, which indicates an acceleration in the trend. In the counterfactual analysis, the expected prevalence in 2024 was 23.75%, whereas the observed prevalence was 25.7%, yielding an excess of 1.95 percentage points. This acceleration was most pronounced in adults aged 25–34 years (1.31 percentage points/year) and 35–44 years (1.29 percentage points/year). In contrast, older age cohorts exhibited more modest growth. Regarding sex, a steeper increase was observed among women (1.05 percentage points/year) compared to men (0.97 percentage points/year) during the post-pandemic period. Obesity prevalence in Brazilian adults increased over the entire study period, with evidence of a steeper rise after 2020. The findings suggest a post-pandemic shift in obesity trends and highlight the importance of monitoring vulnerable subgroups.





16977

ANALYSIS OF HOSPITALIZATIONS VERSUS DEATHS FROM ACUTE MYOCARDIAL INFARCTION IN BRAZILIAN REGIONS (2021–2025)

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Introdução/Fundamentos: Acute Myocardial Infarction (AMI) leads the causes of cardiovascular death in Brazil, with heterogeneous regional patterns reflecting inequalities in access to and quality of healthcare. Evaluating hospital outcomes by region is essential to guide public policies. Objetivos: To identify Brazilian regions with better outcomes (lower in-hospital case fatality) for AMI between 2021 and 2025, to analyze temporal trends, and to compare prognosis between sexes. Métodos: Ecological study using data from the Department of Information Technology of the Unified Health System (DATASUS) (SIH/SUS), ICD-10 I21. All hospitalizations and deaths due to AMI in the five Brazilian regions from 2021 to 2025 were included. Case fatality was calculated (deaths/hospitalizations × 100), odds ratio (OR) with 95% CI, using the chi-square test and linear regression for trend (p<0.05). Resultados e Conclusões: During the period, there were 856,078 hospitalizations and 70,244 deaths (Brazil case fatality: 8.21%). The lowest cumulative case fatality was in the Central-West (6.95%), followed by South (7.65%), North (8.10%), Southeast (8.14%), and Northeast (9.44%). Significant differences were observed between regions (χ^2=1,205.7; p<0.001). Using the Northeast as reference (worst outcome), all other regions had a lower chance of death: Central-West OR=0.71 (0.69–0.74); South OR=0.79 (0.77–0.81); North OR=0.84 (0.81–0.88); Southeast OR=0.85 (0.83–0.87); all p<0.001. All regions reduced case fatality between 2021 and 2025 (p<0.001), with emphasis on the Northeast (−3.14 percentage points). Women had higher case fatality than men (9.82% vs 7.28%; OR=1.39; 95% CI: 1.36–1.42; p<0.001). The Central-West stands out as the region with the best hospital performance in AMI management, while the Northeast has the highest case fatality, although it achieved the greatest temporal reduction. The consistent improvement across the country suggests advances in the cardiovascular care pathway. Female sex constitutes an independent risk factor for worse in-hospital prognosis, requiring specific care strategies.

Tabela 1. Tendência temporal da letalidade total (2021–2025).

Região	2021 (%)	2022 (%)	2023 (%)	2024 (%)	2025 (%)	Variação (p.p.)
Norte	9,48	9,32	8,32	6,94	7,12	-2,36
Nordeste	11,09	10,68	9,62	8,59	7,95	-3,14
Sudeste	9,54	8,85	8,24	7,65	6,94	-2,60
Sul	9,67	8,30	6,98	7,17	6,69	-2,98
Centro-Oeste	7,22	7,66	7,37	6,84	5,93	-1,29

Fonte: Ministério da Saúde – DATASUS. Sistema de Informações Hospitalares do SUS (SIH/SUS)

Tabela 2. Internações, óbitos, letalidade, OR (vs Nordeste) por região e OR (F vs M) – IAM, 2021-2025.

Região	Internações	Óbitos	Letalidade (%)	OR vs Centro-Oeste (IC95%)	OR (F vs M) (IC95%)
Norte	39.950	3.237	8,10	1,18 (1,13 – 1,24)	–
Nordeste	170.456	16.087	9,44	1,40 (1,35 – 1,45)	–
Sudeste	413.199	33.650	8,14	1,19 (1,15 – 1,23)	–
Sul	159.502	12.197	7,65	1,10 (1,06 – 1,15)	–
Centro-Oeste	72.971	5.073	6,95	1,00 (referência)	–
Brasil					
Feminino	312.303	30.679	9,82	–	1,39 (1,36 – 1,42)
Masculino	543.773	39.565	7,28	–	1,00 (referência)
Total	856.078	70.244	8,21	1,18 (1,16 – 1,20)	–

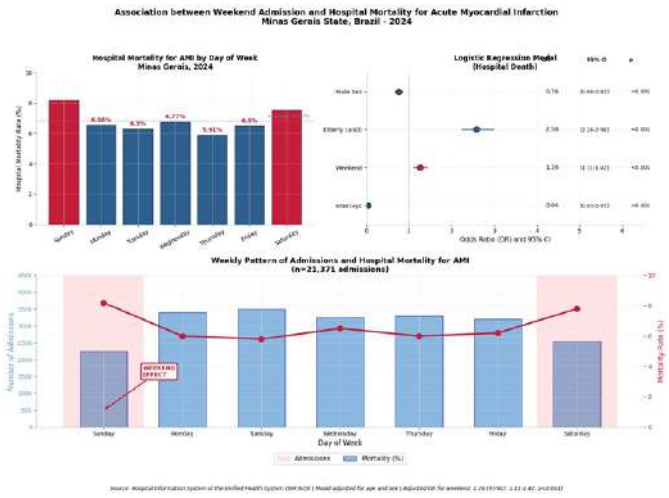
Fonte: Ministério da Saúde – DATASUS. Sistema de Informações Hospitalares do SUS (SIH/SUS)

17855

ASSOCIATION BETWEEN WEEKEND ADMISSION AND IN-HOSPITAL MORTALITY FOR ACUTE MYOCARDIAL INFARCTION IN MINAS GERAIS: A POPULATION-BASED ADJUSTED ANALYSIS USING SIH-SUS

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Introdução/Fundamentos: Acute myocardial infarction (AMI) is one of the leading causes of morbidity and mortality worldwide. Beyond clinical factors, organizational aspects of healthcare services may influence in-hospital outcomes. The weekend effect, characterized by worse outcomes among patients admitted during weekends, has been widely reported internationally; however, it remains underexplored in analytical studies involving AMI patients in Brazil, particularly within a universal public health system. Objetivos: To evaluate the association between weekend hospital admission for acute myocardial infarction and in-hospital mortality in the state of Minas Gerais, and whether this association persists after adjustment for age and sex. Métodos: A retrospective observational study was conducted using data from the Hospital Information System of the Brazilian Unified Health System (SIH-SUS), including all hospitalizations for acute myocardial infarction in Minas Gerais between January and December 2024. This population-based analysis included all eligible hospitalizations recorded in the system during the study period. Demographic variables and in-hospital outcome (death) were analyzed. The association between weekend admission and in-hospital mortality was assessed using multivariable logistic regression adjusted for age and sex, with results expressed as odds ratios (OR) and 95% confidence intervals (CI). Resultados e Conclusões: A total of 21,371 AMI hospitalizations in Minas Gerais in 2024 were analyzed. Patients admitted on weekends showed significantly higher odds of in-hospital death compared to those admitted on weekdays (OR = 1.26; 95% CI: 1.11–1.42; p < 0.001). After adjustment for age and sex, the association remained statistically significant, indicating that the effect was not explained solely by demographic differences between groups. The findings suggest the presence of a weekend effect among AMI patients, potentially related to organizational variations in hospital care, including reduced availability of full medical teams, limited access to specialized procedures, and possible delays in the performance of interventions during weekends, particularly in time-sensitive conditions such as AMI. Despite the inherent limitations of secondary administrative data, the results underscore the need for care strategies that ensure equity in cardiovascular care regardless of the day of hospital admission within a large universal public health system.

19236

CARDIOVASCULAR MORTALITY ATTRIBUTABLE TO FINE PARTICULATE MATTER (PM 2.5) IN THE STATE OF SÃO PAULO: A POPULATION-BASED ECOLOGICAL STUDY OF HEALTH IMPACTS AND MORTALITY TRENDS ACROSS FOUR TRIENNIUMS (2013–2024)

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Introdução/Fundamentos: Exposure to fine particulate matter (PM 2.5) is a critical environmental challenge for circulatory health. Due to its microscopic diameter (2.5 μ), it translocates across the alveolar-capillary barrier, triggering systemic inflammation and endothelial dysfunction. Despite clinical advances, air pollution remains a persistent contributor to cardiovascular mortality in the State of São Paulo, suggesting the need for broader discussion on environmental determinants in cardiovascular care. Objetivos: To investigate trends in cardiovascular mortality attributable to PM 2.5 across the State of São Paulo (2013–2024), assessing the impact of seasonal variations, regional exposure hotspots, and the burden of preventable deaths. Métodos: A population-based ecological study was conducted using mortality data from the DATASUS platform (SIM/SUS and SIH/SUS) for the State of São Paulo. Cardiovascular mortality in adults aged ≥ 30 years was analyzed across four trienniums (2013–2024). Health impacts were estimated using AirQ+, a software developed by the World Health Organization (WHO) to quantify air quality effects. The model applies concentration-response functions to local PM 2,5 levels to estimate the Attributable Fraction (AF), representing deaths preventable through adherence to the WHO annual safety threshold of 5 μg/m³. A temporal analysis was performed to identify months of maximum and minimum PM 2.5 concentrations, as annual averages may mask acute seasonal peaks that standard modeling might underrepresent. Resultados e Conclusões: Temporal analysis identified a marked seasonal pattern; PM 2.5 levels peaked between August and September, reaching 51.16μg/m³ in 2024. Cardiovascular mortality per 100,000 inhabitants declined from 111.50 (95%CI: 95.0–133.8) in 2013–15 to 91.50 (95%CI: 77.5–110.7) in 2022–24. However, environmental risk remains critical: the AF in the final triennium was 26.61% (95%CI: 22.54–32.18), corresponding to 19,752 deaths (95%CI: 16,735–23,894). Population exposure to concentrations >25μg/m³ expanded to 74.63% (34.8 million people). A primary limitation is the reliance on ecological data from DATASUS, subject to potential underreporting and the absence of individual clinical records. These trends support implementing environmental-specific protocols to ensure equitable cardiovascular prevention.

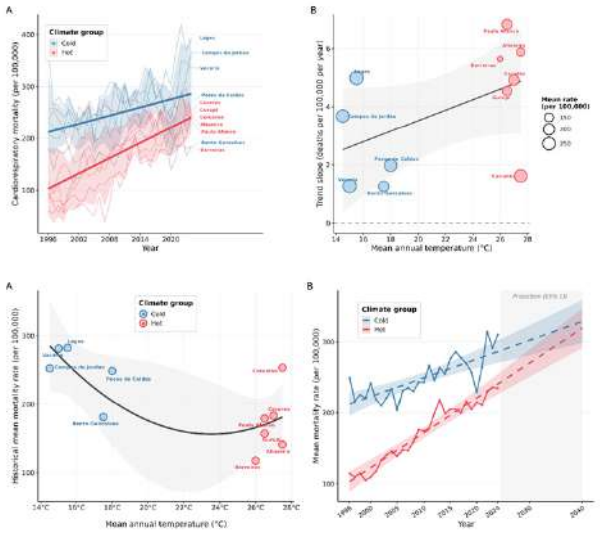
15701

CLIMATE ANTAGONISM AND CARDIORESPIRATORY MORTALITY: AN EXPLORATORY 29-YEAR ANALYSIS IN BRAZILIAN TROPICAL AND TEMPERATE REGIONS

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Introdução/Fundamentos: Climate change has become increasingly evident, with pronounced effects on human populations, among which cardiorespiratory mortality represents one of the fastest-growing consequences. Objetivos: To analyze the 29-year (1996–2025) spatiotemporal trends in cardiorespiratory mortality associated with temperature gradients across 11 Brazilian municipalities. Métodos: An exploratory study was conducted using DataSUS, selecting municipalities representing a broad climatic gradient within Brazil, ranging from equatorial Amazonian climate (Altamira, AM; mean 26.5°C) to high-altitude temperate oceanic climate (Campos do Jordão, SP; mean 14.5°C), with comparable population sizes (46,000 to 168,000 inhabitants). Resultados e Conclusões: The association between temperature and mortality followed a U/J-shaped curve. Among the analyzed municipalities, colder regions exhibited higher absolute mortality rates, with a mean of 276.9 per 100,000 compared to 195.0 per 100,000 in warmer regions (42% difference). High-altitude and colder municipalities showed the highest average absolute rates, such as Vacaria, RS (307.4 per 100,000), followed by Campos do Jordão, SP (300.4 per 100,000). However, the rate of increase in mortality over time was approximately threefold higher in warmer municipalities (mean slope +4.12/year) compared to colder ones (+1.37/year), indicating a threefold greater rise in cardiorespiratory deaths per 100,000 inhabitants in warmer regions. High-temperature clusters demonstrated marked acceleration, including Paulo Afonso, BA (+6.43/year), Cáceres, MT (+5.37/year), and Barreiras, BA (+5.18/year). In contrast, colder regions showed declining trends, such as Bento Gonçalves, RS (−1.28/year), Poços de Caldas, MG (−0.71/year), and Vacaria, RS (−0.48/year). Notably, Barreiras, BA increased from a baseline rate of 79.6 to 182.6 per 100,000 (+126.5%) between the periods 1996–2000 and 2020–2024. These findings suggest that, if current trends persist, mortality rates in warmer municipalities will surpass those in colder regions within a few decades. Overall, temperature extremes amplify the risk of circulatory and respiratory diseases and mortality: while cold climates are associated with higher absolute rates, heat drives a more rapid and exponential increase in mortality in warmer regions. Therefore, climate adaptation policies are urgently needed to mitigate the burden on healthcare systems in vulnerable regions of Brazil.



17438

CROSS-CULTURAL ADAPTATION OF A PRENATAL COUNSELING QUESTIONNAIRE FOR CONGENITAL HEART DISEASE INTO BRAZILIAN PORTUGUESE

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Introdução/Fundamentos: Congenital heart disease is the most common structural birth defect and a leading driver of neonatal morbidity and mortality globally and yet the moment of diagnosis, in many centers, remains poorly supported. Receiving a prenatal diagnosis of CHD is a profoundly distressing experience for families, and the quality of counseling provided at that moment shapes how parents cope, make decisions, and engage with care. Despite this, no validated instrument existed in Brazilian Portuguese to systematically evaluate whether that counseling is actually being done well. Objetivos: This study set out to fill that gap through the cross-cultural adaptation and content validation of the Kovacevic Questionnaire, a tool originally designed to assess parental counseling quality following prenatal CHD diagnosis. Métodos: The adaptation followed the internationally recognized framework proposed by Beaton et al., covering translation, synthesis, back-translation, expert committee review, pre-testing, and psychometric evaluation. Two independent expert committees assessed semantic, idiomatic, cultural, and conceptual equivalence across all items. Content validity was quantified using the Content Validity Index (CVI), Prevalence- and Bias-Adjusted Kappa (PABAK), and Content Validity Coefficient (CVC). The final version was pre-tested with ten pregnant women carrying fetuses diagnosed with CHD. Resultados e Conclusões: The process yielded a culturally grounded, linguistically precise Brazilian Portuguese version of the instrument. Expert agreement was consistently high — most items reached CVI and PABAK values near 1.0, and all CVC values met the ≥0.80 threshold. Minor wording adjustments were made where needed to improve clarity and cultural fit. In pre-testing, all participants rated every item as clear and relevant, with CVI and PABAK reaching 1.00. The Brazilian Portuguese Kovacevic Questionnaire showed strong validity and high acceptance, filling a critical gap in humanized prenatal care by providing a standardized way to assess support for families facing a Congenital Heart Disease (CHD) diagnosis. Given Brazil's socioeconomic disparities and expanding CHD detection, this validated tool is essential for public health, allowing for auditing, identifying institutional failures, and driving policy focused on the family experience.



20402

HEAT WAVES AND CARDIOVASCULAR MORTALITY: GLOBAL META-ANALYSIS AND THE MAGNITUDE OF THE PROBLEM IN BRAZIL

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Introdução/Fundamentos: Heat waves are becoming more frequent, intense, and prolonged worldwide. In Brazil, between the 1970s and 2010s, their frequency increased from 0–3 to 3–11 events per year. Although prior reviews have examined temperature and health, a quantitative synthesis integrating global evidence with Brazilian studies has not been previously performed. Objetivos: To quantify, through meta-analysis, the risk of cardiovascular (CV) mortality associated with heat waves at a global level and to systematically describe the Brazilian evidence on extreme temperature and CV outcomes. Métodos: Systematic review conducted in accordance with PRISMA guidelines. Two large global systematic reviews reporting relative risk (RR) of CV mortality during heat waves (Liu et al., 2022; Bell et al., 2024) were included. Pooled estimates were calculated using a random-effects model (inverse variance method), considering the independence of effect estimates reported in each primary study. Heterogeneity was assessed globally as described in the included reviews. Additionally, Brazilian studies evaluating the association between extreme heat/heat waves and cardiovascular outcomes (mortality and hospitalization), published between 2019 and 2026, were systematically analyzed. Resultados e Conclusões: The global quantitative synthesis demonstrated a consistent increase in CV mortality risk during heat waves, with a pooled RR of 1.118 (95% CI: 1.102–1.135), corresponding to an 11.8% increase compared to non–heat wave periods. In Brazil, studies consistently show an association between extreme heat and cardiovascular outcomes, including increased mortality and hospitalizations, particularly among vulnerable populations. Higher risks were observed among older adults, women, and socioeconomically disadvantaged groups. National estimates indicate increased mortality associated with extreme temperatures, as well as a substantial number of deaths attributable to heat waves in metropolitan areas. Additional evidence suggests a greater impact in lower-income municipalities, and projections indicate increased CV mortality under high-emission scenarios. Heat waves are associated with a significant increase in cardiovascular mortality globally. In Brazil, the impact is already substantial and disproportionately affects vulnerable populations, highlighting the urgent need for mitigation strategies, early warning systems, and climate adaptation policies.

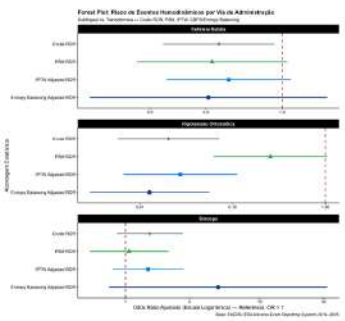
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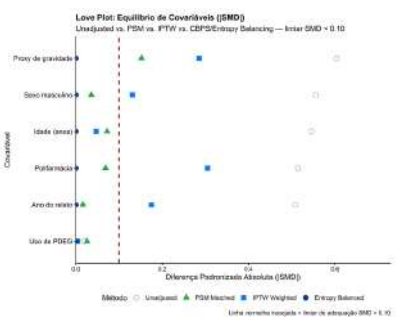
Impact of Route of Administration on Hemodynamic Adverse Events of Nitroglycerin: A Real-World Pharmacovigilance Study.

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Introdução/Fundamentos: Nitroglycerin is a cornerstone vasodilator in coronary artery disease; however, the comparative impact of the route of administration on its hemodynamic safety remains poorly characterized in real-world data. Sublingual (rapid plasma peak) and transdermal (sustained release) formulations exhibit distinct pharmacokinetic profiles and potentially divergent adverse event patterns. Objetivos: To evaluate whether the route of administration modifies the profile of reported hemodynamic adverse events in real-world settings. Métodos: Retrospective pharmacovigilance study using the FAERS database (2014–2025, 44 quarters), incorporating disproportionality analysis and causal inference. The cohort was restricted to nitroglycerin as a Primary or Secondary Suspect, identified via validated regex strategies (RxNorm/MeSH), stratified into Sublingual versus Transdermal groups, and deduplicated by case (age 18–110 years, sex M/F). Confounding was primarily addressed using entropy balancing, promoting rigorous covariate equalization and high comparability between groups. As supportive approaches, propensity score matching (PSM 1:1; caliper = 0.1) and inverse probability of treatment weighting (IPTW; ATE) were applied for triangulation. The propensity model included age, sex, PDE-5 inhibitor use, report year, polypharmacy, and severity proxy. Outcomes (syncope/presyncope, orthostatic hypotension, headache) were defined using MedDRA terms. Metrics included PRR (Haldane–Anscombe), Bayesian IC, and reporting odds ratio (ROR) estimated via Firth logistic regression and weighted models. Resultados e Conclusões: Final cohort comprised 1,480 reports, with entropy balancing achieving SMD = 0.000 across covariates. Orthostatic hypotension showed a robust and consistent signal across all models—Crude ROR = 0.020 (95% CI: 0.006–0.072); IPTW = 0.027 (0.007–0.112); Entropy = 0.013 (0.003–0.056; p < 0.001)—indicating higher disproportionality in the transdermal group. Headache showed a directional trend but lost significance after adjustment. Syncope showed no robust association, with wide confidence intervals indicating instability. Overall, the route of administration significantly modulates hemodynamic safety, with transdermal nitroglycerin associated with increased orthostatic hypotension, supporting systematic blood pressure monitoring in clinical practice.





20253

IMPACT OF THE COVID-19 PANDEMIC ON HEART FAILURE HOSPITALIZATIONS AND IN-HOSPITAL MORTALITY IN BRAZIL: A NATIONWIDE ANALYSIS OF REGIONAL DISPARITIES (2015–2023)

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Introdução/Fundamentos: The COVID-19 pandemic imposed an abrupt disruption on healthcare systems, potentially compromising access to and outcomes of chronic cardiovascular care. Heart failure (HF) represents one of the leading causes of hospitalization within Brazil's public health system (SUS), making it a sensitive marker of systemic strain. Objetivos: To evaluate temporal trends in heart failure hospitalizations and in-hospital mortality in Brazil (2015–2023), quantifying regional disparities and the impact of the COVID-19 pandemic on these indicators. Métodos: Retrospective analysis of all HF hospitalizations (ICD-10: I50) recorded in Brazil's national inpatient database (SIH/SUS) from 2015 to 2023, stratified by the five Brazilian macro-regions. Temporal trends in annual hospitalization volume and in-hospital mortality rate were assessed using Prais-Winsten regression to account for first-order serial autocorrelation. Regional mortality disparities were described with exact binomial 95% confidence intervals (CI). The association between hospitalization volume and in-hospital mortality was evaluated by Pearson correlation. Resultados e Conclusões: A total of 1,784,731 hospitalizations were identified over the study period; overall in-hospital mortality was 11.54%. Hospitalization volume declined significantly during the pandemic, with the Northeast and North regions recording the steepest reductions (-23.5% and -20.6% vs. 2019). In-hospital mortality peaked at 13.54% in 2021 — the highest value in the series — compared to 11.37% in 2019, with no return to pre-pandemic levels by 2023 (11.64%). Regional disparities were substantial: the Northeast reached 12.38% (95% CI 12.04-12.73%) in 2020, compared to 9.80% (95% CI 9.51-10.09%) in the South. A strong inverse correlation was observed between annual hospitalization volume and in-hospital mortality rate ($r = -0.86$; $p = 0.003$), consistent with a severity-shift mechanism whereby restricted access selected for higher-risk admissions. In conclusion, HF hospitalizations declined sharply during the pandemic while in-hospital mortality worsened and failed to recover to pre-pandemic levels by 2023. The disproportionate impact on regions with lower healthcare infrastructure capacity highlights a critical vulnerability of the Brazilian cardiovascular care system and underscores the need for region-specific strategies to maintain continuity of care during public health emergencies.

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IMPACT OF VOLCANIC ACTIVITY ON CARDIOVASCULAR HEALTH: A SYSTEMATIC REVIEW OF EVIDENCE

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Introdução/Fundamentos: Volcanic eruptions and persistent gas emissions release ash, particulate matter, and toxic gases that may adversely affect human health. While respiratory outcomes are well documented, cardiovascular effects remain less clearly defined. Objetivos: To synthesize the scientific evidence regarding the impact between volcanic exposure and cardiovascular health outcomes. Métodos: A search was conducted on April 14, 2026, in PubMed, Embase, Scopus, and Web of Science. Gray literature, study reference lists, and the first 10 pages of Google Scholar were screened. The review followed PRISMA 2020 guidelines. Quality evaluation was assessed using the Mixed Methods Appraisal Tool (MMAT). Two reviewers independently performed study selection and data extraction after pilot training. Resultados e Conclusões: A total of 5 studies were included. The 1996 Ruapehu eruption (New Zealand) showed no consistent cardiovascular increase (IHD RR=1.44, p=0.032 for bronchitis only). Chronic SO□ exposure at Kilauea (Hawaii) was associated with hypertension (OR≈2.45) and increased systolic BP (+14.4 mmHg). During the 2002 Etna eruption (Italy), hospital admissions rose for IHD (RR=1.13), MI (RR=1.34), and cerebrovascular disease (RR=1.24). A retrospective Etna study found increased heart disease emergency visits (OR=1.36, p=0.0001). At Colli Albani (Italy), chronic gas exposure showed elevated cardiovascular mortality in high-exposure men (HR=1.6, 95%CI 0.95–2.7). Overall, 50% (3/6) of studies were rated high quality and 50% (3/6) moderate quality according to MMAT criteria. Volcanic activity can exert measurable cardiovascular impacts, particularly under sustained exposure to gases and particulates. Further longitudinal studies are needed to clarify causal pathways and vulnerable subgroups.

14481

LIPID REFERENCE VALUES IN BRAZIL: LACK OF NATIONAL VALIDATION AND IMPLICATIONS FOR CARDIOVASCULAR RISK ASSESSMENT

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Introdução/Fundamentos: Lipid reference values are essential for cardiovascular risk stratification and clinical decision-making. In Brazil, these thresholds are largely derived from international guidelines, which may limit their applicability to a highly heterogeneous population. Objetivos: To assess the origin, validity, and applicability of lipid reference values currently used in the Brazilian population. Métodos: A systematic review was performed in accordance with PRISMA 2020 guidelines. Searches were conducted in PubMed, Scopus, Web of Science, SciELO, LILACS, and Embase for studies published between 2019 and 2025. Population-based studies, epidemiological analyses, systematic reviews, and clinical guidelines reporting lipid distributions or reference values relevant to Brazil were included. Study selection and data extraction were independently performed by two reviewers. Resultados e Conclusões: Among 751 identified records, 25 studies were included. Lipid reference values currently used in Brazil are predominantly adapted from international consensus documents rather than derived from nationally designed laboratory reference interval studies. National surveys describe lipid distributions but do not meet methodological criteria for establishing reference intervals. Limited stratification by sex, ethnicity, and geographic region was observed, along with interlaboratory variability in analytical methods. These limitations may affect cardiovascular risk classification. Multicenter studies using standardized laboratory criteria are needed to establish population-specific reference intervals and improve accuracy in cardiovascular risk assessment.

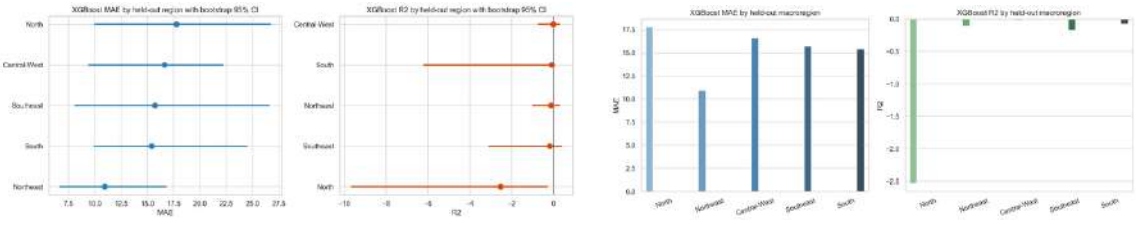
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NATIONAL POOLED PERFORMANCE MASKS HETEROGENEOUS REGIONAL TRANSPORTABILITY OF MACHINE LEARNING MODELS FOR ACUTE MYOCARDIAL INFARCTION HOSPITALIZATION ACROSS BRAZIL

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Introdução/Fundamentos: Brazil has vast regional disparities in cardiovascular risk profiles and acute myocardial infarction (AMI) outcomes. Machine learning (ML) models trained on national data may appear adequate overall while masking poor accuracy in specific regions. Whether these models generalize across macroregions remains unknown. Objetivos: To evaluate the geographic transportability of ML models for AMI hospitalization rates across Brazilian macroregions. Métodos: We analyzed 27 state capitals (2013–2021; N=243 capital-year observations). A Leave-One-Region-Out (LORO) framework trained on four macroregions and tested on the fifth. We compared Linear Regression, Elastic Net, Random Forest, and XGBoost. Robustness analyses included capital-cluster bootstrap 95% CI, sensitivity excluding 2021 (COVID-19), and 1,000 random size-matched permutations. Resultados e Conclusões: Although XGBoost appeared satisfactory nationally (pooled MAE 14.75; R^2 0.105), this aggregate view was misleading. When each macroregion was held out, the model predicted AMI rates worse than simply using each region's historical mean (macro-average R^2 −0.581). No algorithm escaped this pattern: Random Forest ranked 2nd (pooled R^2 −0.032), Linear Regression 3rd (R^2 −0.259), and Elastic Net 4th (R^2 −0.402). None of the five macroregions achieved positive R^2, ranging from Northeast (−0.109) to North (−2.531; bootstrap 95% CI −9.695 to −0.276). The most striking finding was that the North, despite being statistically most similar to the rest of the country (lowest covariate shift, SMD 0.55), showed the worst failure — suggesting that its clinical-epidemiological particularities, notably distinct hypertension and diabetes prevalence, are poorly captured by models trained elsewhere. COVID-19 disruptions amplified but did not create these failures: excluding 2021 improved macro R^2 from −0.581 to −0.435 (delta +0.146), yet the North remained worst (R^2 −1.694). Permutation testing confirmed that geographic structure drives this gap (observed R^2 −0.581 vs. null mean −0.263; P=0.120). A nationally adequate ML model proved unreliable at the macroregional level, with the North showing the most robust failure. National-level validation alone is insufficient for AMI surveillance tools intended for regional use. Local recalibration or region-specific modeling should precede deployment. As an ecological study, findings do not support individual-level or causal inferences.



20923

OUT-OF-HOSPITAL CARDIAC ARREST, HEART FAILURE, AND COMPOUND HEATWAVES: A SYSTEMATIC REVIEW WITH QUANTITATIVE SYNTHESIS AND THE CRITICAL ROLE OF NIGHTTIME TEMPERATURE

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Introdução/Fundamentos: Extreme heat imposes acute cardiovascular stress capable of triggering catastrophic events. Although increased cardiovascular mortality is well established, the specific risks of out-of-hospital cardiac arrest (OHCA) and heart failure (HF)-related mortality remain incompletely integrated. Nighttime heat as an amplifier of these outcomes is also underestimated in traditional heatwave definitions. Objetivos: To estimate, through quantitative synthesis, the risk of OHCA associated with extreme heat and heatwaves; describe the impact of compound heatwaves (day+night) and hot nights on cardiac mortality; and assess temporal trends in HF mortality related to temperature. Métodos: A systematic review was conducted according to PRISMA guidelines. Meta-analyses reporting relative risk (RR) of OHCA associated with extreme heat and primary studies on sudden cardiac arrest, compound heatwaves, and HF were included. Quantitative synthesis was performed using a random-effects model. Overlap among studies from prior meta-analyses was assessed to minimize double counting. Resultados e Conclusões: The quantitative synthesis included 38 independent studies and over 1 million OHCA events. The pooled RR was 1.067 (95% CI: 1.051–1.084), representing a 6.7% increase. Heatwaves showed an RR of 1.248 (95% CI: 1.091–1.427), with elderly individuals and men as more vulnerable subgroups. Hot nights alone were associated with a 28% increase in sudden cardiac arrest risk (OR=1.28; 95% CI: 1.22–1.34), while heatwaves increased this risk by 40% (OR=1.40). Compound heatwaves showed an OR of 1.86 for cardiac mortality, exceeding daytime-only (OR 1.19) and nighttime-only (OR 1.16) definitions, with an estimated 41,869 excess deaths. Traditional metrics based only on maximum daily temperature underestimated mortality burden by 35%. The most sensitive causes were sudden cardiac arrest, myocardial infarction, and HF. Recent evidence also suggests increasing HF vulnerability to high temperatures. Extreme heat is associated with increased OHCA risk, while heatwaves exert an even greater impact. Compound heatwaves are substantially more lethal than traditional definitions, and HF-related mortality shows a rising temporal trend. Emergency services mabenefit from reinforcement during heat alerts, and nighttime temperature should be incorporated into warning systems. These findings have important implications amid climate change and the growing global burden of cardiovascular disease.

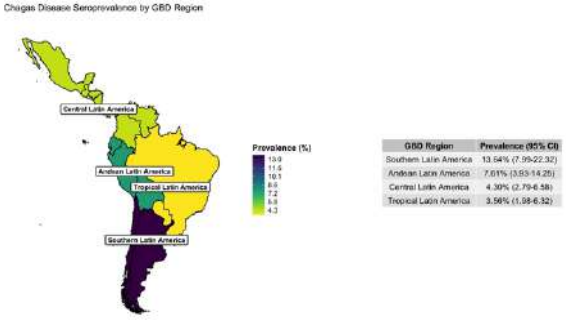
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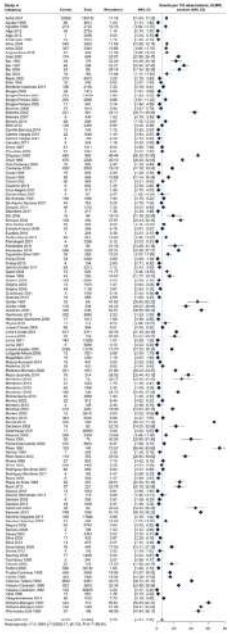
PREVALENCE OF CHAGAS DISEASE AMONG POPULATIONS AT RISK IN LATIN AMERICA: AN UPDATED SYSTEMATIC REVIEW AND META-ANALYSIS OF OBSERVATIONAL STUDIES

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Introdução/Fundamentos: Chagas disease (ChD) poses a significant public health challenge in Latin America (LA), with a notable scarcity of up-to-date data on its prevalence. Objetivos: This study assesses the seroprevalence of ChD in Latin American endemic countries, among populations at risk, through a systematic review and meta-analysis. Métodos: Medline, Web of Science, Science Direct, and SciELO were searched to identify population-based studies that investigated the seroprevalence of ChD among individuals at risk in endemic countries published from Jan/1980 to Dec/2021. Study quality was assessed using the Joanna Briggs Institute's tool. Pooled prevalence estimates and 95% confidence intervals (CIs) were calculated using random-effects models with a generalized linear mixed model. Heterogeneity was assessed using the I2 statistic. Subgroup, sensitivity, and publication bias analyses were performed. Endemic countries were grouped into regions based on geographic proximity and similar epidemiological patterns. A separate analysis was performed focusing exclusively on children and adolescents (≤21 years). Resultados e Conclusões: Results: A total of 141 studies were included, encompassing 615,553 participants and 44,627 ChD cases. The overall pooled prevalence of ChD among at risk population was 5.8% (95% CI: 4.4 - 7.7), varying between regions: Andean LA (7.6% [95% CI: 3.9 - 14.2]; 21 studies), Central LA (4.4% [95% CI: 2.9 - 6.7]; 52 studies), Southern LA (13.93% [95% CI: 8.31 - 22.43]; 30 studies), and Tropical LA (5.8% ([95% CI: 4.4 - 7.7;] 38 studies). In the sub-analysis of children, pooled prevalence was 2.7% (95% CI: 1.8 - 3.8; 89 studies), with region rates as follows: Andean LA (5.9% [95% CI: 2.9 - 11.7]; 15 studies), Central LA (1.6% [95% CI: 1.0 - 2.5]; 30 studies), Southern LA (7.9% [95% CI: 4.3 - 14.1]; 23 studies), and Tropical LA (0.9% [95% CI: 0.4 - 1.9]; 21 studies). The highest prevalence rates were observed in Bolivia, Paraguay, and Argentina. Conclusion: The findings indicate a higher prevalence of ChD among populations at risk in Southern and Andean LA, consistent across the general population and the subset of children. High heterogeneity was observed overall, attributed to the suboptimal quality of the included studies





17293

PREVALENCE OF ELEVATED BLOOD PRESSURE AND ASSOCIATED FACTORS IN MILITARY POLICE OFFICERS IN AMAZONAS: PRELIMINARY ANALYSIS OF THE HIPER-PMAM STUDY

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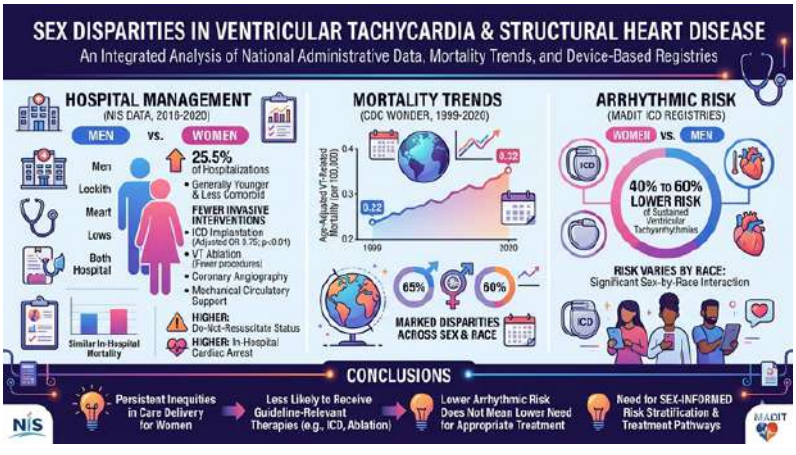
Introdução/Fundamentos: Systemic arterial hypertension is a multifactorial condition and an important modifiable risk factor for cardiovascular morbidity and mortality. Among police officers, chronic occupational stress, irregular routines, sedentary behavior, and other behavioral factors may increase this risk and impair quality of life. In this context, the Hiper-PMAM project was designed to investigate this condition among military police officers in Amazonas. Objetivos: To analyze the prevalence of elevated blood pressure and associated factors among military police officers in Amazonas, and describe quality-of-life indicators related to mental health and well-being. Métodos: Cross-sectional, quantitative, descriptive-analytical study with 142 military police officers. Data were collected through a structured questionnaire, anthropometric assessment, standardized blood pressure measurement in three readings, considering the mean of the last two according to the 2025 Brazilian Guideline on Arterial Hypertension, and administration of the WHOQOL-BREF, an instrument developed by the World Health Organization (WHO) to assess quality of life. Sociodemographic, occupational, clinical, and behavioral variables, blood pressure, BMI, medication use, and quality-of-life scores were analyzed. Resultados e Conclusões: A total of 142 military police officers were analyzed, with a mean age of 37.4±6.8 years, 86.6% were male, with a predominance of privates and corporals, accounting for 68.3%, followed by sergeants with 30.3%. Elevated blood pressure was observed in 80.3%. Self-reported hypertension or antihypertensive use occurred in 5.6%. Hypertensive patients not meeting blood pressure targets accounted for 75%. Overweight or obesity was present in 86.6% of cases, with obesity observed in 31%. Police officers with elevated blood pressure had a higher mean age (38.9 years; p=0.007), longer service duration (12.4 years; p=0.014), and higher BMI (30 kg/m²; p<0.001). In the WHOQOL-BREF, the environment domain, suggesting a greater influence of external and occupational factors on perceived quality of life, showed the poorest performance (67.0±11.5), and 19.6% reported negative feelings occurring frequently to always. The findings reveal a concerning scenario for the cardiovascular health of military police officers, marked by high prevalence of abnormal blood pressure, excess weight, and poorer perceived quality of life, reinforcing the need for continuous institutional strategies focused on prevention, monitoring, and health promotion.

19545

SEX DISPARITIES IN VENTRICULAR TACHYCARDIA WITH STRUCTURAL HEART DISEASE: EPIDEMIOLOGY, MANAGEMENT, AND OUTCOMES FROM NATIONAL ADMINISTRATIVE AND DEVICE-BASED REGISTRIES

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Introdução/Fundamentos: Sex-related differences in ventricular arrhythmias are increasingly recognized; however, comprehensive epidemiological data on disparities in presentation, management, and outcomes of ventricular tachycardia (VT) in patients with structural heart disease remain limited. Objetivos: To evaluate sex differences in the epidemiology, hospital management, and outcomes of patients admitted with VT and structural heart disease using national administrative databases and multicenter implantable cardioverter-defibrillator registries. Métodos: This retrospective study integrated data from the National Inpatient Sample (NIS), CDC WONDER mortality records, and multicenter implantable cardioverter-defibrillator cohorts from the MADIT studies. Adults aged ≥18 years hospitalized with a primary diagnosis of VT (ICD-10 code I47.2) and concomitant structural heart disease between 2016 and 2020 were identified in the NIS. Multivariable logistic regression was used to assess the association between sex and in-hospital outcomes and management patterns. Long-term arrhythmic risk was examined in device-based cohorts, and mortality trends were evaluated using age-adjusted rates from CDC WONDER. Resultados e Conclusões: Among approximately 193,600 hospitalizations for VT/ventricular fibrillation in the NIS between 2016 and 2020, women accounted for 25.5% of cases. Women were younger and had fewer comorbidities, yet underwent fewer invasive and advanced therapeutic interventions, including coronary angiography, mechanical circulatory support, implantable cardioverter-defibrillator implantation (adjusted odds ratio 0.75; p<0.01), and VT ablation. Women also had higher rates of do-not-resuscitate status and in-hospital cardiac arrest, whereas in-hospital mortality did not differ significantly by sex. Age-adjusted VT-related mortality increased from 0.22 to 0.32 per 100,000 between 1999 and 2020, with significant disparities across sex and race. In implantable cardioverter-defibrillator cohorts, women had a 40% to 60% lower risk of sustained ventricular tachyarrhythmias, although this association varied by race, with a significant interaction between sex and race. Marked sex disparities exist in the management and outcomes of VT among patients with structural heart disease. Despite lower arrhythmic risk in device-based cohorts, women were less likely to receive guideline-relevant therapeutic interventions, raising concern for persistent inequities in care delivery.

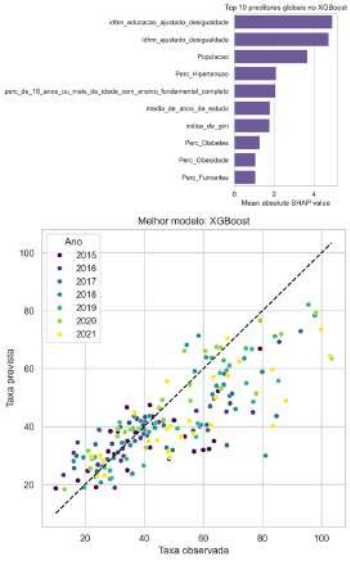
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SOCIAL AND EDUCATIONAL INDICATORS SURPASS TRADITIONAL CARDIOVASCULAR RISK FACTORS IN EXPLAINING DIFFERENCES IN MYOCARDIAL INFARCTION HOSPITALIZATION RATES ACROSS BRAZILIAN CAPITALS: AN ECOLOGICAL PREDICTIVE MODELING STUDY

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Introdução/Fundamentos: Acute myocardial infarction (AMI) hospitalization rates vary markedly among Brazilian state capitals. While individual-level risk factors like hypertension and diabetes are well-established predictors, the role of population-level social determinants in driving these geographic disparities remains poorly characterized. Objetivos: To identify the most influential population-level predictors of AMI hospitalization rates across Brazilian capitals and to evaluate whether nonlinear predictive models outperform conventional linear approaches. Métodos: This ecological study analyzed 243 observations from all 27 Brazilian state capitals (2013–2021). The outcome was AMI hospitalizations per 100,000 inhabitants. Sixteen predictors spanning four domains — cardiovascular risk factors, demographics, education, and social development — were examined. Four models (linear regression, elastic net, random forest, XGBoost) were compared using temporal validation. Robustness was assessed by excluding 2021, using a reduced variable set, and performing permutation testing (n=200). Resultados e Conclusões: The model XGBoost achieved the best performance (MAE 10.59/100,000; R^2=0.50, 95% CI 0.36–0.64), outperforming random forest (R^2=0.39), linear regression (R^2=0.33), and elastic net (R^2=0.24). Permutation testing confirmed non-chance findings (p=0.005). The inequality-adjusted human development index, population size, educational indicators, and income inequality consistently ranked as the most influential predictors — above hypertension (5th) and diabetes (8th). A structural break in 2021 (R^2 dropping from 0.75 to 0.34) was consistent with pandemic-related disruption rather than model failure. Social determinants, particularly education and human development, were stronger ecological predictors of geographic AMI hospitalization variation than traditional cardiovascular risk factors. These findings suggest that addressing educational and socioeconomic inequalities may be as relevant to reducing AMI disparities as clinical risk factor management. These population-level associations should not be interpreted as individual-level causal effects and may partly reflect differences in healthcare access across capitals.



22063

SOCIOECONOMIC VULNERABILITY AND ACUTE MYOCARDIAL INFARCTION MORTALITY: A SPATIAL ECOLOGICAL ANALYSIS OF BRAZILIAN MUNICIPALITIES (2015–2023)

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Introdução/Fundamentos: Socioeconomic inequities are structural determinants of cardiovascular mortality. Ischemic heart disease remains the leading cause of death in Brazil, with a heterogeneous distribution. Ecological analyses correlating social indicators with acute myocardial infarction (AMI) mortality are crucial for identifying public health priorities and mitigating notification biases. Objetivos: To investigate the association between socioeconomic vulnerability and AMI mortality in Brazilian municipalities using spatial analysis and adjusted Poisson regression (2015–2023), accounting for age-standardization and ill-defined causes. Métodos: Nationwide ecological study using AMI mortality data (ICD-10: I21) from SIM/DataSUS. Rates were adjusted for ill-defined causes (ICD-10: R00-R99) and age- standardized (Direct Method). Vulnerability was assessed via the Social Vulnerability Index (SVI) and Municipal Human Development Index (MHDI). Spatial analysis (LISA) identified mortality clusters. Poisson regression, adjusted for primary care coverage and population density, estimated Incidence Rate Ratios (IRR). Resultados e Conclusões: From 2019–2023, 473,861 AMI deaths were recorded (mean: 94,772/year), predominantly among males (59.4%) and elderly ≥60 years (76.5%). While the Southeast (46.1%) concentrated the highest absolute volume of deaths, adjusting for ill-defined causes revealed significantly higher rates of mortality in the North and Northeast compared to crude rates. Higher SVI was associated with increased AMI mortality (p<0.05), with an estimated Incidence Rate Ratio (IRR) of 1.12 (95% CI: 1.08–1.16) for each 0.1 increase in SVI, consistent with findings for broader cardiovascular diseases. LISA identified “high-high” mortality clusters in low-MHDI municipalities, particularly in North/Northeast hinterlands, confirming a strong correlation between structural poverty and cardiovascular outcomes. Socioeconomic vulnerability is a robust predictor of AMI mortality. Crude data mask the true burden in vulnerable regions due to notification biases. Policies must prioritize high-SVI areas and low primary care coverage to reduce cardiovascular inequities, addressing the distinct patterns of absolute volume versus adjusted mortality rates

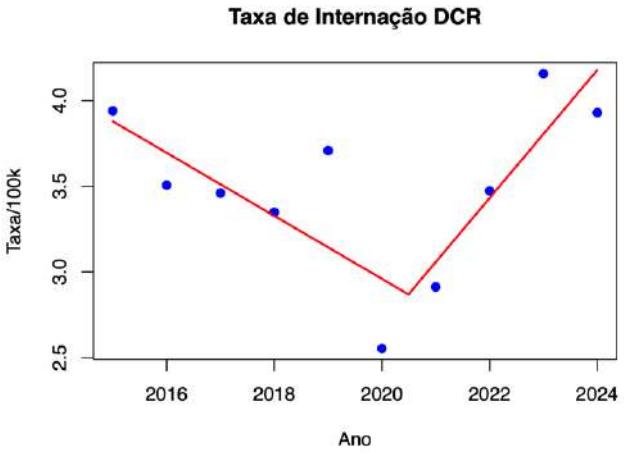
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TEMPORAL TRENDS AND IN-HOSPITAL OUTCOMES OF RHEUMATIC HEART DISEASE IN BRAZIL (2015–2024): A SEGMENTED REGRESSION ANALYSIS

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Introdução/Fundamentos: Rheumatic heart disease (RHD) remains a cause of preventable hospitalizations in Brazil and contributes substantially to cardiovascular mortality. Disruptions in healthcare services during the COVID-19 pandemic may have influenced the dynamics of diagnosis and management of this condition. In this context, the temporal trend and epidemiological profile of hospitalizations for RHD in Brazil were analyzed. Objetivos: To describe the epidemiological profile and temporal trend of hospitalizations and in-hospital mortality for RHD in Brazil from 2015 to 2024, comparing hospitalization and mortality trends across the pre-, intra-, and post- pandemic periods. Métodos: This ecological time-series study used data from the SUS Hospital Information System (SIH/SUS). Hospitalizations for RHD (ICD-10: I05-I09) were stratified by sex and region. Temporal trend analysis was performed using Joinpoint Analysis to identify inflection points in the slopes of the rates. Resultados e Conclusões: During the analyzed period, Brazil recorded 73,613 hospitalizations for rheumatic heart disease, with an in-hospital case fatality rate of 8.16%. The regional distribution revealed higher average annual hospitalization rates in the Central-West (4.71/100,000 inhabitants) and Northeast (4.19/100,000 inhabitants). The South region, although having a moderate hospitalization rate (3.39/100,000), presented the highest case fatality rate among the regions (10.19%). A higher proportion of deaths was observed in women (59.6%). Joinpoint analysis identified a significant inflection point in 2020 (p = 0.01), with a change in the trend pattern of hospitalizations over time. A progressive decline was observed pre-pandemic (APC=-16.8%), followed by a reversal of the pattern in 2020 and a subsequent increase in the post-pandemic period (APC=45.26%). The magnitude of the reduction in 2020 was 30.62% compared to 2019, followed by an increase of 67.22% in 2024. This pattern suggests a shift in hospitalization trends during the pandemic period, followed by partial recovery. Regional inequalities and variations in hospital mortality were also observed, indicating persistent heterogeneity in healthcare outcomes.



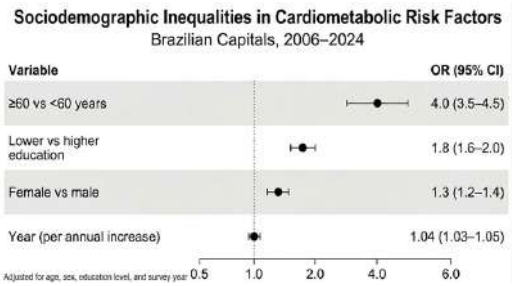
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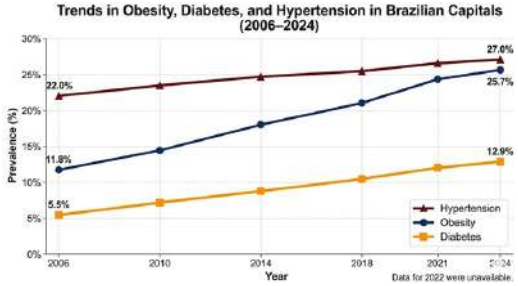
TEMPORAL TRENDS AND SOCIODEMOGRAPHIC INEQUALITIES IN OBESITY, DIABETES, AND HYPERTENSION IN BRAZILIAN CAPITALS, 2006–2024

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Introdução/Fundamentos: Cardiometabolic risk factors are major contributors to cardiovascular disease. In Brazil, long-term trends in obesity, diabetes, and hypertension, as well as their sociodemographic distribution, remain incompletely characterized. Objetivos: To assess temporal trends and sociodemographic inequalities in the prevalence of obesity, diabetes, and hypertension in Brazilian capitals from 2006 to 2024. Métodos: We conducted a population-based analytical cross-sectional study using Vigitel Brazil data from adults aged ≥18 years living in the capitals of the 26 Brazilian states and the Federal District between 2006 and 2024, excluding 2022 because data were unavailable. Obesity was defined as body mass index ≥30 kg/m², while diabetes and hypertension were based on self-reported medical diagnosis. Sex, age group, education level, and survey year were included as independent variables. Multivariable logistic regression models adjusted for these variables were used to estimate adjusted odds ratios (aORs), 95% confidence intervals (95%CIs), and p-values. Year was modelled as a continuous variable. All analyses accounted for the complex survey design. Resultados e Conclusões: A total of more than 700,000 adults were included. Between 2006 and 2024, the prevalence of obesity increased from 11.8% to 25.7%, diabetes from 5.5% to 12.9%, and hypertension from 22.0% to 27.0%. Older age was strongly associated with a higher burden of cardiometabolic risk factors, with adults aged ≥60 years showing fourfold higher odds than younger individuals (aOR 4.0, 95%CI 3.5–4.5; p<0.001). Lower educational attainment was also independently associated with these conditions (aOR 1.8, 95%CI 1.6–2.0; p<0.001). Female sex was independently associated with higher odds of obesity and hypertension (aOR 1.3, 95%CI 1.2–1.4; p<0.001). Each survey year was associated with increased odds of the analysed outcomes (aOR 1.04, 95%CI 1.03–1.05; p<0.001), indicating a persistent upward trend and marked sociodemographic inequalities. From 2006 to 2024, obesity, diabetes, and hypertension increased substantially across Brazilian capitals. Their unequal distribution by age, education, and sex highlights a persistent and unequal cardiometabolic burden, reinforcing the need for equity-oriented public health strategies in Brazil.





19381

THE HIDDEN BURDEN OF HEART FAILURE WITH PRESERVED EJECTION FRACTION: ETHNICITY AS A MARKER OF EXTREME MORTALITY RISK

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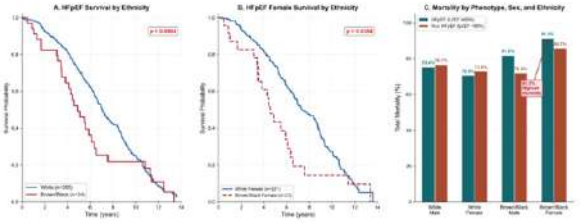
(1) BARRA D`OR - RIO DE JANEIRO - RJ - BRASIL; (2) IDOR - RIO DE JANEIRO - RJ - BRASIL; (3) INSTITUTO DO CORACAO EDSON SAAD/UFRJ - RIO DE JANEIRO - RJ - BRASIL;

Introdução/Fundamentos: Heart failure with preserved ejection fraction (HFpEF) is the fastest-growing HF phenotype, yet its long-term prognosis and the role of social determinants of health (SDH) in this population remain poorly defined. In middle-income countries with marked racial and socioeconomic inequalities, HFpEF may carry a hidden burden of social vulnerability that conventional clinical assessment fails to capture. Objetivos: To characterize the clinical profile, SDH distribution, and long-term mortality of HFpEF patients in a dual-center decompensated heart failure (DHF) cohort, with emphasis on the intersection of ethnicity, sex, and socioeconomic context. Métodos: From 1,023 consecutive DHF patients at two tertiary centers in contrasting socioeconomic zones (West Zone HDI 0.959 vs. North Zone HDI 0.814; median follow-up 6.9 years, IQR 4.4–9.9), patients with LVEF ≥50% were classified as HFpEF. Clinical characteristics, SDH markers (hospital zone, ethnicity, sex), and outcomes were compared against non-HFpEF patients. Subgroup analyses explored SDH–phenotype interactions. Resultados e Conclusões: HFpEF comprised 389 patients (38.0%): predominantly female (244/389; 62.7%), older (median 82 years, IQR 73–88), with high prevalence of hypertension (329/389; 84.6%) and chronic AF (104/389; 26.7%). Despite preserved systolic function, long-term mortality was 287/389 (73.8%), with 34 (8.7%) in-hospital deaths. SDH markedly amplified mortality within HFpEF: Brown/Black patients had 88.2% (30/34) mortality versus 72.4% (257/355) in White patients (P=0.064). Among Brown/Black women with HFpEF, mortality reached 91.3% (21/23) — the highest rate in any phenotype–sex–ethnicity subgroup — compared with 70.6% (156/221) in White women with HFpEF. Hospital zone did not significantly differentiate HFpEF outcomes (West Zone 75.6% vs. North Zone 72.9%; P=0.80), suggesting that ethnicity-related social vulnerability operates through pathways independent of institutional context. HFpEF represents a substantial, predominantly female phenotype with high long-term mortality in which ethnicity — as a proxy for cumulative social disadvantage — identifies an extremely high-risk subgroup that clinical variables alone cannot detect.

Table. HFpEF Clinical Profile and Mortality by SDH Subgroups (n=389)

Characteristic	HFpEF Total (n=389)	White HFpEF (n=355)	Brown/Black HFpEF (n=34)	P-value
Age, median (IQR), years	82 (73–88)	82 (73–88)	82 (73–87)	NS
Female sex, n (%)	244 (62.7%)	221 (62.3%)	23 (67.6%)	NS
LVEF, median (IQR), %	62 (54–70)	62 (55–70)	59 (53–68)	NS
Hypertension, n (%)	329 (84.6%)	300 (84.5%)	29 (85.3%)	NS
Chronic AF, n (%)	104 (26.7%)	96 (27.0%)	8 (23.5%)	NS
Total mortality, n (%)	287 (73.8%)	257 (72.4%)	30 (88.2%)	0.064
In-hospital mortality, n (%)	34 (8.7%)	30 (8.5%)	4 (11.8%)	NS
Female mortality, n (%)	177/244 (72.5%)	156/221 (70.6%)	21/23 (91.3%)	0.046
West Zone mortality	99/131 (75.6%)	—	—	—
North Zone mortality	188/258 (72.9%)	—	—	0.80*

**West Zone vs. North Zone within HFpEF. LVEF=left ventricular ejection fraction; AF=atrial fibrillation; NS=not significant.*



19338

THE HYPERTENSION PARADOX IN DIABETIC BLACK WOMEN: HIGH BASELINE RISK VS. MITIGATED PROGRESSION THROUGH INTENSIVE CLINICAL MANAGEMENT – ELSA-BRASIL STUDY.

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Introdução/Fundamentos: Diabetes mellitus (DM) combined with hypertension represents a high-risk combination for renal and cardiovascular complications, with an uneven distribution across racial and gender groups. Black women constitute the group with the highest prevalence of hypertension among people with DM in the ELSA-Brasil cohort, facing significant sociodemographic disadvantages, such as lower educational attainment, lower income, and reduced access to health insurance. Paradoxically, evidence from the cohort suggests that this group makes more intensive use of antihypertensive medications and diuretics, raising the hypothesis that intensive clinical management may mitigate the progression of complications. Understanding this paradox is essential for guiding strategies for equitable care in vulnerable populations. Objetivos: To investigate whether intensive antihypertensive management mediates the reduction in renal and cardiovascular risk among black women with diabetes in the ELSA-Brasil cohort, by comparing blood pressure burden, treatment intensity, and the incidence of diabetic kidney disease (DKD) and cardiovascular disease (CVD) across intersectional sex/race subgroups, adjusting for sociodemographic and clinical determinants. Métodos: A prospective longitudinal study using data from 2008 to 2019 from the ELSA-Brasil cohort. The study included individuals with DM (self-reported, use of antidiabetic medications, or laboratory criteria) and complete data on HbA1c, renal function, and albuminuria. Exposures were race/skin color and sex, using an intersectional approach. Outcomes included DKD and major cardiovascular events, such as acute myocardial infarction, stroke, and heart failure. Survival analysis and Cox regression were used, with p<0.05. Resultados e Conclusões: At the start of the study, the group of black women had the highest prevalence of hypertension, being 68.3% among those without DKD and 82.7% among those with DKD, as well as a higher prevalence of obesity. However, after clinical adjustments, it was not possible to establish an independent association between the group and the risk of developing DKD or CVD, highlighting the group's greater access to and use of clinical treatment as protective factors not as prominently present in the other groups, thereby mitigating social inequalities and those related to pre-existing comorbidities over time. Therefore, the clinical surveillance promoted by the ELSA-Brasil study acted as an essential protective factor against DKD and CVD progression.

19342

THE INTERACTION BETWEEN SOCIAL DETERMINANTS AND CLINICAL FACTORS ON CARDIO-RENAL OUTCOMES IN INDIVIDUALS WITH DIABETES: RESULTS FROM THE ELSA-BRASIL STUDY

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Introdução/Fundamentos: Type 2 diabetes mellitus (T2DM) is the primary cause of diabetic kidney disease (DKD) and increases the risk of cardiovascular events (CVD) by up to four times. The distribution of these complications aligns with structural markers of inequality such as race/ethnicity, gender, and educational attainment. An intersectional analysis allows us to examine how these markers produce distinct risks. Objetivos: To analyze, from an intersectional perspective, the combined influence of race/color, sex, and socioeconomic status on renal and cardiovascular complications in individuals with diabetes in the ELSA-Brasil cohort. Métodos: A prospective longitudinal study using data from waves 1 (2008–2010), 2 (2012–2014), and 3 (2017–2019) of the ELSA-Brasil cohort. The study included individuals with diabetes who had complete laboratory data. DKD was defined by persistent albuminuria (≥30 mg/g) and/or glomerular filtration rate <60 mL/min/1.73 m² in two consecutive waves. CVD included myocardial infarction, stroke, and heart failure. The analysis considered intersectionality between sex, race/ethnicity, and education level, using Kaplan-Meier curves, Cox regression and Hazard Ratios (HR) Resultados e Conclusões: A total of 1,138 individuals with diabetes were analyzed (51,7% men; 58.5% black/pardo and 45.4% with a university degree). Black women exhibited greater social vulnerability, with lower educational attainment (32.4% with a university degree), poorer self-perceived health (47.2% regular and 4.8% poor), and a higher prevalence of hypertension (68.3%), while white men were more likely to be in a higher socioeconomic class (52.7% in class B). The sex/race intersection was not independently associated with DKD or CVD. For DKD, the main predictor was duration of diabetes (10–19 years: HR =1.71, 95%Confidence Interval (CI): 1.28–2.28; ≥20 years: HR=1.99, 95%CI 1.37–2.63). For CVD, low educational attainment stood out as the main determinant (elementary/illiterate: HR 1.83, 95% CI 1.41–2.37; p < 0.001; high school: HR 1.57, 95% CI 1.27–2.07; p < 0.001), independent of clinical factors Despite social disparities, race/color, gender and socioeconomic status intersectionality was not an independent predictor of DKD or CVD in diabetic participants of ELSA-Brasil cohort. DKD was mainly related to prolonged metabolic exposure, while CVD more significantly reflected the influence of structural social determinants, especially educational attainment.

20891

URBAN GREEN INFRASTRUCTURE AND CARDIOVASCULAR MORTALITY DURING HEATWAVES: A SYSTEMATIC REVIEW OF INTERVENTION AND MODELLING STUDIES

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Introdução/Fundamentos: Urban heat islands (UHI) may increase local temperatures by up to 4.4°C and are associated with 4.3% of summer mortality (Iungman et al., 2023). Nature-based interventions, such as urban tree planting, have emerged as promising mitigation strategies, but their quantitative impact on cardiovascular (CV) outcomes remains insufficiently consolidated. Objetivos: To systematically review studies evaluating the effects of urban green infrastructure (tree canopy expansion, cool roofs) on CV mortality, emergency department (ED) visits, and temperature during extreme heat events. Métodos: Systematic review conducted according to PRISMA guidelines. Original studies assessing the impact of increased urban green coverage or high-albedo surfaces on cardiovascular outcomes or ambient temperature during extreme heat were included. Both modelling and observational studies with quantitative data were considered. Seven studies published between 2022 and 2026 were included, covering Europe, China, the United States, and Hong Kong. Resultados e Conclusões: Studies consistently demonstrated associations between higher urban green coverage and reductions in temperature and heat-related CV outcomes. In 93 European cities, increasing tree coverage to 30% reduced mean temperature by 0.4°C and prevented 2,644 summer deaths, corresponding to 39.5% of deaths attributable to UHI. In 232 Chinese cities, an 18.3% increase in green coverage could prevent 19,764–26,360 annual CV deaths under future climate scenarios. In 10 US cities, a 10% increase in tree canopy could prevent 50–3,800 deaths, with up to 22% lower heat-related mortality in Phoenix. In Los Angeles, combining tree canopy and high-albedo surfaces reduced ED visits by 25–50% during heat events. In Hong Kong, relative risk decreased from 1.103 in low-green areas to 0.943 in high-green areas. Meta-analyses also showed reduced CV mortality associated with greater vegetation exposure. Urban green infrastructure, particularly tree canopy expansion, is consistently associated with lower temperatures and reduced cardiovascular mortality during heatwaves across different settings and methodologies, supporting its role as a relevant climate adaptation strategy, especially for vulnerable populations.

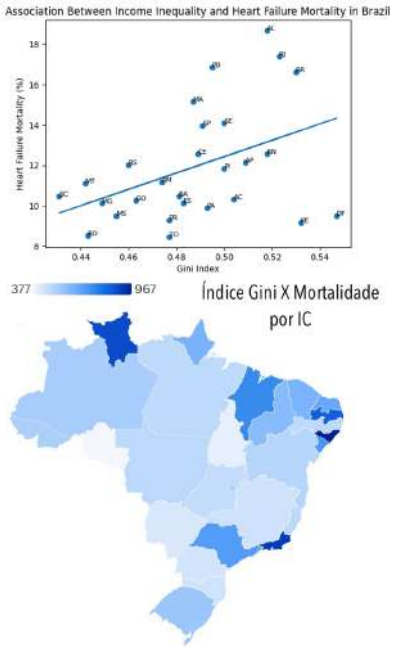
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“SOCIOECONOMIC INEQUALITY AND HEART FAILURE OUTCOMES IN BRAZIL: A NATIONWIDE ECOLOGICAL ANALYSIS”

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Introdução/Fundamentos: Heart failure (HF) is a complex syndrome with high morbidity and mortality worldwide. In Brazil, HF prevalence is estimated at 1.1% among adults and 3.3% among individuals over 60 years old. Although the association between poorer socioeconomic conditions and higher HF mortality has been established, recent Brazilian studies linking cardiovascular diseases to socioeconomic conditions remain scarce. Objetivos: To analyze the association between heart failure morbidity and mortality indicators (hospitalizations, mortality rate, and deaths) and socioeconomic variables such as the Gini index, average income, and years of schooling. Métodos: This was an ecological, cross-sectional study using data obtained from public databases. Hospitalizations, mortality rates, and deaths—stratified by Brazilian states—were collected from DATASUS. Socioeconomic indicators were obtained from census data published by the Brazilian Institute of Geography and Statistics (IBGE). Initially, descriptive analyses of the studied variables were performed. Bivariate associations between socioeconomic indicators and heart failure outcomes were assessed using Pearson’s correlation coefficient, considering the continuous nature of the variables. Subsequently, a multiple linear regression model was constructed to evaluate the independent association between socioeconomic factors and heart failure mortality. Regression coefficients (β), 95% confidence intervals, and p-values were estimated, adopting a significance level of 5%. Resultados e Conclusões: In the bivariate analysis, the Gini index showed a moderate positive correlation with heart failure mortality (r = 0.42). In contrast, average income showed a weak negative correlation (r = -0.18), while years of schooling showed no relevant association with mortality (r = -0.09). Regarding HF hospitalizations, average income showed a moderate positive correlation (r = 0.35). Schooling showed a weak association (r = 0.15), while the Gini index showed a weak negative correlation with hospitalizations (r = -0.19). In the multivariate analysis using multiple linear regression, the Gini index remained significantly associated with HF mortality (β = 38.9; p = 0.045). In contrast, neither average income (p = 0.623) nor schooling (p = 0.963) showed statistically significant associations.



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INTEGRATED EVALUATION OF CLINICAL PARAMETERS, PLASMA BIOCHEMICAL MARKERS, AND CARDIAC PROTEOMICS IN SPRAGUE-DAWLEY RATS SUBMITTED TO A HIGH-FAT DIET AND BETA-ALANINE SUPPLEMENTATION

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Introdução/Fundamentos: Obesity is associated with important inflammatory and metabolic alterations, including insulin resistance, dyslipidemia, and increased visceral adiposity. In this context, compounds with potential antioxidant effects, such as beta-alanine, have gained scientific interest. Objetivos: To evaluate the effects of a high-fat diet and beta-alanine supplementation on clinical parameters, plasma biochemical markers, and the proteomic profile of the left ventricle. Métodos: The study was approved by the Animal Ethics Committee (Protocol 005/2023). Forty male Sprague-Dawley rats were divided into four groups: control (CO), control supplemented with beta-alanine (COBA), high-fat diet (HI), and high-fat diet supplemented with beta-alanine (HIBA). The experimental protocol consisted of 10 weeks of diet consumption, including 4 weeks of supplementation with agar containing beta-alanine. At the end of the experimental period, the animals were euthanized, and body weight, energy efficiency, blood glucose, plasma cholesterol, triglycerides, and visceral adiposity were evaluated. In addition, proteomic analysis of the left ventricle was performed. Biochemical parameters were analyzed using two-way ANOVA ($p<0.05$), while proteomic data were analyzed using Student's t-test, considering $p<0.05$ for proteins with lower abundance and $1-p>0.95$ for proteins with higher abundance. Resultados e Conclusões: Animals submitted to the high-fat diet showed greater weight gain, with a 1.5-fold increase compared to the control group, as well as increased visceral adiposity, higher energy efficiency, and elevated blood glucose levels. These findings were associated with increased abundance of proteins such as Paternally-expressed gene 3 protein (2.46-fold) and mitochondrial long-chain specific acyl-CoA dehydrogenase (1.46-fold) compared with control groups. Beta-alanine supplementation did not significantly affect body weight, plasma triglycerides, blood glucose, or visceral adiposity. However, reduced plasma cholesterol levels were observed in obese animals supplemented with beta-alanine compared to non-supplemented obese animals, which was associated with increased abundance of proteins such as mitochondrial Carnitine O-palmitoyltransferase 2 (1.09-fold) and mitochondrial Superoxide dismutase [Mn] (1.23-fold). These findings suggest that the high-fat diet induced an obesity-related metabolic profile, whereas beta-alanine showed a potential beneficial effect by reducing plasma cholesterol and increasing antioxidant proteins.

16120

MODULATION OF CARDIOMETABOLIC RISK BY DIFFERENT FATTY ACID COMPOSITIONS IN KETOGENIC DIETS: AN EXPERIMENTAL STUDY IN WISTAR RATS

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Introdução/Fundamentos: The ketogenic diet has gained prominence in nutrition, but its effects on cardiometabolic risk remain controversial, particularly due to the qualitative composition of fatty acids. Objetivos: Accordingly, the aim of this experimental study was to evaluate the effect of different fatty acid compositions in ketogenic diets on cardiometabolic markers. Métodos: The study involved 24 male Wistar rats, divided into 3 groups: control diet (CD), classic ketogenic diet (CKD), rich in saturated fatty acids, and modified ketogenic diet (MKD), rich in mono- and polyunsaturated fatty acids, including eicosapentaenoic acid (EPA). At the end of the intervention, body composition was analyzed by Dual-Energy X-ray Absorptiometry (DEXA), and serum samples were collected to assess antioxidant capacity via lag time, and plasma samples were collected to analyze the lipid profile (total cholesterol, HDL-c, LDL-c, triglycerides, and free fatty acids) using specific kits, except for LDL-c, which was estimated based on the Friedewald equation. Data were analyzed using ANOVA with Bonferroni post hoc tests, with a significance level of 5%. Resultados e Conclusões: Regarding changes in body composition, fat mass in the CKD group [167.78 (22.80 g)] was higher than that in the CD group [87.67 (12.55 g), $p = 0.009$]. The MKD group [142.67 (13.38 g), $p = 0.095$] did not differ from the others. For lean mass, we observed a similar yet opposite pattern, as the CKD group [273.82 (10.94 g), $p = 0.029$] had a lower value compared to the CD group [324.14 (14.10 g)]. Once again, the MKD group [280.91 (12.17 g), $p = 0.069$] did not differ from the others. Regarding triglycerides, a reduction was observed in the MKD group compared to the CD group [134.57 (4.44) mg/dL vs. 155.69 (4.64) mg/dL, $p = 0.013$], while the CKD group showed no significant difference [149.91 (4.99) mg/dL, $p > 0.05$]. Regarding total cholesterol, reductions were observed in the MKD [110.73 (2.23) mg/dL, $p < 0.01$] and CKD [116.90 (3.61) mg/dL, $p = 0.007$] groups when compared to the CD group [138.81 (6.55) mg/dL]. A reduction in HDL-c was also observed in the MKD [45.16 (2.23) mg/dL] and CKD [44.92 (2.23) mg/dL] groups compared to the CD group [65.89 (5.02) mg/dL]. There was no significant difference in LDL-c, free fatty acids, and antioxidant capacity among the groups. It is concluded that the classic ketogenic diet presented a worse body composition and triglyceride profile compared to the control diet and that both DCC and DCM decreased total cholesterol, but also HDL-c.

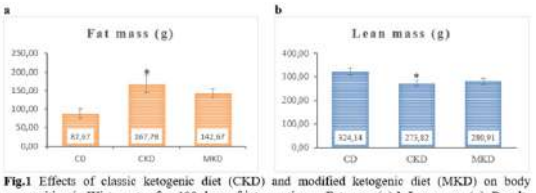


Fig.1 Effects of classic ketogenic diet (CKD) and modified ketogenic diet (MKD) on body composition in Wistar rats after 100 days of intervention. **a** Fat mass (g) **b** Lean mass (g). Results presented as mean (SEM). N = 8/group. *Difference from CD; $p<0.05$.

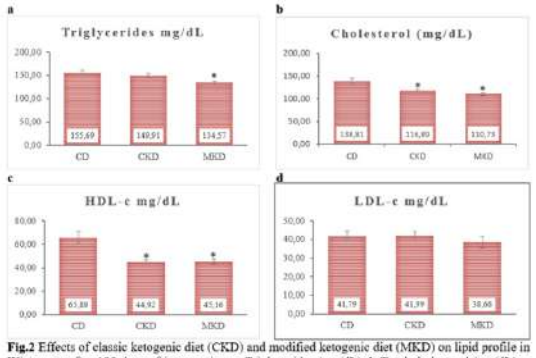


Fig.2 Effects of classic ketogenic diet (CKD) and modified ketogenic diet (MKD) on lipid profile in Wistar rats after 100 days of intervention. **a** Triglycerides (mg/dL). **b** Total cholesterol (mg/dL). **c** High density lipoprotein cholesterol (mg/dL). **d** Low density lipoprotein cholesterol (mg/dL). Results presented as mean (SEM). N = 8/group. *Difference from CD; $p<0.05$.

16123

REMNANT CHOLESTEROL IS ASSOCIATED WITH ATHEROSCLEROTIC RISK, BUT NOT HEART FAILURE RISK, EVEN AT NORMAL TRIGLYCERIDE CONCENTRATIONS

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Introdução/Fundamentos: Remnant cholesterol has emerged as a marker of residual cardiovascular risk. However, whether it identifies risk in individuals with normal plasma triglyceride concentrations and across different cardiovascular outcomes remains unclear. Objetivos: To evaluate the association between remnant cholesterol and predicted cardiovascular risk using PREVENT risk equations, and to investigate whether this association differs according to plasma triglyceride concentrations. Métodos: This cross-sectional study used baseline data (2014–2018) from 500 adults aged 20–79 years in the SHIP-Brazil cohort. Sociodemographic and lifestyle data were obtained through structured questionnaires, including smoking, alcohol consumption, physical activity, and dietary intake. The lipid profile included analyses of total cholesterol, LDL-C, HDL-C, and triglycerides. Remnant cholesterol was calculated as total cholesterol – LDL-C – HDL-C. Predicted 10-year risks for total cardiovascular disease, atherosclerotic cardiovascular disease (ASCVD), and heart failure were estimated using PREVENT equations. Multivariable linear regression models were adjusted for age, sex, LDL-C, smoking, alcohol consumption, and caloric intake. Collinearity diagnostics showed low variance inflation factors (VIF<1.14). Resultados e Conclusões: The sample comprised predominantly women (56.6%), with a mean age of 51 years (SD 14.5); 19.6% were former smokers and 9.6% were current smokers. Most participants reported low-risk alcohol consumption (75.4%). Mean LDL-C concentration was 118.1 mg/dL (36.3), HDL-C 42.6 mg/dL (10.8), triglycerides 124.7 mg/dL (69.6), and remnant cholesterol 27.6 mg/dL (8.6). Mean predicted risks were 7.72% (8.7) for total cardiovascular disease, 4.56% (5.1) for ASCVD, and 4.04% (5.7) for heart failure. In stratified analyses, remnant cholesterol was positively associated with predicted total cardiovascular risk among individuals with normal plasma triglyceride concentrations (β=0.146; 95%CI: 0.038–0.254; p=0.008), but not among those with elevated triglyceride concentrations (p=0.417). Similar findings were observed for ASCVD risk (β=0.092; 95%CI: 0.029–0.155; p=0.004 vs p=0.142, respectively). No significant association was observed for predicted heart failure risk. Remnant cholesterol was associated with atherosclerotic cardiovascular risk, particularly among individuals with normal triglyceride concentrations, indicating residual risk. These findings support its clinical utility for improving cardiovascular risk stratification.

16182

THE ASSOCIATION BETWEEN DIETARY QUALITY AND ATHEROSCLEROTIC CARDIOVASCULAR DISEASE RISK IN A POPULATION-BASED COHORT

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Introdução/Fundamentos: Dietary patterns are among the top modifiable risk factors driving the global burden of cardiovascular diseases (CVD), with atherosclerosis being the primary underlying cause of these conditions. Objetivos: We aimed to investigate the association between diet and atherosclerotic cardiovascular disease risk (ASCVDR) using the validated Brazilian Healthy Eating Index-Revised (BHEI-R). Métodos: This is a cross-sectional study in which sociodemographic data were collected using a structured questionnaire, and trained personnel measured weight and height to assess Body Mass Index (BMI) and waist circumference (WC). Total cholesterol, triglycerides (TG) and cholesterol in high-density lipoprotein (HDL-c) and low-density lipoprotein (LDL-c) were measured using an automatic analyzer. Overall diet quality was assessed using the Revised Brazilian Healthy Eating Index (BHEI-R), which ranges from 0 to 100, with higher scores indicating better diet. Ultrasound was used to assess the presence of atherosclerotic plaques and stenosis in the arteries. ASCVDR was assessed by the PREVENT calculator, and its association with diet quality was analyzed using logistic regression models. Resultados e Conclusões: Three hundred and eighty-five individuals, in which 55.9% were females, with a mean age of 51.2 ± 14.7 years, a mean BMI of 29.4 ± 5.5 kg/m², and a mean BHEI-R score of 66.2 ± 8.2 points. The prevalence of increased ASCVDR was 32.7%. Individuals with high ASCVDR were men (54.8% vs. 45.2%; p=0.038), older (66.7 ± 7.8 vs. 44.0 ± 10.8 years; p<0.001), presented high WC (99 ± 13 vs. 90 ± 13 cm; p<0.001), and TG (145 ± 91 vs. 115 ± 58 mg/dL; p=0.001), and low BHEI-R (65 ± 9 vs. 69 ± 6 points; p<0.001). There were no significant statistical differences for BMI, total cholesterol, LDL-c, or HDL-c (p>0.05). Additionally, high prevalence of ASCVDR was seen among individuals with arterial stenosis (80.0% vs. 31.1%; p<0.0001) and atherosclerotic plaque (82.8% vs. 28.8%; p<0.001). In logistic regression analyses, high BHEI-R points were associated with low chances of high ASCVDR (OR = 0.93; 95% CI:0.90–0.96; p<0.001). Similar profile was observed for arterial stenosis (OR=0.93; 95% CI:0.89–0.98; p=0.006), however no significant association was found between BHEI-R score and atherosclerotic plaque (OR=0.96; 95% CI:0.91–1.02; p=0.239). In conclusion, high diet quality was associated with lower chances of increased ASCVDR and arterial stenosis, reinforcing the relevance of diet in the global management of CVD risk factors.

Pericárdio / Endocárdio / Valvopatias / Doenças da Aorta



81º CONGRESSO BRASILEIRO DE CARDIOLOGIA together with WORLD CONGRESS OF CARDIOLOGY





18903

ANTICOAGULATION CONTROL IN PATIENTS WITH MECHANICAL HEART VALVES IN THE BRAZILIAN PUBLIC HEALTH SYSTEM

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Introdução/Fundamentos: Mechanical heart valves require lifelong warfarin therapy and regular International Normalized Ratio (INR) monitoring. Maintaining anticoagulation within the therapeutic range is critical to reduce thromboembolic and bleeding complications. However, the multiple factors influencing warfarin response make anticoagulation control particularly challenging, especially in public healthcare settings. Objetivos: To assess the quality of warfarin anticoagulation control in patients with mechanical aortic and/or mitral valves treated in the Brazilian public health system, and to identify clinical and demographic factors associated with poor therapeutic control and adverse events. Métodos: This retrospective longitudinal study included patients aged 18 years or older with mechanical aortic and/or mitral valves receiving warfarin and followed at a tertiary hospital in Paraná, Brazil, between 2023 and 2025. Patients with fewer than five INR measurements were excluded. Demographic and clinical data, adverse events (thrombotic and bleeding), and INR values were collected. Time in therapeutic range (TTR) was calculated using the Rosendaal method. ROC curves were used to determine TTR and INR coefficient of variation (CV) cutoffs associated with adverse events. Logistic regression models were also performed. Resultados e Conclusões: A total of 133 patients were analyzed; 66.9% were women, mean age was 59.3 ± 10.8 years, and valve position was mitral in 45.1%, aortic in 38.8%, and mitro-aortic in 21.1%. Rheumatic heart disease was the leading etiology (54.1%), and 49.6% of patients had atrial fibrillation. Mean TTR was 53.4% ± 23.0%; 58.6% of patients had TTR <60%, and 27.8% had INR CV ≥37%. Adverse events occurred in 17.3% of patients during a median follow-up of 975 days (111-1065). TTR <44% was associated with higher odds of adverse events (OR 3.27, 95% CI 1.26-8.48; p=0.015), as was INR CV ≥37% (OR 4.13, 95% CI 1.58-10.7; p=0.004), independently of age and sex. In this cohort, adequate anticoagulation control was difficult to achieve, with a predominance of TTR <60% and marked INR variability. TTR <44% and INR CV ≥37% were independently associated with adverse events. These findings highlight the need for more effective anticoagulation monitoring strategies for patients with mechanical heart valves in the Brazilian public health system.

14535

BEDSIDE SCREENING FOR ABDOMINAL AORTIC DILATIONS IN HEMODIALYSIS PATIENTS: A POCUS-BASED STUDY

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Introdução/Fundamentos: Abdominal aortic aneurysm (AAA) rupture carries high mortality. While arterial dilation frequently affects patients with chronic kidney disease (CKD) on dialysis, a cohort plagued by accelerated vascular aging, detecting these anomalies before a crisis strikes remains a clinical challenge. Point-of-care ultrasound (POCUS) offers an accessible alternative. It bypasses the need for specialized imaging technicians, allowing frontline physicians to efficiently evaluate cardiovascular structures directly at the dialysis chair. Objetivos: To assess the prevalence of abdominal arterial dilations using POCUS in hemodialysis patients. Métodos: In this cross-sectional study of 154 stage 5 CKD patients, intra-dialytic POCUS measurements of the abdominal aorta were systematically paired with clinical data gathered from semi-structured interviews and routine medical records. To preserve blinding protocols, the specific dialysis center remains undisclosed. Investigators measured the transverse diameter of the abdominal aorta (proximal, middle, and distal) using POCUS while subjects rested semi-supine during their treatment sessions. A semi-structured interview questionnaire was used to collect clinical and epidemiological data, and laboratory results, including calcium, phosphorus, and parathyroid hormone levels, were obtained from medical records. Clinical and sociodemographic variables were analyzed using the Chi-square test. Resultados e Conclusões: Investigators identified 31 cases of aortic dilation (20.1% prevalence). Ectasias accounted for this number (18.8%), whereas true AAA were present in a minority of the cohort (1.3%). Classic lifestyle and demographic risk factors proved highly predictive: male gender and black ethnicity strongly correlated with dilation (both p=0.001; Table 1), closely followed by smoking (p=0.03) and alcohol use (p=0.004; Table 2). Surprisingly, neither advancing age nor deranged bone mineral profiles showed any significant statistical link. This unexpected disconnect illustrates the multifactorial nature of vascular aging in nephrology. Ultimately, waiting for symptoms is a dangerous strategy. These findings suggest that POCUS could serve as a valuable adjunct in cardiovascular risk stratification for hemodialysis patients, potentially identifying structural decay before symptomatic progression.

Table 1. Clinical and sociodemographic profile of the interviewed CKD patients

Variables	Frequency	Aorta diameter		p value
	n (%)	Normal	Ectasia/Aneurysm	
Sex				
Female	65 (42.2%)	60 (39.0%)	5 (3.2%)	0.001
Male	89 (57.8%)	63 (40.9%)	26 (16.9%)	
Age (years)				
< 40	28 (18.2%)	24 (15.6%)	4 (2.6%)	0.41
40-60	66 (42.9%)	53 (34.4%)	13 (8.4%)	
> 60	60 (39.0%)	46 (29.9%)	14 (9.1%)	
Body mass index				
< 18.5 kg/m²	13 (8.4%)	9 (5.8%)	4 (2.6%)	0.72
> 18.5–24.9 kg/m²	92 (59.7%)	75 (48.7%)	17 (11.0%)	
> 25.0–29.9 kg/m²	31 (20.1%)	24 (15.6%)	7 (4.5%)	
> 30.0 kg/m²	18 (11.7%)	15 (9.7%)	3 (1.9%)	
Race				
White	37 (24.0%)	32 (20.8%)	5 (3.2%)	0.001
Black	61 (39.6%)	40 (26.0%)	21 (13.6%)	
Mixed race	56 (36.4%)	51 (33.1%)	5 (3.3%)	
Dialysis time				
< 12 months	57 (37.0%)	46 (29.9%)	11 (7.1%)	0.83
12–36 months	43 (27.9%)	33 (21.4%)	10 (6.5%)	
> 36 months	54 (35.1%)	44 (28.6%)	10 (6.5%)	
Total	154 (100.0%)	123 (79.9%)	31 (20.1%)	

Source: Own authorship.

Table 2. Main comorbidities and associated risk factors.

Variables	Frequency	Aorta diameter		p value
	n (%)	Normal	Ectasia/Aneurysm	
Sedentary lifestyle				
Yes	115 (74.7%)	92 (59.7%)	23 (14.9%)	0.54
No	39 (25.3%)	31 (20.1%)	8 (5.2%)	
Alcohol use				
Yes	84 (54.6%)	60 (39.0%)	24 (15.6%)	0.004
No	70 (45.4%)	63 (40.9%)	7 (4.5%)	
Smoking				
Yes	58 (37.7%)	41 (26.6%)	17 (11.0%)	0.03
No	96 (62.3%)	82 (53.2%)	14 (9.1%)	
SAH				
Yes	125 (81.2%)	100 (64.9%)	25 (16.2%)	0.83
No	29 (18.8%)	23 (14.9%)	6 (3.9%)	
Diabetes mellitus				
Yes	58 (36.4%)	44 (28.6%)	12 (7.8%)	0.70
No	98 (63.6%)	79 (51.3%)	19 (12.3%)	
Dyslipidemia				
Yes	42 (27.3%)	34 (22.1%)	8 (5.2%)	0.84
No	112 (72.7%)	89 (57.8%)	23 (14.9%)	
Cardiovascular disease				
Yes	55 (35.7%)	41 (26.6%)	14 (9.1%)	0.22
No	99 (64.3%)	82 (53.2%)	17 (11.0%)	
Family history of CVD				
Yes	62 (40.3%)	45 (22.2%)	17 (11.0%)	0.09
No	92 (59.7%)	78 (50.6%)	14 (9.1%)	
Cerebrovascular disease				
Yes	19 (12.3%)	15 (9.7%)	4 (2.6%)	0.81
No	135 (87.7%)	108 (70.1%)	27 (17.5%)	
Total	154 (100.0%)	123 (79.9%)	31 (20.1%)	

SAH: Systemic arterial hypertension; CVD: Cardiovascular disease.
Source: Own authorship.

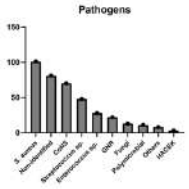
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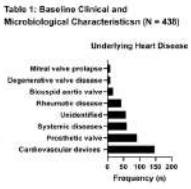
CLINICAL AND MICROBIOLOGICAL PREDICTORS OF IN-HOSPITAL MORTALITY IN INFECTIVE ENDOCARDITIS: A 25-YEAR COHORT STUDY

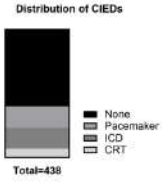
BEATRIZ VELOSO DE ALMEIDA VENUTO1; ANTÔNIO MARCONDES MUTARELLI1; EDUARDO ENRIQUE CARVALHO GRADE VALLEJO1; JOÃO GABRIEL FRANCISCO RODA1; LAURA DELPHINI CORRÊA PEREIRA1; SARA REGINA SILVA CUPERTINO1; WILLIAM SILVA BARBOSA1; WILLIAM ANTÔNIO DE MAGALHÃES ESTEVES1; MARILDES LUIZA DE CASTRO1; PEDRO VIANA DINIZ1; TERESA CRISTINA ABREU FERRARI1; MARIA DO CARMO PEREIRA NUNES1;

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Introdução/Fundamentos: Infective endocarditis (IE) remains a major global health burden accounting for over 1.09 million cases and 66,000 deaths annually. Current literature suggests that its epidemiological profile has evolved alongside an aging population, healthcare-related factors and growing use of cardiovascular implantable eletronic devices (CIEDs). In this scenario, Staphylococcus aureus remains the most common agent, responsible for 29% of cases, alongside other pathogens. Therefore, evaluating the prognostic impact of microbiological etiology and baseline host characteristics on in-hospital mortality is crucial to refine risk stratification and improve clinical care. Objetivos: To identify independent predictors of in-hospital mortality by analyzing the clinical and microbiological characteristics of inpatients in a Brazilian quaternary care teaching hospital. Métodos: This cohort study included 450 patients with IE according to the modified Duke criteria, who were admitted to a teaching hospital in Belo Horizonte, Brazil, between 2001 and 2026. To identify independent predictors of in-hospital mortality, a multivariable logistic regression analysis was performed using a generalized linear model with a binomial distribution and logit link. Odds ratios (ORs) and 95% confidence intervals (CIs) were estimated. Statistical significance was assessed using Wald tests. Resultados e Conclusões: Among the 450 pacients, the median age was 57 years (IQR 42–66). Predisposing conditions were common, particularly prior CIEDs (n=147; 33.6%) and prosthetic valves (n=92;21.0%). Multivariable analysis identified advanced age (OR 1.02(1.00–1.04); p=0.019) and heart failure (OR 1.72(1.03–2.92);p=0.042) as the two primary independent clinical predictors of in-hospital death. Regarding microbiological etiology, Staphylococcus aureus (n =101;29%) and coagulase-negative staphylococci (n=70;20%) were the most prevalent pathogens and both were independent predictors of mortality (OR 4.62(1.69–15.02); p=0.005 and OR 4.31(1.45–14.87);p=0.012). Additionally, Gram-negative bacilli (OR 7.51(1.96–31.72);p=0.004) as well as fungi (OR 5.17(1.06–26.61);p=0.043) and unidentified pathogens (OR 4.12 (1.45–13.73); p=0.012) were also associated with increased risk of death. In summary, although Staphylococcus spp. remain the predominant etiology, atypical and unidentified pathogens are also associated with a substantially higher risk of in-hospital mortality underscoring the need for further studies to address the profile of these unidentified cases







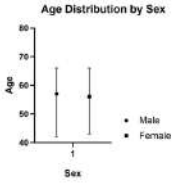


Table 2. Predictors of In-Hospital Mortality in Patients with IE.

Variable	OR (IC95%)	p-value
Age	1.02 (1.00–1.04)	0.019
Heart Failure	1.72 (1.03–2.92)	0.042
Embolic events	1.81 (0.96–3.44)	0.067
Chronic Kidney Disease	1.84 (0.97–3.52)	0.062
Previous Endocarditis	0.82 (0.34–1.90)	0.657
Previous Condition – Prosthetic valve	0.41 (0.16–1.03)	0.057
Previous Condition – Devices	0.29 (0.11–0.73)	0.008
Previous Condition – Systemic diseases	0.47 (0.17–1.29)	0.145
Previous Condition – Non-identified	0.58 (0.21–1.62)	0.300
Previous Condition – Prolapse	0.19 (0.01–1.57)	0.176
Previous Condition – Bicuspid Aortic Valve	0.91 (0.24–3.39)	0.892
Previous Condition – Degenerative	0.24 (0.03–1.47)	0.138
Staphylococcus aureus	4.62 (1.69–15.02)	0.005
Staphylococcus coagulase negativo	4.31 (1.45–14.87)	0.012
Enterococcus	3.26 (0.92–12.71)	0.074
GNB	7.51 (1.96–31.72)	0.004
Fungi	5.17 (1.06–26.61)	0.043
HACEK	2.97 (0.12–40.03)	0.421
Polymicrobial	4.45 (0.85–23.07)	0.071
Unidentified pathogens	4.12 (1.45–13.73)	0.012
Other pathogens	0.99 (0.04–8.70)	0.992

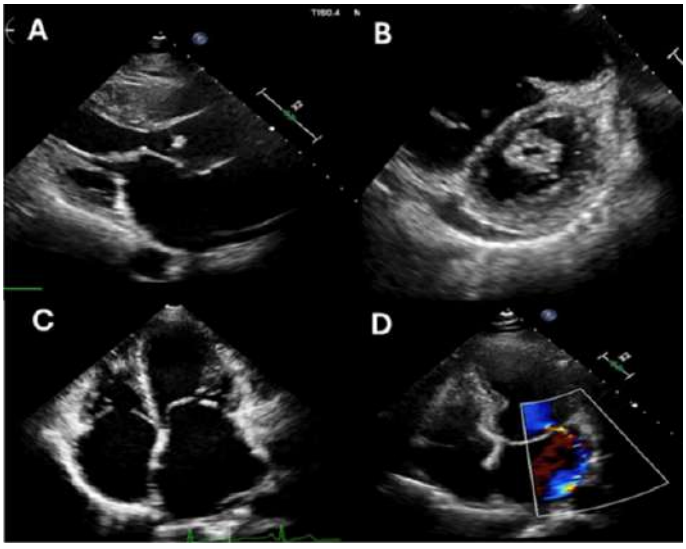
18539

IMPACT OF PRIOR ACUTE RHEUMATIC FEVER ON OUTCOMES IN CHRONIC RHEUMATIC HEART DISEASE

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Introdução/Fundamentos: Acute rheumatic fever (ARF) and rheumatic heart disease (RHD) are post-infectious autoimmune sequelae of group A streptococcal infection. Secondary antibiotic prophylaxis reduces disease progression. However, most patients with established RHD lack a documented history of ARF, missing a critical window for intervention. Objetivos: To assess the association between prior ARF diagnosis and disease progression in adults with RHD. Métodos: We retrospectively analysed 425 adults with echocardiographically confirmed RHD (mean age 48 ± 12 years; 83% women). Prior ARF was defined by documented Jones criteria requiring hospitalization. Patients without prior ARF were diagnosed based on established echocardiographic features of RHD (Figure 1). The primary outcome was progression to severe mitral valve disease requiring intervention (percutaneous mitral valvuloplasty or valve replacement). Resultados e Conclusões: Results: Isolated mitral valve involvement was present in 228 patients, predominantly mitral stenosis (valve area 1.27 ± 0.5 cm²), while 165 had combined mitral and aortic disease. Over a median follow-up of 6.4 years (IQR 2.1–10.7), 164 patients required intervention (105 percutaneous valvuloplasty; 59 valve replacement). In multivariable analysis adjusted for age and sex, prior ARF diagnosis was associated with a lower risk of intervention (HR: 0.32; 95% CI: 0.11–0.93; p=0.036). Longer duration of secondary prophylaxis was independently protective (HR: 0.94 per year; 95% CI: 0.91–0.98; p=0.006). Conversely, carditis at ARF presentation predicted adverse outcomes (HR: 2.75; 95% CI: 1.14–6.62; p=0.024). Conclusions: Prior diagnosis of ARF and implementation of secondary prophylaxis are associated with reduced progression to severe valvular disease requiring intervention. These findings highlight the critical importance of early detection of ARF to prevent long-term RHD complications.



19866

INCIDENCE AND THERAPEUTIC MANAGEMENT OF BIOPROSTHETIC VALVE THROMBOSIS AFTER MITRAL VALVE-IN-VALVE PROCEDURES: A SINGLE-CENTER REGISTRY

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Introdução/Fundamentos: Mitral Valve-in-Valve (MViV) is an established therapeutic option for bioprosthetic dysfunction in high-risk patients. However, bioprosthetic valve thrombosis (BVT) remains a challenging complication with uncertain incidence and management. Objetivos: To evaluate the incidence, clinical profile, and response to intensified anticoagulation in patients with BVT following MViV. Métodos: A prospective registry included 102 patients (mean age 61.8 years; 68.6% female) who underwent MViV between 2023 and 2025. High surgical risk was confirmed by mean EuroSCORE II (7.95) and STS Score (8.09). Clinical and echocardiographic follow-up was performed at baseline, 30 days, and 1 year. BVT was diagnosed based on clinical worsening and echocardiographic criteria. Resultados e Conclusões: BVT occurred in 3 patients (2.9%), all female, at a mean of 40 days post-procedure. The BVT subgroup showed a high prevalence of atrial fibrillation (66.6%) and renal dysfunction (66.6%). At diagnosis, mean transmitral diastolic gradients (MG) were significantly elevated (14 to 22 mmHg). All three patients were treated with intensified vitamin K antagonist therapy (target INR 2.5–3.5). After approximately 30 days, all cases showed clinical improvement to NYHA class II and a significant reduction in MG (to 6–9 mmHg), confirming thrombus resolution. The mechanism of BVT appears multifactorial, involving patient-related factors (e.g., chronic AF, low flow states) and prosthesis-related factors (e.g., incomplete endothelialization, local flow disturbances). Despite the high prevalence of AF and baseline anticoagulation in this cohort (83.3%), BVT still occurred early, highlighting the pro-thrombotic environment of the mitral position. This study suggests that BVT should be strongly suspected in patients with clinical deterioration and a >50% increase in echocardiographic gradients. While surgery or thrombolysis are options, intensified anticoagulation proved to be a safe and effective first-line therapy in this frail population. Bioprosthetic valve thrombosis after MViV is uncommon but impactful. Early detection through serial imaging and an intensified anticoagulation strategy (INR 2.5–3.5) are effective and safe, leading to complete clinical and hemodynamic resolution.

Tabela 1- Características clínicas e ecocardiográficas da população do estudo.

Características Clínicas	Valve-in- valve mitral (n= 102)
Idade	61,82
Sexo Feminino	70
FA crônica/ paroxística	85
Diabetes mellitus	18
Hipertensão	51
Tabagismo	21
DPOC	9
AVC1	22
DAOP	2
eGFR < 60 mL/ min	38
EuroSCORE II	7,95
STS Score	8,09

Tabela 2- Características dos pacientes acometidos por trombose de prótese após valve-in-valve mitral.

	Paciente 1	Paciente 2	Paciente 3
Idade	68	73	68
Sexo Feminino	X	X	X
FA crônica/ paroxística	-	X	X
Diabetes mellitus	-	-	-
HAS	X	X	-
Tabagismo	X	-	-
DPOC	X	-	-
AVC1	-	-	X
DAOP	-	-	-
eGFR < 60 mL/ min	X	X	-
EuroSCORE II	6,68	7,84	5,03
STS Score	10,6	5,38	4,56

13871

LONGITUDINAL VARIATION IN END-SYSTOLIC VOLUME AS AN INFLECTION POINT FOR EARLY LEFT VENTRICULAR MALADAPTATION IN PRIMARY MITRAL REGURGITATION

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Introdução/Fundamentos: Primary mitral regurgitation (PMR) increases volumetric overload, promoting adaptive changes of the left ventricle (LV) in response to the ejection load. Two-dimensional echocardiography (2D echocardiography) is the principal clinical tool for assessing ventricular remodelling, with left ventricular dimensions (LVD), left ventricular ejection fraction (LVEF), global longitudinal strain (GLS), and left atrial (LA) volume being the variables most commonly monitored. However, these parameters reflect later stages in the natural history of the disease and lack clearly defined prognostic predictors to better anticipate the transition to maladaptation. Objetivos: To evaluate structural and functional parameters in order to identify early diagnosis of the LV maladaptive phase in patients with PMR and to better determine optimal surgical timing. Métodos: This was a retrospective, observational, longitudinal cohort study including patients with primary PMR (n = 224), in New York Heart Association (NYHA) functional class I and II, with a mean follow-up of 21.07 ± 10.92 months and uncertain surgical indication. Serial 2D echocardiographic assessments were performed, and the following parameters were analysed: left ventricular end-diastolic diameter (LVEDD), left atrial volume (LA), LVEF, fractional shortening (Δ%), and end-systolic volume (ESV). Appropriate statistical analyses were applied, adopting $p < 0.05$ as statistically significant. Resultados e Conclusões: Results: A total of 64,000 medical records of mitral regurgitation were screened, and 224 patients with primary PMR were included. The mean age was 63.2 ± 16 years, and 109 were male. Absolute ESV (cut-off 51 mL) showed moderate discrimination for predicting reductions in LVEF and Δ% (AUC ≈ 0.77 and 0.60, respectively). Longitudinal variation in ESV proved to be a superior predictor, with improved discriminatory performance (AUC = 0.73 and 0.75). For every 2 mL increase in ESV over time, a corresponding 1% reduction in LVEF and Δ% was observed. Pearson's correlation showed strong negative associations between ΔLVEF and ΔESV ($r = -0.636$; $p = 1.92e{-}27$) and between Δ% and ΔESV ($r = -0.634$; $p = 3.14e{-}27$). The remaining parameters showed no significant correlation. C: Longitudinal anatomo-functional changes in ESV, LVEF, and Δ% more sensitively detected early left ventricular maladaptation in primary PMR (NYHA I–II). These 2D echocardiographic markers may help identify the inflection point of reverse remodeling exhaustion and guide surgical decision-making.

20261

PERIVALVULAR ABSCESS: A DEADLY THREAT IN INFECTIVE ENDOCARDITIS

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Introdução/Fundamentos: Perivalvular abscess (PA) is a feared complication of endocarditis and is a class IB indication for valve replacement surgery. Most studies report it involves left side prosthetic valves more often and is associated with S. aureus etiology. Objetivos: We aimed to describe features of PA and assess risk factors associated with in- hospital mortality. Métodos: The study is a post hoc analysis of PA episodes in a prospective cohort of adult patients with definite IE, according to the modified Duke criteria, in the years 2010 to 2025. PA was identified echocardiographically. Patients with PA were compared to those without (group 1, G1, and Group 2, G2). Statistical analyses were performed using JAMOVI software. Factors associated with in-hospital death were assessed using stepwise multivariable logistic regression. The significance level was set at 5%. Resultados e Conclusões: There were 110 PA in 517(21.3%) episodes of IE in the study period. Median age was 50 years in G1, and 52 in G2. PA was not associated with any comorbidities. Males predominated in G1 (75.5% vs 62.9%, p=0.014), and in patients with late PVE (30.9% vs 19.7%; p=0.012). There was no difference in the frequency of community or healthcare associated IE. The aortic valve (AV) was more often affected in G1 (68.2% vs 33.6%, p<0.001). Valve leaflet perforation was seen in 25.5% vs 11.4% (p<0.001), paravalvular leak in 27.5% vs 15.3% (p=0.003) and new severe regurgitation in 59.6% vs 43.7%(p=0.003). High degree atrioventricular (AV) block was seen in 24.5% vs 7.6% of G2(p<0.0001). Splenic emboli (44% vs 29.4%, p=0004), acute kidney injury (42.7% vs 31%, p=0.020) and the need for inotropes (38.2% vs 23.8%, p=0.003) were more frequent in G1. In G1, coagulase-negative staphylococci (CNS) were more frequent (21.5% vs 8.6%, p<0.0001). Surgery was indicated for 97.3% of patients in G1 and 78.4% of G2 (p<0.0001). In- hospital surgical mortality was 31.6% in G1 vs 19.9% of G2(p=0.013). In-hospital mortality associated risk factors on multivariable analysis were age, the presence of pacemakers, CNS and fungal etiology, previous IE, need for inotropes, having surgical indication and not being operated. PA more often affected AV, patients with late PVE, and males. CNS were the main pathogens and were related to death. PA resulted in higher frequency of local destructive and systemic complications. Mortality was higher, even in those who were operated on. PA needs to be diagnosed early and acted upon swiftly.

18738

PREDICTORS OF EARLY POSTOPERATIVE ATRIAL FIBRILLATION AFTER MITRAL VALVE SURGERY

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Introdução/Fundamentos: Background: Postoperative atrial fibrillation (POAF) following mitral valve surgery is common and associated with increased mortality and stroke. Although previous studies have identified electrocardiographic and echocardiographic predictors of POAF, findings remain heterogeneous. Objetivos: Purpose: To identify clinical and echocardiographic predictors of POAF in patients undergoing native mitral valve surgery. Métodos: Methods: This was a single-centre retrospective registry including patients undergoing native mitral valve surgery. Postoperative events were assessed up to 30 days after the procedure. Resultados e Conclusões: Results: A total of 205 patients were included, with a median age of 54 (44–63) years, and 67% were female. Diabetes mellitus and coronary artery disease were present in 18% and 11%, respectively. Median left atrial volume was 78 (55–103) mL/m², left ventricular ejection fraction was 61 (55–66) %, and left ventricular mass index (LVMI) was 100 (81–126) g/m². Median creatinine clearance was 67 (51–88) mL/min. Median cardiopulmonary bypass time was 93 (72–115) minutes, and aortic cross-clamp time was 74 (54–93) minutes. Regarding mitral valve disease, 27% had stenosis, 36% regurgitation, and the remainder had mixed lesions. POAF occurred in 25% of patients, with 71% of cases observed in those undergoing mitral valve replacement (p=0.006). These patients had higher LVMI and a higher prevalence of diabetes mellitus. Coronary artery disease was less frequent among patients who developed POAF. In multivariable analysis adjusted for cardiopulmonary bypass time, cross-clamp time, diabetes mellitus, and left atrial volume, LVMI emerged as an independent predictor of POAF (OR 1.019; 95% CI 1.002–1.036; p=0.028). An LVMI threshold >84.4 g/m² yielded 83% sensitivity and 39% specificity for POAF prediction, with an area under the ROC curve of 0.63 (95% CI 0.54–0.72; p=0.004). Conclusions: LVMI was independently associated with the occurrence of POAF after mitral valve surgery. However, its moderate discriminatory performance suggests that LVMI may reflect underlying ventricular remodeling related to structural comorbidities rather than serving as a strong stand alone predictor.

15989

PROGNOSTIC VALUE OF BNP FOR POSTOPERATIVE MORTALITY IN PATIENTS WITH VALVULAR HEART DISEASE

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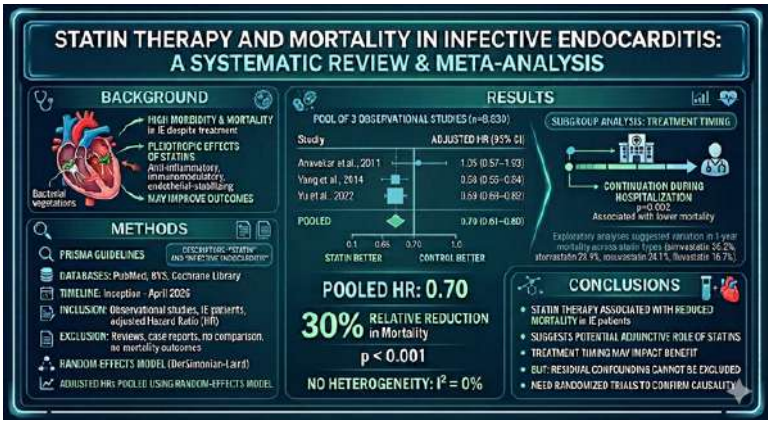
Introdução/Fundamentos: Background: B-type natriuretic peptide (BNP) is a widely used biomarker for the assessment of hemodynamic overload and cardiac dysfunction and may provide relevant prognostic information in patients with valvular heart disease undergoing cardiac surgery. Objetivos: Purpose: To evaluate the prognostic accuracy of BNP for predicting postoperative mortality in patients with valvular heart disease. Métodos: Methods: This was a single-centre, retrospective registry of patients undergoing valve surgery. BNP values collected up to 12 months before surgery were included. The primary endpoint was 30-day all-cause mortality. Resultados e Conclusões: Results: A total of 437 patients were included, with a median age of 57 (46–68) years, and 52% were female. A history of atrial fibrillation was present in 43%, and previous valve surgery in 32%. Dyspnea was reported in 96% of patients, predominantly NYHA functional class II–III (82%). The most frequent valvular lesions were severe mitral regurgitation (35%), severe mitral stenosis (29%), severe tricuspid regurgitation (18%), and severe aortic stenosis (15%). Median BNP was 245 (124–698) pg/mL, corresponding to a BNP ratio of 2.45 (1.24–6.98). Median EuroSCORE II was 2.80 (1.31–6.20)%, and median STS score was 2.07 (1.12–3.80)%. Overall, 30-day mortality was 10%, and postoperative stroke occurred in 2.3%. The BNP ratio was an independent predictor of 30-day mortality (OR 1.04; 95% CI 1.01–1.06; p<0.01), demonstrating incremental risk increase with rising values. A cut-off >2.9 yielded 74% sensitivity and 58% specificity, with an area under the ROC curve of 0.70 (95% CI 0.63–0.76; p<0.01). The inclusion of absolute BNP levels in the model containing BNP ratio did not provide incremental prognostic value, suggesting superior predictive performance of BNP ratio compared with absolute BNP alone. Conclusions: BNP ratio demonstrated superior prognostic performance compared with absolute BNP in predicting postoperative mortality in patients with valvular heart disease. It remained independently associated with adverse outcomes and showed moderate discriminatory ability. These findings suggest that BNP ratio may enhance perioperative risk stratification and support more accurate clinical decision-making.

17526

STATIN THERAPY AND MORTALITY IN INFECTIVE ENDOCARDITIS: A SYSTEMATIC REVIEW AND META-ANALYSIS WITH INSIGHTS INTO TREATMENT TIMING

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Introdução/Fundamentos: Infective endocarditis (IE) remains associated with high morbidity and mortality despite advances in antimicrobial and surgical treatment. Statins exert pleiotropic anti-inflammatory, immunomodulatory, and endothelial-stabilizing effects that may improve clinical outcomes in this population, particularly in the context of systemic inflammation and endothelial dysfunction. Objetivos: To evaluate the association between statin therapy and all-cause mortality in patients with infective endocarditis and to explore the potential impact of treatment timing. Métodos: This systematic review and meta-analysis was conducted in accordance with PRISMA guidelines. A comprehensive search was performed in PubMed, WOS, Google Scholar, Embase and Cochrane Library databases from inception through April 2026. The following descriptors were used: “Statin” AND “Infective Endocarditis”. Observational studies evaluating statin therapy and all-cause mortality in adult patients with IE were included. Only studies reporting adjusted hazard ratios (HR) with 95% confidence intervals were considered. Reviews, meta-analyses, case reports, studies without a comparison group, and those not reporting mortality outcomes were excluded. Heterogeneity was assessed using the I² statistic. Resultados e Conclusões: Three observational studies (n = 8,830) were included. Statin therapy was associated with reduced mortality (pooled HR 0.70; 95% CI 0.61–0.80; p < 0.001), corresponding to a 30% relative reduction, with no heterogeneity (I² = 0%) and consistent direction of effect across studies. In a subgroup analysis from one of the included cohorts, continuation of statins during hospitalization was associated with a greater reduction in mortality (HR 0.52; 95% CI 0.34–0.78; p = 0.002), suggesting a potential effect of treatment timing, with exploratory differences in mortality across statin types. The inclusion of a smaller cohort with neutral findings did not materially change the overall estimate, supporting the robustness of the observed association. These findings suggest a potential adjunctive role of statins in IE; however, residual confounding cannot be excluded, and randomized trials are needed to confirm causality and define optimal therapeutic strategies.

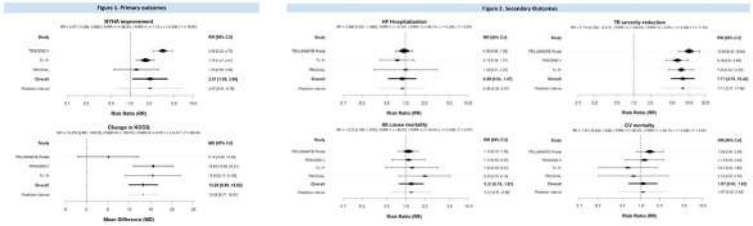
17874

TRANSCATHETER TRICUSPID VALVE INTERVENTION VERSUS MEDICAL THERAPY IN SEVERE TRICUSPID REGURGITATION: A SYSTEMATIC REVIEW AND BAYESIAN META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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Introdução/Fundamentos: Severe tricuspid regurgitation causes disabling symptoms and predicts adverse outcomes independently of left-sided disease. Transcatheter tricuspid interventions have emerged as minimally invasive therapeutic options; however, their benefit compared with optimized medical therapy remains uncertain. Conventional meta-analyses provide dichotomous statistical conclusions, which may limit clinical interpretability. Objetivos: To perform a Bayesian meta-analysis of randomized trials comparing transcatheter tricuspid interventions versus optimized medical therapy to quantify the probability of benefit and harm and better inform clinical decision-making. Métodos: A systematic search of MEDLINE, Embase, and Cochrane databases was performed to identify studies comparing transcatheter tricuspid valve intervention (TTVI) with optimized medical therapy (OMT). Primary outcomes were improvement in NYHA functional class and Kansas City Cardiomyopathy Questionnaire (KCCQ) score. Bayesian random-effects meta-analyses were conducted in R (version 4.5.1) using the bayesmeta package. Posterior probabilities of benefit were estimated as P(RR > 1) for binary outcomes and P(MD > 0) for continuous outcomes. Resultados e Conclusões: Four randomized controlled trials including 1,292 patients (710 TTVI, 582 OMT) were analyzed, with a mean age of 78.6 years (78.6 TTVI vs 78.5 OMT). At one year, TTVI significantly improved health-related quality of life (KCCQ) compared with OMT (MD 13.28 points; 95% CrI 9.89–16.62; P(MD > 0) 100%; I²=69.4%) and increased the likelihood of NYHA functional class improvement (RR 2.07; 95% CrI 1.09–3.89; P(RR > 1): 98.9%; I²=76.6%). Although heterogeneity was high for both outcomes, prior sensitivity analyses did not demonstrate any meaningful impact on the results. TTVI also reduced tricuspid regurgitation severity (RR 7.71; 95% CrI 4.76–12.42; P(RR > 1): 100%; I²=11%). No evident differences were observed in heart failure hospitalization (RR 0.89; 95% CrI 0.53–1.47; P(RR < 1): 68.1%; I²=0%), all-cause mortality (RR 1.21; 95% CrI 0.78–1.87; P(RR < 1): 19.5%; I²=0%), or cardiovascular mortality (RR 1.07; 95% CrI 0.62–1.83; P(RR < 1): 40.1%; I²=0%). These findings demonstrate transcatheter tricuspid intervention provides clear symptomatic benefit, while survival benefit may require longer follow-up to emerge.



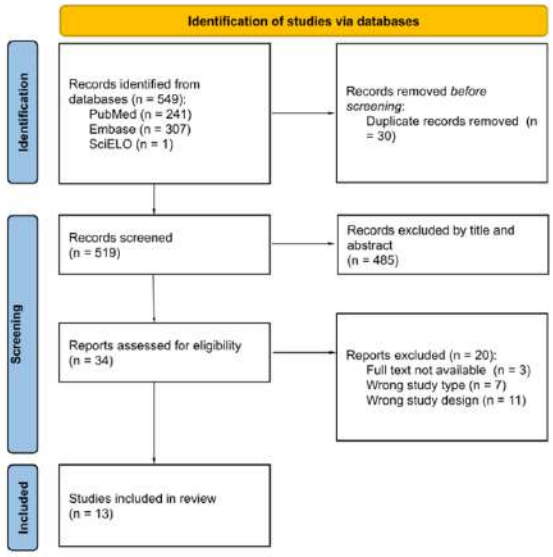
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TRANSCATHETER VERSUS SURGICAL AORTIC VALVE REPLACEMENT IN LOW-INTERMEDIATE AND HIGH-RISK PATIENTS: A SYSTEMATIC REVIEW OF LONG-TERM OUTCOMES IN AORTIC STENOSIS

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Introdução/Fundamentos: Aortic stenosis (AS) is the most common non-rheumatic valvular disease, and its treatment continues to evolve. While TAVI was initially reserved for high-risk patients, its indication expanded to lower-risk populations, but comparative data on long-term valve durability, mortality, and reintervention rates across different surgical risk strata remain limited. This systematic review aims to compare TAVI and SAVR outcomes stratified by surgical risk (low-intermediate versus high-risk) to better inform valve selection. Objetivos: Synthesize comparative durability of TAVI versus SAVR, analyzing structural valve deterioration (SVD), reintervention, and mortality in ≥5 years. Métodos: A systematic review was conducted following PRISMA 2020 guidelines, using databases PubMed, Embase, and SciELO through March 2026. Descriptors "TAVI", "SAVR", and "long-term outcomes" were combined using Boolean AND, and alternative MeSH descriptors with Boolean OR. Randomized clinical trials and observational studies comparing TAVI versus SAVR in AS patients, with follow-up ≥5 years, published in the last 10 years, were selected. Two independent researchers selected the articles, with conflicts resolved by a third researcher. A narrative synthesis was made of the findings. Resultados e Conclusões: 13 studies (9 RCTs, 4 cohorts), totalling 31,770 patients (13,953 TAVI; 17,817 SAVR) were included. Among low-intermediate-risk patients <75 years (4 studies), 3 showed comparable mortality, reintervention, or SVD; 1 with younger cohort (mean age 60) showed higher TAVI mortality. In patients ≥75 years (5 studies), mortality was similar in 3 and favored SAVR in 2 (one study showed higher frailty in TAVI); SVD favored TAVI in 2 studies, with no difference in 1; reintervention was similar in 4 studies comparing it. Among high-risk patients (3 studies), all were ≥80 years; 2 showed comparable mortality and SVD but higher TAVI reintervention; 1 favored TAVI in both outcomes. One unstratified study using propensity score weighting found higher 5-year TAVI mortality, though patient frailty, surgical risks, and other factors might have contributed. TAVI shows comparable durability to SAVR in patients ≥75 years across risk profiles, though younger, lower-risk patients may benefit from SAVR. In high-risk elderly patients, outcomes are similar despite higher TAVI reintervention rates. These findings support risk and age-stratified valve selection, though more studies are needed to guide definitive recommendations.



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18034

A SYSTEMATIC REVIEW ON MYOCARDITIS AND CARDIAC DYSFUNCTION IN LONG COVID: CLINICAL AND IMMUNOLOGICAL EVIDENCE ASSOCIATED WITH THE PRESENCE OF AUTOANTIBODIES

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Introdução/Fundamentos: Post-acute SARS-CoV-2 syndrome (Long COVID) frequently presents with persistent multisystemic complications, such as myocarditis and chest pain. Unlike the acute phase, chronic cardiac dysfunction suggests an immune-mediated pathogenesis involving the breakdown of self-tolerance and sustained inflammation, mechanisms that remain underutilized in clinical practice. Objetivos: To analyze the clinical and immunological evidence of myocarditis in Long COVID, focusing on the identification of specific autoantibodies in persistent myocardial injury. Métodos: A systematic review conducted in accordance with the PRISMA guidelines. Searches were performed in the PubMed, Embase, and Elsevier databases between 2020 and 2026, using the search terms “Long COVID,” “Myocarditis,” and “Autoantibodies,” combined using the Boolean operator AND. A total of 12 studies were included, consisting of observational studies, prospective cohorts, and immunological analyses in humans that investigated the persistence of cardiac symptoms 12 weeks after acute infection. Studies involving only animals, isolated case reports, and narrative reviews were excluded. Resultados e Conclusões: The selected articles demonstrated that myocarditis in Long COVID is immune-mediated by a dysregulated adaptive immune response. Radiological evidence from cardiac magnetic resonance imaging (CMRI) revealed the presence of myocardial edema, hyperemia, and delayed gadolinium enhancement in symptomatic patients. Immunologically, the role of autoantibodies (AABs) against G protein-coupled receptors, specifically β1, β2 adrenergic, and angiotensin II receptors, is noteworthy. The detection of these markers correlates directly with cases of dysautonomia, tachycardia, and exercise intolerance. Furthermore, the persistence of viral reservoirs and spike protein fragments may act as a continuous antigenic stimulus, maintaining T-cell activation and the chronic secretion of pro-inflammatory cytokines. Thus, the evidence supports the notion that myocarditis in Long COVID has a strong immune-mediated component, in which reactivity against cardiac receptors plays a central role in dysfunction. The convergence of imaging findings CMR and the identification of autoantibodies reinforces the need for diagnostic protocols that include screening for autoimmunity, and this understanding is crucial for the development of immunomodulatory strategies aimed at mitigating persistent myocardial damage.

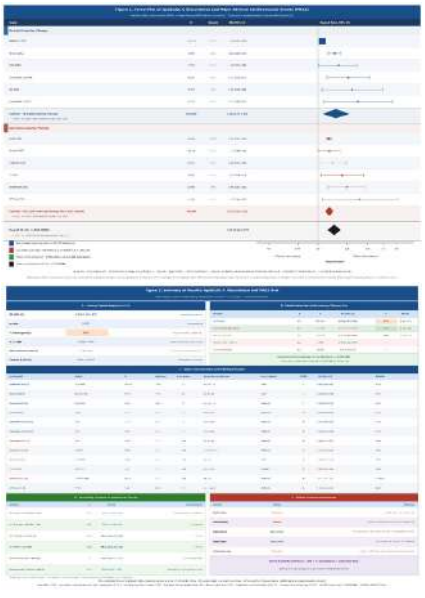
20771

APOLIPOPROTEIN B AND LOW-DENSITY LIPOPROTEIN CHOLESTEROL DISCORDANCE AND MAJOR ADVERSE CARDIOVASCULAR EVENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS STRATIFIED BY LIPID-LOWERING THERAPY USE

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Introdução/Fundamentos: Apolipoprotein B (ApoB) quantifies total circulating atherogenic particles and may reveal residual cardiovascular risk when LDL-cholesterol (LDL-C) appears controlled. Discordance between elevated ApoB and on-target LDL-C is frequent in metabolic syndrome, hypertriglyceridemia, and under lipid-lowering therapy. Despite its clinical relevance, quantitative synthesis of this association stratified by treatment status is lacking. Objetivos: To quantitatively synthesize the association between ApoB/LDL-C discordance and incident major adverse cardiovascular events (MACE) in prospective cohorts, stratified by lipid-lowering therapy use, per a pre-specified PROSPERO protocol. Métodos: Systematic review and meta-analysis (PRISMA 2020; PROSPERO registered). Databases: PubMed, Embase, Cochrane, Web of Science. Eligibility (PICOT): prospective cohorts, ApoB measured, incident MACE, adjusted HR with 95% CI. After deduplication, 915 records screened and 34 full-texts assessed; 12 studies (n≈534,000, adjusted for cohort overlap) included. Risk of bias: QUIPS (3 low, 9 moderate). Analysis: random-effects model (REML, HKSJ); I^2, τ^2, 95% prediction interval (PI). Pre-specified stratification: no lipid-lowering therapy (k=6) vs. any therapy (k=5). Meta-regression: statin proportion (k=11). Leave-one-out sensitivity. Publication bias: Egger test. Software: R (metafor, meta). Resultados e Conclusões: Pooled (k=12; n≈534,000): HR=1.25 [95% CI 1.14–1.37], p=0.0002; I^2=83%; PI [1.00–1.57]. No lipid-lowering therapy (k=6; n=425,355): HR=1.28 [1.07–1.54], I^2=83%. Any therapy (k=5; n=150,209): HR=1.17 [1.11–1.23], I^2=25%, PI [1.10–1.24]. Interaction: p=0.948 (NS); meta-regression (statin %): p=0.96. Sensitivity — prospective only (k=10): HR=1.25 [1.12–1.40]; ≥5-year follow-up (k=10): HR=1.29 [1.15–1.45]. Leave-one-out: Δmax=2.6%. Egger p=0.0005. ApoB/LDL-C discordance predicts 25% excess MACE risk independently of lipid-lowering therapy (interaction p=0.948) — the study’s central finding. In treated patients, heterogeneity fell markedly (I^2=25% vs. 83%) and the prediction interval excluded the null [1.10–1.24], indicating a more consistent and actionable association. Despite LOW evidence certainty (methodological heterogeneity across 6 discordance definitions; potential publication bias), these data demonstrate that LDL-C alone is insufficient to capture residual atherogenic risk. Therefore, our findings support routine ApoB measurement in high-risk patients with apparently controlled LDL-C, regardless of treatment status.



21183

ARE POLYGENIC RISK SCORES SUPERIOR TO TRADITIONAL RISK SCORES AND CORONARY ARTERY CALCIUM SCORE FOR EARLY DETECTION OF SUBCLINICAL ATHEROSCLEROSIS? A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Polygenic Risk Scores (PRS) have emerged as a promising tool for cardiovascular risk stratification, while coronary artery calcium score (CACS) is an important imaging marker of subclinical atherosclerosis. However, the predictive value of PRS compared with traditional cardiovascular risk scores (TCRS) and CACS remains uncertain. Objetivos: To compare PRS with TCRS and CACS in the early detection of subclinical atherosclerosis. Métodos: A systematic review was performed in accordance with PRISMA guidelines across PubMed, Embase, and Cochrane databases, including studies published between 2010 and 2026. Following the PICO framework, we included adults without established cardiovascular disease. The intervention consisted of PRS compared with TCRS and CACS. Screening was conducted by two reviewers with data extraction focusing on discrimination capacity (area under the curve [AUC]) and risk reclassification (net reclassification improvement [NRI]), followed by qualitative synthesis. Resultados e Conclusões: Four studies encompassing 16,610 patients, including 1 randomized trial and 3 observational studies, were included. In the early detection of subclinical atherosclerosis, TCRS showed moderate discrimination (AUC: 0.60–0.67), while PRSs demonstrated slightly higher performance (AUC: 0.63–0.69). Adding PRS to clinical models resulted in limited discrimination gain (ΔAUC up to 0.12) and modest risk reclassification improvement (NRI up to 0.47; IDI up to 0.008). In a cross-sectional study (50–60 years), PRS alone showed better discrimination than clinical factors in women (AUC: 0.711 vs 0.662). Combining PRS with clinical factors improved discrimination in both sexes (ΔAUC: 0.055 in men; 0.076 in women), with greater improvement in low- to moderate-risk women compared to men (NRI = 0.649 vs 0.450) Coronary artery calcium score (CACS) consistently demonstrated superior predictive (ΔAUC up to 0.09; NRI up to 0.79) value compared with PRS alone. Combined models (TRCS + CACS + PRS) achieved the best predictive performance (AUC up to 0.80). PRS remained independently associated with cardiovascular events (HR up to 3.2), although less strongly than CACS (HR up to 5.0). PRSs have moderate utility in the early detection of atherosclerosis and in predicting cardiovascular events, performing slightly better than TCRS. However, their isolated incremental gain is still limited. The CACS demonstrated greater predictive capacity, while the combination of PRS, clinical factors, and CACS showed the best overall performance.

21880

ASSOCIATION BETWEEN APOLIPOPROTEINS A AND B AND THE TRADITIONAL LIPID PROFILE IN AN OUTPATIENT POPULATION: IMPLICATIONS FOR CARDIOVASCULAR RISK STRATIFICATION

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Introdução/Fundamentos: Cardiovascular diseases are the leading cause of death and dyslipidemias are among the main modifiable risk factors. Although widely used, the conventional lipid profile has limitations, as LDL-C estimates cholesterol mass without fully reflecting the atherogenic profile. In this context, apolipoproteins have emerged as a more precise approach for cardiovascular assessment. Objetivos: To evaluate the association of apoA-I, apoB, and the apoB/apoA-I ratio with the traditional lipid profile in a Brazilian outpatient population. Métodos: We conducted a retrospective cross-sectional study of 18,082 outpatients who underwent laboratory evaluation between January 2021 and December 2025 at a clinical laboratory in northeastern Brazil. The variables analyzed included apoA-I, apoB, apoB/apoA-I ratio, total cholesterol, HDL-C, LDL-C, triglycerides, HbA1c, fasting glucose, urea, creatinine, uric acid, hs-CRP, and insulin. For qualitative data, analysis was conducted using absolute and relative values (%). For quantitative data, descriptive statistical analysis was performed (mean, median, standard deviation), between-sex comparisons using Student's t-test, Pearson's correlation matrix, and two multiple linear regression models. Statistical significance was set at $p<0.05$. Resultados e Conclusões: A total of 18.082 individuals were analyzed (66.8% women). Mean apoA-I and apoB levels were 132 ± 24.3 and 87.1 ± 23.2 mg/dL, respectively, with a mean apoB/apoA-I ratio of 0.68. Women had higher apoA-I (137.5 vs 122.5; $p<0.001$) and HDL-C (58.0 vs 46.5; $p<0.001$), while men had higher apoB (89.0 vs 86.1; $p<0.001$), triglycerides ($p<0.001$), and metabolic markers. ApoB was strongly correlated with LDL-C ($r = 0.938$; $p<0.001$) and total cholesterol ($r = 0.872$; $p<0.001$), and apoA-I with HDL-C ($r = 0.872$; $p<0.001$). The apoB/apoA-I ratio was associated with LDL-C ($r = 0.670$; $p<0.001$), total cholesterol ($r = 0.478$; $p<0.001$), triglycerides ($r = 0.203$; $p<0.001$), and negatively with HDL-C ($r = -0.480$; $p<0.001$). Regression models for apoB ($R^2 = 0.907$) and apoA-I ($R^2 = 0.807$) demonstrated high explanatory power. The apoB/apoA-I ratio was higher in individuals with total cholesterol >190 mg/dL (0.789 vs 0.587; $p<0.001$) and triglycerides ≥150 mg/dL (0.821 vs 0.662; $p<0.001$). The findings confirm a strong association between apolipoproteins and the traditional lipid profile, and that the apoB/apoA-I ratio identifies atherogenic dyslipidemia with good accuracy, reinforcing its utility in outpatient cardiovascular risk stratification.

21171

ASSOCIATION BETWEEN CARDIOVASCULAR HEALTH AND EDUCATION LEVEL AMONG INDUSTRIAL SECTOR WORKERS

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Introdução/Fundamentos: Social determinants of health (SDH) include socioeconomic, environmental, cultural, and behavioral factors that influence the development of cardiovascular diseases. Education level stands out as an important SDH and impacts cardiovascular outcomes, meaning that lower educational levels are associated with poorer cardiovascular health (CVH). Objetivos: To investigate the association between CVH and education level among industrial sector workers. Métodos: This was a cross-sectional study conducted with 293 workers, with a mean age of 35.5 (±11.7) years; 64.6% were male and 35.4% female. Sociodemographic data (marital status), clinical data (continuous-use medications – CUM and presence of comorbidities), and anthropometric data for body mass index (BMI) calculation were collected. CVH was assessed using the 8 metrics established in the Life's Essential 8 study by the American Heart Association (AHA), categorized into health behaviors (physical activity level, diet, nicotine exposure, and sleep health) and health factors (BMI, non-HDL cholesterol levels, blood pressure, and fasting glucose or glycated hemoglobin). CVH classification was defined as low (0–49 points), moderate (50–79 points), and high (80–100 points). The average of the metrics established the total score. Education level, considered the SDH outcome variable, was classified as completed elementary school, completed/incomplete high school, completed/incomplete higher education, and postgraduate education. Student's t-test was used for group comparisons, and the chi-square test was applied to assess associations between categorical variables. Resultados e Conclusões: Among workers, 68% presented moderate CVH and 32% low CVH. Most participants were married (46.3%) or single (43.2%); 22.1% used continuous-use medications and 15.6% had comorbidities. Workers with elementary school education had lower mean CVH scores (46.8, ±12.4, n=41) than those with high school (53.2, ±10.2, p=0.002, n=137), higher education (53.2, ±10.2, p<0.001, n=97), and postgraduate education (58.0, ±8.3, p<0.001, n=19). Education level was associated with CVH classification (x^2=22.58, p<0.001), and most workers with high school education presented low (53.2%) or moderate (43.5%) CVH. Education level may be considered a marker of cardiovascular vulnerability. In this sense, educational inequalities should be regarded as a strategic factor in cardiovascular health promotion and prevention actions.

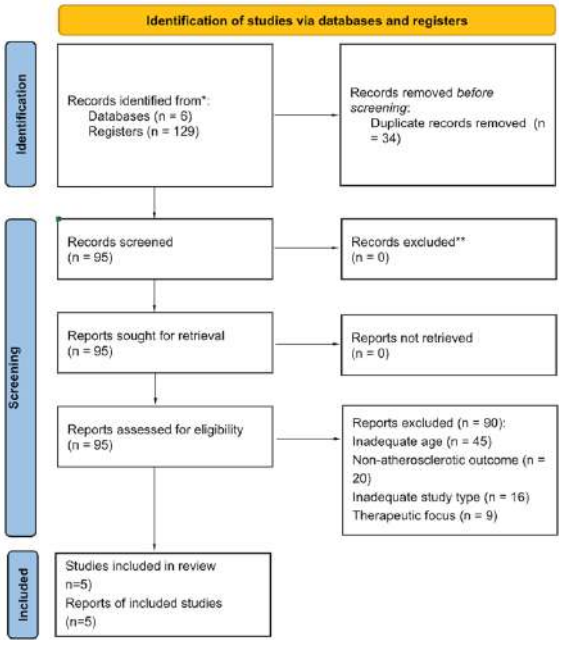
20693

ASSOCIATION BETWEEN ELEVATED LIPOPROTEIN(A) LEVELS AND EARLY ATHEROSCLEROTIC DISEASE IN YOUNG ADULTS

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Introdução/Fundamentos: Premature coronary artery disease in young adults, in the absence of LDL-c dyslipidemia or diabetes, poses a clinical challenge. Thus, Lipoprotein(a) [Lp(a)] emerges as an independent and genetically determined risk predictor. This study is justified by the need to improve risk stratification in asymptomatic young adults, mitigating early ischemic events and providing evidence for the update of cardiology guidelines. Objetivos: To analyze the association between elevated Lipoprotein(a) levels and the early development of atherosclerosis and atherosclerotic cardiovascular disease in young adults. Métodos: This is a review, adopting the PRISMA guideline for systematizing the search and selection, 95 records were screened and 5 articles were included. MeSH/DeCS descriptors were used in the following databases: PubMed, Scopus, Web of Science, SciELO, Embase, LILACS. Original studies published between 2020-2025, focusing on individuals (18-40 years old) without previous cardiovascular disease, were included. Studies that did not correlate Lp(a) levels with cardiovascular outcomes were excluded. Resultados e Conclusões: Physiopathologically, Raitakari et al. confirmed that chronic exposure to high levels of Lp(a) (≥30 mg/dL) from youth doubles the risk of cardiovascular events in adulthood. This is due to the dual mechanism of Lp(a): the transport of oxidized phospholipids that promote endothelial dysfunction (pro-atherogenic) and the inhibition of fibrinolysis by apolipoprotein(a) (pro-thrombotic). Clinically, Namitokov et al. associated Lp(a) ≥50 mg/dL with early myocardial infarctions (MI) and a higher multi-vessel disease burden. However, the YOUNG-MI registry revealed that 71% of post-MI young adults with elevated Lp(a) had low traditional risk scores (<7.5%), evidencing severe clinical underestimation. The analysis shows a strong correlation between elevated Lipoprotein(a) [Lp(a)] levels and premature atherosclerotic cardiovascular disease (ASCVD). Tian et al. demonstrated that Lp(a) doubles the risk of ASCVD in young adults (OR 2.15), particularly for coronary artery disease, and Koh et al. found a higher risk of ischemic stroke (OR 1.61). Lp(a) shows a strong correlation with cardiovascular outcomes, independent of early atherosclerosis and cardiovascular events secondary to atherosclerotic processes, justifying its routine incorporation into cardiovascular risk stratification in young adults, aiming at accurate stratification and early prevention.



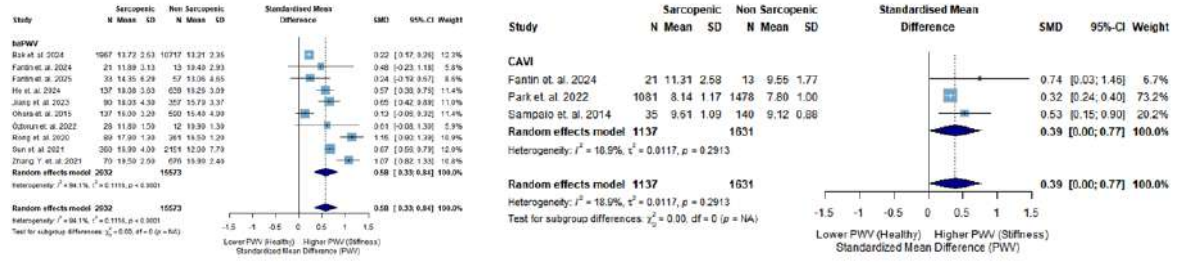
18847

ASSOCIATION BETWEEN SARCOPENIA AND ARTERIAL STIFFNESS IN OLDER ADULTS: AN UPDATED SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Sarcopenia and arterial stiffness are both hallmarks of aging and significant predictors of cardiovascular risk and physical disability. Although a bidirectional relationship has been hypothesized, the strength of the association between muscle depletion and vascular aging remains to be fully synthesized. This meta-analysis investigated the relationship between sarcopenia and arterial stiffness, specifically focusing on Pulse Wave Velocity (PWV) and the Cardio-Ankle Vascular Index (CAVI) in individuals over 50 years of age. Objetivos: To evaluate the association between sarcopenia and arterial stiffness (PWV/CAVI) in individuals over 50 years old through a systematic review and meta-analysis, investigating if muscle loss correlates with increased vascular aging and worse cardiovascular prognostic risk factors. Métodos: A systematic search was conducted on October 10, 2025, across PUBMED, EMBASE, COCHRANE, and ELSEVIER databases. We included observational studies and randomized controlled trials evaluating the association between sarcopenia and markers of arterial stiffness. The meta-analysis was performed using a random-effects model with the Restricted Maximum-Likelihood (REML) estimator and the Hartung-Knapp adjustment. Effect sizes were expressed as Hedges' g standardized mean difference (SMD) to account for potential bias in smaller samples. Resultados e Conclusões: From an initial pool of 1,484 articles, 12 studies met the final inclusion criteria after rigorous screening and deduplication. The quantitative synthesis for Brachial-Ankle Pulse Wave Velocity (baPWV) included 10 studies with a total of 18,505 participants, revealing that sarcopenic individuals had significantly higher baPWV compared to non-sarcopenic peers with a moderate effect size (SMD 0.58; 95% CI: 0.33 to 0.84; p = 0.0006), despite high heterogeneity (I2 = 94.1%). Regarding the Cardio-Ankle Vascular Index (CAVI), the analysis of 3 studies involving 2,768 participants also showed a significant association (SMD 0.39; 95% CI: 0.00 to 0.77; p = 0.0499) with notably lower heterogeneity (I2 = 18.9%). In conclusion, sarcopenia is significantly associated with increased arterial stiffness in the aging population. The stronger association observed with baPWV suggests that muscle loss is closely linked to increased vascular stiffness. These findings highlight the clinical importance of integrated screening for both muscle health and vascular aging to better identify older adults at high risk for cardiovascular events and physical frailty.



18235

ASSOCIATION OF PULSE WAVE VELOCITY WITH SOCIODEMOGRAPHIC AND LIFESTYLE FACTORS IN A COMMUNITY-BASED COHORT

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Introdução/Fundamentos: Pulse wave velocity (PWV) is a marker of arterial stiffness and a predictor of cardiovascular risk. In community settings, PWV may also capture how social position, cultural background and daily behaviours cluster with vascular ageing, which can inform targeted prevention in populations underrepresented in arterial stiffness research. Objetivos: To examine associations between PWV quartiles and sociodemographic and lifestyle factors in adults from a community based cohort Métodos: Cross sectional analysis of 1,848 adults. PWV was measured using a validated brachial cuff based oscillometric method and categorised into quartiles: Q1 <5.4 m/s; Q2 5.4 to 6.3 m/s; Q3 6.3 to 7.7 m/s; Q4 7.7 m/s or higher. Exposures included age, sex, self reported skin colour, educational attainment, German ancestry (highly prevalent in the population), smoking status, alcohol use, physical activity level, sleep quality, and occupational stress domains (demand, control and social support). Associations across quartiles were tested with appropriate methods for categorical and continuous variables (two sided p values). Resultados e Conclusões: PWV increased markedly with age (mean age: 28.3 in Q1, 35.0 in Q2, 46.8 in Q3, 63.1 in Q4; p<0.001). Age distribution shifted sharply across quartiles, with younger participants concentrated in Q1 and 99.4% of those aged 60 to 79 years in Q4 (p<0.001). PWV was also associated with sex (p<0.001), lower educational attainment (64.1% in Q4 among those with 0 to 4 years vs 6.8% among those with ≥12 years; p<0.001), self reported skin colour (p=0.0001), and German ancestry (32.0% in Q4 vs 13.5% without; p<0.001). Adverse lifestyle factors clustered in higher PWV quartiles, including former smoking (39.7% in Q4; p<0.001), physical inactivity (36.7% vs 18.6% in active participants; p=0.002), and poor sleep quality (30.7% vs 22.0%; p=0.0001). Alcohol use and occupational stress domains also differed across quartiles (all p<0.05). These findings show that higher PWV clusters with sociodemographic disadvantage, adverse behaviours, and sociocultural context, supporting its use in community risk profiling and in identifying modifiable targets to slow vascular ageing.





18682

ASSOCIATION OF REMNANT CHOLESTEROL WITH CARDIOVASCULAR RISK MARKERS ASSESSED BY CENTRAL ADIPOSITY AND C-REACTIVE PROTEIN IN ADOLESCENTS

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Introdução/Fundamentos: Introduction: Remnant cholesterol (RC), which represents the cholesterol content of triglyceride-rich lipoproteins, has emerged as a marker of cardiovascular risk (CVR) and may be more sensitive than LDL-c in adolescents. In this context, inflammatory markers such as C-reactive protein (CRP) and anthropometric indicators, including waist-to-height ratio (WHtR), have been widely used to predict CVR. Objetivos: Objective:This study aimed to assess the association of RC and LDL-c levels with CVR, evaluated by central adiposity and CRP, in adolescents Métodos: Methods: This cross-sectional study was conducted with adolescents from public schools in Fortaleza, Brazil. Blood samples were collected to measure total cholesterol, HDL-c, LDL-c, and CRP. RC was calculated by subtracting HDL-c and LDL-c from total cholesterol. CVR classification based on CRP was defined as low risk (<1 mg/L), intermediate risk (1–3 mg/L), and high risk (>3 mg/L). Central adiposity was assessed using WHtR, calculated as waist circumference divided by height, with CVR defined as values ≥0.5. Statistical analysis: Associations between lipoprotein markers and CVR were evaluated using binary and multinomial logistic regression models. Analyses were adjusted for sex, age, and HDL-c levels. Results were expressed as odds ratios (OR) with 95% confidence intervals (95% CI). Resultados e Conclusões: Results: A total of 251 adolescents were evaluated, with a mean age of 12.53 (1.15) years, and a predominance of females (52.2%). Most participants presented CVR based on WHtR (54.6%), while 84 (33.5%) were classified with some degree of risk according to CRP. RC was associated with CVR assessed by central adiposity in both crude [OR = 1.16; 95% CI (1.10–1.24)] and adjusted models [OR = 1.17; 95% CI (1.09–1.25)], whereas LDL-c showed a weaker association in the adjusted model [OR = 1.03; 95% CI (1.01–1.04)]. Regarding CRP-based CVR, RC remained associated in adjusted models for both intermediate [OR = 1.09; 95% CI (1.02–1.19)] and high risk [OR = 1.11; 95% CI (1.04–1.18)]. Conclusion: Remnant cholesterol was associated with cardiovascular risk assessed by central adiposity and C-reactive protein, demonstrating better performance than LDL-c in identifying this risk in the studied population.

17710

BASELINE LIPOPROTEIN(A) AND MAJOR ADVERSE LIMB EVENTS AFTER PERIPHERAL REVASCULARIZATION: A SYSTEMATIC REVIEW AND META-ANALYSIS.

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Introdução/Fundamentos: Lipoprotein(a) [Lp(a)] is an established genetic risk factor for atherosclerotic cardiovascular disease (ASCVD). While its association with coronary artery disease (CAD) is known, its prognosis on peripheral artery disease (PAD) undergoing revascularization remains unclear. Objetivos: To evaluate the association between baseline lipoprotein(a) levels and clinical outcomes in patients with peripheral artery disease undergoing revascularization through a systematic review and meta-analysis of observational studies. Métodos: We performed a systematic search of MEDLINE, Embase, and Cochrane databases from inception through July 2025, without language restrictions to identify studies that assessed the association between baseline Lp(a) levels and clinical outcomes in patients with PAD undergoing revascularization. Study selection and data extraction were performed independently by two reviewers, following PRISMA guidelines. Risk of bias was assessed using Cochrane standardized tools. Primary endpoints were Major Adverse Cardiovascular Events (MACE), Major Adverse Limb Events (MALE), myocardial infarction (MI), stroke, and cardiovascular death. Effect sizes were pooled using a random-effects model and reported as Odds Ratios (OR) or Hazard Ratios (HR) with 95% confidence intervals (CI); HRs were used when time-to-event data were available, while ORs were applied otherwise. Resultados e Conclusões: 15 studies were included, with a total of 3,097 patients. The mean age was 71.5 years, and 70.2% were males. Hypertension was present in 85.3% of patients, and 73.9% had dyslipidemia. Patients with higher Lp(a) levels presented a higher incidence of MALE (HR 1.71; 95% CI 1.03-2.85). Pooled effect sizes showed no statistically significant differences of MACE (HR 1.31; 95% CI 0.9-1.91), and cardiovascular death (HR 2.44; 95% CI 0.9-6.59). Similarly, MI (OR 1.08; 95% CI 0.68-1.72) and stroke (OR 1.73; 95% CI 0.55-5.40) did not differ statistically between groups. High Lp(a) may increase MALE in PAD patients, while effects on thromboembolic outcomes and cardiovascular mortality remain uncertain.

Figure 1a) Random-effects meta-analysis of HR for MALE after PAD revascularization, comparing higher versus lower baseline Lp(a) levels. Diamonds indicate pooled HR with 95% confidence intervals (CI); horizontal lines show 95% CI. Heterogeneity: I^2 = 99%, P = 0.04 .

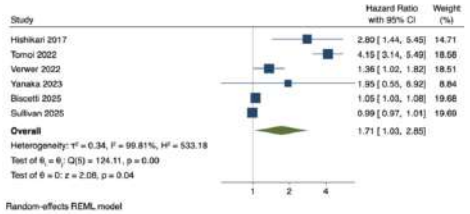
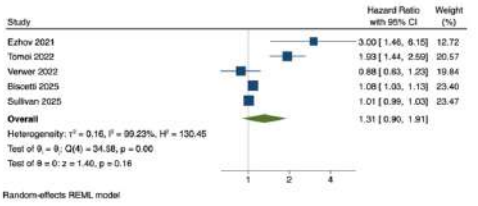


Figure 1b) Random-effects meta-analysis of HR for MACE after PAD revascularization by baseline Lp(a) level. Diamonds show pooled HR with 95% CI; horizontal lines represent 95% CI. Heterogeneity: I^2 = 99%, P = 0.16.



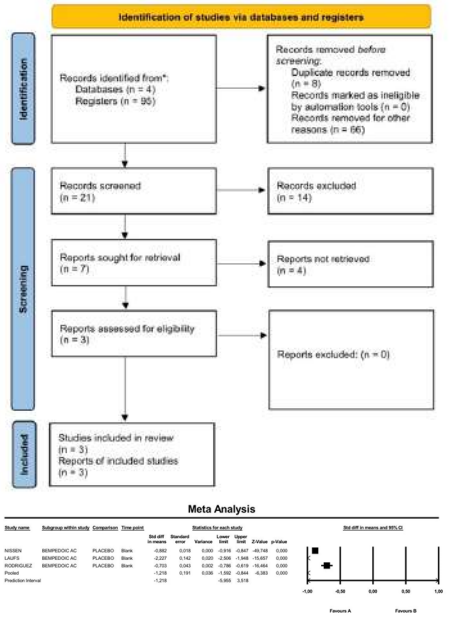
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BEMPEDOIC ACID EFFECT ON LDL-COLESTEROL LEVELS IN STATIN-RESISTANT PATIENTS: A SYSTEMATIC REVIEW WITH META-ANALYSIS.

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Introdução/Fundamentos: Statins are the first line treatment for dyslipidemia, but alternative therapies are necessary for approximately 10-15% of patients who do not tolerate them. Bempedoic acid lowers low-density lipoprotein cholesterol (LDL-C) by 21% to 24% as monotherapy in patients with statin-attributed side effects, and by an additional 17% to 18% in combination with the maximally tolerated statin. These benefits raise the question of whether this medication could be an ideal adjunct in statin-resistant patients' therapy who can not achieve their LDL-C targets with traditional treatment. Objetivos: Observe the extent to which bempedoic acid reduces LDL-C levels as add-on therapy for patients who do not tolerate statins. Métodos: Systematic review combined with meta-analysis, which searched for randomized studies in the Scielo, PubMed and Cochrane databases using the keywords "bempedoic acid", "statin-resistant" and "LDL-C", resulting in 95 articles. Articles published in the last 15 years, in Portuguese and English were included. Using the PRISMA system, three articles were ultimately selected. Resultados e Conclusões: The use of bempedoic acid in the studies was an add-on therapy to standard treatment, which included other non-statin drugs or minimum tolerated doses of statins. The total sample analyzed consisted of 7,222 individuals with documented intolerance to at least two statins. The risk of bias assessed by RoB 2 for the included clinical trials is classified as low in all domains, due to the rigorous randomization process, double blinding, and intention-to-treat analysis. Overall, there was a reduction in LDL-C levels with the use of bempedoic acid with a decrease from 26 to 34 mg/dL in these levels (SMD -1.21), while in the control group it was only -1.0 to 0.1 mg/dL (95% CI: -1.59 to -0.84; $p < 0.001$), with a confidence interval of -1.59 to -0.84. However, high statistical heterogeneity can be observed among the studies ($I2=98.1\%$; $Q=106.7$; $p<0.001$). This may have occurred because Laufs et al. presented a more significant reduction in their experience (SMD: -2.22) compared to Nissen et al. (SMD: -0.88) and Rodriguez et al. (SMD: -0.70), and the latter only included the Latin American population. Despite these more subtle effects, likely due to differences in populations or study designs, it is still possible to state that even across diverse population contexts, bempedoic acid had a significant impact on reducing LDL-C levels in statin-resistant patients.



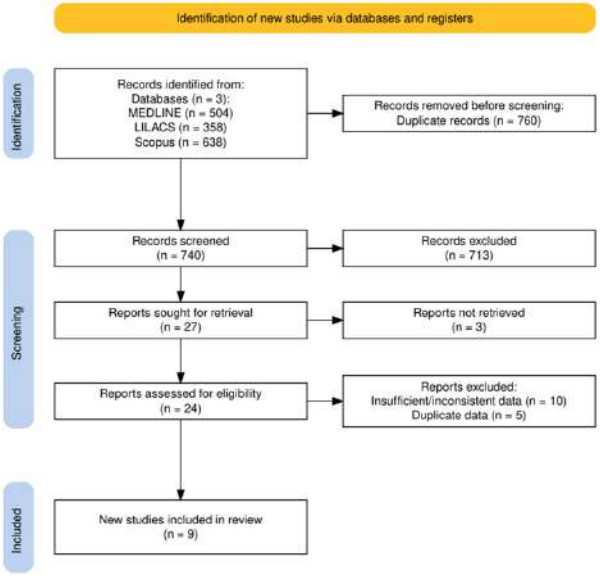
15905

BEMPEDOIC ACID FOR CARDIOVASCULAR PREVENTION IN STATIN-INTOLERANT PATIENTS: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Bempedoic acid (BA) has emerged as an alternative for the statin-intolerant population regarding cardiovascular risk reduction, due to fewer muscle-related side effects. This medication has enabled the treatment of a subset of patients with uncontrolled dyslipidemia and high cardiovascular risk. Objetivos: To analyze the effects of BA on cardiovascular prevention through markers such as low-density lipoprotein (LDL) levels, major adverse cardiovascular events (MACE), C-reactive protein (CRP), and side effects. Métodos: This systematic review followed the PRISMA guidelines. The search was conducted in the MEDLINE, LILACS, and Scopus databases, using the keywords: Bempedoic acid, Statin intolerant, Statin, and Cardiovascular prevention. Using a time restriction from 2018 to January 2026, a total of 27 articles were identified, of which 9 English-language studies were included. Duplicate works, systematic reviews, meta-analyses, narrative review, pediatric population studies, animal studies, and those without full-text access were excluded. Resultados e Conclusões: Of the total, 9 studies demonstrated a reduction in LDL levels by at least 23%, with similar values in primary and secondary prevention, highlighting the fundamental role of BA for cardiovascular protection in populations with higher baseline LDL levels. Furthermore, 3 studies revealed data on the incidence of MACE, including coronary revascularization, cardiovascular death, nonfatal myocardial infarction, and nonfatal stroke. The use of BA demonstrated a reduction in MACE incidence in 2 studies, mainly in primary prevention, with a relative risk reduction of at least 13%; 1 study showed inconclusive results on the topic. Similarly, 6 studies reported a decrease in inflammation, assessed through an estimated reduction of 24% in CRP levels, suggesting a potential pleiotropic effect of BA, as observed with statins. Additionally, 7 studies reported adverse effects during BA use, consisting mainly of hyperuricemia, increased liver enzymes, and kidney impairment, with low rates of discontinuation due to side effects. Therefore, the relevance of BA in cardiovascular prevention is evident, as it demonstrates positive results in reducing LDL, MACE, and systemic inflammation parameters in statin-intolerant patients and presents minimal side effects, contributing to treatment adherence in these patients.



19283

BETWEEN PREVENTION AND TREATMENT: WHERE ARE WE FAILING IN LDL CONTROL BEFORE ACUTE MYOCARDIAL INFARCTION?

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Introdução/Fundamentos: Low-density lipoprotein (LDL) is a key determinant of atherosclerosis and a central target in cardiovascular prevention strategies. Despite well-established guidelines and the availability of effective lipid-lowering therapies, acute myocardial infarction (AMI) still occurs in patients who are potentially eligible for treatment. This raises an important clinical question: are these failures related to gaps in primary prevention, inadequate risk stratification, or insufficient therapeutic intensification? Objetivos: To evaluate lipid profiles and lipid-lowering therapy at the time of acute myocardial infarction, investigating potential failures in LDL control prior to the event. Métodos: This cross-sectional observational study included patients admitted for AMI at a university hospital between February 2022 and December 2024. Clinical variables, lipid profiles, and ongoing lipid-lowering treatments were analyzed. Patients were categorized according to statin use (none, moderate-intensity, or high-intensity), as well as the use of ezetimibe. Statistical analyses included Kolmogorov-Smirnov tests, Student's t-test or Kruskal-Wallis for continuous variables, and chi-square tests for categorical variables, with post hoc analyses when appropriate. A significance level of 5% was adopted. Resultados e Conclusões: A total of 380 patients were included, with a mean age of 62.2 ± 11.9 years, and 69.2% were male. A high prevalence of cardiovascular risk factors was observed, including hypertension (73.2%), diabetes (36.8%), and prior smoking (47.9%). At the time of the event, most patients were not receiving statins (73.2%), while 20.8% were on moderate-intensity and 6.1% on high-intensity statins. LDL levels progressively decreased according to treatment intensity (122 mg/dL without statins, 113 mg/dL with moderate-intensity, and 102 mg/dL with high-intensity; p 0.003). However, lipid control remained suboptimal: only 35.8% had LDL <100 mg/dL, 12.4% <70 mg/dL, and 2.6% <50 mg/dL. Conclusion: The occurrence of AMI in a population largely untreated with statins and with inadequate LDL control highlights a significant gap between prevention and treatment. These findings reinforce the need for earlier identification of high-risk individuals and more aggressive lipid-lowering strategies to achieve LDL targets and prevent future cardiovascular events.

20423

BRAIN ALARMINS HMGB1 AND S100B AND BLOOD–BRAIN BARRIER DYSFUNCTION AS DRIVERS OF ATHEROSCLEROSIS: A SYSTEMATIC REVIEW OF TRANSLATIONAL AND CLINICAL STUDIES

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Introdução/Fundamentos: Acute brain injury induces release of alarmins (HMGB1, S100B), triggering systemic inflammation and potentially accelerating atherosclerosis. Blood–brain barrier (BBB) dysfunction enables leakage of neurogenic mediators into circulation, linking cerebral injury to cardiovascular outcomes. However, the magnitude and mechanisms of these associations remain incompletely integrated. This review summarizes translational and clinical evidence on these pathways. Objetivos: To evaluate associations between brain alarmins (HMGB1, S100B), BBB markers (CDH5, CD93, ICAM2, GP1BB, PlGF), and cardiovascular outcomes, and to explore mechanisms in the brain–atherosclerosis axis. Métodos: Systematic review following PRISMA. Clinical and translational studies were retrieved from PubMed (2011–2026). Inclusion: human studies assessing HMGB1, S100B, brain endothelial cell (BEC) proteins or PlGF; cardiovascular outcomes (functional myocardial ischemia by QFR, acute coronary syndrome [ACS], heart failure, dementia); and effect measures (OR, HR, adjusted correlations). Disease severity and mortality were extracted when available. Due to heterogeneity, qualitative synthesis was performed without meta-analysis. Resultados e Conclusões: S100B – In unstable angina (n=233), levels >33.28 pg/mL predicted ischemia (QFR ≤0.8) (OR=5.058; 95%CI 2.912–8.793; p<0.001) and correlated with Gensini score (Liu 2024). In ACS (n=420), levels were higher vs. stable angina/controls (p<0.01) (Cai 2011). In chronic HF (n=242), independently associated with major events (Li 2011). HMGB1 – Elevated in ACS/stroke vs. controls, associated with severity and mortality (de Souza 2012). Experimental stroke showed HMGB1 activates monocytes via RAGE, increasing plaque burden/vulnerability; inhibition attenuated progression (Roth 2018). BEC proteins – Composite score (CDH5, CD93, ICAM2, GP1BB) explained 11% of white matter lesion variability and predicted dementia risk over 25 years (Cordon 2023). PlGF – In 488 participants, correlated with white matter hyperintensity volume (r=0.20), GFAP (r=0.11), and NfL (r=0.19) (Edwards 2025). Results should be interpreted considering heterogeneity. HMGB1 and S100B associate with myocardial ischemia, ACS, and HF, while BBB markers and PlGF reflect neurovascular dysfunction and cognitive risk. Translational data support a RAGE-mediated monocyte activation mechanism linking brain injury to atherosclerosis. These biomarkers may aid risk stratification and future therapies.

20422

BRAIN INFLAMMATORY MARKERS PREDICT CARDIOVASCULAR EVENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS OF MOLECULAR IMAGING, SERUM BIOMARKERS, AND MRI STUDIES

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Introdução/Fundamentos: Brain inflammation—triggered by stress-related neural activity, neuronal injury, or small vessel disease—has been linked to atherosclerosis and cardiovascular (CV) events, but its magnitude across different biomarkers remains incompletely integrated. Objetivos: To quantify, via systematic review and meta-analysis, the association between brain inflammatory markers (amygdalar activity, NfL, GFAP, sTREM2, IL-6, hsCRP, white matter hyperintensities, microbleeds) and major adverse cardiovascular events (MACE), stroke, and CV mortality. Métodos: Systematic review following PRISMA guidelines using PubMed (studies up to 2026). Included prospective cohorts or meta-analyses (≥100 participants) assessing brain inflammatory markers (FDG-PET amygdalar activity; serum biomarkers NfL, GFAP, sTREM2, IL-6, hsCRP; MRI markers) and reporting CV outcomes (MACE, stroke, CV death) with adjusted HR or RR. Random-effects models were applied; heterogeneity was assessed with I^2. Resultados e Conclusões: Seventy-one studies (>120,000 participants) were included. Amygdalar activity was associated with MACE (HR 1.61, 95% CI 1.12–2.32) and all-cause mortality (HR 2.49, 1.96–3.17). NfL was associated with stroke (HR 1.31, 1.09–1.57), CV death (HR 1.36, 1.20–1.54), all-cause mortality (HR 1.41, 1.27–1.56) in atrial fibrillation, mortality in HFrEF (HR 4.44, 3.02–6.53), and CV death in REGARDS (HR 2.16, 1.66–2.81). GFAP was linked to CV mortality (REGARDS HR 2.06; CHAP HR 1.87). sTREM2 post-stroke predicted death/CV events (HR 1.57, 1.11–2.21). IL-6 was associated with CV events (RR 1.12 per log-unit; RR 1.35 Q4 vs Q1), and hsCRP modestly (RR 1.09). Galectin-3 predicted incident CVD (HR 1.74). MRI markers were also predictive: white matter hyperintensities (HR 1.72), microbleeds (HR 1.88), silent infarcts (HR 2.9). Mechanistically, brain alarmins (HMGB1) may activate monocytes via RAGE. BDNF showed protective association (HR 0.88). Brain inflammatory markers across imaging and circulating biomarkers are consistently associated with higher risk of MACE, stroke, and CV mortality. Their integration into risk stratification may improve identification of high risk individuals and support anti-inflammatory strategies.

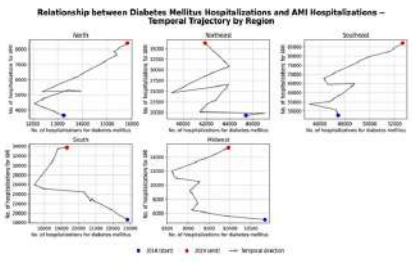
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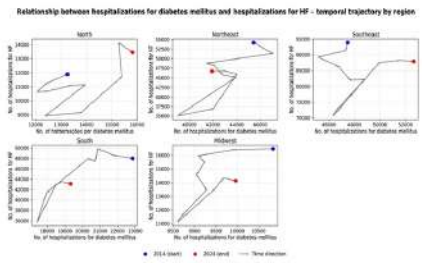
BURDEN AND REGIONAL DISTRIBUTION OF HOSPITALIZATIONS FOR AMI, HF AND DM IN THE BRAZILIAN UNIFIED HEALTH SYSTEM (SUS) AND THEIR TEMPORAL CO-VARIATION.

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Introdução/Fundamentos: Diabetes Mellitus (DM) is a major risk factor for cardiovascular diseases, especially Acute Myocardial Infarction (AMI) and Heart Failure (HF), contributing to high morbidity, mortality and healthcare burden. The temporal and regional analysis of these conditions allows for an understanding of the impact of cardiometabolic diseases on the Brazilian Unified Health System (SUS). Objetivos: To analyse the burden and regional distribution of hospitalizations for DM, AMI, and HF in SUS between 2014-2024, evaluating temporal trends, population rates and co-variation among these conditions. Métodos: Descriptive ecological study using SIH/SUS. Hospitalizations with primary diagnoses corresponding to ICD-10 codes E10-14 (DM), I21 (AMI), and I50 (HF) between 2014 and 2024 were included. DM hospitalization rates per 100,000 inhabitants were calculated using IBGE population estimates. The co-variation between DM and cardiovascular conditions was assessed by simple linear regression, considering each year-region combination as the unit of analysis. Resultados e Conclusões: AMI hospitalizations increased from 94399 in 2014 to 180876 in 2024. In contrast, HF hospitalizations decreased from 224377 to 205373, with a sharper decline between 2020 and 2021 and subsequent partial recovery. DM hospitalizations remained stable, varying from 139819 to 139598; when adjusted for population, the rates decreased from 68,9 to 65,7 hospitalizations per 100.000 inhabitants. Regional heterogeneity was observed, with the highest absolute concentration in the Southeast and Northeast, while the North showed the most marked proportional growth. Positive correlation was found between hospitalizations for DM and AMI (r=0,80; β=1,108) and between DM and HF (r=0,87; β=1,484). Linear regression demonstrated a stronger association between DM and HF (R^2=0,757; p<0,05). AMI, HF, and DM represent a high hospital burden in SUS, with significant regional inequalities. The stability of DM hospitalizations and a slight reduction in population rates suggests the persistence of the cardiometabolic burden in Brazil. Although the data does not allow for casual inference, the observed temporal co-variation reinforces the relevance of the cardiometabolic axis. In this context, the STEP-HFpEF randomized clinical trial demonstrated the benefits of semaglutide in patients with obesity, type 2 diabetes, and heart failure with preserved ejection fraction, highlighting the potential of cardiometabolic therapies in reducing the future burden of these conditions.





19417

CAR T-CELL THERAPY FOR THE REDUCTION OF MYOCARDIAL FIBROSIS: A SYSTEMATIC REVIEW OF PRECLINICAL STUDIES

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Introdução/Fundamentos: Heart failure (HF) triggers pathological ventricular remodeling, where fibrotic tissue replaces functional myocardium, severely impairing cardiac compliance and contractility. While current pharmacological therapies delay disease progression, reversing established fibrosis remains a significant clinical challenge. Recently, Chimeric Antigen Receptor (CAR) T-cell therapy targeting Fibroblast Activation Protein (FAP) has emerged as a transformative cardioregenerative strategy to eliminate activated fibroblasts. This systematic review synthesizes preclinical evidence regarding FAP-targeted CAR-T cells as an antifibrotic intervention, evaluating their impact on cardiac structural and functional parameters in in vivo experimental models. Objetivos: To synthesize preclinical findings regarding CAR-T cell therapy as an antifibrotic strategy, evaluating its impact on cardiac structural and functional parameters in in vivo experimental models. Métodos: Following PRISMA 2020 guidelines, a comprehensive search was conducted across PubMed, SciELO, LILACS, and Embase without language or date restrictions. The search strategy utilized DeCS/MeSH terms and Boolean operators: (“CAR-T Cells” OR “Chimeric Antigen Receptor T-Cell”) AND (“Cardiac Fibrosis” OR “Heart Failure”) AND (“FAP” OR “Fibroblast Activation Protein”). Inclusion criteria targeted in vivo preclinical experimental studies involving the induction of fibrosis and heart failure in murine models. Study selection and data extraction were performed by two independent, double-blind reviewers using Rayyan software. Methodological quality was rigorously assessed using the SYRCLE’s Risk of Bias tool. Resultados e Conclusões: A total of 144 studies were identified; four high-impact preclinical trials were selected. Results demonstrate that CAR-T immunotherapy promotes significant regression of adverse ventricular remodeling. Myocardial injury was established through distinct protocols, such as pathway reprogramming via mRNA-encoded lipid nanoparticles or alpha-MHC immunization. Analysis reveals robust efficacy, with fibrotic load reductions ranging from 60% to undetectable levels. Furthermore, data indicating the restoration of cardiac function suggest that this therapy not only halts lesion progression but also promotes effective tissue-level regeneration. Despite being a disruptive approach, CAR-T therapy provides a solid translational basis for restoring myocardial architecture.

18854

CARDIOAI: AN ARTIFICIAL INTELLIGENCE-BASED PROTOTYPE FOR THE IDENTIFICATION OF HIDDEN CARDIOVASCULAR RISK BEYOND TRADITIONAL RISK SCORES

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Introdução/Fundamentos: Cardiovascular diseases remain the leading cause of mortality worldwide. Although risk scores such as Framingham, SCORE2, and the Pooled Cohort Equations are widely used, a proportion of individuals classified as low risk still experience major cardiovascular events, highlighting the existence of residual cardiovascular risk. In addition, these models have limited capacity to incorporate behavioral and psychosocial determinants, as well as emerging biomarkers such as lipoprotein(a). In this context, artificial intelligence may facilitate the integration of multidimensional data and the identification of non-linear patterns, with potential applications in precision medicine. Objetivos: To develop a digital platform based on explainable artificial intelligence to support the identification of residual cardiovascular risk in individuals classified as low risk by conventional models. Métodos: This was a descriptive technological development study. The platform was designed to integrate two groups of variables: traditional variables (age, sex, blood pressure, lipid profile, body mass index, smoking status, and family history of premature cardiovascular disease) and expanded variables (psychosocial stress, sleep quality, sedentary behavior, and subclinical biomarkers such as high-sensitivity C-reactive protein, fibrinogen, and lipoprotein(a)). The prototype includes the application of supervised machine learning models, including Random Forest, Gradient Boosting, and neural networks, with explainability features based on variable importance and interpretable outputs. Resultados e Conclusões: The developed prototype features a structured interface for sequential data collection and integrated cardiovascular risk stratification, with transparent visualization of the relative contribution of the analyzed variables. The platform was designed to support the identification of profiles potentially underestimated by traditional risk scores and to provide guidance for individualized complementary investigation, while also anticipating scalability, interoperability, and integration into digital health ecosystems. CardioAI represents a promising proposal for expanding residual cardiovascular risk stratification through a multidimensional and explainable approach. The incorporation of emerging biomarkers, such as lipoprotein(a), reinforces its potential alignment with precision medicine. Future studies should assess external validity, discrimination, calibration, algorithmic bias, equity, and clinical utility.

21952

CARDIOMETABOLIC AND HEMATOLOGICAL ALTERATIONS ASSOCIATED WITH SUPRAPHYSIOLOGICAL TESTOSTERONE EXPOSURE

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Introdução/Fundamentos: The increasing use of supraphysiological doses of testosterone, both for medical and non-medical purposes, has raised concerns regarding cardiovascular safety. However, real-world data evaluating the cardiometabolic effects of extreme testosterone exposure, particularly including women, remain limited. Objetivos: To evaluate the association between supraphysiological testosterone levels and metabolic, inflammatory, and hematological parameters in adults using exogenous testosterone. Métodos: This retrospective cross-sectional study evaluated laboratory tests collected between 2022 and 2024 from a clinical laboratory in northeastern Brazil. Individuals aged ≥18 years with elevated testosterone levels and reported testosterone use were included. Testosterone test results were stratified according to sex-specific testosterone ranges. Fasting glucose, HbA1c, hematocrit, lipid profile, hs-CRP, and insulin were analyzed using Pearson correlation and one-way ANOVA, with significance defined as $p < 0.05$. Resultados e Conclusões: A total of 1,890 testosterone test results were analysed, of which 82.4% were male. Among men, 35.0% showed testosterone levels >2500 ng/dL and 12.7% exceeded 3400 ng/dL, while among women, 29.2% showed testosterone levels >250 ng/dL and 12.0% exceeded 500 ng/dL. Testosterone levels positively correlated with hematocrit ($r = 0.511$, $p < 0.001$) and inversely correlated with HbA1c ($r = -0.106$, $p < 0.001$), total cholesterol ($r = -0.092$, $p < 0.001$), and HDL cholesterol ($r = -0.370$, $p < 0.001$). In men, higher testosterone levels were associated with increased hematocrit ($F = 6.29$, $p = 0.002$; 50.7 ± 3.5 in >3400 ng/dL vs 49.8 ± 3.6 in 1440–2500 ng/dL and 49.9 ± 3.3 in 2500–3400 ng/dL) and lower HDL cholesterol levels ($F = 3.94$, $p = 0.020$; 38.5 ± 11.3 in >3400 ng/dL vs 41.0 ± 10.7 in 1440–2500 ng/dL and 40.8 ± 11.0 in 2500–3400 ng/dL). In women, testosterone levels were associated with hematocrit ($F = 7.29$, $p < 0.001$; 44.4 ± 3.0 in >500 ng/dL vs 43.1 ± 2.8 in 100–250 ng/dL and 42.0 ± 2.7 in 72–100 ng/dL) and hs-CRP levels ($F = 4.79$, $p = 0.005$). No significant differences were observed for glucose, insulin, LDL cholesterol, or triglycerides. Overall, supraphysiological testosterone exposure was strongly associated with increased hematocrit levels in both sexes and reduced HDL cholesterol levels in men, reinforcing potential cardiovascular risks associated with extreme androgen exposure.

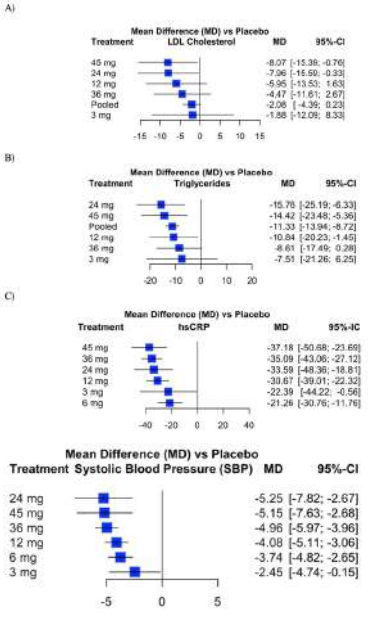
19291

CARDIOMETABOLIC EFFICACY AND SAFETY OF VARYING DOSAGES OF ORAL ORFORGLIPRON IN ADULTS WITH OVERWEIGHT, OBESITY, OR TYPE 2 DIABETES: A SYSTEMATIC REVIEW AND NETWORK META-ANALYSIS

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Introdução/Fundamentos: Orforglipron is an oral, non-peptide glucagon-like peptide-1 receptor agonist with promising metabolic effects in adults with overweight, obesity, or type 2 diabetes. However, the dose that best balances cardiometabolic efficacy and safety remains uncertain. Evidence to date has focused mainly on weight loss and glycaemic control, while dose-specific effects on cardiometabolic risk markers and tolerability have not been comprehensively synthesised. Objetivos: To compare the cardiometabolic efficacy and safety of different doses of oral orforglipron versus placebo and to identify the most favourable dose range. Métodos: We performed a systematic review and network meta-analysis of randomised controlled trials comparing different doses of oral orforglipron with placebo in adults with overweight, obesity, or type 2 diabetes. MEDLINE, Embase, and the Cochrane Central Register of Controlled Trials were searched from inception to April 6, 2026. Eligible studies reported at least one prespecified cardiometabolic or safety outcome. Continuous outcomes were analysed as mean differences and dichotomous outcomes as relative risks with 95% confidence intervals in a frequentist random-effects model. Treatments were ranked using the surface under the cumulative ranking curve (SUCRA). The protocol was prospectively registered in PROSPERO (CRD420261363012). Resultados e Conclusões: A total of 381 records were identified, 124 duplicates removed, and 8 full-text reports assessed; 5 studies (6 publications) including 5982 participants were included. All evaluated doses reduced systolic blood pressure versus placebo, with the greatest reduction observed at 24 mg. Improvements in lipid markers and high-sensitivity C-reactive protein showed a plateau at approximately 24–36 mg, while heart rate increased in a dose-dependent manner. Gastrointestinal tolerability worsened above 12 mg, and treatment discontinuation due to adverse events was higher with orforglipron than placebo (RR 2.53, 95% CI 1.84–3.48; p<0.001). Serious adverse events were not increased overall (RR 0.97, 95% CI 0.73–1.29; p=0.84). Overall, orforglipron improved cardiometabolic risk markers without increasing serious adverse events. Among evaluated doses, 24 mg showed the most favourable balance between efficacy and tolerability, although gastrointestinal side effects remain a limitation. Long-term outcome trials are needed to confirm whether surrogate improvements translate into reduced cardiovascular events and mortality.



20326

CARDIOVASCULAR BENEFITS OF FINERENONE IN PATIENTS WITH CHRONIC KIDNEY DISEASE AND TYPE 2 DIABETES MELLITUS: A SYSTEMATIC REVIEW.

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Introdução/Fundamentos: Patients with type 2 diabetes mellitus (DM2) associated with chronic kidney disease (CKD) have a substantially elevated cardiovascular risk, contributing to increased morbidity and mortality in this population. In this context, finerenone, a non-steroidal antagonist of the mineralocorticoid receptor, has emerged as a promising therapeutic option in reducing cardiovascular outcomes. Objetivos: The objective is to evaluate, through a systematic review, the available evidence on the cardiovascular benefits of finerenone in patients with chronic kidney disease (CKD) associated with type 2 diabetes mellitus (DM2). Métodos: A systematic review was conducted in the PubMed, SciELO, and LILACS databases, including randomized clinical trials, combined analyses, and meta-analyses that investigated cardiovascular outcomes in patients with type 2 diabetes mellitus (DM2) and chronic kidney disease (CKD) treated with finerenone. The main outcomes evaluated were major cardiovascular events (MACE), hospitalization for heart failure, and cardiovascular mortality. The descriptors used were: "finerenone," "diabetes mellitus," "chronic kidney disease," and "cardiovascular mortality." The search period was from September 2025 to January 2026. The PRISMA 2020 workflow was used to select articles, along with the Rayyan QCRI platform. Three independent researchers evaluated the articles in a blinded manner. Resultados e Conclusões: After analysis according to inclusion and exclusion criteria, reading of abstracts or full text, and exclusion of duplicate articles, 11 studies were selected according to the PRISMA 2020 flowchart. Phase III studies, such as FIDELIO-DKD and FIGARO-DKD, were included, in addition to the combined FIDELITY analysis, totaling more than 13,000 patients. The use of finerenone was associated with a significant reduction in the risk of composite cardiovascular outcomes, notably a decrease in hospitalizations for heart failure. Regarding safety, a higher incidence of hyperkalemia was observed, generally manageable through adequate laboratory monitoring.Available evidence indicates that finerenone provides consistent cardiovascular benefit in patients with CKD and type 2 diabetes, establishing itself as an effective additional therapeutic strategy in reducing cardiorenal risk in a high-risk population.

18068

CARDIOVASCULAR EVENTS AND MORTALITY IN OBESE PATIENTS RECEIVING BARIATRIC SURGERY: A MULTI-CENTER RETROSPECTIVE COHORT

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Introdução/Fundamentos: Obesity is a major driver of cardiovascular morbidity and mortality worldwide. Although bariatric surgery (BS) produces sustained weight loss and metabolic improvement, its real-world impact on major cardiovascular events and survival at scale remains incompletely defined. Objetivos: To evaluate the association between BS and cardiovascular events and mortality in obese patients. Métodos: This retrospective, propensity-score-matched (PSM) cohort study was completed using the TriNetX database, which includes data from 93 different large healthcare organizations with over 132 million patient records. Primary outcomes included all-cause mortality (ACM) and major adverse cardiac events (MACEs). Secondary outcomes included the assessment of acute myocardial infarction (MI), arrhythmias, heart failure (HF), ischemic cardiomyopathy (ICM), ischemic stroke (IS), and thromboembolic events. Risk ratios (RRs) and (HRs) with 95% confidence intervals (CI) were calculated using TriNetX analytical tools. Resultados e Conclusões: The TriNetX database yielded a total of 244,070 patients (122,035 underwent BS; 122,035 for control group) after PSM. BS was associated with a consistent reduction in MACEs (RR 0.92, 95% CI 0.88–0.96; HR 0.84, 95% CI 0.81–0.88) and ACM (RR 0.83, 95% CI 0.79–0.86; HR 0.75, 95% CI 0.71–0.78) when compared with non-surgical controls. The incidence of acute MI was significantly lower in the surgical group (RR 0.71, 95% CI 0.66–0.76; HR 0.66, 95% CI 0.62–0.70), as were HF (RR 0.86, 95% CI 0.83–0.90; HR 0.81, 95% CI 0.77–0.84), atrial fibrillation/flutter (RR 0.90, 95% CI 0.85–0.94; HR 0.83, 95% CI 0.79–0.88), ventricular arrhythmias (RR 0.78, 95% CI 0.72–0.85; HR 0.72, 95% CI 0.67–0.79), and ICM (RR 0.76, 95% CI 0.67–0.85; HR 0.70, 95% CI 0.62–0.79). BS was also associated with a modest reduction in ischemic stroke (RR 0.95, 95% CI 0.89–1.02; HR 0.89, 95% CI 0.83–0.95). In contrast, no significant differences were observed for venous thromboembolic outcomes, including pulmonary embolism (RR 0.99, 95% CI 0.92–1.08; HR 0.93, 95% CI 0.86–1.01) and deep vein thrombosis (RR 1.08, 95% CI 1.01–1.17; HR 1.02, 95% CI 0.94–1.09). BS was associated with substantial reductions in MACEs, ACM, and other cardiovascular events among patients with obesity. These findings support the role of BS as a powerful intervention not only for its metabolic benefit but also for long-term cardiovascular risk reduction and survival benefit.

Cardiovascular and Mortality Outcomes in Bariatric Surgery vs. Non-Surgical Controls

Outcome	Incidence (n/N, %)		Risk Ratio (RR)	Hazard Ratio
	Bariatric Surgery	Controls	(95% CI)	(HR)(95% CI)
Acute Myocardial Infarction	1,498/119,677 (1.3%)	2,075/117,398	0.71 (0.66–0.76)	0.66 (0.62–0.70)
Heart Failure	3,725/113,915 (3.3%)	4,159/109,674	0.86 (0.83–0.90)	0.81 (0.77–0.84)
Atrial Fibrillation / Flutter	2,898/114,014 (2.5%)	3,190/112,726	0.90 (0.85–0.94)	0.83 (0.79–0.88)
Ventricular Arrhythmias	1,024/120,649 (0.8%)	1,298/119,630	0.78 (0.72–0.85)	0.72 (0.67–0.79)
Ischemic Cardiomyopathy	470/121,280 (0.4%)	619/120,574	0.76 (0.67–0.85)	0.70 (0.62–0.79)
Ischemic Stroke	1,631/119,363 (1.4%)	1,684/117,708	0.95 (0.89–1.02)	0.89 (0.83–0.95)
3P-MACE	4,050/115,524 (3.5%)	4,233/111,196	0.92 (0.88–0.96)	0.84 (0.81–0.88)
Pulmonary Embolism	1,177/119,311 (1.0%)	1,174/118,327	1.00 (0.92–1.08)	0.93 (0.86–1.01)
Deep Vein Thrombosis	1,525/118,625 (1.3%)	1,393/117,457	1.08 (0.92–1.08)	1.02 (0.94–1.09)
All-Cause Mortality	3,711/119,970 (3.1%)	4,478/119,722	0.83 (0.79–0.86)	0.75 (0.71–0.78)

17996

CARDIOVASCULAR EVENTS AND MORTALITY IN OBESE PATIENTS RECEIVING GLUCAGON-LIKE PEPTIDE-1 RECEPTOR AGONISTS: A MULTI-CENTER RETROSPECTIVE COHORT

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Introdução/Fundamentos: Glucagon-like peptide-1 receptor agonists (GLP-1As) have demonstrated cardiometabolic benefits in patients with obesity; however, their real-world impact on cardiovascular outcomes and mortality in large, diverse populations remains incompletely characterized. Objetivos: To evaluate the association between GLP-1A therapy and cardiovascular events and mortality in obese patients. Métodos: This retrospective, propensity-score-matched (PSM) cohort study was completed using the TriNetX database, which includes data from 93 different large healthcare organizations with over 132 million patient records. Primary outcomes included all-cause mortality (ACM) and major adverse cardiac events (MACEs). Secondary outcomes included the assessment of acute myocardial infarction (MI), atrial arrhythmias, heart failure (HF), ischemic stroke (IS), and thromboembolic events. Risk ratios (RRs) and (HRs) with 95% confidence intervals (CI) were calculated using TriNetX analytical tools. Resultados e Conclusões: The TriNetX database yielded a total of 327,351 GLP-1As users before PSM, with 226,054 patients being matched for each arm (users and non-users). GLP-1A utilization was associated with a reduced risk of: MACE (RR 0.45, 95% CI 0.44–0.47; HR 0.95, 95% CI 0.92–0.98); ACM (RR 0.32, 95% CI 0.31–0.33; HR 0.69, 95% CI 0.66–0.71); acute MI (RR 0.44, 95% CI 0.42–0.46; HR 0.90, 95% CI 0.86–0.94); IS (RR 0.48, 95% CI 0.45–0.50; HR 0.95, 95% CI 0.91–1.00); HF (RR 0.48, 95% CI 0.46–0.49; HR 0.97, 95% CI 0.94–1.00); atrial fibrillation/flutter (RR 0.44, 95% CI 0.42–0.46; HR 0.88, 95% CI 0.84–0.91); pulmonary embolism (RR 0.45, 95% CI 0.41–0.48; HR 0.88, 95% CI 0.82–0.95); and deep vein thrombosis (RR 0.45, 95% CI 0.42–0.47; HR 0.86, 95% CI 0.81–0.92). In this large, multicenter retrospective cohort, GLP-1A therapy in obese patients was associated with substantial reductions in MACEs, ACM, thromboembolic complications and many cardiovascular events. Consistent findings across RR and HR analyses reinforce the cardioprotective benefits of GLP-1As in real-world clinical practice and reinforce their use as a cornerstone therapy in high-risk obese populations.

Cardiovascular and Mortality Outcomes (PSM Cohort)

Outcome	GLP-1 RA (n/N, %)	Control (n/N, %)	Risk Ratio (95% CI)	Hazard Ratio (95% CI)
3P-MACE	5,416/208,858 (2.6%)	11,515/201,537 (5.7%)	**0.45** (0.44–0.47)	**0.95** (0.92–0.98)
Acute Myocardial Infarction	2,694/218,233 (1.2%)	5,993/214,974 (2.8%)	**0.44** (0.42–0.46)	**0.90** (0.86–0.94)
Ischemic Stroke	2,312/218,992 (1.1%)	4,785/215,748 (2.2%)	**0.48** (0.45–0.50)	**0.95** (0.91–1.00)
Heart Failure	5,905/205,924 (2.9%)	12,076/201,096 (6.0%)	**0.48** (0.46–0.49)	**0.97** (0.94–1.00)
Atrial Fibrillation / Flutter	3,981/210,184 (1.9%)	8,965/207,811 (4.3%)	**0.44** (0.42–0.46)	**0.88** (0.84–0.91)
Pulmonary Embolism	1,104/221,844 (0.5%)	2,470/220,866 (1.1%)	**0.45** (0.41–0.48)	**0.88** (0.82–0.95)
Deep Vein Thrombosis	1,420/221,056 (0.6%)	3,151/219,093 (1.4%)	**0.45** (0.42–0.47)	**0.86** (0.81–0.92)
All-Cause Mortality	4,056/224,188 (1.8%)	12,570/222,602 (5.6%)	**0.32** (0.31–0.33)	**0.69** (0.66–0.71)

19533

CARDIOVASCULAR IMPACT OF ELECTRONIC CIGARETTES: A SYSTEMATIC REVIEW OF VASCULAR AND HEMODYNAMIC EFFECTS

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(1) AFYA MANACAPURU - MANACAPURU - AM - BRASIL;

Introdução/Fundamentos: Electronic Nicotine Delivery Systems (ENDS) have been promoted as safer alternatives to conventional cigarettes. However, growing evidence indicates that their aerosols contain nicotine, heavy metals, and oxidative compounds capable of inducing significant cardiovascular changes. With the increasing popularity of e-cigarettes, especially among young individuals, understanding their cardiovascular effects is essential to support preventive strategies and public health policies. Objetivos: To systematically review the scientific evidence on the cardiovascular impacts of e-cigarette use, focusing on hemodynamic changes, endothelial dysfunction, and vascular stiffness. Métodos: A systematic review was conducted following PRISMA guidelines. Searches were performed in PubMed, Virtual Health Library (VHL), and SciELO using the descriptors “Electronic Cigarettes,” “Cardiovascular System,” and “Vascular Stiffness,” combined with Boolean operators. A total of 230 studies were identified. Notably, no studies meeting the inclusion criteria were found in SciELO. After removing duplicates and applying eligibility criteria, clinical trials, observational studies, and meta-analyses published within the last five years were considered. Narrative reviews, duplicate studies, those with insufficient data, and studies lacking specific cardiovascular outcomes were excluded. Study selection was independently conducted by two blinded reviewers, with disagreements resolved by a third evaluator. Ultimately, 21 studies were included in the qualitative analysis. Resultados e Conclusões: Among the 21 included studies, 16 reported significant increases in heart rate and blood pressure following e-cigarette exposure. Fourteen studies identified endothelial dysfunction and increased arterial stiffness, suggesting early vascular impairment. Additionally, 12 studies associated ENDS use with increased oxidative stress, vascular inflammation, and platelet activation—mechanisms directly linked to atherosclerosis and thrombotic events. The consistency of findings across different populations and study designs strengthens the association between e-cigarette use and relevant cardiovascular risk. These results challenge the “harm reduction” narrative and indicate that ENDS may contribute to early vascular injury and progression of cardiovascular disease, highlighting the need for stricter regulation and clinical monitoring of users.

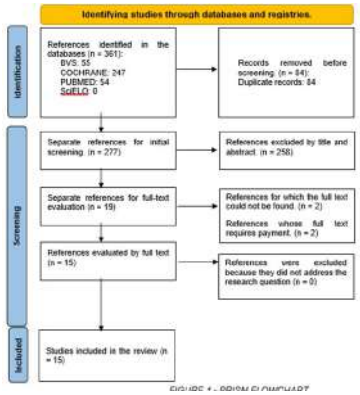
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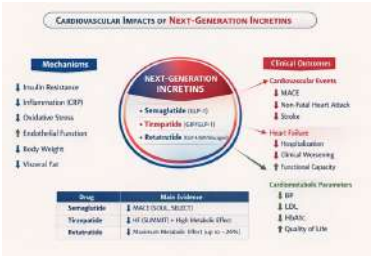
CARDIOVASCULAR IMPACT OF NEXT-GENERATION INCRETIN THERAPIES (SEMAGLUTIDE, TIRZEPATIDE, AND RETATRUTIDE) IN PATIENTS WITH TYPE 2 DIABETES AND/OR OBESITY: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Obesity and type 2 diabetes (T2D) are associated with an increased risk of major adverse cardiovascular events (MACE), mediated by chronic inflammation, insulin resistance, and endothelial dysfunction. In this context, next-generation incretin agonists have emerged as therapies capable of reducing cardiometabolic risk beyond glycemic and weight control. Objetivos: To evaluate the cardiovascular impact of semaglutide, tirzepatide, and retatrutide in patients with T2D and/or obesity, focusing on MACE and heart failure (HF). Métodos: A systematic review was conducted according to PRISMA guidelines. PubMed, BVS, and Cochrane databases were searched for randomized clinical trials evaluating cardiovascular outcomes between 2021 and April 2026. Study selection was performed using Rayyan by two independent reviewers, and data were qualitatively synthesized. Resultados e Conclusões: A total of 277 records were identified, of which 15 studies were included in the qualitative analysis, comprising 39,459 patients. Semaglutide demonstrated a consistent reduction in MACE, notably in the SOUL trial (12.0% vs. 13.8%; HR 0.86; 95% CI 0.77–0.96; p=0.006), as well as reduction in nonfatal myocardial infarction (HR 0.74) and peripheral ischemic events (HR 0.71). In the SELECT study, a 20% reduction in MACE (HR 0.80) was observed, independent of glycemic control. In patients with HFpEF, semaglutide (STEP-HFpEF) improved quality of life (+7.8 points in KCCQ; p<0.001) and functional capacity (+20.3 m), with reduced heart failure events (HR 0.08, exploratory analysis). In the SUMMIT trial, tirzepatide demonstrated a reduction in the composite outcome of cardiovascular death or worsening HF (9.9% vs. 15.3%; HR 0.62; p=0.026), as well as in HF hospitalizations (HR 0.44), and was associated with significant functional improvement. In obesity studies (SURMOUNT-1 and SURMOUNT-5), it promoted weight reduction of up to 20.9%, with improvement in cardiovascular risk factors, without MACE during follow-up. Retatrutide demonstrated weight reduction of up to 24.2% and improved cardiometabolic parameters, without increased adverse cardiovascular events (4% in both groups), although major outcomes have not yet been evaluated. These findings consolidate incretin-based therapies as a transformative strategy for reducing cardiovascular risk.





18136

CARDIOVASCULAR RISK UNDERESTIMATION BY THE 2019 WHO CHARTS: THE IMPACT OF LOW HDL AND METABOLIC SYNDROME IN A BRAZILIAN HIGH-RISK POPULATION

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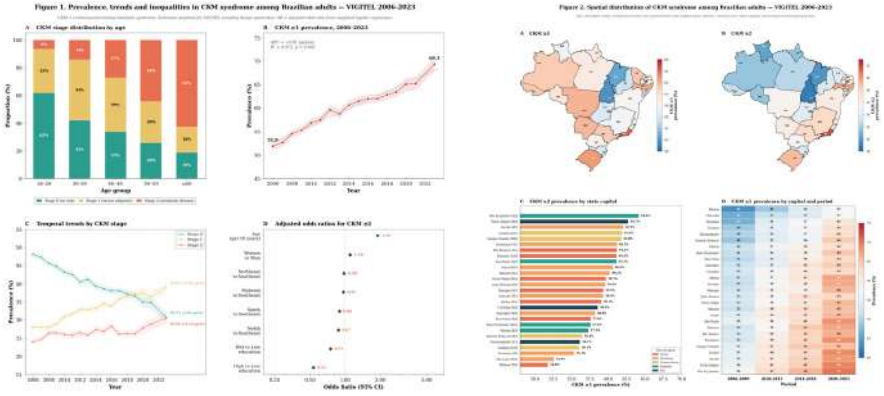
Introdução/Fundamentos: The 2019 WHO cardiovascular risk charts remain the default stratification tool in resource-limited settings and are still widely used in Brazil's public health system, even following the 2025 SBC Guideline's shift from the Framingham Global Risk Score (FGRS) to the PREVENT score. A notable limitation is the omission of HDL-cholesterol, particularly consequential where low HDL, a hallmark of metabolic syndrome (MetS), is highly prevalent. Whether this structural gap causes clinically meaningful misclassification, and whether it disproportionately affects patients with MetS, has not been systematically evaluated in Brazil. Objetivos: To evaluate the independent association of low HDL-cholesterol and MetS with cardiovascular risk underestimation by the 2019 WHO charts, and to examine whether a reduced threshold (≥10%) preferentially recovers misclassified patients with this metabolic phenotype. Métodos: Cross-sectional study of 140 adults (aged 40–74 years) at a tertiary care center. Underestimation was defined as FGRS ≥20% combined with WHO standard risk <20%. MetS was defined by IDF 2006 criteria. HDL was compared by Mann-Whitney U test; sex-specific low HDL (men <40 mg/dL; women <50 mg/dL) by Fisher's exact test; MetS-underestimation association by chi-square. Multivariate logistic regression identified independent predictors. Reclassification rates using WHO ≥10% were stratified by MetS status. Resultados e Conclusões: MetS was present in 75.7% of patients (n=106) and 35.7% were underestimated (n=50). Mean HDL was lower in the underestimated group (35.7±10.3 vs. 46.6±19.5 mg/dL; p<0.001). Multivariate analysis identified four independent predictors. Male sex carried the strongest association (OR=8.30; 95%CI 2.97–23.21; p<0.001), followed by MetS (OR=4.71; 95%CI 1.39–15.97; p=0.013) and low HDL (OR=3.68; 95%CI 1.45–9.36; p=0.006). Older age was independently associated (OR=1.14/year; 95%CI 1.08–1.21; p<0.001), with underestimated patients averaging 8 years older (64.3±7.4 vs. 56.2±9.2 years). With the adjusted threshold, 36 of 50 were reclassified as high risk, 91.7% of whom had MetS (n=33). These findings suggest the 2019 WHO charts carry a systematic blind spot for patients with MetS and low HDL, a phenotype that accounts for the majority of Brazil's cardiovascular burden. A simple threshold adjustment to ≥10% recovered more than two-thirds of misclassified patients, nearly all with MetS, offering a pragmatic, no-cost adaptation where more sophisticated tools are unavailable.

15311

CARDIOVASCULAR-KIDNEY-METABOLIC SYNDROME AFFECTS 60% OF BRAZILIAN ADULTS AND ROSE 17 PERCENTAGE POINTS OVER 17 YEARS: A POPULATION-BASED ANALYSIS OF 735,130 PARTICIPANTS (VIGITEL, 2006–2023)

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Introdução/Fundamentos: Cardiovascular-kidney-metabolic (CKM) health has emerged as a key driver of cardiovascular disease burden since American Heart Association (AHA) formalized its staging framework in 2023, yet no population-level study has applied it in Latin America, reflecting a critical epidemiological gap. Objetivos: To estimate the prevalence, temporal trends, and spatial distribution of CKM syndrome across 27 Brazilian capitals, and identify factors associated with metabolic-stage CKM syndrome. Métodos: Cross-sectional study using 2006-2023 VIGITEL data. We analyzed 735,130 adults (≥18 years) from 17 waves (2006–2023) with valid BMI data. CKM staging was adapted from AHA 2023 framework: Stage 0 (no risk), Stage 1 (BMI ≥25 kg/m² without metabolic disease), and Stage 2 (self-reported hypertension and/or diabetes). Weighted prevalences with 95% CI were calculated using post-stratification raking weights. Temporal trends were assessed via survey-weighted logistic regression. Spatial autocorrelation was tested using Moran's I and LISA. Multivariable logistic regression identified factors associated with CKM ≥2. Ethics approval was waived per Resolution CNS 510/2016. Resultados e Conclusões: Overall, 60.2% (95% CI: 59.9–60.5) of adults met criteria for CKM ≥1: 33.4% at Stage 1 (excess adiposity) and 26.8% at Stage 2 (metabolic disease). Prevalence increased from 51.9% in 2006 to 69.3% in 2023 (+0.91 pp/year; R^2=0.973; p< 0.001), with a steeper rise among women (+1.06 vs +0.75 pp/year) and young adults aged 18–29 (+0.97 pp/year). A marked age gradient was observed: 38.2% at 18–29 years rising to 81.1% at ≥60 years. Educational disparities were pronounced, with a prevalence of 71.0% among those with ≤8 years of schooling versus 53.3% with higher education (p< 0.001). Spatial analysis demonstrated significant clustering (Moran's I=0.238; p= 0.024), ranging from 51.8% in Palmas to 64.2% in Rio de Janeiro across 27 capitals. Stage 0 prevalence declined from 48,1% to 30.7% (- 0.91 pp/year), while Stage 1 rose from 28.0% to 38.9% (+ 0.68 pp/year), indicating an ongoing epidemiological transition. In multivariable regression, age (aOR=1.99 per 10 years), female sex (aOR=1.07), and lower education were independently associated with CKM ≥2. CKM syndrome has become a majority-level condition among Brazilian adults, with a sustained generational shift that demands integrated cardiometabolic prevention strategies to mitigate the future burden of end-stage cardiovascular and renal diseases in middle-income countries.

19012

CLINICAL IMPACT OF OMEGA-3 FORMULATIONS AND DOSAGE ON CARDIOVASCULAR OUTCOMES: A SYSTEMATIC REVIEW AND RISK OF BIAS ASSESSMENT (2018–2026).

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Introdução/Fundamentos: The cardiovascular (CV) efficacy of Omega-3 supplementation is a subject of intense debate. This study synthesizes evidence from landmark trials to clarify how formulation (purified EPA vs. mixtures) and dosage influence Major Adverse Cardiovascular Events (MACE) and safety profiles. Objetivos: To compare the efficacy and safety of purified EPA versus EPA+DHA mixtures on major cardiovascular events (MACE) and atrial fibrillation (AF) risk. Métodos: A systematic review was conducted following PRISMA guidelines using clinical datasets (up to 2026) from PubMed and Cochrane. The descriptors (Decs/MeSH) used were "Fatty Acids, Omega-3", "Eicosapentaenoic Acid", "Cardiovascular Diseases" and "Atrial Fibrillation". RCTs reporting MACE and incident atrial fibrillation (AF) were included. Selection was performed through peer review. Due to clinical and methodological heterogeneity, a narrative review was conducted. Quality assessment was performed using the Cochrane Risk of Bias (RoB 2) tool. Resultados e Conclusões: Were found 9,588 records and used 4 landmark trials that met all inclusion criteria. High-dose purified EPA (REDUCE-IT, 4g/day) significantly reduced MACE by 25% (p < 0.001), although it presented "some concerns" in RoB assessment due to the mineral oil comparator. Conversely, high-dose EPA+DHA mixtures (STRENGTH, 4g/day) were clinically neutral (p=0.84) and categorized as low risk of bias. Standard-dose supplementation (VITAL, 1g/day) demonstrated absolute neutrality, with no significant reduction in MACE (p=0.24) and no increased risk of incident AF (p=0.19), maintaining a low risk of bias across all domains. Safety data indicates that arrhythmic signals (AF) are dose-dependent (observed at 4g/day but not at 1g/day). In conclusion, cardiovascular benefits are exclusively associated with high-dose purified EPA. While high doses of any formulation may carry an arrhythmic risk, standard doses (1g/day) as seen in VITAL are safe but ineffective for MACE reduction. These findings support a precision-medicine approach to Omega-3 prescription based on specific clinical goals.

16360

COMPARATIVE ANALYSIS OF FINERENONE VERSUS SGLT2 INHIBITORS IN CARDIOVASCULAR PROTECTION IN PATIENTS WITH CHRONIC KIDNEY DISEASE: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Chronic kidney disease (CKD) is closely linked to an elevated cardiovascular risk, requiring therapeutic strategies that go beyond glycemic and blood pressure control. Farinone, a selective non-steroidal mineralocorticoid receptor (MR) antagonist, and sodium-glucose cotransporter 2 (SGLT2) inhibitors have emerged as cornerstones of cardiorenal protection, acting through distinct yet complementary pathophysiological mechanisms. While finerenone focuses on reducing MR-mediated inflammation and fibrosis, SGLT2Is primarily act to restore tubuloglomerular feedback and provide hemodynamic and metabolic benefits. Objetivos: A comparison of the cardiovascular efficacy, mechanisms of action, and safety of finerenone versus SGLT2 inhibitors in patients with CKD, while also evaluating the potential of combination therapy. Métodos: An systematic review was conducted following the PRISMA flowchart recommendations, encompassing the stages of identification, screening, eligibility, and inclusion of studies. The search was performed in the PubMed, Cochrane, and LILACS databases. Resultados e Conclusões: Results: Fineronone demonstrated a 14% reduction in the composite cardiovascular outcome, driven primarily by a 22% decrease in hospitalizations for heart failure (HF). Its benefit is particularly robust in patients with elevated albuminuria, preventing adverse cardiac remodeling and diastolic dysfunction. On the other hand, iSGLT2 inhibitors show a 17% reduction in cardiovascular death and a 30% reduction in hospitalization for HF (p<0.05; RR 0.70). Although there are no direct head-to-head trials, network meta-analyses suggest comparable efficacy for major adverse cardiovascular events (MACE). In terms of safety, finerenone is associated with an increased risk of hyperkalemia (10.8% vs. 5.3% with placebo), while iSGLT2 inhibitors show a reduced risk of acute kidney injury and hypoglycemic events (p<0.05; RR 0.93). Recent data indicate that adding finerenone to iSGLT2s may reduce all-cause mortality by 63% (HR 0.37), suggesting a significant additive cardioprotective effect. Conclusions: Both finerenone and iSGLT2s are effective in reducing cardiovascular events in patients with CKD. iSGLT2s show superiority in preventing hospitalization for HF, while finerenone offers an essential pathway for blocking fibrosis and inflammation, especially in patients with persistent albuminuria. Combination therapy is a rational and promising strategy for the comprehensive management of patients with chronic kidney diseas

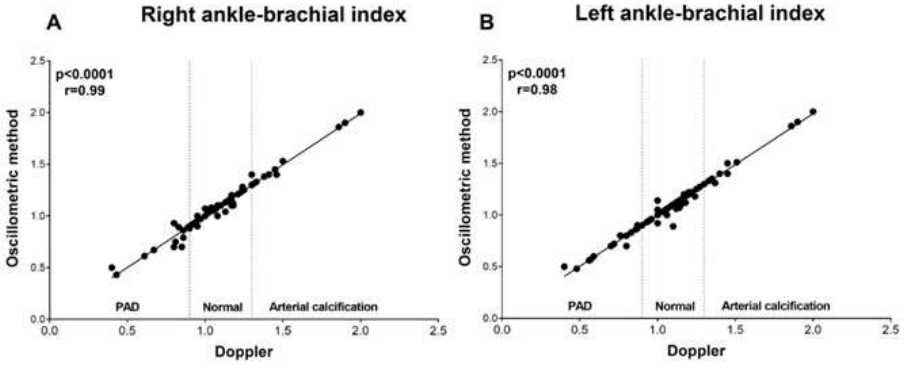
14731

COMPARISON OF ANKLE-BRACHIAL INDEX VALUES OBTAINED BY POINT-OF-CARE ULTRASOUND AND THE OSCILLOMETRIC METHOD IN HEMODIALYSIS PATIENTS

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Introdução/Fundamentos: Peripheral arterial disease (PAD) increases mortality risk in the dialysis unit. While the ankle-brachial index (ABI) serves as a classic, non-invasive screening standard, its traditional oscillometric application has a blind spot: it relies purely on pressure readings. Point-of-care ultrasound (POCUS), however, addresses this issue. It allows clinicians to visually assess vascular damage, providing an immediate morphological assessment of stiffened arteries at the bedside. Objetivos: To determine whether ABI values derived from modern POCUS align with the traditional oscillometric method in an end-stage renal disease cohort. Métodos: In this cross-sectional study of 85 hemodialysis patients, bilateral systolic blood pressures (brachial, posterior tibial, and dorsalis pedis) were measured after a five-minute rest. To determine the ABI, investigators applied two concurrent techniques: a portable POCUS device (pulsed Doppler mode with a linear transducer) and the traditional oscillometric approach (stethoscope and sphygmomanometer). Concordance between the methods was subsequently evaluated using Spearman's rank correlation. Resultados e Conclusões: The cohort exhibited a high prevalence of vascular disease, nearly a quarter of the cohort (24.7%) presenting an ABI indicative of PAD (≤ 0.9), and 22.4% showing severe arterial calcification (≥ 1.3). Despite this high degree of arterial calcification, results demonstrated a strong correlation between ABI values obtained through the oscillometric method and POCUS (p<0.0001, r>0.98; Figure 1). This high correlation suggests that the low-cost, accessible oscillometric technique remains reliable for routine ABI assessment in hemodialysis patients. However, POCUS offers the clinical benefit of directly visualizing arterial calcifications, which are very common in this group. It provides a detailed morphological assessment along with physiological information screening.



19352

COMPARISON OF THE EFFICACY AND SAFETY OF EZETIMIBE, INCLISIRAN, AND BEMPEDOIC ACID AS ADJUNCTIVE THERAPY TO STATINS FOR REDUCING LDL CHOLESTEROL IN PATIENTS WITH HYPERCHOLESTEROLEMIA: A SYSTEMATIC REVIEW.

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Introdução/Fundamentos: Hypercholesterolemia, characterized by elevated LDL levels, is a significant risk factor for cardiovascular disease. Although statins are the first-line treatment, adjuvant therapies such as ezetimibe, inclisiran, and bempedoic acid are recommended when statins fail to achieve therapeutic goals or are poorly tolerated. The aim of this study was to compare the efficacy and safety of these adjuvant therapies, when combined with statins, in reducing LDL cholesterol in patients with hypercholesterolemia. Objetivos: Evaluate the efficacy and safety of the adjuvants ezetimibe, inclisiran, and bempedoic acid, when associated with statins, for the reduction of LDL cholesterol in patients with hypercholesterolemia. In addition, it seeks to guide clinical practice regarding the most appropriate therapeutic choice, contributing to better management of hypercholesterolemia and to the reduction of associated cardiovascular events. Métodos: A systematic review was conducted using PubMed, BVS, and Cochrane Library, following the PRISMA 2020 guidelines and using the RoB 2.0 tool to assess the risk of bias. Randomized clinical trials were selected that compared ezetimibe, inclisiran, and bempedoic acid in combination with statins. The primary outcome was the reduction of LDL-c levels, with additional analysis of adverse events. Resultados e Conclusões: 255 studies were identified, with inclusion of 10 randomized clinical trials. Combination therapies showed consistent superiority over statin monotherapy. Studies with ezetimibe demonstrated significant additional LDL-c reductions, including >50% when combined with pitavastatin, while combinations with rosuvastatin had comparable efficacy to higher doses alone, with less drug exposure. The triple combination (atorvastatin + ezetimibe + bempedoic acid) had the greatest impact, with >90% of patients achieving reductions >50% and LDL-c <70 mg/dL. Inclisiran showed sustained LDL-c reductions of approximately 47–50% with semi-annual administration. Bempedoic acid reduced LDL-c by 21–28%, especially in statin-intolerant patients. Regarding safety, all studies reported low rates of serious adverse events, with no significant increase versus monotherapy. Tolerability was particularly favorable for inclisiran and bempedoic acid. Combination therapies are effective and safe alternatives, especially for patients who struggle to achieve targets with statins. However, further long-term studies are needed to consolidate their role in hypercholesterolemia treatment.

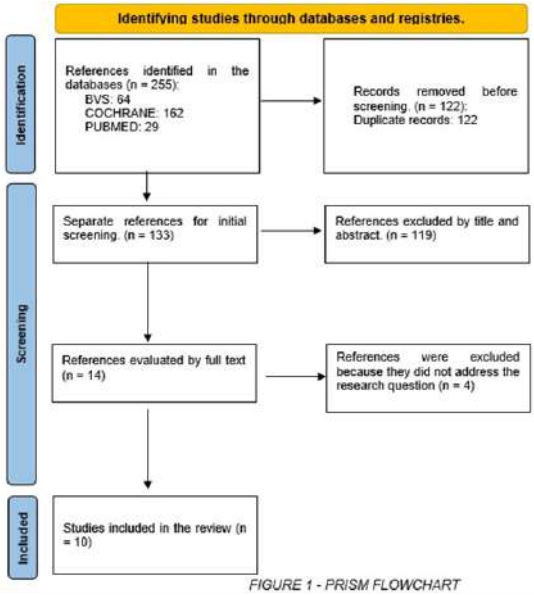


FIGURE 1 - PRISM FLOWCHART

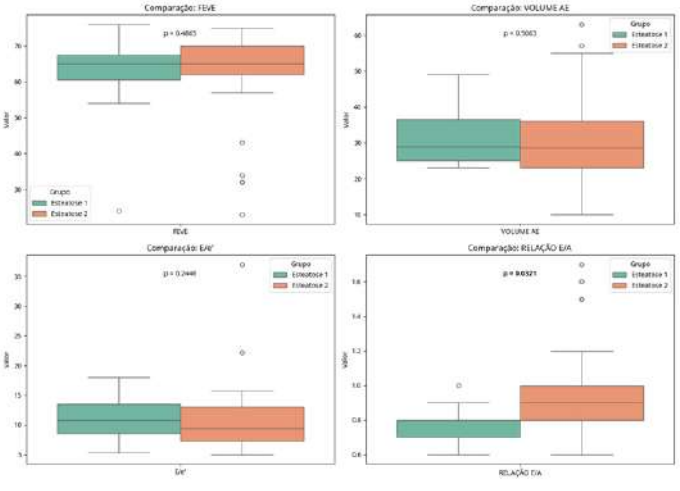
20009

CORRELATION BETWEEN DIASTOLIC DYSFUNCTION AND DIFFERENT DEGREES OF HEPATIC STEATOSIS: A CROSS-SECTIONAL ANALYSIS OF PATIENTS FOLLOWED AT A TERTIARY CARE HOSPITAL

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Introdução/Fundamentos: Metabolic Dysfunction–Associated Steatotic Liver Disease (MASLD) is currently one of the leading causes of chronic liver disease worldwide and is characterized by the presence of hepatic steatosis associated with criteria for metabolic syndrome.Recent evidence has suggested that MASLD may also be associated with subclinical cardiovascular abnormalities detectable on echocardiography. Objetivos: This study aimed to evaluate alterations in diastolic function parameters among patients with hepatic steatosis who underwent transthoracic echocardiography. Métodos: A cross-sectional analytical study was conducted including 72 patients diagnosed with MASLD and followed at the Metabolic Syndrome outpatient clinic of a tertiary care hospital. Hepatic elastography and abdominal ultrasound were used to stratify steatosis severity into two distinct groups according to controlled attenuation parameter (CAP) values, using a cutoff of 268 dB/m: Group 1 (mild steatosis, n = 23) and Group 2 (moderate/severe steatosis, n = 49). Echocardiographic variables related to the diastolic phase of the cardiac cycle were assessed, including degree of diastolic dysfunction (DD), E/e' ratio, E/A ratio, left atrial volume (LAV), and left ventricular ejection fraction (LVEF). Inclusion criteria comprised age ≥18 years and a previous diagnosis of MASLD. Exclusion criteria included inability to undergo hepatic elastography, abdominal ultrasound, or echocardiography, as well as isolated liver cirrhosis. Resultados e Conclusões: Categorical variables were analyzed using the Chi-square test, whereas numerical variables were assessed using the Mann–Whitney U test. Comparison of numerical variables (LVEF, LAV, E/e' ratio, and DD) between groups did not demonstrate statistically significant differences in any parameter (p > 0.05). However, analysis of the E/A ratio revealed a statistically significant difference between groups (p = 0.0321), with Group 2 presenting slightly higher values. These findings are summarized in Table 1. Overall, most of the echocardiographic parameters previously associated with MASLD in the literature were not significantly correlated with steatosis severity in the present sample, except for the E/A ratio. This finding may be partly explained by the relatively limited sample size. Nevertheless, the results suggest that the E/A ratio may represent one of the earliest markers of cardiac involvement in patients with advanced hepatic steatosis.



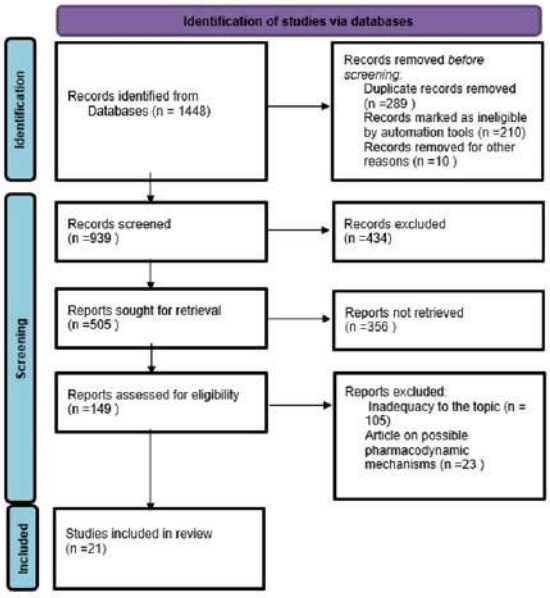
15841

DIFFERENCE IN OUTCOME REDUCTION BETWEEN GLP-1 ANALOGS IN PATIENTS WITH PREVIOUS CARDIOVASCULAR EVENT: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Glucagon-like peptide-1 (GLP-1) analogs have emerged in the last two decades as an important therapeutic strategy in the treatment of type 2 diabetes mellitus (T2DM), especially after the demonstration of additional cardiovascular benefits beyond glycemic control. These drugs have come to occupy a central role in cardiometabolism with growing evidence demonstrating a favorable impact on cardiovascular parameters, including anti-inflammatory and anti-atherogenic effects. Objetivos: To conduct a systematic review addressing the different types of GLP-1 analogs according to their cardiovascular benefits. Métodos: This systematic review was developed according to the PRISMA flowchart. The review protocol was registered in the Open Science Framework. The search for articles was conducted in the electronic databases PubMed (MEDLINE), LILACS, and Cochrane Central Register of Controlled Trials (Cochrane Library), using the MeSH descriptors: “GLP-1 Analogs”, “Cardiovascular Disease”, and “Cardiovascular Mortality”.1448 articles were found published in the PubMed, SciELO, Cochrane Library, and LILACS platforms. After evaluating the articles, we selected 21 studies for our systematic review. The quality of the Randomized Controlled Trials was assessed using the revised Cochrane tool for risk of bias in randomized trials (RoB2). Resultados e Conclusões: In the recent STEP HFpEF DM study, which evaluated the efficacy of semaglutide in patients with heart failure with preserved ejection fraction (HFpEF) related to obesity and type 2 diabetes, a reduction in time to the first heart failure event was observed in the intervention group, but as a secondary outcome. In a large clinical study, liraglutide reduced cardiovascular events (non-fatal myocardial infarction or non-fatal stroke) and cardiovascular mortality compared to placebo in patients with at least one cardiovascular disease or cardiovascular risk factor.The results of the Select study demonstrated a 19% reduction in all-cause mortality (95% CI 0.71–0.93), a 28% reduction in non-fatal myocardial infarction (95% CI 0.61–0.75), a 23% reduction in coronary artery bypass graft procedures (95% CI 0.68–0.87), and a 22% reduction in nephropathy progression.Randomized clinical trials and prospective studies have indicated improved clinical, metabolic, and quality of life outcomes in this patient profile, suggesting a potential therapeutic role for GLP-1 agonists in this context.



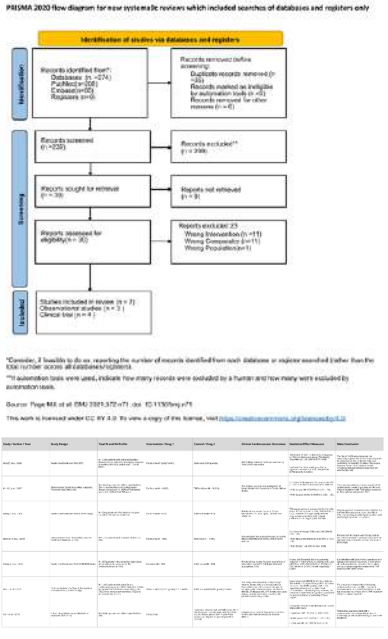
18936

EFFECT OF ANTI-TNF AND ANTI-IL-6 THERAPY ON THE CARDIOVASCULAR RISK OF PATIENTS WITH RHEUMATOID ARTHRITIS: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Rheumatoid arthritis (RA) confers a high cardiovascular (CV) risk. Biologic therapies like Tumor Necrosis Factor (TNF) and Interleukin-6 (IL-6) inhibitors are essential for clinical control. However, their impact on atherothrombotic risk remains debated, mainly due to the known effect of IL-6 inhibitors in elevating LDL levels. Objetivos: To compare the incidence of MACE and atherogenic biomarker profiles between RA patients treated with Anti-IL-6 versus Anti-TNF therapies. Métodos: Following PRISMA guidelines, a systematic review of PubMed and EMBASE was conducted, restricted to articles from the last 10 years. Using PICOT criteria, clinical trials and observational studies comparing cardiovascular risk between Anti-TNF and Anti-IL-6 therapies in adult RA patients were included. Two independent reviewers screened 274 initial records; conflicts were resolved by a third author. After duplicate removal and title/abstract screening, 30 full-text articles were reviewed. Ultimately, 7 studies met the eligibility criteria and were selected. Methodological quality was evaluated using a standardized risk of bias tool. Resultados e Conclusões: An analysis of the evidence demonstrated no increased risk of major adverse cardiovascular events (MACE) associated with anti-IL-6 therapy compared to anti-TNF therapy (Hazard Ratios: 0.84 to 1.05). In cohort studies, tocilizumab exhibited a vascular safety profile superior to that of specific biologics, yielding a relative risk reduction when compared with etanercept (HR 1.10) and adalimumab (HR 1.33). Despite the isolated increase in low-density lipoprotein (LDL) induced by IL-6 inhibitors, this effect was counterbalanced by substantial reductions in proatherogenic biomarkers, including lipoprotein(a) (-41%) and C-reactive protein (-94%; p < 0.0001). Furthermore, evidence indicated that the presence of baseline cardiovascular comorbidities did not compromise the clinical efficacy of anti-IL-6 treatment, in contrast to anti-TNF therapy, which demonstrated a loss of efficacy. In conclusion, Anti-IL-6 therapies exhibit a cardiovascular safety profile equivalent or superior to that of anti-TNF agents, demonstrating that the isolated elevation in LDL does not translate into an increased incidence of MACE. Therefore, anti-IL-6 therapy is consolidated as a safe and effective strategy for mitigating cardiovascular risk in patients with rheumatoid arthritis (RA).



20705

EFFECTIVE ARTERIAL ELASTANCE REVEALS ALTERED VENTRICULAR–ARTERIAL COUPLING IN CYSTIC FIBROSIS: POSITIVE ASSOCIATION WITH AUGMENTATION INDEX

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Introdução/Fundamentos: Cystic Fibrosis (CF) is recognized as a disease with significant cardiovascular involvement. While the Augmentation Index (AIx@75) reflects arterial stiffness and ventricular afterload, the Effective arterial elastance (Ea) provides a more integrated assessment of arterial load and ventricular–arterial coupling. However, the role of Ea in CF remains poorly characterized, particularly in relation to established indices of arterial stiffness. Objetivos: To compare and verify the association between the AIx@75 and Ea in CF patients. Métodos: This cross-sectional observational analytical study included 164 patients allocated into CF group (n=82, 31.21±11.59 years) and CTRL (n=82, 31.09±11.74 years), matched by age and sex. The oscillometric Mobil-O-Graph device (IEM, Solberg, Germany) was used to noninvasively estimate cardiovascular parameters based on brachial blood pressure. Ea was estimated by ratio of peripheral mean arterial pressure (MAP) to stroke volume (SV). The variables were compared using the unpaired test or the Mann-Whitney test when appropriate. Pearson or Spearman correlation coefficients were used, as appropriate, to assess the association between the AIx@75 and Ea and p<0.05 was considered statistically significant. Resultados e Conclusões: Ea and AIx@75 were significantly higher in the CF group (1.80±0.34mmHg/mL and 29.11±10.22%) compared to the CTRL (1.53±0.3mmHg/mL and 18.48±7.93%). There was a strong positive correlation between Ea and AIx@75 (r 0.84 | CI95%0.7652–0.8957;p<0.001). Reflection coefficient and augmentation pressure were also significantly higher in the CF group (62.44±6.54% and 6.52±2.89mmHg) compared to the CTRL (57.71±7.34% and 5.30±2.39mmHg). Peripheral systolic blood pressure (pSBP) was significantly smaller in the CF group (113.9±11.84mmHg) compared to the CTRL (117.3±10.76mmHg). Heart rate was significantly higher in the CF group (87.26±14.65bpm) compared to the CTRL (76.93±9.46bpm), while stroke volume and cardiac output were significantly lower in the CF group (52.53±13.44ml and 4.55±0.56 L/min) compared to the CTRL (63.95±12.97ml and 4.83±0.61L/min). These findings reveal a previously underrecognized cardiovascular phenotype in CF, characterized by increased afterload despite lower peripheral blood pressure and reduced SV. Noninvasive assessment of Ea may provide incremental value for early cardiovascular risk stratification and pathophysiological understanding in this population.

17192

EFFECTS OF SGLT2 INHIBITORS ON BLOOD PRESSURE IN INDIVIDUALS WITHOUT THE CLASSIC INDICATIONS FOR THESE DRUGS: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Systemic arterial hypertension remains a leading modifiable cardiovascular risk factor worldwide. Sodium-glucose cotransporter 2 inhibitors (SGLT2i), initially developed for type 2 diabetes mellitus, have demonstrated pleiotropic effects, including blood pressure reduction, through natriuresis, osmotic diuresis, and attenuation of sympathetic activity, mechanisms potentially independent of glycemic status. Objetivos: To evaluate the effects of SGLT2 inhibitors on blood pressure in adults without classic indications for their use, specifically without diabetes mellitus, heart failure, or chronic kidney disease. Métodos: Systematic review conducted according to PRISMA 2020 guidelines. Searches were performed in PubMed/MEDLINE, Cochrane, Embase, LILACS, and Web of Science, covering publications up to March 2026 with no language restrictions. Randomized clinical trials (RCTs) in non-diabetic adults without heart failure or chronic kidney disease, receiving SGLT2i as monotherapy or add-on therapy versus placebo or comparable standard treatment, reporting blood pressure as an outcome, were included. Risk of bias was assessed using the Cochrane RoB 2.0 tool and evidence quality by the GRADE approach. The protocol for this review was registered on the PROSPERO platform (CRD420261362873). Resultados e Conclusões: Of 195 records identified, 4 RCTs were included (canagliflozin, dapagliflozin, empagliflozin vs. placebo; follow-up: 4–52 weeks). Two trials showed statistically significant reductions in systolic blood pressure (−5.1 mmHg and −12.0 mmHg). Significant diastolic reduction was observed in one study (−2.0 mmHg via 24-hour ABPM). Weight loss was consistent (−2.7 to −3.0 kg) in three trials; no hypoglycemia episodes were reported. GRADE assessment indicated low evidence quality for blood pressure outcomes and moderate quality for weight and glycemic safety. SGLT2 inhibitors may offer modest antihypertensive benefits in non-diabetic individuals, but confirmation by larger, well-designed trials is needed before incorporation into routine antihypertensive management.

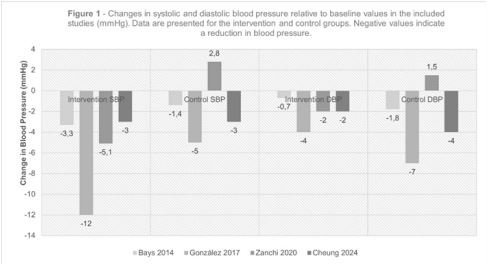


Figure 1 - Changes in systolic and diastolic blood pressure relative to baseline values in the included studies (mmHg). Data are presented for the intervention and control groups. Negative values indicate a reduction in blood pressure.

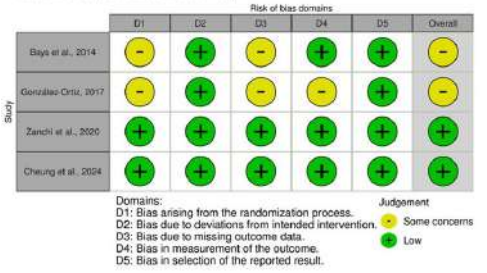


Figure 2 - Assessment of the risk of bias in the included randomized clinical trials, according to the RoB 2 tool (Cochrane Risk of Bias Tool)

18379

EFFICACY AND SAFETY OF BEMPEDOIC ACID IN PATIENTS WITH ESTABLISHED ATHEROSCLEROTIC CARDIOVASCULAR DISEASE: A SYSTEMATIC REVIEW AND META-ANALYSES OF RANDOMIZED CLINICAL TRIALS

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Introdução/Fundamentos: Atherosclerotic Disease Cardiovascular (ASCVD) is the leading cause of morbidity and mortality worldwide. Although statin therapy is the mainstay of treatment, many patients do not achieve therapeutic goals or experience intolerance. The Bempedoic Acid (BA) emerges as a promising alternative, with a distinct mechanism of action and a favorable safety profile. This systematic review with meta-analysis evaluated the efficacy and safety of BA in patients with established ASCVD. Objetivos: To evaluate the efficacy and safety of BA 180 mg/day in combination with a statin, compared to placebo, in patients with ASCVD. Métodos: This study is a systematic review with meta-analysis of randomized, double-blind, placebo-controlled clinical trials, following the PRISMA guidelines. The PUBMED, Cochrane Central, Scopus and Web of Science databases were consulted. Inclusion criteria were patients older than 18 years with ASCVD who received BA 180mg/day in combination with a statin. The primary efficacy outcomes were MACE - 4 (Cardiovascular death, non-fatal acute myocardial infarction, non-fatal stroke and coronary revascularization), reduction in LDL-c levels, and high-sensitivity C-reactive protein (hs-CRP). Safety outcomes included hyperuricemia, gout, worsening renal function, cholelithiasis and muscle events. Statistical analysis was performed using a random-effect model, and the risk of bias was assessed using the Cochrane RoB 2 tool. Resultados e Conclusões: Four studies were included (CLEAR Outcomes, 2023; Serour M H, 2024; Colivicchi, Furio., 2025; Sayed, Ahmed., 2024) totaling 18.496 patients (BA: 9.959: Control: 8.537), with a median follow-up of 3,4 years (40,6 months). The mean age was 65,3 years, 45,6% were female and 42,5% had diabetes mellitus. Treatment with bempedoic acid resulted in a lower incidence of primary MACE - 4 events per 100 patient-years (5.0 vs 6.2; HR, 0.80; 95% CI, 0.72 - 0.82; P < 0.001), but increased the risk of gout, renal failure and cholelithiasis. Interestingly, it also reduced the risk of myalgia after starting statin therapy. Bempedoic acid represents an effective and safe therapeutic option for patients with established ASCVD, especially those with statin intolerance or who do not achieve therapeutic goals with standard treatment.

19455

EFFICACY AND SAFETY OF FXIA PLUS STANDARD OF CARE VERSUS STANDARD OF CARE IN SECONDARY STROKE PREVENTION: A BAYESIAN META-ANALYSIS

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Introdução/Fundamentos: Secondary prevention of ischemic stroke remains a clinical challenge, requiring a balance between antithrombotic efficacy and bleeding risk. While Factor XI (FXI) inhibitors like asundexian and milvexian are theorized to decouple hemostasis from thrombosis, their clinical utility as an add-on therapy to standard of care (SoC) requires rigorous quantification. Objetivos: To evaluate the efficacy and safety of FXIa 50mg plus SoC compared with SoC alone in patients undergoing secondary stroke prevention. Métodos: We systematically searched Pubmed, Embase, Cochrane, and ClinicalTrials.gov through March 2026 for Randomized Controlled Trials (RCTs). A Bayesian hierarchical model was fitted in Stan using Hamiltonian Monte Carlo with the No-U-Turn Sampler. Treatment effects were expressed as hazard ratios (HR) with 95% credible intervals (CrI). We calculated the posterior probability of any benefit [Pr(HR<1)] and of a clinically relevant effect [Pr(HR<0.85)]. For safety, a non-inferiority tolerance threshold was set at Pr(HR<1.25). Statistical analysis was performed using the brms package in R. Resultados e Conclusões: We included 14,239 patients across 3 RCTs with FXIa as an add-on therapy. For stroke recurrence, asundexian demonstrated a clear protective signal (HR 0.74; 95% CrI 0.58–0.97), driven by a 98.2% posterior probability of superiority [Pr(HR<1)], an 89.8% probability of delivering a clinically relevant risk reduction of at least 15% [Pr(HR<0.85)], and a 93.4% predictive probability that a future study will demonstrate benefit. Regarding safety, the risk of major bleeding was higher in the FXIa group (HR 1.14; 95% CrI 0.65–2.15), characterized by substantial uncertainty. Posterior estimates revealed an almost 73% probability of increased bleeding risk, and the probability that the therapy meets the clinical tolerance threshold for safety (HR < 1.25) was 64.8%. Consequently, the probability of a future study finding a safety benefit for the intervention was 27.2%. In conclusion, while FXIa provides a highly probable signal for stroke reduction, its safety profile remains a concern due to the high posterior probability of increased major bleeding pending confirmation in future studies.



18100

EFFICACY OF RESPIRATORY VACCINATION IN CORONARY ARTERY DISEASE

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Introdução/Fundamentos: Cardiovascular diseases, especially coronary artery disease, are the leading global cause of death. Despite modern therapies, patients face residual risks of major adverse cardiovascular events. Acute respiratory infections like influenza and pneumonia act as potent systemic triggers, heavily exacerbating this risk. Influenza elevates the likelihood of myocardial infarction by up to ten times rapidly after infection. These infections provoke an inflammatory cytokine storm that leads to atherosclerotic plaque rupture and thrombosis. Objetivos: Although guidelines strongly advocate for influenza and pneumococcal immunizations, actual vaccination rates remain inadequately low in clinical practice. Métodos: Researchers systematically reviewed databases including MEDLINE and Embase for literature published between 2021 and 2026. The focus was on adult patients with stable coronary artery disease receiving influenza or pneumococcal vaccines versus placebo or no vaccine. The selection included randomized controlled trials and observational studies, explicitly excluding pediatric or uncontrolled reports. Independent reviewers evaluated bias using standard tools and performed quantitative meta-analysis utilizing a random-effects model. Resultados e Conclusões: The analysis of 45 studies revealed distinct efficacy profiles for both interventions. Influenza clinical trials demonstrated a significant 30% to 34% relative risk reduction for major cardiovascular events, mortality, and myocardial infarction. This protective benefit is most pronounced in patients with recent acute coronary syndromes and rivals the efficacy of interventions like statins and smoking cessation. Furthermore, evidence indicates that standard vaccine doses are completely sufficient to achieve this cardiovascular protection. In contrast, pneumococcal vaccination outcomes remain actively debated. While large observational studies indicated reduced mortality and infarction, the primary clinical trial failed to show significant decreases in ischemic events. This discrepancy may stem from healthy user bias in observational data or a lack of statistical power in the clinical trial. Despite limitations regarding seasonal variables, the low number needed to treat confirms the high cost-effectiveness of implementing these immunizations in cardiology. Influenza immunization is an indispensable, cost-effective measure that reduces cardiovascular events in coronary disease. Pneumococcal vaccine efficacy still requires further randomized trials.

Table 1 Main studies on vaccination efficacy in MACE reduction in cardiovascular disease patients

Author(s)	Study Design	Studied Population	Intervention	Main Results	Limitations
Vardeny et al., 2021 (INVESTED)	Multicenter RCT, double-blind, active comparator; 157 centers, USA/Canada; 3 influenza seasons	5,260 patients with recent AMI or HF hospitalization + ≥1 additional risk factor; mean age 65 years; 75% men	High-dose trivalent vs. standard-dose quadrivalent influenza vaccine	Primary: all-cause death or cardiopulmonary hospitalization. Co-primary: HR 1.06; 95% CI 0.91-1.24; P=0.21. No difference between high dose and standard dose. More adverse reactions in the high-dose group	Absence of placebo arm; comparison between formulations, not against non-vaccination; possible attenuation of the effect due to high seroprotection rate in both groups
Loeb et al., 2022 (IVVE)	Multicenter RCT, double-blind, placebo-controlled; 30 centers in 10 countries (Asia, Africa, Middle East)	5,129 patients with HF (NYHA II-IV); age ≥≥18 years; 52.1% women; annual vaccination for up to 3 years	Standard-dose inactivated influenza vaccine vs. placebo (saline)	Co-primaries: (1) CV death, non-fatal AMI, non-fatal stroke; (2) recurrent composite including HF hospitalization. 1: HR 0.93; 95% CI 0.81-1.07; P=0.30. 2: HR 0.92; 95% CI 0.84-1.02; P=0.12. Significant reduction in all-cause	Recruitment impacted by the COVID-19 pandemic; variable seasonality among regions; predominantly NYHA II population (70%); low influenza circulation in some periods
Ware et al., 2026 (AUSPICE)	Multicenter RCT, double-blind, placebo-controlled; 6 centers in Australia; mean follow-up of 7 years	4,725 community-dwelling adults, 55-80 years old, with ≥2 CV risk factors (obesity, HTN, hypercholesterolemia), no previous CV event; 52% men	23-valent pneumococcal polysaccharide vaccine (PPSV23) vs. placebo (saline)	Primary: composite of fatal/non-fatal AMI or ischemic stroke. HR 0.80, 95% CI 0.63-1.28; P=0.57. No significant difference in the primary endpoint nor in the exploratory endpoints (all-cause mortality, hospitalizations)	Study significantly underpowered (event rate lower than expected); primary prevention population; single dose without booster; endpoints obtained by registry linkage
Anderson et al., 2025 (PANDA II)	Cluster-randomized RCT, open-label, multicenter; 12 hospitals in China; 3 influenza seasons (2021-2024)	Hospitalized patients with acute HF (NYHA II-IV), age ≥18 years; pre-hospital discharge vs. outpatient vaccination	Free influenza vaccine pre-hospital discharge vs. usual care (vaccination counseling)	Primary: all-cause death or hospital readmission in 12 months (specific data in the original article). Significant reduction in the primary endpoint	Open-label design (cluster-randomized); exclusively Chinese population; vaccination rate in the control group 1%; potential performance

21913

EFFICACY OF THE POLYPILL IN THE PREVENTION OF MAJOR CARDIOVASCULAR EVENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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Introdução/Fundamentos: Low adherence to pharmacological treatment is one of the main challenges in the prevention of cardiovascular diseases. The polypill strategy, which combines multiple drugs into a single tablet, has been proposed as an alternative to improve adherence and reduce cardiovascular events. However, the magnitude of its clinical benefit still requires consolidation through quantitative analysis. Objetivos: To evaluate the efficacy of the polypill in reducing major cardiovascular events compared to conventional treatment. Métodos: A systematic review conducted according to PRISMA guidelines, with searches in PubMed, Embase, and Cochrane Library databases up to January 2026. Randomized controlled trials comparing the use of a polypill versus standard treatment in patients with high cardiovascular risk or established disease were included. The primary outcome was a composite of major cardiovascular events (MACE). The meta-analysis was performed using a random-effects model, with calculation of relative risk (RR) and 95% confidence intervals (95% CI). Heterogeneity was assessed using the I^2 index. Resultados e Conclusões: Seven studies were included, totaling 15,238 patients. The use of the polypill was associated with a significant reduction in major cardiovascular events (RR=0.73; 95% CI: 0.65–0.82; p<0.001), with low heterogeneity (I^2=26%). A significant improvement in treatment adherence was observed, without a relevant increase in serious adverse events. The polypill strategy was shown to reduce major cardiovascular events and improve therapeutic adherence in high-risk patients. These findings reinforce its potential as an effective large-scale intervention, especially in public health settings and resource-limited systems.

19270

FUNCTIONAL CAPACITY AND CLINICAL PROFILE OF SMOKERS WITH COPD UNDERGOING SMOKING CESSATION: INSIGHTS FROM THE 6-MINUTE WALK TEST

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(1) UFJF - JUIZ DE FORA - MG - BRASIL;

Introdução/Fundamentos: The 6-Minute Walk Test (6MWT) assesses functional capacity through cardiovascular, respiratory, and musculoskeletal responses during submaximal exercise. In Chronic Obstructive Pulmonary Disease (COPD), chronic inflammation, structural lung changes, and progressive exercise intolerance can be measured by the 6MWT. Objetivos: To evaluate smokers with multimorbidities, including COPD, undergoing smoking cessation treatment and its association with clinical characteristics, smoking history, and functional capacity. Métodos: Cross-sectional study conducted in a multidisciplinary smoking cessation outpatient clinic from October 2023 to April 2026. Cognitive-behavioral therapy and pharmacological treatment were provided, along with clinical and smoking history assessment. Positive COPD screening was defined as post-bronchodilator FEV1/FVC <0.70; high nicotine dependence as Fagerström Test ≥5; and heavy smokers as ≥20 cigarettes/day. Functional capacity was assessed by the 6MWT, with blood pressure (BP), heart rate (HR), peripheral oxygen saturation (SpO□), and modified Borg scale recorded before, during, and after the test. Descriptive analyses used mean±SD or percentages. Associations were tested using Student's t-test and Chi-square test (p<0.05). Resultados e Conclusões: : Fifty smokers were evaluated: 80% women, mean age 58.10±10.53 years; 50% sedentary; 57.1% hypertensive; 50% diabetic; and 42% with COPD. Mean smoking duration was 40.20±12.79 years, cigarette consumption 23.68±12.75/day, and 75.5% had high nicotine dependence. All participants performed the 6MWT, with mean distance of 422.83±66.25 m. Compared with smokers without COPD, those with COPD had longer smoking duration (p<0.051) and higher prevalence of heavy smoking (p<0.047). In the 6MWT, smokers with COPD showed lower baseline systolic and diastolic BP (p<0.022; p<0.047), a trend toward higher HR at baseline and peak (p<0.063; p<0.065), higher respiratory Borg scores at baseline and peak (p<0.009; p<0.014), and higher peak lower-limb Borg score (p=0.051).

VARIABLE	COPD	N	MEAN	STANDARD DEVIATIO	p-VALUE
AGE	YES	37	59,8972	8,70114	0,068
	NO	44	56,7979	11,74879	
Smoking Duration (years)	YES	35	42,7001	10,89865	0,063
	NO	33	38,8652	13,89665	
Systolic BP (baseline)	YES	21	115,7143	10,0655	0,022
	NO	29	124,3103	15,88525	
Diastolic BP (baseline)	YES	21	72,8095	7,71764	0,039
	NO	29	79,1034	9,80795	
Heart Rate (baseline)	YES	21	87,381	14,32906	0,065
	NO	29	79,9655	13,77234	
Heart Rate (peak)	YES	21	126,1905	18,84056	0,061
	NO	29	96,6897	16,74957	
Borg Dyspnea (peak)	YES	21	3,2619	2,76414	0,009
	NO	29	1,4483	1,05183	
Borg Dyspnea (final)	YES	21	1,1429	1,48844	0,014
	NO	29	0,3276	0,75918	
Borg Lower Limbs (peak)	YES	21	2,5476	2,54069	0,009
	NO	29	1,2931	1,61188	
Borg Lower Limbs (final)	YES	21	1,5	1,61188	0,063
	NO	29	0,6724	1,03748	

Table: Evaluation of Categorical Variables – Chi-square Test

Variables	COPD Present	COPD Absent	p-VALUE
Asthma	100%	0%	0,019
Obstructive Sleep Apnea Syndrome (OSAS)	21,40%	8,90%	0,046
Type 2 Diabetes Mellitus (T2DM)	19,30%	35,10%	0,043
Gastroesophageal Reflux Disease (GERD)	40,40%	25,50%	0,07
Alcohol Triggers	32,70%	47,80%	0,086

20901

GLP-1 AGONIST RECEPTORS AND CARDIOPROTECTION: NEW PERSPECTIVES ON THE TREATMENT OF TIPE 2 DIABETES

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Introdução/Fundamentos: The glucagon-like peptide-1 receptor agonist (GLP1RA) has shown an important role in the treatment of type 2 Diabetes (T2DM) and obesity, once it stimulates the biosynthesis and release of insulin, suppresses glucagon release, delays gastric emptying and improves glucose metabolism, in addition to increasing satiety. It can be activated in pancreatic cells, digestive tract, myocardium, skeletal muscle, hepatocytes, central nervous system and immune system. Cardiovascular diseases (CVD) are the main complications of T2DM and studies have shown that GLP1RA can improve outcomes in these patients Objetivos: This literature review seeks to elucidate the role of GLP1R in reducing cardiovascular events. Métodos: This is a narrative literature review conducted in the PubMed and LILACS databases using the descriptors 'GLP-1', 'cardiovascular', 'Semaglutide', and 'Diabetes', combined by the Boolean operators AND and NOT. Articles from the last 5 years in English that addressed cardiovascular outcomes related to the use of GLP-1 receptor agonists were included Resultados e Conclusões: Studies such as SUSTAIN-6, which evaluated the use of weekly subcutaneous Semaglutide, and PIONEER 6, which evaluated the use of daily oral Semaglutide, observed that in diabetic patients with high cardiovascular risk there was a reduction in major CV events and that the use of the oral medication achieved a significant reduction in cardiovascular and all-cause mortality, without evidence of superiority among the different types of GLP1RA. In addition, in the phase 3 SELECT study it showed that Semaglutide mitigated major cardiovascular events, especially in patients with heart failure with preserved and reduced ejection fraction, despite this result GLP1RA do not treat this comorbidity. The SOUL CVOT study also shows a reduction of major events in patients with T2DM, atherosclerotic cardiovascular disease and chronic kidney disease. Due to these results these medications are recommended in guidelines. GLP-1 receptor agonists demonstrate relevant cardiovascular benefits in patients with type 2 diabetes mellitus and obesity, especially in reducing major cardiovascular events. Recent studies highlight the cardioprotective potential of this drug class, however, despite the promising results, additional studies are still needed for a better understanding of the mechanisms involved on the benefits in different patient profiles.

19538

HIGH-SENSITIVITY TROPONIN IN RISK STRATIFICATION OF CHEST PAIN: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Chest pain is one of the leading causes of emergency department visits. The use of high-sensitivity troponin (hs-cTn) has revolutionized the early diagnosis of acute myocardial infarction, enabling faster detection of myocardial injury. However, its role in risk stratification for major cardiovascular events still requires further clarification. Objetivos: To evaluate the accuracy of high-sensitivity troponin in risk stratification for major cardiovascular events in patients presenting with chest pain. Métodos: A systematic review conducted according to PRISMA guidelines, with searches in PubMed, Embase, and Cochrane Library databases up to January 2026. Prospective studies evaluating high-sensitivity troponin in patients presenting with chest pain in emergency departments were included. The primary outcome was a composite of major cardiovascular events within 30 days. The meta-analysis was performed using a random-effects model, with calculation of sensitivity, specificity, and area under the ROC curve (AUC). Heterogeneity was assessed using the I^2 index. Resultados e Conclusões: Thirteen studies were included, totaling 67,845 patients. High-sensitivity troponin demonstrated high sensitivity for predicting cardiovascular events (sensitivity=0.94; 95% CI: 0.91–0.96), with moderate specificity (0.78; 95% CI: 0.72–0.83). The overall AUC was 0.91 (95% CI: 0.88–0.93), indicating excellent diagnostic accuracy. Heterogeneity was moderate (I^2=44%). High-sensitivity troponin shows high accuracy in risk stratification of patients with chest pain, being an essential tool for decision-making in emergency departments. Its use may optimize care pathways and reduce adverse outcomes.

15862

HIV-1 SUBTYPE, ANTIRETROVIRAL RESISTANCE, AND SEX DISPARITIES IN CARDIOVASCULAR RISK: A NATIONWIDE STUDY IN BRAZIL

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Introdução/Fundamentos: Cardiovascular disease (CVD) is one of the leading causes of non-AIDS-related morbidity and mortality in people living with HIV (PLWH). However, current cardiovascular risk stratification models neglect virological determinants, such as HIV-1 genetic diversity and antiretroviral resistance profiles, limiting diagnostic accuracy in diverse populations. Objetivos: To investigate the association between HIV-1 subtypes, resistance mutations (DRMs) and the risk of major cardiovascular events (MACE), analyzing the mediating role of biological sex. Métodos: A retrospective nationwide cohort study was conducted using database linkage of genotyping, hospital admission, and mortality records in Brazil (2008-2017), including 20,692 individuals on antiretroviral therapy (ART). Subtypes and DRMs were identified via pol gene sequencing. MACE were defined based on ICD-10 codes. Sex-stratified multivariable logistic regression models were used to estimate adjusted Odds Ratios (OR) and 95% CI, controlling for age and traditional non-HIV-related cardiovascular risk factors. Resultados e Conclusões: HIV-1 subtype C was associated with a lower risk of MACE compared with subtype B in both men (OR 0.65; p=0.001) and women (OR 0.61; p<0.001). In contrast, a distinct sex-specific pattern emerged for antiretroviral resistance, with multiple DRMs associated with increased cardiovascular risk exclusively in women. Notably, the M41L (OR 1.72; 95% CI 1.33-2.23) and M46I (OR 1.51) mutations were strong independent predictors of MACE in females. Additional signals were observed for T215F and L33F, while no consistent associations were identified in males. HIV-1 genetic architecture and resistance profile exert a differential influence on cardiovascular risk, with a disproportionate impact on women. These findings suggest that the incorporation of viral biomarkers and consideration of sex disparities can refine risk prediction and personalize cardiovascular prevention strategies in the overall management of HIV.

17096

HYPERTENSIVE RETINOPATHY AS A PREDICTOR OF CARDIOVASCULAR EVENTS: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Hypertension stands as a leading global risk factor for cardiovascular disease (CVD), necessitating precise risk stratification to reduce major adverse outcomes. Blood pressure measurements may not fully capture the microvascular damage caused by chronic hypertension. The retina offers a non-invasive window into systemic microcirculation, where hypertensive retinopathy reflects target-organ damage. Given this pathophysiological link, hypertensive retinopathy may serve as a valuable marker for cardiovascular risk prediction. Objetivos: To systematically evaluate the current evidence examining the prognostic utility of hypertensive retinopathy as an independent predictor of incident cardiovascular events. Métodos: A systematic review was conducted in accordance with the PRISMA 2020 guidelines. PubMed and EBSCO were searched from inception to March 2026 using MeSH terms and keywords related to hypertensive retinopathy, cardiovascular events, and longitudinal study designs; the full search strategy is available upon request. Additional screening was performed in Google Scholar. Study selection was conducted independently by two reviewers. Eligible studies included longitudinal designs, primarily prospective population-based cohorts, while case reports, pediatric populations, and reviews or meta-analyses were excluded. Risk of bias was assessed using standardized tools. Primary outcomes were stroke, myocardial infarction, and cardiovascular mortality. Resultados e Conclusões: Ten studies were included, predominantly prospective cohorts. Findings consistently showed that hypertensive retinopathy was associated with increased risk of major adverse cardiovascular events (MACE), independent of traditional risk factors such as blood pressure, glycemic status, and lipid levels. Mild retinopathy was associated with incident stroke (hazard ratio [HR] 1.26, 95% confidence interval [CI] 1.01–1.58), while severe retinopathy showed a stronger association (HR 2.40, 95% CI 1.49–3.84). Retinopathy grade ≥2 was associated with more than a twofold increase in mortality risk (HR 2.08, 95% CI 1.04–4.15), and in high-risk hypertensive patients with a twofold higher risk of coronary heart disease (risk ratio [RR] 2.1, 95% CI 1.0–4.2). Hypertensive retinopathy appears to be a consistent and independent predictor of incident MACE. These findings suggest that retinal microvascular assessment may improve cardiovascular risk stratification and clinical decision-making in practice.

19427

IMPACT OF DUAL AND TRIPLE AGONISTS (GIP/GLP-1/GLUCAGON) ON ATRIAL FIBRILLATION BURDEN AND STRUCTURAL REMODELING IN PATIENTS WITH OBESITY: A SYSTEMATIC REVIEW.

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Introdução/Fundamentos: Obesity is a major driver of atrial structural remodeling and increased epicardial adipose tissue, perpetuating atrial fibrillation (AF). Although weight loss reduces arrhythmic burden, the clinical impact of emerging incretin-based therapies remains insufficiently synthesized. Objetivos: To evaluate whether dual and triple incretin agonists (GIP/GLP-1/Glucagon) reduce AF burden and promote reverse atrial remodeling compared with standard treatment in patients with obesity. Métodos: This systematic review was conducted according to PRISMA guidelines. A literature search was performed in PubMed, EMBASE, and SciELO (2020–2026) using MeSH/DeCS terms and free-text keywords related to atrial fibrillation, obesity, and dual/triple incretin agonists. Randomized clinical trials and observational studies including adults (≥18 years) with obesity and reporting AF and/or cardiovascular remodeling outcomes were included. Animal studies, reviews, and studies without relevant cardiovascular endpoints were excluded. Study selection was performed by two independent reviewers. Risk of bias was assessed using RoB 2.0 for randomized trials and ROBINS-I for observational studies. Resultados e Conclusões: From 1,240 records, 5 propensity score–matched observational studies and 2 randomized controlled trials were included (N=18,450; mean BMI 34.2 kg/m²). The use of dual/triple agonists (e.g., tirzepatide) reduced AF recurrence and burden by 38% compared with standard treatment (HR 0.62; 95% CI 0.54–0.71; p<0.001). In the structural remodeling analysis (mean follow-up of 14 months), combined incretin therapy promoted a greater reduction in left atrial volume index (-4.8 mL/m²; 95% CI -6.2 to -3.4) and significant regression of epicardial adipose tissue thickness (-2.3 mm; p<0.01). The incidence of major adverse cardiovascular events (MACE) was also lower in the intervention group. Dual and triple agonist therapy acts as a disease-modifying strategy in obesity-related atrial fibrillation. By promoting regression of epicardial adipose tissue and reverse atrial remodeling, these agents reduce arrhythmic burden. These findings suggest a paradigm shift, positioning combined incretin therapies not only as anti-obesity agents but also as key components in the management of the arrhythmogenic substrate, with potential implications for future rhythm control guidelines.

Study	Design and Population	Exposure	Outcomes	Key Findings	Conclusion
E1	Propensity-matched obese AF patients post-ablation	GLP-1 RA	AF recurrence, mortality, CV hospitalizations	Lower AF recurrence and improved clinical outcomes	GLP-1 receptor agonists are associated with improved post-ablation rhythm and clinical outcomes
E2	Evidence synthesis in obesity	Anti-obesity drugs	CV events, arrhythmias	Heterogeneous effects; GLP-1 RA most favorable	GLP-1 receptor agonists demonstrate the most robust cardiovascular safety among weight loss therapies
E3	Longitudinal obese AF cohort	GLP-1 RA	Long-term AF recurrence	Sustained reduction in recurrence	GLP-1 receptor agonists may provide durable rhythm control benefits
E4	Narrative review	GLP-1 RA and emerging agents	Cardiometabolic outcomes	Significant metabolic benefit with potential indirect antiarrhythmic effects	Incretin-based therapies may play an increasing role in cardiovascular and arrhythmia management

21391

IMPACT OF GLP-1 RECEPTOR AGONISTS ON CARDIOVASCULAR OUTCOMES IN PATIENTS WITH HEART FAILURE AND OBESITY: A SYSTEMATIC REVIEW

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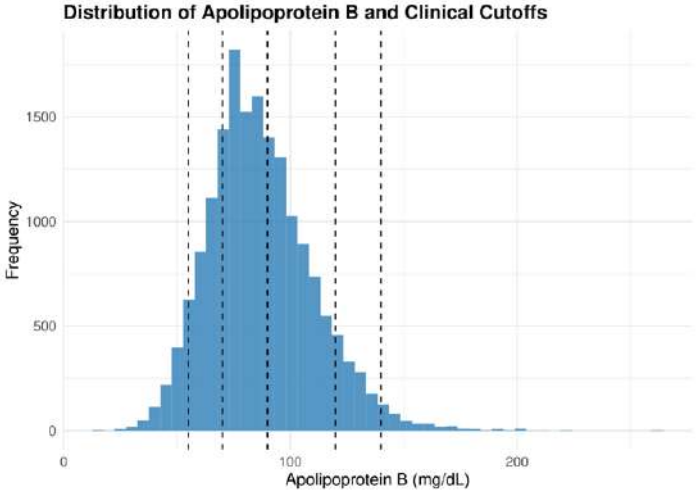
Introdução/Fundamentos: Obesity is a major global public health problem and is strongly associated with cardiovascular diseases, including heart failure (HF). Excess body weight contributes to metabolic and inflammatory alterations, cardiac remodeling, hypertension, and type 2 diabetes mellitus, factors linked to HF progression. In this context, glucagon-like peptide-1 (GLP-1) receptor agonists have emerged as promising therapies, initially developed for glycemic control but currently recognized for cardiovascular and metabolic benefits. Recent studies have shown significant weight loss, improved functional capacity, and reduced cardiovascular hospitalizations, especially in patients with heart failure with preserved ejection fraction (HFpEF). Objetivos: To evaluate the effects of GLP-1 receptor agonists on clinical and cardiovascular outcomes in patients with heart failure associated with obesity. Métodos: A systematic literature review was conducted using PubMed, Scopus, and the Virtual Health Library (VHL). The descriptors "GLP-1 receptor agonists," "heart failure," "obesity," and "cardiovascular outcomes" were combined using the Boolean operators AND and OR. Studies published between 2020 and 2026 in English, Portuguese, and Spanish were included. Eligible studies involved adults with HF and obesity treated with GLP-1 receptor agonists. Duplicate studies, narrative reviews, case reports, and articles without cardiovascular outcome analysis were excluded. Resultados e Conclusões: A total of 428 studies were identified, and 17 met the inclusion criteria. The findings demonstrated significant reductions in body weight, improved functional capacity, and decreased inflammatory markers among patients receiving GLP-1 receptor agonists. Several studies also reported lower hospitalization rates for HF and improved quality of life, particularly in individuals with obesity-related HFpEF. Additionally, better glycemic and blood pressure control were observed, factors associated with slower cardiovascular disease progression. However, evidence regarding cardiovascular mortality reduction remained inconsistent. Overall, GLP-1 receptor agonists appear to provide important clinical, metabolic, and functional benefits in patients with HF and obesity, although long-term randomized studies are still needed to clarify their impact on cardiovascular mortality and HF progression.

21544

IMPACT OF GUIDELINE-BASED APOLIPOPROTEIN B THRESHOLDS IN A REAL-WORLD BRAZILIAN LABORATORY POPULATION

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Introdução/Fundamentos: Apolipoprotein B (Apo B) reflects the number of circulating atherogenic lipoprotein particles and has gained prominence in cardiovascular risk assessment. However, the impact of applying fixed guideline-based thresholds to real-world populations remains insufficiently characterized. Objetivos: To evaluate how different guideline-based Apo B thresholds modify atherogenic lipoprotein burden classification in a large Brazilian laboratory population, and to assess the position of these thresholds within the local Apo B distribution. Métodos: A cross-sectional study was conducted using 17,338 Apo B measurements obtained from routine laboratory data of outpatient individuals between 2021 and 2025 at a laboratory in northeastern Brazil. Sex-specific reference intervals were estimated using percentile methods (2.5th–97.5th). The proportion of individuals exceeding clinically relevant Apo B thresholds (≥55, ≥70, ≥90, ≥120, and ≥140 mg/dL) was determined, and their position within the population distribution was assessed. Group comparisons were performed using the Wilcoxon rank-sum and chi-square tests. Secondary analyses included LDL-C/Apo B discordance (LDL-C <130 mg/dL with Apo B ≥90 mg/dL), correlation between Apo A-I and Apo B (Spearman), and logistic regression. Resultados e Conclusões: Apo B values showed a right-skewed distribution (median 85 mg/dL; 97.5th percentile 137 mg/dL). Guideline-based thresholds ranged from the 6.7th percentile (55 mg/dL) to the 98.0th percentile (140 mg/dL). The proportion of individuals classified above target varied: 41.9% (≥90 mg/dL), 77.4% (≥70 mg/dL), and 93.9% (≥55 mg/dL), demonstrating threshold dependence. Elevated Apo B was observed in 8.93% (≥120 mg/dL) and 2.13% (≥140 mg/dL). Discordance was present in 9.64% and differed by sex (p<0.001). In secondary analyses, 9.64% of individuals with normal LDL-C had elevated Apo B, indicating residual risk not captured by traditional lipid parameters, and this discordance differed by sex (p<0.001). No significant correlation was observed between Apo A-I and Apo B (rho=-0.008, p=0.320), while 14.9% had an elevated Apo B/Apo A-I ratio. Male sex was independently associated with elevated Apo B (OR≈1.37, p<0.001). These findings demonstrate that guideline-based Apo B thresholds map to different points of the distribution and alter Apo B classification, highlighting the importance of distinguishing population-based reference distributions from clinical decision thresholds when interpreting Apo B in cardiovascular risk assessment.

21125

Impact of Lipoprotein(a) on Clinical Outcomes in Patients with Aortic Stenosis: A Systematic Review

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Introdução/Fundamentos: Aortic stenosis (AS), the most prevalent valvular disease in older adults, is characterized by progressive calcification and fibrosis of the valve leaflets, leading to left ventricular outflow obstruction. The disease is associated with heart failure, syncope, and sudden cardiac death due to arrhythmias, while still lacking effective pharmacological therapies. In this context, lipoprotein(a) [Lp(a)] has emerged as a factor associated with accelerated disease progression and poorer clinical outcomes due to its pro-inflammatory and pro-calcific properties. Despite these associations, important gaps remain regarding the impact of Lp(a) on broader clinical outcomes and the potential benefits of targeted therapies. Therefore, this systematic review aims to synthesize the current evidence on this topic. Objetivos: The objective of this study is to synthesize the evidence regarding the contribution of Lp(a) to the progression of aortic stenosis, aiming to evaluate the still untapped potential of therapies targeting Lp(a) reduction as a novel strategy to modify the clinical course of the disease. Métodos: This systematic review, conducted according to PRISMA guidelines, searched PubMed, Web of Science, CINAHL, and Google Scholar for studies published up to April 2026 regarding the role of Lp(a) in aortic stenosis. Search terms included: “aortic stenosis”, “aortic valve stenosis”, “calcific aortic valve stenosis”, “lipoprotein(a)”, “Lp(a)”, and “aortic valve calcification”. After screening, 10 studies were included: 8 cohort studies, 1 randomized controlled trial (RCT), and 1 cross-sectional study. Methodological quality was assessed using the Newcastle-Ottawa Scale and the Cochrane Risk of Bias tool. Resultados e Conclusões: Lp(a) was shown to be a causal and independent risk factor for calcific aortic valve stenosis (CAVS). Elevated levels were associated with initial valvular calcification (OR=1.43 baseline; OR=1.30 incident) and hemodynamic progression, evidenced by increased peak aortic jet velocity (+0.26 m/s/year; p=0.005), although no consistent association was observed with calcification progression. Furthermore, elevated Lp(a) was associated with higher risks of valvular reintervention (HR=1.58), cardiovascular events/death (HR=1.43), and reduced post-TAVI survival. Thus, Lp(a) appears to be a relevant prognostic marker in CAVS, although further clinical trials are still needed.

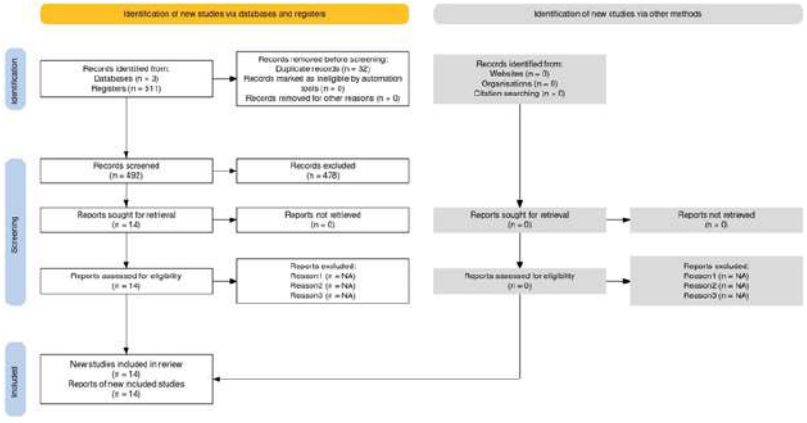
17199

IMPACT OF SUBCLINICAL HYPOTHYROIDISM ON CARDIOVASCULAR RISK: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Subclinical hypothyroidism, characterized by elevated thyroid-stimulating hormone (TSH) levels with normal circulating thyroid hormones, is a common condition in clinical practice. Its clinical relevance has been widely debated, particularly due to its potential association with adverse cardiovascular outcomes, including increased cardiovascular mortality. However, the available evidence remains inconsistent, leading to uncertainty regarding the true impact of this condition. Therefore, it is essential to synthesize current evidence on the association between subclinical hypothyroidism and cardiovascular risk compared with euthyroid individuals. Objetivos: To evaluate the association between subclinical hypothyroidism and cardiovascular risk, including metabolic, inflammatory, and subclinical alterations, as well as major outcomes such as coronary artery disease, myocardial infarction, stroke, heart failure, and cardiovascular mortality. Métodos: A systematic review was conducted in accordance with PRISMA recommendations using PubMed, Embase, and ScienceDirect (2021–2025), based on the PICO strategy. Inclusion criteria comprised observational studies and clinical trials evaluating adults (≥18 years) with subclinical hypothyroidism compared to euthyroid individuals, considering outcomes such as acute myocardial infarction, stroke, and mortality. Resultados e Conclusões: Of 492 records identified, 478 were excluded after screening, and 14 studies were included. Subclinical hypothyroidism was consistently associated with an adverse cardiometabolic profile, including increased LDL, triglycerides, and total cholesterol, reduced HDL, and elevated atherogenic indices. A higher prevalence of insulin resistance, metabolic syndrome, and elevated high-sensitivity C-reactive protein was observed. Subclinical cardiovascular changes were also frequent, including diastolic dysfunction, reduced myocardial strain, increased epicardial fat, and greater carotid intima–media thickness. An increased risk of heart failure was reported. Overall, subclinical hypothyroidism is associated with cardiometabolic and early cardiovascular alterations, suggesting a role in atherogenesis. Although associations with myocardial infarction, stroke, and mortality is not uniform, likely due to methodological limitations, this condition should not be considered benign and may represent an early marker of cardiovascular risk, warranting careful clinical evaluation.



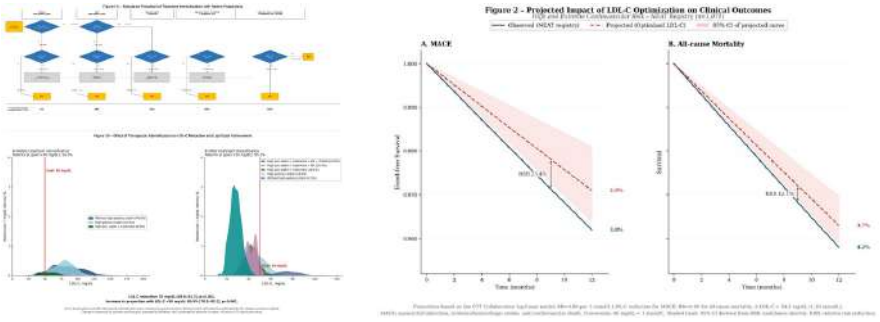
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IMPLEMENTATION OF THE 2025 BRAZILIAN DYSLIPIDEMIA GUIDELINES IN ATHEROTHROMBOTIC DISEASE: A NATIONWIDE SIMULATION BASED ON THE NEAT REGISTRY

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Introdução/Fundamentos: Suboptimal control of low-density lipoprotein cholesterol (LDL-C) remains the main unmet need in secondary prevention of atherothrombotic disease in Brazil. The 2025 Brazilian dyslipidemia guidelines introduced novel lipid-lowering strategies that may improve LDL-C goal attainment and reduce residual cardiovascular risk. Objetivos: To simulate the impact of guideline-directed lipid-lowering intensification on LDL-C control and to estimate the expected reduction in major adverse cardiovascular events (MACE) and all-cause mortality in a nationwide cohort. Métodos: The NEAT registry is a prospective, multicenter observational study including 2,005 patients with atherothrombotic disease across 25 centers in Brazil. Among individuals with available LDL-C, a deterministic stepwise simulation was performed according to the 2025 guidelines, including intensification to high-intensity statins followed by addition of ezetimibe, bempedoic acid, and PCSK9 inhibitors. Expected LDL-C reductions were applied at each step. A counterfactual model based on the log-linear relationship estimated relative reductions in MACE and all-cause mortality per 1 mmol/L LDL-C reduction. Resultados e Conclusões: After one year, 14.3% achieved LDL-C <50 mg/dL. Goal attainment varied by treatment intensity: 9.2% (95% CI 6.9–12.2) without high-intensity statins, 17.0% (95% CI 13.8–20.7) with high-intensity statins, and 27.4% (95% CI 19.0–37.6) with statin plus ezetimibe. In the simulation, 55.1% would reach target with bempedoic acid and 95.1% (95% CI 93.6–96.3) with PCSK9 inhibitors, totaling 1019/1071 patients at goal. A mean LDL-C reduction of 50.5 mg/dL (~1.26 mmol/L) across the full cohort would be associated with an estimated 23.4% (95% CI 5.1–49.9%) relative reduction in MACE and 12.1% (95% CI 2.4–27.8%) in all-cause mortality, corresponding to absolute reductions from 3.8% to 2.9% (95% CI 1.9–3.6%) and from 4.2% to 3.7% (95% CI 3.0–4.1%), respectively, over one year. Guideline-based intensification could markedly increase LDL-C control and is projected to reduce cardiovascular events and mortality, directly addressing the study objective and supporting more intensive lipid-lowering strategies in secondary prevention.



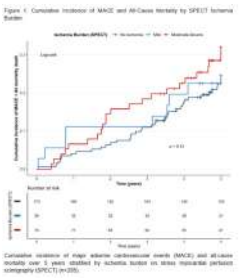
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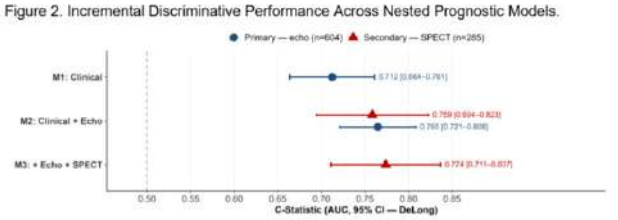
INCREMENTAL PROGNOSTIC VALUE OF ECHOCARDIOGRAPHY AND SPECT BEYOND CLINICAL ASSESSMENT IN CHRONIC CORONARY SYNDROME

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Introdução/Fundamentos: Contemporary guidelines recommend multimodality imaging for risk stratification in chronic coronary syndrome (CCS), yet the comparative prognostic contribution of resting echocardiography and stress myocardial perfusion scintigraphy (SPECT) beyond clinical assessment remains incompletely characterized in outpatient practice. Objetivos: To evaluate whether addition of echocardiographic parameters to a baseline clinical model improves risk discrimination and reclassification for the composite primary endpoint (all-cause death, myocardial infarction, or stroke) in CCS, and whether further addition of SPECT-derived indices provides incremental information. Métodos: This single-center prospective cohort included 1,129 patients with angiographically confirmed CCS (mean age 64.4±9.2 years; 31.2% female). Three nested models were constructed: M1 (clinical variables); M2 (M1 plus echocardiography: left ventricular ejection fraction, regional wall motion abnormalities, diastolic dysfunction, left ventricular mass index); M3 (M2 plus SPECT: stress-induced perfusion defects, fixed defects, ischemia burden). Due to clinician-directed testing, echocardiography was available in 604 patients (53.5%) and SPECT in 285 (25.2%). Model comparisons used complete-case subsets (M1 vs M2: n=604; M2 vs M3: n=285). Multiple imputation (MICE; m=20) was performed as sensitivity analysis. Discrimination was assessed via C-statistic and Harrell's C-index; reclassification via continuous NRI and IDI. Resultados e Conclusões: The primary endpoint occurred in 273 patients (24.2%); all-cause death in 240 (21.3%). Addition of echocardiography improved discrimination (AUC 0.712→0.765; p=0.002; Figure 2), reclassification (NRI 0.513, p<0.001; IDI 0.067, p<0.001), and calibration (Brier 0.163→0.151). Addition of SPECT improved reclassification (NRI 0.314, p=0.019; IDI 0.022, p=0.010) but not discrimination (AUC 0.759→0.774; p=0.191), with graded ischemia-event relationship (Figure 1). In multivariable Cox analysis (C-index 0.769), independent mortality predictors were age (HR 1.063, p<0.001), NYHA class (HR 1.176, p=0.029), diabetes (HR 1.595, p=0.002), and left ventricular mass index (HR 1.013, p<0.001); no SPECT variable retained significance. Echocardiography provided incremental prognostic information beyond clinical assessment. SPECT's reclassification benefit without discrimination improvement may reflect multicollinearity or selection bias.





C-statistics (AUC, 95% CI; DeLong method) for M1 (clinical), M2 (clinical + echocardiography; n=604), and M3 (clinical + echocardiography + SPECT; n=285).

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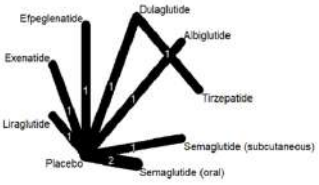
INCRETIN-BASED THERAPIES AND CARDIOVASCULAR OUTCOMES IN TYPE 2 DIABETES: A NETWORK META-ANALYSIS OF RANDOMIZED CARDIOVASCULAR OUTCOME TRIALS

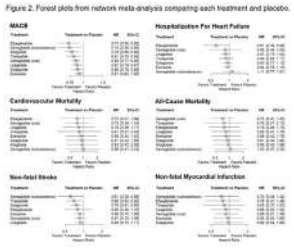
VINICIUS SILVA LARA1; CARLOS EDUARDO SILVA CRUZ2; RENATO GARCIA LISBOA BORGES1; LEONARDO GOUVÊA DE OLIVEIRA1; LUANA KAORI SAKAGUCHI SAKAMOTO1; VITÓRIA CAMPOS CORDEIRO1; EDSON LUIS DE BARROS SIQUEIRA1; MARIA EDUARDA GRASSI3; JONATHAS ADRIEL TAVARES AMARAL1; LUCAS ALENCAR QUEIROZ1; MILTON CESAR VASCONCELOS MACHADO JUNIOR1;

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Introdução/Fundamentos: Incretin-based therapies have demonstrated cardiovascular benefits in large cardiovascular outcome trials (CVOTs). More recently, dual GIP/GLP-1 receptor agonists have expanded this therapeutic group, raising questions about potential differences in cardiovascular effects across agents. However, a comprehensive comparative evaluation of these therapies remains uncertain. Objetivos: To compare the effects of incretin-based therapies on cardiovascular outcomes in adults with type 2 diabetes. Métodos: A systematic review and network meta-analysis of randomized CVOTs was conducted in accordance with PRISMA guidelines. Literature searches were performed in PubMed, Embase, and Cochrane databases according to predefined eligibility criteria. Studies evaluating GLP1 receptor agonists and dual GIP/GLP1 receptor agonists were eligible. The primary outcome was major adverse cardiovascular events (MACE-3). Secondary outcomes included all-cause mortality, cardiovascular mortality, nonfatal myocardial infarction, nonfatal stroke, and hospitalization for heart failure. Hazard ratios and 95% confidence intervals were extracted and pooled using a random-effects model. Sensitivity analyses were performed. Resultados e Conclusões: A total of 771 records were screened, of which 9 CVOTs including 76,827 participants were eligible for analysis. All incretin-based therapies significantly reduced the risk of MACE compared with placebo, with no heterogeneity observed ($I^2 = 0\%$). A consistent reduction in nonfatal stroke was observed for dulaglutide (HR 0.76, 95%CI 0.61–0.95), subcutaneous semaglutide (HR 0.61, 95%CI 0.38–0.98), and tirzepatide (HR 0.69, 95%CI 0.52–0.92), with significant effects and no heterogeneity. Effects on hospitalization for heart failure were largely neutral across treatments, with the exception of efpeglenatide, which demonstrated a significant reduction (HR 0.61, 95% CI 0.38–0.98). No consistent benefit was observed for nonfatal myocardial infarction, all-cause mortality, and cardiovascular mortality, which showed substantial heterogeneity across analyses. Sensitivity analyses confirmed the robustness of MACE and stroke findings, while results for myocardial infarction and mortality outcomes were sensitive to study inclusion. In conclusion, incretin-based therapies are associated with a reduction in MACE, mainly driven by decreased nonfatal stroke. No consistent benefits were observed for myocardial infarction, mortality, or heart failure outcomes, with these findings showing variability across analyses.

Figure 1. Network structure comparing each treatment and placebo.





22001

INFLAMMATORY AND OXIDATIVE LIPID BIOMARKER EFFECTS OF LP(A)-TARGETED THERAPIES: A BAYESIAN CLASS-STRATIFIED META-ANALYSIS

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Introdução/Fundamentos: Lp(a)-targeted therapies reduce cardiovascular risk through mechanisms beyond Lp(a) lowering, including modulation of oxidized phospholipids (OxPL) and inflammatory pathways. While OxPL-ApoB and OxPL-ApoA are emerging as mechanistic mediators of Lp(a)-driven atherosclerosis, their class-level quantification across siRNA, ASO, and oral inhibitors, alongside hs-CRP, remains uncharacterized with formal probabilistic inference. Objetivos: To evaluate the effects of Lp(a)-targeted drug classes on hs-CRP, OxPL-ApoB, OxPL-ApoA, HDL-C, and triglycerides through class-stratified Bayesian meta-analysis with threshold-exceedance probability estimation. Métodos: We systematically searched PubMed, Embase, Cochrane, and ClinicalTrials.gov through March 2026 for RCTs evaluating Lp(a)-targeted therapies. Class-stratified Bayesian hierarchical models were fitted in Stan using Hamiltonian Monte Carlo with the No-U-Turn Sampler. Treatment effects were expressed as MD with 95% CrI. Statistical analysis was performed using the bayesmeta package in R. Resultados e Conclusões: We included 6 RCTs across three drug classes. For hs-CRP, the pooled estimate was null (MD −0.01 mg/L; 95% CrI −0.40 to 0.38; I^2=4%), with only a 4.2% posterior probability of exceeding a 0.3 mg/L reduction [Pr(<−0.3)] and a 16.8% predictive probability of future benefit, providing no evidence of an anti-inflammatory class effect. For OxPL-ApoB, the pooled estimate demonstrated a robust reductive signal (MD −70.6%; 95% CrI −93.5 to −47.2; I^2=93%), with a 96.3% posterior probability of exceeding 50% reduction and a 75.4% predictive probability of future benefit. Class-stratified analysis revealed siRNA as the strongest reducer [Pr(>70%) = 94.5%], followed by ASO [Pr(>70%) = 46.1%] and oral inhibitors [Pr(>70%) = 18.4%]. For OxPL-ApoA, the pooled estimate showed meaningful lowering (MD −51.0%; 95% CrI −72.6 to −29.7; I^2=93%), with an 86.7% probability of exceeding 40% reduction; oral inhibitors demonstrated markedly higher efficacy [Pr(>50%) = 98.6%] versus ASO [Pr(>50%) = 7.7%]. HDL-C and triglycerides showed negligible pooled effects (MD −0.21% and −0.86%, respectively), with posterior probabilities of clinically relevant changes below 5%. In conclusion, Lp(a)-targeted therapies exert a potent and highly probable effect on OxPL reduction, particularly OxPL-ApoB, with siRNA demonstrating the deepest reductive profile, while hs-CRP, HDL-C, and triglycerides remain largely unaffected, reinforcing the mechanistic specificity of this drug class.

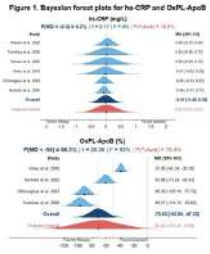
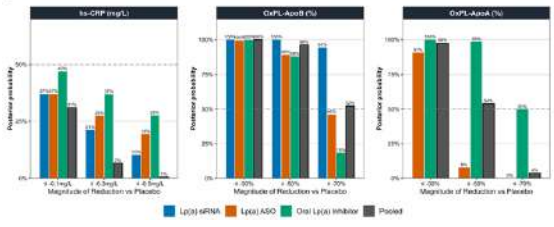


Figure 2: Posterior probabilities of clinically meaningful reductions by therapeutic class



17387

INTESTINAL DYSBIOSIS IN THE PATHOGENESIS AND PROGRESSION OF ATHEROSCLEROTIC DISEASE: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Atherosclerotic cardiovascular disease (ASCVD), including Coronary Artery Disease (CAD) and Acute Coronary Syndrome (ACS), remains the main cause of death worldwide. Despite well-established risk factors, a residual cardiovascular risk unexplained by traditional determinants persists. In this context, the intestinal microbiota emerges as an endocrine modulator of cardiometabolic homeostasis and its dysbiosis, a qualitative and quantitative imbalance of this microbial community, has been linked to the genesis and progression of atherosclerosis through bacterial product translocation and activation of systemic inflammatory pathways. Objetivos: This study aims to assess the connection between intestinal dysbiosis, elevated circulating TMAO and LPS levels, and the pathophysiology of atherosclerosis in patients with ASCVD, CAD or previous ACS. Métodos: Systematic review conducted in accordance with PRISMA guidelines, integrating studies published in PubMed and PubMed Central (PMC) over the past five years, in English. Using PICO framework: (P) patients with atherosclerosis; (I/E) exposure to gut dysbiosis and elevated LPS and TMAO levels; (C) baseline levels and absence of gut dysbiosis; (O) ASCVD and cardiovascular events. Keywords: “gut microbiota,” “dysbiosis,” “TMAO,” “LPS,” “atherosclerosis,” “endothelial dysfunction,” and “CAD.” Inclusion criteria: studies regarding patients with ASCVD, CAD, or ACS and levels of circulating TMAO or LPS. The articles were selected in two stages: title/abstract screening followed by full-text assessment. Resultados e Conclusões: The analyzed studies demonstrate that dysbiosis is associated with elevated plasmatic levels of trimethylamine N-oxide (TMAO), a bacterial metabolite that favors atherogenesis by reducing bile acid synthesis and subsequent fecal cholesterol excretion, increasing foam cell formation, and inducing endothelial dysfunction via IL-6, CRP, TNF-α, and reactive oxygen species. Furthermore, dysbiosis induces the translocation of lipopolysaccharides (LPS) from gram-negative bacteria into systemic circulation due to increased intestinal permeability, creating a chronic low-grade endotoxemia mediated by IL-1-, IL-6-, and TNF-α-. Therefore, intestinal dysbiosis represents a relevant pathophysiological link in atherosclerosis, operating through measurable bacterial metabolites. TMAO and LPS emerge as promising biomarkers and therapeutic targets in ASCVD, CAD, and ACS.

21159

IS P2Y12 INHIBITOR MONOTHERAPY SUPERIOR TO ASPIRIN FOR LONG-TERM SECONDARY PREVENTION IN ATHEROSCLEROTIC CARDIOVASCULAR DISEASE? A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Antiplatelet therapy is well established in the secondary prevention of atherosclerotic cardiovascular disease (ASCVD). Aspirin (ASA) has long been the standard for long-term monotherapy; however, the role of P2Y12 inhibitor (iP2Y12) monotherapy remains uncertain. Thus, evaluating the comparative efficacy, safety, and net clinical benefit (NCB) of these strategies remains essential. Objetivos: To evaluate the net clinical benefit of iP2Y12 monotherapy versus ASA in long-term secondary prevention. Métodos: A systematic review was conducted according to PRISMA. Searches were performed in PubMed, Embase, and Cochrane using predefined terms “Coronary artery disease”, “P2Y12 inhibitors”, “Aspirin”, and “Monotherapy”. Eligibility followed the PICO framework. Studies including adult patients with coronary artery disease in long-term secondary prevention, comparing iP2Y12 monotherapy versus ASA, were included. Screening was performed by two reviewers, with disagreements resolved by consensus. Data extraction focused on major adverse cardiovascular events (MACE) and major bleeding (MB), followed by qualitative synthesis. Resultados e Conclusões: Four studies involving 25.162 patients with established ASCVD were included, comprising three randomized trials and one post-hoc analysis. Across the included studies, reported outcomes demonstrated that iP2Y12 monotherapy (mainly Clopidogrel and Ticagrelor) demonstrated superior or non-inferior efficacy compared with ASA monotherapy. Additionally, clopidogrel consistently reduced MACE (HR 0.71–0.86; 95% CI 0.54–0.96) and was associated with lower MB rates during long-term follow-up (HR 0.71; 95% CI 0.57–0.88). Conversely, ticagrelor reduced MACE versus ASA (HR 0.74; 95% CI 0.58–0.96) but increased BARC 3 to 5 bleeding (HR 1.89; 95% CI 1.03–3.45). Moreover, NCB generally favored iP2Y12 monotherapy (HR 0.78–0.85; 95% CI 0.61–1.01), primarily driven by reductions in ischemic events without significant differences in all-cause mortality. Findings were consistent across high-ischemic-risk and complex percutaneous coronary intervention (PCI) subgroups. In long-term secondary prevention, clopidogrel monotherapy provided a NCB over ASA, reducing both ischemic events and MB with no difference in all-cause mortality. Ticagrelor reduced ischemic events but increased severe bleeding. These findings were consistent even in high-ischemic-risk and complex PCI subgroups. Thus, clopidogrel represents an advantageous alternative to ASA, with the choice guided by individual bleeding risk.

18509

LIPID DISCORDANCE IN YOUNG ADULTS (25–35 YEARS) AND CARDIOVASCULAR RISK: A SYSTEMATIC REVIEW

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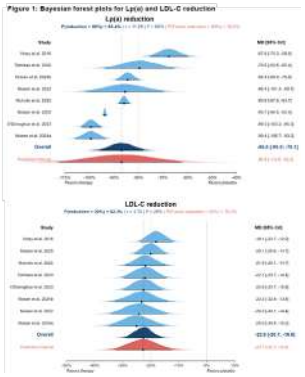
Introdução/Fundamentos: Introduction Traditional cardiovascular risk assessment is primarily based on serum LDL-cholesterol (LDL-C) levels. However, growing evidence suggests that LDL-C may underestimate true atherogenic risk in a significant portion of the population, especially in young adults and individuals with atherogenic dyslipidemia. Lipid discordance occurs when highly correlated markers such as LDL-C, non-HDL cholesterol, and apolipoprotein B (ApoB) provide conflicting information about cardiovascular risk. Each atherogenic particle contains exactly one ApoB molecule; therefore, ApoB concentration directly reflects the number of circulating particles, regardless of cholesterol content. In young adults aged 25–35 years, the window for primary prevention is particularly critical. Lipid abnormalities at this stage promote cumulative exposure to atherogenic particles and accelerate the silent progression of atherosclerosis. Identifying individuals with normal LDL-C but elevated ApoB represents a key opportunity for early intervention. This systematic review aims to synthesize current evidence on the association between lipid discordance especially ApoB/LDL-C and cardiovascular risk in young adults. Objetivos: To evaluate lipid discordance (ApoB vs. LDL-C) and cardiovascular risk in young adults aged 25–35. Métodos: Systematic review conducted according to PRISMA 2020 guidelines. Searches were performed in PubMed, Scopus, and Web of Science. Resultados e Conclusões: Twelve studies (n = 42,847). High ApoB/normal LDL-C discordance associated with subclinical atherosclerosis (OR 1.55; 95% CI: 1.38–1.74). LDL-C alone underestimates cardiovascular risk. ApoB should be incorporated into risk stratification.

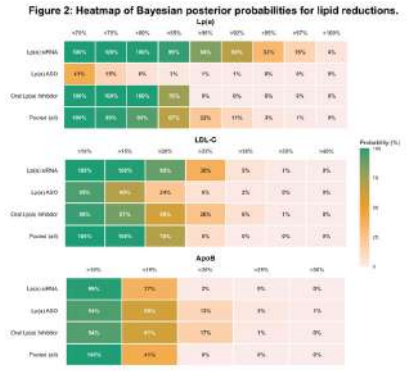
21719

LIPID-LOWERING EFFICACY OF LP(A)-TARGETED THERAPIES ACROSS DRUG CLASSES: A BAYESIAN CLASS-STRATIFIED META-ANALYSIS

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(1) FACULDADE DE MEDICINA DE OLINDA - OLINDA - PE - BRASIL; (2) UFRN - NATAL - RN - BRASIL; (3) UNIVERSIDADE ESTADUAL DO RIO GRANDE DO NORTE - MOSSORÓ - RN - BRASIL; (4) FACULDADE DE MEDICINA DA UNIVERSIDADE DE SAO PAULO - SÃO PAULO - SP - BRASIL; (5) UNIVERSIDADE DE SAO PAULO - SÃO PAULO - SP - BRASIL;





Introdução/Fundamentos: Lipoprotein(a) [Lp(a)] is an independent cardiovascular risk factor inadequately addressed by conventional lipid-lowering therapies. Three mechanistically distinct drug classes, siRNA agents, antisense oligonucleotides (ASO), and oral Lp(a) inhibitors, have emerged as targeted therapies, each exerting variable effects on Lp(a), LDL-C, and ApoB. A rigorous class-level quantification with formal probabilistic inference remains lacking. Objetivos: To evaluate and compare the lipid-lowering efficacy of Lp(a)-targeted therapy classes, Lp(a) siRNA, Lp(a) ASO, and oral Lp(a) inhibitors, on Lp(a), LDL-C, and ApoB, through class-stratified Bayesian meta-analysis with threshold-exceedance probability estimation. Métodos: We systematically searched PubMed, Embase, Cochrane, and ClinicalTrials.gov through March 2026 for Randomized Controlled Trials (RCTs) evaluating Lp(a)-targeted therapies. Class-stratified Bayesian hierarchical models were fitted in Stan using Hamiltonian Monte Carlo with the No-U-Turn Sampler. Treatment effects were expressed as mean differences (MD) in percent reduction with 95% credible intervals (CrI). Statistical analysis was performed using the brms package in R. Resultados e Conclusões: We included 8 RCTs across three drug classes. For Lp(a) reduction, siRNA demonstrated the largest effect (MD −93.3%; 95% CrI −101.2 to −85.2; I²=61%), with an 83% posterior probability of exceeding a 90% reduction [Pr(>90%)], versus ASO (MD −69.6%; 95% CrI −83.9 to −57.4; Pr(>90%)=1%) and oral inhibitors (MD −85.8%; 95% CrI −88.0 to −83.6; Pr(>90%)=0%). For LDL-C, siRNA showed the strongest probabilistic signal (MD −27.0%; 95% CrI −36.8 to −18.6; I²=26%; Pr(>20%)=97%), followed by ASO (MD −39.9%; 95% CrI −90.1 to −10.3; I²=87%; Pr(>20%)=75%) and oral inhibitors (MD −21.3%; 95% CrI −32.5 to −10.1; Pr(>20%)=59%). For ApoB, all classes demonstrated near-certain efficacy exceeding a 10% reduction: siRNA (MD −15.4%; 95% CrI −20.3 to −11.1; Pr(>10%)=100%), ASO (MD −36.8%; 95% CrI −89.3 to −9.5; Pr(>10%)=99%), and oral inhibitors (MD −16.1%; 95% CrI −24.1 to −8.1; Pr(>10%)=93%). In conclusion, Lp(a) siRNA demonstrates the highest posterior probability of clinically meaningful lipid reductions across all three parameters. ASO exhibited substantial heterogeneity in LDL-C and ApoB estimates, warranting caution in pooled inference, while oral inhibitors showed robust Lp(a) lowering that nonetheless fell short of the 90% threshold, highlighting important class-level distinctions for therapeutic decision-making.

19199

LIPOPROTEIN(A) AS AN EMERGING THERAPEUTIC TARGET IN CARDIOVASCULAR PREVENTION: CURRENT EVIDENCE AND FUTURE PERSPECTIVES

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Introdução/Fundamentos: Lipoprotein(a) [Lp(a)] is recognized as an independent, genetically determined cardiovascular risk factor associated with the development of atherosclerosis and thrombotic events. Despite its clinical relevance, effective therapeutic strategies for reducing Lp(a) levels remain limited, driving the development of novel targeted approaches. Objetivos: To evaluate the role of lipoprotein(a) in cardiovascular risk stratification and to critically discuss the impact of emerging therapies on the modification of residual cardiovascular risk. Métodos: A literature review was conducted using the PubMed database, including studies published between 2020 and 2026. Clinical trials, observational studies, systematic reviews, and international guidelines addressing Lp(a) as a cardiovascular risk factor and emerging therapeutic approaches were selected. Studies were screened through title and abstract analysis, followed by full-text review according to predefined eligibility criteria. Resultados e Conclusões: Consistent evidence demonstrates that elevated Lp(a) levels are associated with an increased risk of coronary artery disease, stroke, and major adverse cardiovascular events. Mechanistically, Lp(a) contributes to the progression of atherosclerosis and promotes prothrombotic activity. Conventional therapies have shown limited efficacy in reducing its circulating levels. However, novel RNA-based approaches, including antisense oligonucleotides and small interfering RNA (siRNA) therapies, have demonstrated substantial reductions in Lp(a) levels in recent clinical trials, representing a paradigm shift in the management of residual cardiovascular risk. Therefore, Lp(a) has emerged as an important therapeutic target in cardiovascular prevention.

16931

MICROPLASTIC EXPOSURE AND RISK OF CARDIOVASCULAR DISEASE: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Plastic pollution contributes to the formation of microplastics (particles < 5 mm) and nanoplastics (particles < 1,000 nm) (MNPs), associated with toxic effects. These particles enter the body via ingestion, inhalation, and skin contact. Evidence suggests MNPs are risk factors for cardiovascular disease through oxidative stress, inflammation, and apoptosis, and have been detected in atherosclerotic plaques. Objetivos: To assess the association between microplastics exposure and cardiovascular outcomes. Métodos: This systematic review followed PRISMA guidelines. A literature search was performed in the PubMed database. MeSH terms and free-text keywords included “microplastics”, “nanoplastics”, AND “atherosclerosis”, “atheroma”, “plaque”, “cardiovascular”, “carotid”, “coronary”. Boolean operators (AND, OR) were applied. Resultados e Conclusões: A total of eight studies have demonstrated that microplastics and nanoplastics are widely present in human vascular tissues, associated with vascular inflammation and atherosclerotic plaque instability. Approximately 58% of patients have MNPs in plaques, reaching >90% in carotid arteries, suggesting bioaccumulation. Mechanistically, these particles induce M1 macrophage activation, increasing phagocytosis, altering lipid metabolism, and promoting the accumulation of foam cells, contributing to vascular toxicity and arterial thickening. Clinical data demonstrate an increased risk of major cardiovascular events in individuals with MNPs (HR 4.53; 95% CI: 2.00–10.27; $p < 0.001$; Δ absolute risk: 15–18%), maintaining an association with nonfatal myocardial infarction. Experimental studies confirm increased total cholesterol, LDL, lipid uptake by macrophages, and increased plaque area ($p < 0.005$). Taken together, the findings indicate a strong, plausible, and potentially causal association, highlighting MNPs as an emerging environmental risk factor for atherosclerotic cardiovascular disease. Finally, it is concluded that microplastics are widely present in human vascular tissues, associated with atherosclerotic plaque instability. These findings demonstrate a significant increase in cardiovascular risk due to their potential role in atherogenesis. Therefore, they emerge as a possible environmental risk factor for cardiovascular disease, requiring further studies.

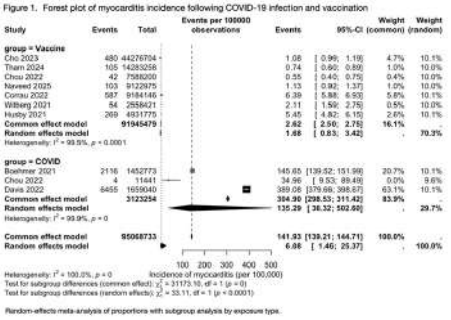
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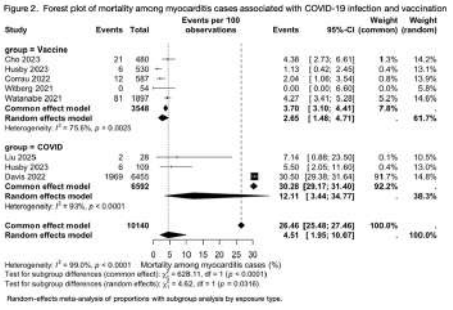
MYOCARDITIS AFTER COVID-19 AND VACCINATION: A SYSTEMATIC REVIEW AND META-ANALYSIS OF INCIDENCE AND MORTALITY

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(1) UFCSPA - PORTO ALEGRE - RS - BRASIL; (2) POMPÉIA ECOSSISTEMA DE SAÚDE - CAXIAS DO SUL - RS - BRASIL;

Introdução/Fundamentos: Myocarditis is an inflammatory condition of the myocardium commonly associated with viral infections and may lead to arrhythmias, cardiac dysfunction and death. During the COVID-19 pandemic, its incidence increased, occurring both as a complication of SARS-CoV-2 infection and, less-frequently, as a post-vaccination event. Although vaccine-related myocarditis has been identified as a potential adverse event, a comparative evaluation of its relative risk to infection is essential. Despite its low frequency following vaccination, widespread media coverage contributed to vaccine hesitancy. Therefore, quantifying and comparing incidence and mortality is essential to better inform clinical practice and public health policies. Objetivos: To quantitatively assess and compare the incidence and mortality of myocarditis associated with SARS-CoV-2 infection and COVID-19 vaccination through meta-analysis. Métodos: This systematic review and meta-analysis was conducted according to PRISMA guidelines. Studies were screened by two independent reviewers based on predefined eligibility criteria. Observational studies reporting myocarditis incidence and/or mortality associated with COVID-19 infection or vaccination were included. Random-effects meta-analyses of proportions with logit transformation were performed, with subgroup analyses by exposure type (COVID-19 vs vaccination). Results were reported as pooled estimates with 95% Confidence Intervals (CI). Statistical analyses were conducted in R using the meta package. Resultados e Conclusões: Twelve studies were included, comprising over 95 million individuals for incidence analysis and 10,140 myocarditis cases for mortality assessment. The incidence of myocarditis was higher in patients with COVID-19 compared to vaccination, with a pooled estimate of 135.29 cases per 100,000 individuals (95% CI: 36.32–502.60) versus 1.68 per 100,000 (95% CI: 0.83–3.42), respectively ($p < 0.0001$). Mortality among myocarditis cases was higher in COVID-19–associated cases, with a rate of 12.11% (95% CI: 3.44–34.77) compared to 2.65% (95% CI: 1.48–4.71) in vaccination-related cases ($p = 0.0316$). Substantial heterogeneity was observed ($I^2 > 90\%$), likely reflecting differences in study populations, diagnostic criteria, and clinical settings; however, the direction of effect remained consistent. In conclusion, both the incidence and mortality of myocarditis are higher in patients with COVID-19 compared to vaccination, supporting the relative safety of vaccines regarding this outcome.





16902

NON-ALCOHOLIC FATTY LIVER DISEASE (NAFLD)/METABOLIC DYSFUNCTION-ASSOCIATED STEATOTIC LIVER DISEASE (MASLD) AND RISK OF MAJOR ADVERSE CARDIOVASCULAR EVENTS (MACE): A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Cardiovascular diseases remain the leading cause of morbidity and mortality worldwide. Non-alcoholic fatty liver disease (NAFLD), recently redefined as metabolic dysfunction-associated steatotic liver disease (MASLD), is the most common chronic liver disease and is strongly linked to metabolic risk factors. Given its association with metabolic dysfunction, systemic inflammation, and endothelial impairment, NAFLD/MASLD may contribute to increased cardiovascular risk; however, this relationship has not been fully characterized across different cardiovascular outcomes. Objetivos: To evaluate the association between NAFLD/MASLD and major adverse cardiovascular events (MACE). Métodos: This systematic review and meta-analysis followed PRISMA guidelines. PubMed and EBSCO were searched (January 2005–March 2026) using predefined terms for NAFLD/MASLD and MACE. Google Scholar was used for supplementary search. Observational cohort studies reporting cardiovascular outcomes were included; reviews, case reports, and editorials were excluded. Two reviewers screened studies and extracted data by consensus. Study quality was assessed using the Newcastle–Ottawa Scale. Studies reporting adjusted hazard ratios (HR) or subdistribution hazard ratios (sHR) were pooled in the meta-analysis, while studies reporting other measures (e.g., odds ratios or risk ratios) were included qualitatively but not pooled due to limited numbers. Pooled estimates were calculated using a random-effects model with inverse variance in RevMan 5.4 (Cochrane), with predefined subgroup analyses. Resultados e Conclusões: Fifty-four studies were included in the qualitative synthesis, of which 32 were included in the meta-analysis (33 entries, as one study contributed to two outcomes), totaling over 86 million participants. Overall, NAFLD/MASLD was associated with increased risk of MACE (HR 1.60, 95% CI 1.43–1.79). In outcome-specific analyses, significant associations were observed for myocardial infarction (HR 1.31, 95% CI 1.20–1.43) and stroke (HR 1.29, 95% CI 1.07–1.56). No significant association was found for cardiovascular mortality (HR 1.68, 95% CI 0.85–3.33) or heart failure (HR 1.75, 95% CI 0.84–3.63), likely due to the small number of studies (n=2 each). Despite high heterogeneity (I^2 = 99%), effect direction was consistent, likely reflecting differences in MACE definitions, populations, and diagnostic methods. Findings support NAFLD/MASLD as a marker of increased cardiovascular risk, but highlight the need for standardization across studies.



19535

PARTICULARITIES OF SMOKERS WITH DEPRESSIVE SYMPTOMS UNDERGOING SMOKING CESSATION

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Introdução/Fundamentos: Depression is a mood disorder associated with clinical and behavioral comorbidities, including smoking. The Patient Health Questionnaire-9 (PHQ-9) identifies probable depression and symptom severity. Smoking may contribute to the development of depression, while depression may hinder smoking cessation. Investigating its association with clinical profile, including smoking history, comorbidities, and functional parameters, may improve understanding the interaction between these factors and their impact on overall health. Objetivos: To evaluate depressive symptom screening and its clinical and smoking-history associations among smokers with multimorbidities. Métodos: Observational cross-sectional study of smokers attending a university hospital smoking cessation clinic, coordinated by a multidisciplinary team, from August 2021 to April 2026. Cognitive-behavioral and pharmacological therapies were offered, with follow-up for up to 12 months. Depressive symptoms were defined as PHQ-9 >9. High nicotine dependence was defined as Fagerström Test ≥5; heavy smoking as ≥20 cigarettes/day; and cognitive decline as MoCA <26. Data were expressed as mean±SD or percentages. Associations were tested using Student's t-test and Chi-square test (p<0.05). Resultados e Conclusões: A total of 294 smokers (40 consecutive treatment groups) were evaluated. Depressive symptoms were present in 59.2%. Overall, 76.9% were women; mean age was 58.03±10.24 years; smoking duration 40.5±12.17 years; cigarette consumption 22.65±12.92/day; 67.8% were heavy smokers; and 75.3% had high nicotine dependence. Compared with smokers without depressive symptoms, those with depressive symptoms had lower prevalence of older adults (p<0.038), higher prevalence of COPD (p<0.001) and anxiety (p<0.002), higher cholesterol (p<0.026) and triglycerides (p<0.009), a trend toward sedentary lifestyle (p<0.087), and lower MoCA scores (p<0.086). Regarding smoking history, they had higher Fagerström scores (p<0.021), more dependence triggers related to phone use (p<0.018) and stress (p<0.017), more previous withdrawal symptoms (p<0.008), and more lapses (p<0.011). Conclusions: Depressive symptoms were highly prevalent and associated with younger smokers, worse metabolic and respiratory markers, and greater nicotine and behavioral dependence. Early screening for depressive symptoms may support timely pharmacological and behavioral interventions and improve smoking cessation outcomes.

VARIABLE	MEAN±SD or PERCENTAGES
Depressive symptoms	59.2%
Women	76.9%
Age	58.03±10.24 years
Smoking duration	40.5±12.17 years
Cigarette consumption	22.65±12.92/day
Heavy smokers	67.8%
High nicotine dependence	75.3%

VARIABLES	DEPRESSION	ABSENT DEPRESSION	p VALUE
Elderly	47%	53%	0.038
COPD	45.2%	25.9%	0.001
Anxiety	73.7%	56%	0.002
Cholesterol	57.2%	42.8%	0.026
Triglycerides	56.9%	43.1%	0.009
Sedentary	52.1%	41.7%	0.087
MoCA Scores	60.4%	29.6%	0.086
Fagerström scores	58.7%	41.3%	0.021
Phone use trigger	44.5%	30.2%	0.018
Stress trigger	92.5%	83.6%	0.017
Abstinence	48.1%	31.4	0.008
Lapses	25.4%	11.4%	0.011

14489

PERFORMANCE OF THE SAMPSON EQUATION FOR LDL-C ESTIMATION IN PRIMARY CARE: AN OBSERVATIONAL STUDY IN A BRAZILIAN POPULATION

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Introdução/Fundamentos: Accurate estimation of low-density lipoprotein cholesterol (LDL-C) is essential for cardiovascular risk stratification in primary care. The Friedewald equation remains widely used but shows reduced accuracy in hypertriglyceridemia and low LDL-C levels. The Sampson equation was developed to improve LDL-C estimation across a broader triglyceride spectrum without increasing operational complexity. Objetivos: To evaluate the analytical performance and clinical impact of the Sampson equation compared with the Friedewald formula in a primary care population. Métodos: An observational analytical study was conducted using lipid profiles from adult patients followed in primary care units in São Bernardo do Campo, Brazil. The study was approved by the local Research Ethics Committee (CEP nº 7.714.125; CAAE 89741425.9.0000.0082). LDL-C was estimated using Friedewald and Sampson equations and compared with directly measured LDL-C in a representative subset. Subgroup analyses were performed according to triglyceride levels (<150, 150–399, and ≥400 mg/dL). Agreement with direct LDL-C was assessed using correlation coefficients, mean absolute error, and Bland–Altman analysis. Reclassification across clinically relevant LDL-C thresholds (70 and 100 mg/dL) was evaluated. Resultados e Conclusões: A total of 1,372 patients were included (mean age 59.2 years; 58.6% female; 36.9% diabetes). Median triglycerides were 192 mg/dL. In the validation subset (n=348), the Sampson equation demonstrated lower mean absolute error compared with Friedewald (9.1 vs 14.7 mg/dL; p<0.001) and stronger correlation with direct LDL-C (r=0.93 vs 0.87). Differences were modest at triglycerides <150 mg/dL but became clinically significant above 150 mg/dL. In patients with triglycerides ≥400 mg/dL, Sampson maintained better agreement (mean absolute error 15.6 vs 33.4 mg/dL; p<0.001), whereas Friedewald showed marked underestimation. Reclassification occurred in 21.4% of patients, predominantly shifting individuals to higher-risk LDL-C categories. The Sampson equation did not increase operational cost, as it is based on a fixed formula without variable adjustments. These findings support the Sampson equation as a more accurate and cost-neutral alternative for LDL-C estimation in primary care, particularly in populations with high metabolic burden.

15783

PREVALENCE AND CHARACTERISTICS OF CORONARY ARTERY LESIONS IN PATIENTS UNDER 40 YEARS: A CORONARY COMPUTED TOMOGRAPHY ANGIOGRAPHY STUDY

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Introdução/Fundamentos: Coronary artery disease (CAD) is uncommon in individuals under 40 years of age; however, when present, it may have significant clinical implications. Data regarding this population remain limited, and strategies for early diagnosis and identification of high-risk individuals continue to be challenging in modern cardiology. Objetivos: To evaluate the prevalence of coronary artery lesions and anatomical characteristics in patients aged ≤40 years undergoing coronary computed tomography angiography (CCTA). Métodos: This retrospective cross-sectional study included all CCTA examinations performed between January 2023 and January 2025. Patients were stratified by age, focusing on those ≤40 years. The analyzed variables included the presence of coronary artery lesions, coronary artery calcium (CAC) score, and anatomical characteristics of lesions, when present. Resultados e Conclusões: A total of 2083 CCTA examinations were performed, of which 94 were in patients aged ≤40 years. Age ranged from 8 to 40 years (median 36 years). Elevated CAC score was observed in 11% of patients (mean 4.4 AU), with only one patient presenting CAC >100 AU. Coronary artery lesions were identified in 14% of patients, most commonly involving the left anterior descending artery. Only two patients (2.1%) had moderate or severe lesions. Most patients with coronary lesions had detectable CAC, with only one patient (1.06%) presenting a lesion despite a CAC score of 0. In this population, the prevalence of coronary artery lesions was low and predominantly mild, and most frequently involved the left anterior descending artery. The presence of CAC was associated with coronary calcification and atherosclerosis, even in younger individuals. These findings support the selective use of CCTA in this age group and highlight the importance of individualized clinical assessment.

CORONARY ARTERY	NUMBER OF LESIONS
LEFT MAIN CORONARY ARTERY	0
LEFT ANTERIOR DESCENDING ARTERY	11
RIGHT CORONARY ARTERY	2
LEFT CIRCUMFLEX ARTERY	1

17038

PREVENT VS. FRAMINGHAM RISK SCORE IN A HIGH-RISK POPULATION: CARDIOVASCULAR RISK RECLASSIFICATION AND THE ROLE OF METABOLIC SYNDROME

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Introdução/Fundamentos: The 2025 Brazilian Guideline on Dyslipidemia and Atherosclerosis Prevention adopts the PREVENT score for cardiovascular risk stratification, replacing the Framingham Global Risk Score (FGRS). By incorporating heart failure outcomes and lowering the high-risk threshold from ≥20% to ≥10%, PREVENT substantially modifies risk classification, however, its clinical impact remains uncertain. Objetivos: To compare cardiovascular risk reclassification by PREVENT versus FGRS and to characterize the clinical and metabolic profile of reclassified patients, emphasizing metabolic syndrome (MetS). Métodos: Cross-sectional study including 140 patients (40–74 years) followed at a tertiary care center. The base PREVENT model was calculated according to Khan SS et al., incorporating age, sex, systolic blood pressure, total cholesterol, HDL-cholesterol, diabetes, smoking, antihypertensive use, and statin therapy. Agreement between scores was assessed using Cohen's kappa coefficient, with net reclassification analysis. Between-group differences were analyzed using Fisher's exact test and Mann-Whitney U test. Resultados e Conclusões: PREVENT category distribution was: low risk 48 (34.3%), borderline 40 (28.6%), intermediate 31 (22.1%), and high (≥20%) 21 (15.0%). Applying the ≥10% high-risk threshold recommended by the 2025 Brazilian guideline, 52 patients (37.1%) were classified as high risk (intermediate + high), compared with 66 (47.1%) by FGRS. Overall agreement was moderate (κ=0.652). Downward reclassification by PREVENT occurred in 13.6% of patients, who were significantly younger (median 55 vs. 67 years, p=0.0002) and had lower systolic blood pressure (p=0.040) compared with the concordant high-risk individuals. Among these reclassified patients, 84% were male and 79% had MetS. Agreement was substantial in patients with MetS (κ=0.645; n=106) but significantly lower in those without MetS (κ=0.370; n=34). Pearson correlation between continuous scores was r=0.608. PREVENT adoption shifts in cardiovascular risk stratification compared with FGRS, with notable proportion of downward reclassification, that largely affects younger male patients with high prevalence of metabolic syndrome, raising concerns about potential underestimation of risk. Lower agreement observed in individuals without MetS further highlights heterogeneity in risk assessment. These findings support the need for complementary risk refinement strategies, such as coronary artery calcium scoring, during the transition to PREVENT-based risk assessment.

19586

PROGNOSTIC VALUE OF CORONARY ARTERY CALCIUM SCORE IN PREDICTING MAJOR CARDIOVASCULAR EVENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Cardiovascular risk stratification is essential to guide preventive interventions. The coronary artery calcium (CAC) score, obtained by computed tomography, has emerged as a noninvasive tool for detecting subclinical atherosclerosis. However, the magnitude of its association with major cardiovascular events still requires quantitative consolidation. Objetivos: To evaluate the prognostic value of the coronary artery calcium score in predicting major cardiovascular events in asymptomatic adults. Métodos: A systematic review conducted according to PRISMA guidelines, with searches in PubMed, Embase, and Cochrane Library databases up to January 2026. Prospective studies evaluating the association between CAC and cardiovascular events were included. Participants were stratified according to CAC levels (0, 1–100, >100). The primary outcome was a composite of major cardiovascular events (MACE). The meta-analysis was performed using a random-effects model, with calculation of relative risk (RR) and 95% confidence intervals (95% CI). Heterogeneity was assessed using the I² index. Resultados e Conclusões: Eleven studies were included, totaling 102,457 participants. Individuals with CAC >100 had a significantly higher risk of cardiovascular events compared to those with CAC=0 (RR=3.12; 95% CI: 2.65–3.67; p<0.001). Even intermediate levels (CAC 1–100) showed increased risk (RR=1.78; 95% CI: 1.45–2.18; p<0.001). Heterogeneity was low (I²=23%). The coronary artery calcium score demonstrated strong prognostic value in predicting major cardiovascular events, allowing more precise risk stratification. Its use may assist in clinical decision-making, especially in guiding preventive therapies such as statins.

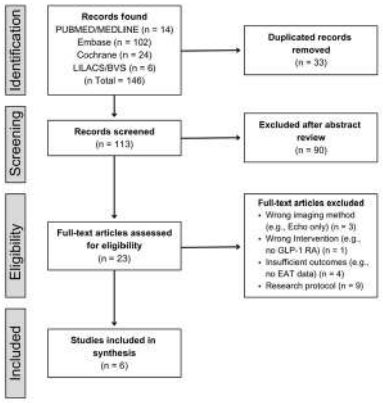
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QUALITATIVE VS. QUANTITATIVE CHANGES IN EPICARDIAL FAT UNDER GLP-1 RECEPTOR AGONIST THERAPY: A SYSTEMATIC REVIEW OF TISSUE COMPOSITION AND VOLUMETRIC IMAGING

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Introdução/Fundamentos: Epicardial adipose tissue (EAT) acts as an inflammatory reservoir contributing to cardiometabolic diseases. Although glucagon-like peptide-1 receptor agonists (GLP-1 RAs) have established cardiovascular benefits, their direct effect on EAT remains debated, prompting a shift from volumetric to qualitative microstructural analysis. Objetivos: To evaluate the impact of GLP-1 RAs and co-agonists on the qualitative and quantitative modulation of EAT in adults with overweight, obesity, or Type 2 Diabetes Mellitus, and its correlation with weight loss. Métodos: A systematic review conducted in strict accordance with the PRISMA 2020 guidelines, standardized searches (PubMed, Embase, Cochrane, LILACS) selected clinical trials and cohorts assessing EAT via Computed Tomography (CT) or Magnetic Resonance (MRI). Due to high heterogeneity, summary measures were inapplicable; data extraction followed the SWiM (Synthesis Without Meta-analysis) narrative synthesis model. Resultados e Conclusões: Six studies (383 patients) were included. EAT volumetric reduction proved inconsistent and, in most cases, passive and mathematically dependent on global weight loss. Liraglutide and tirzepatide induced significant systemic weight loss without achieving superior EAT volume reduction compared to placebo. With exenatide, EAT reduction occurred but was strongly linked to weight loss (r = 0.50). Semaglutide was the anatomical exception, reducing EAT independently of BMI (Body mass index). Regarding qualitative assessment (primary outcome), intracardiac lipotoxicity (triglyceride fraction via MRI) did not change significantly. In sharp contrast, CT revealed early inflammatory modifications: semaglutide significantly increased EAT radiodensity (+4.9 Hounsfield Units; p = 0.010). This increase acts as a radiological marker of tissue “de-inflammation” and beneficial microenvironment remodeling, occurring entirely independently of systemic weight loss. EAT structural reduction is, in most cases, a passive anatomical reflection of global weight loss rather than an intrinsic drug effect. However, the cardioprotection conferred by these therapies appears linked to a direct pleiotropic effect that promotes de-inflammation (increased radiodensity) and beneficial remodeling of the perivascular microenvironment. This phenotypic transition of EAT from a pro-inflammatory organ to a metabolically healthy state occurs regardless of variations in its size or physical shrinkage.



Lead Author (Year)	Main Findings
Dutour et al. (2016)	Exenatide promoted a significant reduction in epicardial adipose tissue (EAT) volume by 8.8% and in hepatic fat (HTGC) by 23.8% when compared to the reference treatment. The decrease in EAT was mathematically dependent on the systemic weight loss of the patients (r = 0.50; p = 0.018). There was no significant change in intracardiac/myocardial lipotoxicity (MTGC).
Manubolu et al. (2024)	The use of semaglutide resulted in a 9% reduction in EAT volume and, innovatively, promoted a 5% (or +4.9 HU) increase in epicardial fat radiodensity. This density increase on computed tomography acts as a marker of tissue "de-inflammation", occurring independently of BMI and body weight reduction (proven in multivariable models)
van Eyk et al. (2019)	Liraglutide induced significant weight loss in South Asian patients, but the intention-to-treat analysis did not reveal significant macrostructural reductions in EAT volume, paracardial fat, or myocardial triglyceride content, The reduction was limited to visceral adipose tissue in the per-protocol analysis, which was associated with improved HbA1c
Kramer et al. (2025)	Tirzepatide was effective in reducing left ventricular mass and global paracardial fat in patients with heart failure and obesity. However, the isolated modulation of EAT showed no significant statistical difference when compared to placebo (adjusted difference of -2 mL, p = 0.57), indicating that overall weight loss did not directly translate into an epicardial fat decrease.
Zhao et al. (2021)	In a single-arm clinical trial, liraglutide therapy significantly reduced EAT thickness by an average of 1.62 mm after 3 months. This effect was accompanied by a marked decrease in body weight (-4.38 kg), waist circumference, and BMI. The study, however, did not perform tests to verify whether this reduction was independent of weight loss
Bizino et al. (2020)	Despite promoting greater weight loss than placebo (-4.5 kg), liraglutide predominantly reduced subcutaneous adipose tissue. No statistically significant reductions in EAT, visceral adipose tissue (VAT), or hepatic and myocardial steatosis were observed compared to the control group

20795

RISK OF MAJOR ADVERSE CARDIOVASCULAR EVENTS IN PATIENTS WITH SEVERE PSORIASIS TREATED WITH BIOLOGICS VERSUS CONVENTIONAL THERAPY: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Psoriasis is a chronic systemic inflammatory disease associated with an increased cardiovascular risk. While biologic therapies may mitigate inflammation-driven atherosclerotic burden, their precise effect on major adverse cardiovascular events (MACE) remains uncertain. Objetivos: To compare the risk of MACE in patients with severe psoriasis treated with biologic agents versus conventional therapies. Métodos: This systematic review and meta-analysis followed PRISMA guidelines and included trials and observational cohorts. Data were obtained from registries and databases, TriNetX, Korean National Health Insurance, BIOBADADERM, BADBIR, MarketScan, and European cohorts. Twenty-five studies involving 300,000 patients were analyzed. Biologic therapies included anti-TNF, anti-IL-17, anti-IL-12/23, and anti-IL-23 agents. Conventional therapies comprised methotrexate, cyclosporine, phototherapy, and topicals. HR, adjusted HR, OR, and IRR were pooled using random-effects models. The primary outcome was MACE, myocardial infarction, stroke, or cardiovascular death. Resultados e Conclusões: Large real-world cohorts consistently demonstrated a lower cardiovascular risk with biologics compared to conventional therapy. Specifically, in TriNetX (n=25,464), biologics reduced MACE (HR 0.697; 95%CI 0.614–0.792). In the Korean nationwide cohort (n=183,212), biologics were associated with a lower incidence of MACE (aHR 0.454; 95%CI 0.359–0.574) and recurrent MACE (aHR 0.343; 95%CI 0.245–0.479) versus phototherapy. Anti-TNF agents showed significant benefit, including lower myocardial infarction risk versus topical therapy (aHR 0.50; 95%CI 0.32–0.79) and lower MACE risk versus methotrexate (HR 0.55; p<0.01). In contrast, randomized trial meta-analyses showed no significant differences, likely attributable to short follow-up periods and low event rates. Ustekinumab demonstrated an overall neutral profile, although one cohort suggested an early excess risk in patients with high baseline cardiovascular risk. Cyclosporine was associated with an increased MACE risk (IRR 3.59; 95%CI 1.17–10.99). In patients with severe psoriasis, biologic therapy—particularly anti-TNF and anti-IL-17 agents—is associated with a lower risk of MACE compared with conventional treatment in large observational studies. Randomized trials remain underpowered for cardiovascular outcomes. These findings support systemic inflammation control as a relevant strategy for cardiovascular risk reduction in psoriasis.

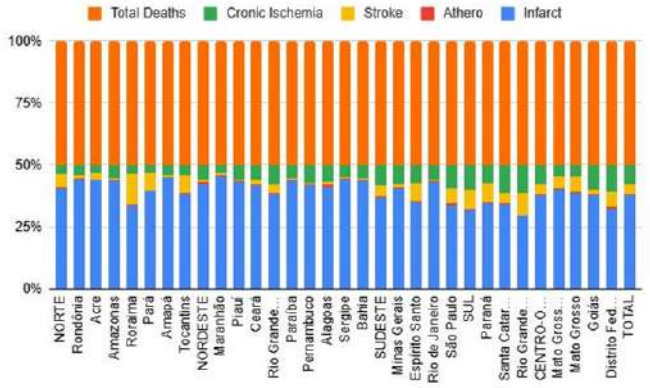
19438

SEX DISPARITIES AND TEMPORAL TRENDS IN CARDIOVASCULAR MORTALITY IN BRAZIL (2015–2024)

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(1) HOSPITAL DAS CLINICAS DA UFMG - BELO HORIZONTE - MG - BRASIL; (2) UNIVERSIDADE ANHEMBI MORUMBI - SÃO PAULO - SP - BRASIL; (3) UNIVERSIDADE NOVE DE JULHO - SÃO PAULO - SP - BRASIL; (4) FACULDADE DE MEDICINA DE SÃO JOSÉ DO RIO PRETO (FAMERP) - SÃO JOSÉ DO RIO PRETO - SP - BRASIL; (5) UNICAMP - CAMPINAS - MT - BRASIL; (6) UNIVERSIDADE SANTO AMARO (UNISA) - SÃO PAULO - SP - BRASIL; (7) CENTRO UNIVERSITÁRIO DE BRUSQUE (UNIFEBE) - BRUSQUE - SC - BRASIL; (8) UNIVERSIDADE DE MOGI DAS CRUZES - MOGI DAS CRUZES - SP - BRASIL; (9) CLINICA PRO CORACAO - SÃO PAULO - SP - BRASIL; (10) CENTRO UNIVERSITÁRIO FACULDADE DE MEDICINA DO ABC - SANTO ANDRÉ - SP - BRASIL;

Introdução/Fundamentos: Cardiovascular diseases (CVD) remain the leading public health challenge in Brazil, with fatal outcomes distributed unequally between sexes. While male mortality is linked to earlier onset, female mortality is often masked by atypical symptoms, diagnostic neglect, and a distorted perception of risk. Objetivos: This study analyzes sex disparities in atherosclerotic cardiovascular mortality in Brazil, comparing ischemic profiles from 2015 to 2024. Métodos: This cross-sectional, descriptive epidemiological study utilized data from the Mortality Information System (SIM/DATASUS). Deaths were analyzed using ICD-10 codes: I21 (Acute Myocardial Infarction), I63 (Cerebral Infarction), I70 (Atherosclerosis), and I25 (Chronic Ischemic Heart Disease). Variables included sex, age, race, education level, and geographic region. Resultados e Conclusões: Out of 2,721,498 recorded deaths, males accounted for 53.3% (n=1,450,418). The age-related contrast highlights significant inequality: men show peak lethality between 60–69 years, whereas 35.5% of female deaths occur after age 80 (n=452,261). Female longevity does not imply protection; the survival benefit provided by estrogen during fertile years shifts fatal events to senescence, often exacerbated by decades of underdiagnosis. Furthermore, regarding the identified ICD codes, there was a higher number of male deaths related to AMI (59.3%) and Ischemia (15.1%). Concerning Stroke, both groups showed similar figures (51.1% vs. 48.9%). However, deaths from atherosclerosis suggest that women may be more affected (52.4%), although the lack of age stratification hinders analytical precision. Socioeconomically, low education (1–3 years of schooling) concentrated the highest death toll (n=558,917), proving social vulnerability is as critical as biological factors. Regionally, the Southeast led in volume (São Paulo: 624,582 cases), reflecting population density and the urgency for targeted strategies. Brazil faces dual challenges: the necessity for early lifestyle intervention in men and the recognition of female ischemic risk, which shifts over time and requires continuous cardiovascular surveillance throughout a woman's life.



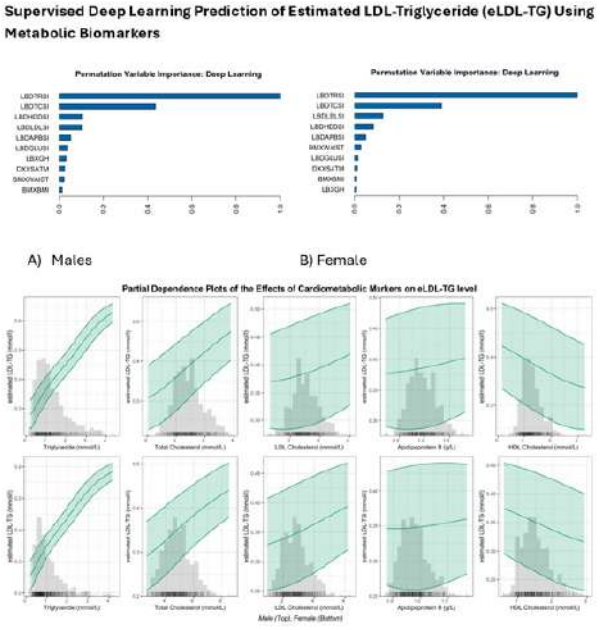
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SUPERVISED DEEP LEARNING PREDICTION OF ESTIMATED LDL-TRIGLYCERIDE (ELDL-TG) USING METABOLIC BIOMARKERS

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Introdução/Fundamentos: Recent studies have shown that estimated LDL triglycerides (eLDL-TG) are more strongly associated with atherosclerotic cardiovascular disease (ASCVD) risk than both estimated LDL-C and directly measured LDL-C. Using a novel equation proposed by Wolska et al. (2024), eLDL-TG was matched to LDL-TG levels measured using the BQ reference method (BQLDL-TG). Despite its clinical significance, there is a paucity of findings exploring the relationships between eLDL-TG and metabolic risk predictors. Objetivos: This study aims to investigate the effects of metabolic risk predictors on eLDL-TG in adult males and females. Métodos: This study was conducted using a subsample of the NHANES 2015–2016 dataset, which included 1,308 participants (660 females and 648 males) aged 18 years or older. A neural network regression model was built using the H2O deep learning framework to predict eLDL-TG levels based on 14 metabolic predictors. The model employed a Gaussian distribution, adaptive learning rate, dropout regularization, and cross-validation to optimize performance. Key hyperparameters such as hidden layers, L1 and L2 regularization, and learning rate were carefully tuned to enhance model performance. Resultados e Conclusões: The models demonstrated strong predictive accuracy for both men and women, with training RMSEs of 0.0148 (men) and 0.0106 (women), and validation RMSEs of 0.0177 (men) and 0.0164 (women), indicating robust performance. While both models showed minimal overfitting, the slightly higher RMSE on validation datasets suggests moderate variability in predictions, particularly in women. Permutation variable importance plots of the top 5 predictors identified triglycerides as the most significant predictor in both sexes, while apo B the least. Partial dependence plots revealed nonlinear positive associations between eLDL-TG and triglycerides, total cholesterol, apo B and LDL-C, while negative correlation with HDL-C respectively in both genders. This study demonstrates that eLDL-TG is significantly associated with routine lipid profile parameters in both genders. This highlights its potential as an adjunct biomarker in hypertriglyceridaemia where calculated LDL-C becomes unreliable. Further studies are warranted to evaluate, and validate its performance relative to LDL-C, non-HDL-C, Lp(a), and Apo B in routine lipid profile measurement, and cardiovascular risk assessment.



19224

SYSTEMIC ATHEROSCLEROSIS AND MULTIORGAN DYSFUNCTION IN CARDIOGENIC SHOCK: A SYSTEMATIC REVIEW.

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Introdução/Fundamentos: Atherosclerosis is a systemic inflammatory disease that compromises multiple vascular beds. In cardiogenic shock, a life-threatening syndrome characterized by severe hypoperfusion, multiorgan dysfunction, and high mortality, this condition makes the outcomes worse by reducing perfusion reserves and fueling a cycle of inflammation and organ failure. Effective treatment must look beyond the patient through a multisystemic strategy that considers the total impact of vascular disfunction. Objetivos: To assess the association between systemic atherosclerosis and multiorgan dysfunction in cardiogenic shock. Métodos: This systematic review followed PRISMA guidelines. Pubmed, Scopus, and Embase were watched from 2019 to 2025 for studies evaluating cardiogenic shock and atherosclerosis-related outcomes. Eligible studies reported least one and-organ outcome, including renal, neurologic, hepatic, or overall mortality endpoints. Resultados e Conclusões: A total of 284 studies were identified, and fourteen were included. Atherosclerosis was associated with worse outcomes, including acute kidney injury, neurological and hepatic dysfunction. Mortality ranged from thirty to fifty percent. The interaction between hypoperfusion, congestion and inflammation drives multiorgan failure. These findings support cardiogenic shock as a systemic condition requiring integrated management beyond hemodynamic support.Thus outcomes depend not only on the heart failure, but on the integrated vulnerability of the renal, cerebral and peripheral systems. Therefore, the majority of the outcomes in cardiogenic shock depends not only on advances in circulatory support, but also in a physiopathological vision capable of recognizing the atherosclerosis as a multiorganic affection and central determining of the vulnerability of the patient's clinic.

14482

TARGETED THERAPIES FOR ELEVATED LIPOPROTEIN(A): A SYSTEMATIC REVIEW AND META-ANALYSIS OF PLACEBO-CONTROLLED RANDOMIZED TRIALS

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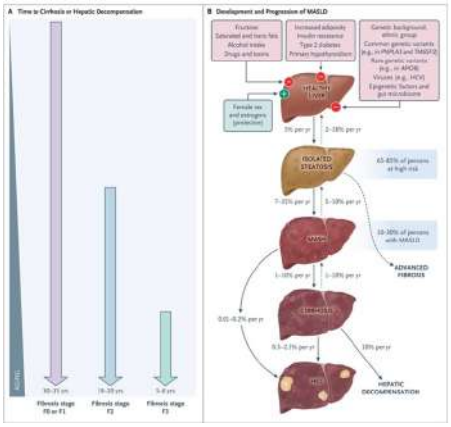
Introdução/Fundamentos: Elevated lipoprotein(a) [Lp(a)] is an independent and causal risk factor for atherosclerotic cardiovascular disease. Conventional lipid-lowering therapies have minimal impact on Lp(a), whereas novel targeted agents, including antisense oligonucleotides and small interfering RNA therapies, have shown promising results in randomized trials. Objetivos: To evaluate the efficacy of targeted Lp(a)-lowering therapies compared with placebo in randomized controlled trials. Métodos: A systematic review was conducted according to PRISMA 2020 and Cochrane recommendations. PubMed/MEDLINE, Embase, and Web of Science were searched from inception to 2025 for placebo-controlled randomized trials evaluating Lp(a)-targeted therapies. The strategy combined controlled vocabulary and free-text terms. Eligible studies included adults with elevated Lp(a) reporting percentage change from baseline. Two reviewers independently performed selection and data extraction. Risk of bias was assessed using RoB 2. A random-effects meta-analysis (DerSimonian–Laird) was performed using mean difference (MD). Heterogeneity was assessed using I^2 and τ^2. Prespecified subgroup and sensitivity analyses were conducted. Certainty of evidence was evaluated using GRADE. Resultados e Conclusões: Six randomized trials (n≈1,950 participants), including pelacarsen phase 2 (2019), OCEAN(a)-DOSE with olpasiran (2022), SLN360 phase 1 (2022), and LY3819469 studies (2023), were included. Targeted therapies significantly reduced Lp(a) compared with placebo (pooled MD: −78.4%; 95% CI: −85.2 to −71.6; p<0.001), with moderate heterogeneity (I^2=52%; τ^2=48.1). Subgroup analyses suggested greater reductions with siRNA-based therapies (MD: −85.1%) compared with antisense approaches (MD: −70.3%). Results were robust across sensitivity analyses, with no single study significantly influencing pooled estimates. Publication bias was not detected on qualitative assessment. The effect was consistent across baseline Lp(a) levels and dosing regimens. Risk of bias was low across trials. According to GRADE, certainty of evidence was high for Lp(a) reduction but moderate for clinical outcomes, as cardiovascular endpoint trials remain ongoing. These findings demonstrate that targeted therapies achieve profound and consistent Lp(a) lowering, representing a major advance in lipid management. Ongoing phase 3 trials will determine whether these reductions translate into cardiovascular risk reduction.

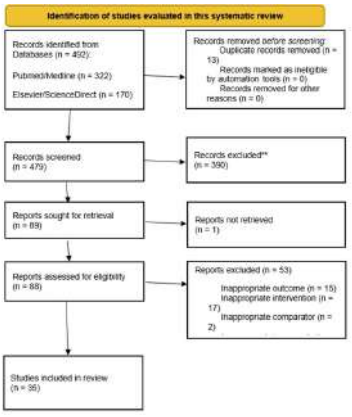
19995

THE CARDIOVASCULAR IMPACT OF GLP-1 RECEPTOR AGONISTS IN STEATOTIC LIVER DISEASE ASSOCIATED WITH METABOLIC DYSFUNCTION: A SYSTEMATIC REVIEW.

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Introdução/Fundamentos: Metabolic liver disease associated with metabolic dysfunction (MASLD), formerly known as non-alcoholic fatty liver disease, is currently the most prevalent form of chronic liver disease globally. MASLD has a complex and multifactorial pathophysiology, whose natural history, as summarized, involves insulin resistance, lipid metabolism dysfunction, and alterations in hepatic metabolic signaling. The recent incorporation of drugs targeting metabolic liver disease, such as semaglutide, has broadened interest in pharmacological approaches with systemic metabolic and cardiovascular impact. Objetivos: The objective is to evaluate the impact of glp1 analogs on MALSD and their correlation with a reduction in cardiovascular outcomes in these patients. Métodos: A systematic search was conducted in the PubMed/MEDLINE and Elsevier databases, encompassing studies published in the last 10 years. Search strategies were developed using descriptors, combined with Boolean operators AND and OR. The descriptors were “Non-alcoholic Fatty Liver Disease”, “Glucagon-Like Peptide-1 Receptor Agonists”, and “Incretin mimetic”. All identified records were exported to a reference manager – the Rayyan platform. 492 articles were identified. After analysis, 35 studies were included in the systematic review. Resultados e Conclusões: Randomized clinical trials demonstrate that semaglutide promotes significantly higher rates of histological resolution of Metabolic Steatohepatitis-Associated Dysfunction (MASH) without worsening fibrosis when compared to placebo. The LEAN study with 52 patients established that liraglutide is capable of inducing histological resolution of MASLD and reducing fibrosis progression. Nine (39%) of 23 patients who received liraglutide and underwent end-of-treatment liver biopsy had resolution of definite non-alcoholic steatohepatitis compared with two (9%) of 22 such patients in the placebo group (relative risk 4·3 [95% CI 1·0-17·7]; p=0·019). Large-scale studies demonstrate an association between the use of GLP-1 analogs and a reduction in cardiovascular events, clinically significant portal hypertension, and all-cause mortality, with semaglutide showing superiority in some outcomes.The decrease in visceral adiposity—a metabolically active compartment strongly associated with systemic inflammation—provides a plausible pathophysiological mechanism for the improvement in steatosis, hepatic necroinflammatory activity, and associated cardiometabolic impact.

21184

THE MIR-34A/SIRT1 AXIS IS ASSOCIATED WITH MOLECULAR DYSREGULATION AND REFINEMENT OF CARDIOVASCULAR RISK STRATIFICATION IN TYPE 2 DIABETES MELLITUS

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Introdução/Fundamentos: Type 2 diabetes mellitus (T2DM) is associated with increased cardiovascular risk, even under clinical control, suggesting the involvement of molecular mechanisms not captured by traditional risk scores. MicroRNAs, particularly miR-34a, have been implicated in the integration of inflammatory, oxidative stress, and endothelial dysfunction pathways, which are central processes in the cardiovascular pathophysiology of T2DM. Objetivos: To characterize the miR-34a/SIRT1 axis as an integrator of inflammatory, redox, and endothelial pathways and to investigate its potential role in cardiovascular risk stratification in individuals with T2DM. Métodos: An observational study was conducted including 128 participants (96 with T2DM and 32 controls). miR-34a expression was quantified by RT-qPCR, while circulating SIRT1, IL-6, TNF-α, hs-CRP, VCAM-1, and ICAM-1 levels were measured by ELISA. Oxidative stress was assessed through malondialdehyde (MDA) and total antioxidant capacity. Cardiovascular risk was estimated using the Framingham risk score. Correlation analyses, multivariate regression models, and ROC curve analyses were performed. Resultados e Conclusões: Individuals with T2DM exhibited significantly increased miR-34a expression, particularly in the high cardiovascular risk group ($p<0.001$), accompanied by reduced SIRT1 levels and intensification of inflammatory, oxidative, and endothelial pathways. In multivariate analysis, miR-34a, SIRT1, IL-6, and MDA were independent predictors of high cardiovascular risk. A multimarker model based on these components demonstrated high discriminative accuracy (AUC=0.92), outperforming isolated biomarkers and conventional clinical assessment. Collectively, these findings characterize an integrated molecular signature associated with metabolic, inflammatory, and vascular dysregulation in T2DM. The superior performance of the multimarker model highlights its ability to identify subclinical alterations not detected by traditional risk scores, supporting its use as a complementary strategy for refining cardiovascular risk stratification in the context of precision medicine. Thus, these findings reinforce the role of immunometabolic pathways in determining cardiovascular risk in T2DM and underscore the potential of integrating molecular biomarkers for the early identification of high-risk cardiometabolic profiles.

15840

THERAPEUTIC EFFECTS OF PCSK9-TARGETING THERAPIES IN HETEROZYGOUS FAMILIAL HYPERCHOLESTEROLEMIA: A SYSTEMATIC REVIEW OF RANDOMIZED CLINICAL TRIALS

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Introdução/Fundamentos: Individuals with heterozygous familial hypercholesterolemia (HeFH) are at increased risk of atherosclerotic cardiovascular disease due to lifelong exposure to elevated low-density lipoprotein cholesterol (LDL-C) levels. Despite the use of currently available lipid-lowering therapies, many patients with HeFH fail to achieve guideline-recommended LDL-C targets. Objetivos: In this context, the aim of this study was to evaluate the efficacy of PCSK9 (protease convertase subtilisin/kexin type 9)-targeted therapies in reducing lipid levels in adults with HeFH. Métodos: A systematic search was conducted in PubMed, Embase, and The Cochrane Library. Randomized clinical trials were included if they enrolled adults with HeFH, compared PCSK9-targeting therapies with placebo, and reported outcomes in LDL-C, non-HDL cholesterol, lipoprotein(a), and apolipoprotein B. Resultados e Conclusões: Five randomized clinical trials were included, evaluating evolocumab, alirocumab, tafolecimab, recaticimab, and enlicitide. Statistically significant reductions ($p<0.001$) in LDL-C levels were observed in all studies, reported as differences between treatment groups compared with placebo. Reductions exceeding 59% were identified with evolocumab and enlicitide, as well as comparable results with tafolecimab at different dosing regimens (57.4% and 61.4%, respectively); alirocumab and recatitimab also showed significant reductions, albeit of lesser magnitude (39.1% and 49.8%, respectively). Substantial decreases were observed in non-HDL cholesterol, including a 41.9% reduction with alirocumab and a −53.0% difference with enlicitida. Tafolecimab and recaticimab also demonstrated superiority over placebo, with robust statistical significance. Similar results were observed for apolipoprotein B, with significant reductions for enlicitida and alirocumab, as well as significant decreases with tafolecimab and recaticimab. Regarding lipoprotein(a), all agents analyzed produced reductions, notably tafolecimab, which showed the greatest effect magnitudes, followed by consistent reductions with recaticimab and alirocumab, demonstrating an additional benefit in the overall lipid profile. It is concluded that PCSK9-targeted therapies provide substantial and consistent lipid-lowering effects in patients with HeFH, demonstrating efficacy across different pharmacological classes and dosing regimens.

Study	Location	Total (N)	Population	Intervention (N)	Control (N)	Duration
Raal F et al. (2014)	Australia, Asia, Europe, New Zealand, North America, South Africa	331	Adults (18–80 years) with HeFH, on stable lipid-lowering therapy (including statins), fasting LDL-C ≥100 mg/dL (2.6 mmol/L), triglycerides ≤400 mg/dL (4.5 mmol/L)	Evolocumab 140 mg SC every 2 weeks (n=111); Evolocumab 420 mg monthly (n=110)	Placebo every 2 weeks (n=55) or monthly (n=55)	12 weeks
Ginsberg HN et al. (2016)	Canada, United States, Netherlands, Russia, South Africa	107	Patients with HeFH, LDL-C ≥160 mg/dL on maximally tolerated statin therapy ± other lipid-lowering therapy	Alirocumab 150 mg SC (n=72)	Placebo (n=35)	78 weeks
Chai M et al. (2023)	China	149	Adults (18–80 years) with definite or probable HeFH (Simon Broome criteria), LDL-C ≥1.8 mmol/L (ASCVD) or ≥2.6 mmol/L (no ASCVD), on stable lipid-lowering therapy ≥4 weeks	Tafolecimab 150 mg SC every 2 weeks (n=52); Tafolecimab 450 mg SC every 4 weeks (n=49)	Placebo every 2 weeks (n=23) or placebo (n=25)	12 weeks
Li L et al. (2025)	China	143	HeFH patients on stable lipid-lowering therapy ≥28 days, LDL-C ≥2.6 mmol/L (or ≥1.8 mmol/L with ASCVD), triglycerides ≤5.6 mmol/L	Recaticimab 150 mg SC (n=95)	Placebo every 4 weeks (n=48)	12 weeks
Ballantyne CM et al. (2026)	United States, Australia, Brazil, Canada, Chile, Colombia, Czech Republic, Finland, Hong Kong, Hungary, Israel, Netherlands, New Zealand, Norway, Singapore, Spain, Taiwan	303	HeFH patients on lipid-lowering therapy (at least moderate/high-intensity statin), LDL-C ≥55 mg/dL with ASCVD or ≥70 mg/dL without ASCVD	Enlicitide 20 mg orally daily (n=202)	Placebo daily (n=101)	52 weeks

Notes: HeFH: heterozygous familial hypercholesterolemia; ASCVD: atherosclerotic cardiovascular disease; LDL-C: low-density lipoprotein cholesterol; SC: subcutaneous; LLT: lipid-lowering therapy.

18224

TITLE: CORRELATION BETWEEN AIR POLLUTION AND ACUTE MYOCARDIAL INFARCTION (AMI): A SYSTEMATIC REVIEW.

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Introdução/Fundamentos: Introduction: The association between air pollution and cardiovascular outcomes has been widely investigated in different contexts. Studies indicate that exposure is linked to a higher risk of acute coronary events and poorer prognosis in individuals previously affected. Short-term exposure acts as a trigger, whereas long-term exposure represents a risk factor for cardiovascular alterations. Objetivos: Objectives: To evaluate the role of air pollution as both a trigger and a risk factor for AMI, emphasizing short- and long-term effects. Métodos: Methods: This systematic review followed PRISMA guidelines. Searches in PubMed, SciELO, and Web of Science (2015-2025) retrieved 1,248 studies; 10 were included for directly assessing the relation between air pollution and AMI. Resultados e Conclusões: Results: For acute exposure, elevated PM2.5, PM10, CO, and SO2 were associated with increased AMI admissions from the exposure day up to 5 days post-exposure. A 10 μg/m³ increase in PM2.5 was associated with higher hospitalization risk (RR=1.02; 95% CI: 1.01-1.03). For chronic exposure, a 10 μg/m³ rise in PM2.5 was related to greater AMI risk (RR=1.18; 95% CI: 1.11-1.26) and worse prognosis. Conclusion: This systematic review indicates that the air pollution exposure is associated with increased AMI morbidity and mortality. Both short- and long-term exposure contribute to coronary events. Despite limitations due to heterogeneity and observational designs, evidence supports air pollution as a modifiable AMI risk factor.

21528

USE OF PRAVASTATIN IN THE PREVENTION OF PRE-ECLAMPSIA IN HIGH-RISK PREGNANT WOMEN AND MATERNAL-FETAL SAFETY PROFILE: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Preeclampsia is a hypertensive disorder of pregnancy and an important cause of maternal and neonatal morbidity and mortality, with limited pharmacological options for prevention. Pravastatin, a statin widely used in cardiovascular prevention, presents low transplacental transfer due to its hydrophilic profile and has demonstrated potential effects in reducing preeclampsia in preclinical studies. Therefore, it has emerged as a possible preventive strategy for the disease. Objetivos: To evaluate the efficacy of pravastatin in the prevention of preeclampsia and its maternal-fetal safety profile. Métodos: This is a systematic review conducted according to the PRISMA protocol. Searches were performed in the PubMed, Cochrane, and Embase databases using the descriptors “Pravastatin,” “Preeclampsia,” and “Gestational Hypertension,” combined with the Boolean operators AND and OR, within the last 10 years. Randomized clinical trials evaluating the prophylactic use of pravastatin in high-risk pregnant women were included. Other study designs, protocols, and studies evaluating pravastatin as treatment were excluded. Outcomes included preeclampsia, preterm birth, and maternal-fetal safety. Resultados e Conclusões: A total of 392 articles were identified, of which 4 were included. Pilot studies observed no relevant maternal-fetal risks with pravastatin (10mg and 20mg) initiated during the second trimester, with anomaly rates similar to the control group and no reduction in fetal cholesterol levels. Regarding prevention, a large multicenter double-blind clinical trial (n=1120) did not demonstrate a preventive effect with a 20 mg/day dose initiated late in pregnancy (35–37 weeks) (P=0.65). In contrast, a smaller open-label study (n=173) showed that a 20 mg twice-daily regimen initiated earlier (10–20 weeks) and combined with aspirin and calcium significantly reduced the occurrence of preterm preeclampsia (13.8% vs 26.7%; p=0.03) and preterm birth (16.1% vs 36%; p=0.003) compared to standard treatment alone. No significant increase in severe adverse events was reported. Therefore, the findings highlight heterogeneity among studies and suggest that therapeutic window, dosage, and drug association may influence outcomes. However, evidence remains limited, and larger randomized clinical trials are necessary to confirm the efficacy of pravastatin in the prevention of preeclampsia.

Perioperative Evaluation



81º CONGRESSO BRASILEIRO
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15771

EFFICACY AND SAFETY OF DEXMEDETOMIDINE IN PATIENTS UNDERGOING TRANSCATHETER AORTIC VALVE REPLACEMENT: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Transcatheter aortic valve replacement (TAVR) has become the standard treatment for patients with severe symptomatic aortic stenosis (AS). Although initially performed under general anesthesia (GA), monitored anesthesia care with procedural sedation has emerged as a feasible alternative. Dexmedetomidine provides sedation, analgesia, and sympatholysis with minimal respiratory depression, making it particularly attractive for high-risk TAVR patients. However, evidence regarding its efficacy and safety compared with other sedative strategies remains limited. Objetivos: To evaluate the efficacy and safety of dexmedetomidine in patients undergoing TAVR. Métodos: A systematic search of PubMed, Embase, and Cochrane databases was performed to identify studies evaluating dexmedetomidine in TAVR. A pairwise meta-analysis was conducted using risk ratios (RRs) with 95% confidence intervals (CIs). Statistical significance was defined as a two-sided P-value < 0.05. A random-effects model with restricted maximum likelihood (REML) estimation was applied to account for between-study heterogeneity. Heterogeneity was assessed using the Cochrane Q test and the I² statistic. Resultados e Conclusões: A total of 09 studies including 1,489 patients were analyzed, of whom 46.74% were male, with a mean age of 81.4 years. Dexmedetomidine was associated with a significant reduction in vasopressor use compared with other sedatives (RR 0.72; 95% CI 0.55–0.94; P = 0.02). There were no significant differences between groups in 30-day mortality (RR 1.02; 95% CI 0.48–2.20; I² = 0%), myocardial infarction (RR 0.75; 95% CI 0.11–5.21; I² = 0%), stroke (RR 1.83; 95% CI 0.39–8.61; I² = 12%), or their composite (RR 1.30; 95% CI 0.38–4.45; I² = 15%). Respiratory outcomes were similar, including overall complications (RR 0.97; 95% CI 0.63–1.49), hypoxemia (RR 1.12; 95% CI 0.43–2.93), and invasive ventilation (RR 2.33; 95% CI 0.45–12.02). No differences were observed in postoperative delirium (RR 0.72; 95% CI 0.26–1.99), sedation failure (RR 2.68; 95% CI 0.55–13.00), need for rescue medication (RR 10.55; 95% CI 0.31–358.75), or conversion to GA (RR 0.58; 95% CI 0.12–2.74). Conclusions: Dexmedetomidine-based sedation in TAVR is safe and associated with reduced vasopressor requirements without increasing major adverse cardiovascular or neurological events. These findings support its use as a hemodynamically favorable sedation strategy in TAVR, although further randomized evidence is needed to confirm its impact on clinically meaningful outcomes.

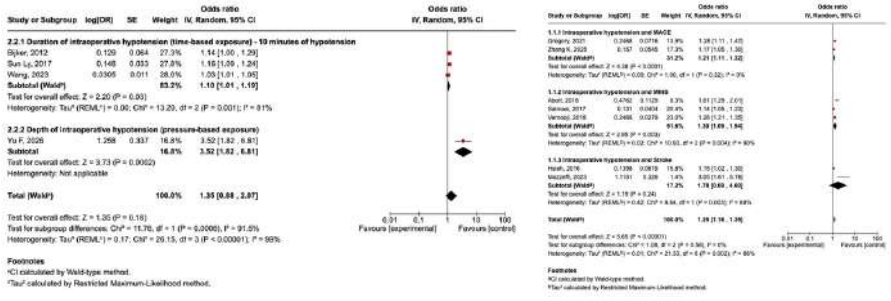
16910

INTRAOPERATIVE HYPOTENSION AND MAJOR ADVERSE CARDIOVASCULAR EVENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Cardiovascular events are leading causes of morbidity and mortality. Intraoperative hypotension (IOH) is defined as low blood pressure during surgery and is associated with clinically significant postoperative complications, including myocardial injury and major adverse cardiovascular events. Objetivos: To evaluate the association between intraoperative hypotension (IOH) and major adverse cardiovascular events (MACE). Métodos: This systematic review and meta-analysis were conducted per PRISMA and included observational and clinical studies. Literature searches were performed in PubMed, Google Scholar, and EBSCO using predefined terms related to intraoperative hypotension and major adverse cardiovascular events. Studies were screened by title and full text. Inclusion criteria comprised studies involving IOH, reporting MACE outcomes, conducted in surgical patients, and designed as observational studies or clinical trials. Exclusion criteria included studies without clinical outcomes, those focused on monitoring or prediction, non-cardiovascular outcomes, and reviews or protocols. After all screening stages, 13 studies were included. Data were extracted into Excel and analyzed using RevMan. Resultados e Conclusões: Intraoperative hypotension was consistently associated with increased risk of MACE (OR 1.21 [1.11–1.32]) and myocardial injury (OR 1.30 [1.09–1.54]), reinforcing its role as a modifiable perioperative target associated with adverse outcomes. The association with stroke was not statistically significant (OR 1.78 [0.69–4.60]), limited by few studies and wide confidence intervals. Duration-based analysis showed a statistically significant but modest association (OR 1.10 [1.01–1.19]), with substantial heterogeneity (I²=81%). Severity-based metrics demonstrated a stronger association (OR 3.52 [1.82–6.81]), though limited to a single study. Continuous exposure analyses showed that both duration and severity of IOH were associated with adverse outcomes, with severity emerging as the strongest predictor of risk. High heterogeneity – especially in duration-based analyses – likely reflects inconsistent definitions and patient variability, while the stronger effect of severity, despite limited data, underscores its relevance. These findings support stricter intraoperative blood pressure control as a potential strategy to reduce cardiovascular risk.



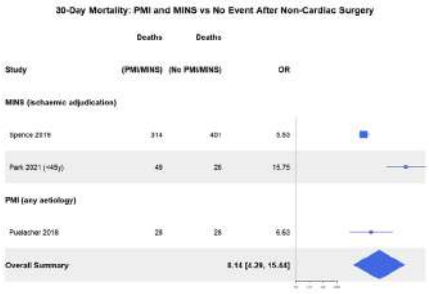
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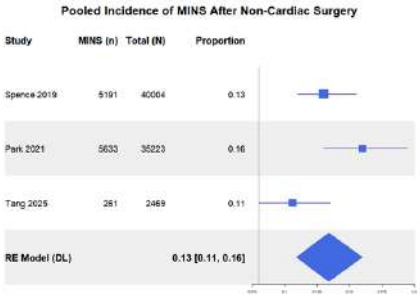
PERIOPERATIVE MYOCARDIAL INJURY AND 30-DAY MORTALITY IN NON-ELDERLY ADULTS UNDERGOING NON-CARDIAC SURGERY: A SYSTEMATIC REVIEW AND META-ANALYSI

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Introdução/Fundamentos: Perioperative myocardial injury (PMI) — defined either as any postoperative troponin elevation (broad PMI) or as ischaemia-confirmed elevation (MINS) — is the most frequent perioperative cardiovascular complication. Its incidence and prognostic impact in adults aged 12–64 years remain poorly characterised. Objetivos: To estimate the pooled incidence of PMI and MINS and their association with 30-day mortality in non-elderly adults undergoing non-cardiac surgery. Métodos: Systematic review and meta-analysis (PRISMA 2020; PROSPERO pre-registered). Searches in five databases and ClinicalTrials.gov yielded 1,560 records; after removing 335 duplicates, 1,225 were screened; 16 studies met inclusion criteria. Pooled MINS incidence was estimated using Freeman-Tukey double arcsine transformation (random-effects, DerSimonian-Laird). For 30-day mortality, Mantel-Haenszel random-effects was applied to three non-overlapping cohorts. Resultados e Conclusões: Pooled MINS incidence was 13.4% (95%CI 10.9–16.0%; I²=95%; n=77,696), though most contributing cohorts enrolled adults ≥45 years. The sole study restricted to adults under 45 years (Park 2021, SMC-TINCO registry; n=4,062) found MINS in 11.7% (475/4,062) — a population rarely screened in routine practice given assumed low cardiac risk. Within this subgroup, 30-day mortality was 10.3% with MINS (49/475) vs 0.7% without (26/3,587; adjusted HR 10.48; 95%CI 6.18–17.78), demonstrating that prognostic impact is preserved even in younger adults. Puelacher 2018 (n=2,018) was the sole study applying the broader PMI definition — any troponin elevation regardless of aetiology; the remaining three cohorts required ischaemic confirmation and thus report MINS. In Puelacher's cohort, 86% of PMI was cardiac in origin; 30-day mortality was 6.1% for cardiac vs 32.5% for extracardiac PMI (predominantly sepsis) — a descriptive finding illustrating distinct prognostic pathways, not included in the pooled estimate. Across three non-overlapping cohorts (n=45,083), both PMI and MINS were associated with an approximately 8-fold increase in 30-day mortality (OR 8.14; 95%CI 4.29–15.44; I²=88%). These findings challenge the assumption that non-elderly adults are low cardiac risk perioperatively and support systematic troponin monitoring in this population undergoing intermediate-to-high-risk non-cardiac surgery.





16030

PREVALENCE OF CORONARY ARTERY DISEASE AND CARDIOVASCULAR RISK STRATIFICATION IN PRE-RENAL TRANSPLANT PATIENTS: ANALYSIS OF AN INSTITUTIONAL PROTOCOL

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(1) INSTITUTO DE MEDICINA INTEGRAL PROFESSOR FERNANDO FIGUEIRA - IMIP - RECIFE - PE - BRASIL;

Introdução/Fundamentos: Patients with end-stage chronic kidney disease (CKD) carry a markedly elevated cardiovascular risk. Preoperative cardiac evaluation is critical for renal transplant candidates; however, the optimal risk stratification strategy remains debated. Objetivos: This study aimed to assess the prevalence of coronary artery disease (CAD) and the performance of an institutional risk stratification protocol in pre-renal transplant patients. Métodos: A cross-sectional, descriptive, and analytical study was conducted among 518 patients who underwent renal transplantation at Medical Institution of Reference in Northeast Brazil, between January 2022 and June 2024. Data were collected retrospectively. Univariate analyses were performed using Pearson's chi-square test or Fisher's exact test (significance level 5%). Resultados e Conclusões: The mean age was 46 years, and 67.4% were male. Only 8.5% had a documented preoperative cardiology consultation. Myocardial perfusion scintigraphy (MPS) was performed in 275 patients (53%), with abnormalities observed in 30%. Of these, 42.7% proceeded to cardiac catheterization, and CAD was confirmed in 19.5%. Overall, 47 patients underwent invasive stratification: CAD was confirmed in 22 (46.8%), and 7 (1.35% of total cohort) required percutaneous coronary intervention. Twelve-month post-transplant mortality was 13.3%, with only 7 cardiovascular deaths. Older age, male sex, diabetes, prior heart failure, prior stroke, and smoking were significantly associated with CAD. The prevalence of CAD was low (~4%) in this younger-than-average transplant cohort, with correspondingly low cardiovascular mortality. MPS demonstrated limited sensitivity for CAD detection in asymptomatic CKD patients, and a substantial proportion of patients underwent testing outside protocol indications. Refinement of institutional risk stratification criteria and prospective studies are warranted.

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16884

EFFECTS OF A RELAXATION PROTOCOL ON ANXIETY IN PATIENTS WITH HEART FAILURE

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Introdução/Fundamentos: Heart Failure (HF) represents a global public health challenge, with an alarming and progressive rise in incidence. As the leading cause of death among heart diseases, it affects more than 23 million people worldwide, with a five-year survival rate after diagnosis estimated at just 35%. The diagnosis of HF is characterized by reduced blood flow through the heart, leading to debilitating symptoms that significantly impact patients' quality of life. Anxiety is a common condition among those affected, occurring in up to 45% of cases, and can worsen prognoses. Cognitive-behavioral therapy (CBT) has been effective in treating anxiety, with relaxation and mindfulness techniques demonstrating positive results. This study evaluated the effects of these techniques on anxiety in patients with HF, aiming to improve psychological well-being and disease prognosis. Objetivos: To evaluate the effectiveness of a relaxation protocol in reducing anxiety in hospitalized patients with heart failure. Métodos: A quasi-randomized clinical trial was conducted with 20 participants allocated into two groups: experimental (n=10) and control (n=10). The experimental group underwent eight individual relaxation sessions, while the control group only completed baseline and final assessments. Anxiety levels were measured using the Hamilton Anxiety Rating Scale (HAM-A). Resultados e Conclusões: The sample (n=20) consisted of two groups (experimental and control, n=10 each), with no significant difference at baseline regarding anxiety levels (p=0.65). The experimental group showed a significant reduction in anxiety scores after the intervention (22.1 ± 5.3 to 13.3 ± 1.7; p < 0.001; d = 2.05), with 100% of participants reclassified as having mild anxiety. In contrast, the control group maintained clinically relevant levels of anxiety, with no significant improvement. At the end of the study, a significant difference was observed between the groups (p < 0.001), with lower anxiety levels in the experimental group. These findings indicate that the relaxation protocol is effective in reducing anxiety in hospitalized patients with heart failure, representing a brief, low-cost intervention applicable to the hospital setting, with potential for integration into multidisciplinary care.

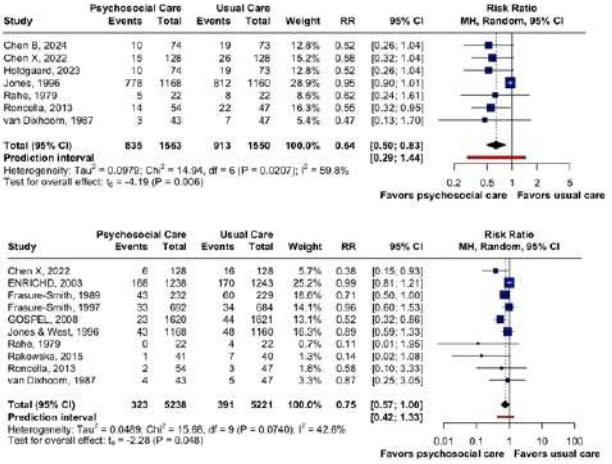
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IMPACT OF PSYCHOLOGICAL INTERVENTIONS ON HARD CARDIOVASCULAR OUTCOMES ACCORDING TO THE UNDERLYING CARDIAC CONDITION: SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Meta-analyses on psychological interventions in cardiology frequently pool heterogeneous populations, masking the true therapeutic effect in each specific clinical scenario. Objetivos: To evaluate the impact of psychological interventions on hard cardiovascular outcomes, stratifying clinical trials by patients' underlying cardiac condition. Métodos: This review followed PRISMA and Cochrane guidelines (PROSPERO: CRD420261370635), with a systematic search of PubMed, Embase, and Cochrane CENTRAL through April 2026, supplemented by manual reference tracking. We included randomized clinical trials comparing active psychological interventions to usual care, stratified into: Post-AMI/ACS, Heart Failure (HF), and Mixed Chronic Coronary Disease (CCD). Relative risk (RR) was calculated using a random-effects model (Mantel-Haenszel/DerSimonian-Laird) in R. Resultados e Conclusões: Twenty-five studies (N = 12,356) were included. Significant outcomes were concentrated in the Post-AMI/ACS scenario (N = 10,459): reduced angina (RR = 0.64; 95% CI [0.50–0.83]; p = 0.006) and recurrent AMI (RR = 0.75; 95% CI [0.57–1.00]; p = 0.048). Non-CBT psychotherapies showed the greatest reduction in reinfarction (RR = 0.33; 95% CI [0.14–0.80]; p = 0.003). No benefit was observed for cardiac mortality in Post-AMI/ACS (RR = 0.81; 95% CI [0.63–1.04]; I^2 = 14.0%), total rehospitalizations in HF (RR = 1.00; 95% CI [0.87–1.14]; I^2 = 0.0%), or cardiac mortality in Mixed CCD (RR = 0.72; 95% CI [0.16–3.20]; sparse data). Clinical stratification radically alters the interpretation of therapeutic efficacy. Psychological interventions reduce recurrent ischemic events exclusively in the Post-AMI/ACS scenario, with no impact on mortality or heart failure. Future guidelines should avoid indiscriminate pooling of distinct cardiovascular syndromes.



Sleep Medicine



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18974

ASSOCIATION BETWEEN OBSTRUCTIVE SLEEP APNEA AND ATRIAL FIBRILLATION - IMPACT OF CPAP THERAPY ON ARRHYTHMIA RECURRENCE: A SYSTEMATIC REVIEW OF THE LITERATURE

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Introdução/Fundamentos: Atrial fibrillation (AF) and obstructive sleep apnea (OSA) coexist in up to 90% of cases, sharing mechanisms of atrial remodeling driven by hypoxemia and mechanical stress. Although Continuous Positive Airway Pressure (CPAP) is the standard treatment for OSA, its impact on AF recurrence remains controversial in the classical literature due to low adherence. In light of recent evidence (2025–2026) incorporating digital monitoring and long-term follow-up, an updated synthesis is warranted to validate the clinical benefit of this therapy on arrhythmic outcomes. Objetivos: To evaluate the impact of CPAP therapy on AF recurrence in patients with OSA undergoing cardioversion or ablation. Métodos: Following PRISMA guidelines, a systematic search was conducted in PubMed, Embase, Cochrane, Scopus, Web of Science, LILACS, and SciELO databases from January 2010 to February 2026. Clinical trials and cohort studies (population ≥18 years) were included, enrolling patients with OSA confirmed by polysomnography (Apnea–Hypopnea Index [AHI] ≥5) and documented AF. Study selection and data extraction were performed independently by two reviewers using Rayyan software, applying the PICO strategy to define eligibility. The primary outcome was post-intervention arrhythmic recurrence rate, comparing treated (CPAP) versus control groups. Resultados e Conclusões: Eight primary studies were included, totaling a sample of over 5,800 patients. The strength of this analysis lies in the integration of cutting-edge evidence (2025–2026), addressing gaps from previous meta-analyses. Data demonstrate that CPAP therapy acts as a critical modulator of atrial electrical stability; recent meta-analyses (Itaya et al., 2025) confirm an overall reduction in recurrence, while real-world studies (Varrias et al., 2026) and long-term follow-up data (Tanaka et al., 2025) show up to a 42% reduction in AF burden among adherent patients (use >4 h/night). Risk of bias ranged from low to moderate, with newer studies overcoming limitations of earlier research through remote digital monitoring. CPAP significantly reduces AF recurrence, provided that therapeutic adherence is maintained. OSA screening and remote adherence monitoring should be integrated into clinical management to optimize the success of arrhythmia therapies.

19229

ASSOCIATION BETWEEN OBSTRUCTIVE SLEEP APNEA AND RISK OF MAJOR CARDIOVASCULAR EVENTS: A SYSTEMATIC REVIEW OF THE LITERATURE

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Introdução/Fundamentos: Obstructive Sleep Apnea (OSA) is a highly prevalent and underdiagnosed condition characterized by recurrent upper airway obstruction during sleep, leading to intermittent hypoxia and sympathetic activation. Increasing evidence suggests a strong association between OSA and cardiovascular diseases, including Hypertension, Atrial Fibrillation, Myocardial Infarction and Stroke. However, the magnitude and consistency of this association across different populations remain to be fully established. Objetivos: To evaluate the association between obstructive sleep apnea and the risk of major adverse cardiovascular events (MACE) through a systematic review of the literature. Métodos: A systematic review was conducted according to PRISMA guidelines. A comprehensive search was performed in PubMed/MEDLINE, Embase, Scopus and Cochrane Library for studies published between 2005 and 2025. Search strategy included: “obstructive sleep apnea” AND “cardiovascular disease” OR “myocardial infarction” OR “stroke” OR “atrial fibrillation”. The inclusion criterias were: observational studies (cohort or case-control), adult population, diagnosis of OSA confirmed by polysomnography, report of cardiovascular outcomes. The exclusion criterias were: reviews, editorials or case reports, pediatric studies, absence of cardiovascular outcomes. Two independent reviewers performed study selection, data extraction and quality assessment. Data synthesis was qualitative due to heterogeneity in study design and outcome reporting. Resultados e Conclusões: A total of 1,040 studies were identified, with 20 studies included after full-text review, comprising over 1 million participants. Most studies demonstrated a significant association between OSA and increased cardiovascular risk. Patients with OSA showed higher incidence of hypertension and a 2–3-fold increased risk of atrial fibrillation. Additionally, moderate-to-severe OSA was associated with increased risk of myocardial infarction and stroke. Cohort studies consistently demonstrated higher rates of MACE among untreated OSA patients compared to controls. Pathophysiological mechanisms include intermittent hypoxia, oxidative stress, systemic inflammation and endothelial dysfunction. These findings support a strong and consistent association between OSA and major cardiovascular events, highlighting the importance of early diagnosis and management of this condition as a strategy to reduce cardiovascular risk.

16368

ASSOCIATION BETWEEN SHORT SLEEP DURATION AND ADVERSE CARDIOVASCULAR EVENTS: A SYSTEMATIC REVIEW OF COHORT STUDIES

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Introdução/Fundamentos: Sleep plays a fundamental role in physiologic regulation and the maintenance of homeostasis. In this context, sleep disturbances, particularly short sleep duration, have been associated with clinically relevant effects on the cardiovascular system. Evidence suggests that individuals with reduced sleep duration are at increased risk of stroke, coronary artery disease, cardiovascular mortality, and major adverse cardiovascular events. Therefore, these conditions represent an important public health concern, with substantial implications for quality of life in the adult population. Objetivos: To evaluate the association between short sleep duration and the occurrence of cardiovascular outcomes in adults. Métodos: A systematic review was conducted in accordance with the PICO framework and PRISMA guidelines. The literature search was performed in the PubMed and SciELO databases using the descriptors “short sleep duration,” “sleep deprivation,” “cardiovascular events,” and “mortality,” combined with the Boolean operators AND/OR, and limited to studies published within the last five years. Observational studies assessing the association between short sleep duration and cardiovascular outcomes in adults were included. Duplicate studies, review articles, and studies that did not analyze cardiovascular outcomes were excluded. Study selection was performed independently by two independent reviewers, resulting in five studies included in the final analysis. Resultados e Conclusões: Five studies were included. Sleep duration was predominantly self-reported, with one study using accelerometry. Short sleep duration (≤5–6 h/day) was compared with adequate sleep (7–8 h/day). Outcomes included cardiovascular mortality, stroke, coronary artery disease, and major adverse cardiovascular events. Short sleep duration, particularly ≤5 h/day, was associated with increased risk, with hazard ratios ranging from 1.23 to 1.66. Higher risks of incident stroke—especially hemorrhagic—and coronary artery disease were also observed, with effect estimates up to 1.82. Associations at 6 h/day were less consistent. Younger and hypertensive individuals showed higher risk. Long sleep duration (≥8–9 h/day) was also associated with increased risk, suggesting a U-shaped relationship. Short sleep duration is a relevant and modifiable cardiovascular risk factor with implications for clinical practice and public health.

16440

ASSOCIATION OF OBSTRUCTIVE SLEEP APNEA WITH CARDIOVASCULAR OUTCOMES: SYSTEMATIC REVIEW AND META-ANALYSIS

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(1) MULTIVIX - CACHOEIRO DE ITAPEMIRIM - ES - BRASIL; (2) UNIVERSIDADE VILA VELHA - VILA VELHA - ES - BRASIL;

Introdução/Fundamentos: Obstructive Sleep Apnea (OSA) is an independent risk factor for cardiovascular disease, mediated by intermittent hypoxia, sympathetic activation, oxidative stress, and systemic inflammation. Although Continuous Positive Airway Pressure (CPAP) is the standard treatment for moderate-to-severe OSA, its effect on major adverse cardiovascular events (MACE) remains controversial, particularly in non-sleepy patients. Objetivos: To evaluate the association between OSA and cardiovascular outcomes, assess the effect of CPAP therapy through meta-analysis, and explore potential modifiers such as treatment adherence and physiological phenotypes. Métodos: A systematic review and meta-analysis were conducted according to PRISMA guidelines. PubMed was searched for studies published between 2016–2026. Inclusion criteria comprised adult populations with OSA, CPAP intervention compared with usual care or no treatment, and reporting of MACE. After screening 388 records, 7 studies were included in the qualitative synthesis. For quantitative analysis, 3 randomized controlled trials (SAVE, ISAACC and RICCADSA) were selected. Hazard ratios (HR) were pooled using a random-effects model. Heterogeneity was assessed using I^2 statistics. Risk of bias in the included randomized trials was considered low to moderate based on Cochrane criteria. Resultados e Conclusões: The qualitative synthesis demonstrated a consistent association between OSA and increased risk of myocardial infarction (particularly nocturnal events), atrial and ventricular arrhythmias, and cardiac remodeling, with nocturnal hypoxia identified as a central mechanistic predictor. In the meta-analysis, CPAP therapy was not associated with a statistically significant reduction in MACE (HR 0.97; 95% CI 0.84–1.12), with low-to-moderate heterogeneity (I^2=30%). Overall, OSA is associated with increased cardiovascular risk; however, randomized evidence does not support a significant reduction in MACE with CPAP in unselected populations, particularly in non-sleepy patients. Secondary analyses suggest a potential benefit in patients with higher adherence (≥4 h/night), indicating a possible dose-response relationship. These findings support the hypothesis that treatment response may be modulated by adherence and individual physiological phenotypes.

21341

CAFFEINE, ENERGY DRINK, AND STIMULANT CONSUMPTION AND ITS ASSOCIATION WITH AUTONOMIC DYSFUNCTION, SLEEP QUALITY, AND STRESS IN MEDICAL STUDENTS

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Introdução/Fundamentos: The academic life of medical students requires a high cognitive and emotional load, leading many to consume stimulants such as caffeine, energy drinks, and psycho-stimulant medications in order to enhance focus and performance. Chronic use may alter the autonomic nervous system, impair sleep, and increase stress, although the long-term effects are still poorly understood. Objetivos: To evaluate the association between stimulant consumption (caffeine, energy drinks, medications) and symptoms of autonomic dysfunction, sleep quality, and perceived stress in medical students, using validated instruments. Métodos: Observational, cross-sectional, analytical study with 200 medical students (>18 years). Participants completed digital questionnaires containing sociodemographic data, patterns of stimulant consumption, and validated instruments: COMPASS-31 (autonomic dysfunction), PSQI (sleep quality), and PSS-10 (perceived stress). Descriptive analyses, correlations, and multiple linear regression were performed, considering levels of consumption and the outcomes studied. Resultados e Conclusões: A high prevalence of caffeine consumption was observed, mainly through coffee, occasional use of energy drinks, and infrequent use of pharmacological stimulants. Caffeine consumption showed a moderate negative association with sleep duration ($r = -0.32$; $p < 0.001$) and a low positive association with perceived stress ($r = 0.24$; $p < 0.01$). Multiple regression did not identify significant independent predictors of stress. The findings indicate that reduced sleep duration is the most consistent effect of caffeine consumption and may indirectly contribute to increased stress. The study reinforces the need for strategies that promote healthy habits, raising awareness among students about the impacts of stimulant use and the importance of sleep quality.

14735

EARLY SUBCLINICAL CARDIOVASCULAR RISK DRIVEN BY SLEEP DEPRIVATION AND CIRCADIAN MISALIGNMENT IN YOUNG ADULTS

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Introdução/Fundamentos: Modern lifestyles characterized by heavy technology use and stress have affected young adults' sleep patterns. While serious cardiovascular events generally happen later in life, early exposure to subclinical risk factors begins in youth. Recent updates from the American Heart Association, which incorporated sleep duration into the "Life's Essential 8," underscore the view that sleep disturbances are active causes rather than merely lifestyle markers. These disturbances activate pathophysiological processes, including sympathetic hyperactivity, dysregulation of the hypothalamic-pituitary-adrenal axis, and systemic inflammation. Objetivos: To analyze the association between sleep disorders and early cardiovascular risk markers, as well as the subsequent development of cardiovascular diseases, specifically in young adults. Métodos: Guided by the PRISMA framework and the PECO strategy. A systematic search was conducted in MEDLINE (via PubMed) and BVS (including LILACS and IBECS) databases for primary studies (2020–2025) evaluating young adults (18-40 years) exposed to sleep disturbances such as insomnia, obstructive sleep apnea, sleep deprivation, and circadian misalignment. Study selection was independently executed by two reviewers via the Rayyan platform, while risk of bias was appraised using the Joanna Briggs Institute (JBI) critical appraisal tools. Resultados e Conclusões: Eighteen studies were included in the synthesis. Evidence demonstrated that sleep deprivation, mild-to-moderate obstructive sleep apnea, and evening chronotypes each independently contribute to early subclinical cardiovascular changes. Notably, insufficient sleep correlates with increased central pulse pressure, greater arterial stiffness, and microvascular endothelial dysfunction. Both experimental and observational evidence indicate that losing sleep homeostasis causes direct vascular damage mainly through sustained sympathetic activation and an adverse cardiometabolic profile, including heightened insulin resistance. Unlike older populations, where cardiovascular risk factors are complicated by multiple chronic conditions, young adults experience direct and early vascular damage from poor sleep habits. Routine screening plays an important role in promoting good sleep hygiene and maintaining healthy circadian rhythms, especially for young people. Including these assessments in regular clinical visits can help catch and address underlying issues early, before overt cardiovascular disease manifests.

17506

EFFECTS OF NOCTURNAL RESPIRATORY INTERVENTIONS IN PATIENTS WITH COPD–OBSTRUCTIVE SLEEP APNEA OVERLAP SYNDROME: A SYSTEMATIC REVIEW OF CLINICAL AND CARDIOPULMONARY OUTCOMES

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Introdução/Fundamentos: Overlap syndrome between chronic obstructive pulmonary disease (COPD) and obstructive sleep apnea (OSA) is associated with worse outcomes, including more exacerbations, hospitalizations, and higher mortality than either condition alone. Intermittent hypoxia and systemic inflammation contribute to poorer prognosis. Positive airway pressure (PAP), especially continuous positive airway pressure (CPAP), is widely used to improve nocturnal oxygenation and reduce sleep-related respiratory events. Objetivos: To evaluate the effects of nocturnal respiratory interventions on clinical and cardiopulmonary outcomes in patients with COPD–OSA overlap syndrome. Métodos: A systematic review of PubMed, SciELO, Cochrane Library, and LILACS identified clinical trials and analytical observational studies published from 2019 to 2024 on therapeutic interventions in adults with COPD–OSA overlap syndrome. The review followed PRISMA and PICO. Outcomes included mortality, hospitalizations, COPD exacerbations, quality of life, nocturnal hypoxemia, blood gas parameters, and cardiovascular complications. Resultados e Conclusões: Three studies were included: one randomized trial and two retrospective observational studies, enrolling 79 to 269 adults. Interventions mainly involved PAP, especially CPAP, alone or combined with pulmonary rehabilitation. Overall, PAP was associated with fewer exacerbations and possible survival benefit. In one retrospective study, CPAP use, better lung function, and lower comorbidity burden independently predicted lower mortality, while poor adherence was linked to more exacerbations and worse outcomes. Another cohort found lower mortality and longer survival in overlap patients and in those prescribed home PAP after discharge, although this lost significance after multivariate adjustment. The randomized trial showed that PAP plus pulmonary rehabilitation improved six-minute walk distance, functional independence, dyspnea, anthropometric measures, and nocturnal oxygenation versus PAP alone, with no significant change in predicted FEV1%. Major cardiovascular outcomes were not robustly assessed. Overall, PAP-based therapies may improve relevant clinical outcomes, and pulmonary rehabilitation may add functional and nocturnal respiratory benefits. However, evidence remains limited by heterogeneity and the predominance of observational studies, supporting the need for larger randomized trials.

18364

IMPACT OF THE TREATMENT OF OBSTRUCTIVE SLEEP APNEA ON THE CLINICAL PROGRESSION OF HEART FAILURE

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Introdução/Fundamentos: Obstructive sleep apnea (OSA) has a high prevalence among patients with heart failure (HF) and is associated with clinical deterioration, increased arrhythmias, and higher mortality. Its pathophysiology involves intermittent hypoxia, activation of the sympathetic nervous system, and intrathoracic pressure changes, contributing to cardiac overload. Despite this well-established association, the impact of different therapeutic strategies on cardiovascular outcomes remains controversial. Objetivos: To critically analyze the impact of OSA treatment on clinical, respiratory, and cardiovascular outcomes in patients with heart failure. Métodos: This is a systematic review based on 11 studies published over the last 8 years, including randomized clinical trials, meta-analyses, and systematic reviews. The search was conducted in databases such as PubMed and Scopus, including studies involving patients with HF and OSA. Interventions analyzed included continuous positive airway pressure (CPAP), automatic positive airway pressure (APAP), adaptive servo-ventilation (ASV), dapagliflozin, and neural stimulation therapies. Outcomes assessed included apnea-hypopnea index (AHI), left ventricular ejection fraction (LVEF), cardiac biomarkers, and quality of life. Resultados e Conclusões: CPAP improved oxygenation and reduced AHI, with modest benefits in ventricular function but no significant impact on major cardiovascular events. APAP improved functional capacity and cardiopulmonary performance. Adaptive servo-ventilation (ASV) showed superior efficacy in improving respiratory parameters, with greater reductions in AHI and improvements in oxygen saturation and LVEF; however, it did not demonstrate consistent prognostic benefit and may pose risks in specific HF subgroups. Dapagliflozin significantly reduced OSA severity and improved metabolic and inflammatory parameters. Neural stimulation therapies were effective in selected patients intolerant to CPAP. Despite consistent physiological benefits, the lack of robust impact on major cardiovascular outcomes highlights the need for individualized treatment and further long-term studies.

18296

NEUROVASCULAR AND FUNCTIONAL PARAMETERS IN PATIENTS WITH CONTROLLED HYPERTENSION AND OBSTRUCTIVE SLEEP APNEA: IMPLICATIONS FOR CARDIOVASCULAR RISK

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Introdução/Fundamentos: Hypertension is a major risk factor for cardiovascular diseases and is strongly associated with endothelial dysfunction, arterial stiffness, and increased cardiovascular events. Obstructive sleep apnea (OSA) further contributes to cardiovascular risk through intermittent hypoxia, sympathetic overactivation, and systemic inflammation, leading to adverse neurovascular alterations. The coexistence of OSA and controlled hypertension may potentiate vascular dysfunction even in clinically stable patients. However, the impact of OSA severity on arterial stiffness and central hemodynamic parameters in this population remains insufficiently characterized. Understanding these interactions is essential for improving cardiovascular risk stratification and guiding early therapeutic interventions. Objetivos: To evaluate the association between obstructive sleep apnea severity and arterial stiffness in patients with controlled hypertension. To investigate the impact of OSA on central hemodynamic and neurovascular parameters. Métodos: A cross-sectional observational study was conducted including 29 patients with controlled hypertension (35–70 years) presenting sleep-related complaints. Obstructive sleep apnea (OSA) was diagnosed using type IV polysomnography, and patients were stratified according to the Oxygen Desaturation Index (ODI) into: control group (no OSA or mild OSA, ODI <15 events/hour) and moderate-to-severe OSA group (ODI ≥15 events/hour). Arterial stiffness was assessed by pulse wave velocity (PWV), and central hemodynamic parameters were obtained using a validated oscillometric method. Group comparisons were performed using Student's t-test and chi-square test. Statistical significance was set at p<0.05. The study was approved by a local Research Ethics Committee (protocol number: 93967125.0.0000.5514). Resultados e Conclusões: Patients with moderate-to-severe OSA (n=14) showed significantly higher PWV compared to controls (n=15) (8.1 ± 1.5 vs. 6.4 ± 1.2 m/s; p<0.03). Additionally, the OSA group presented a reduced cardiac index (1.9 ± 0.2 vs. 2.3 ± 0.2 L/min/m²; p<0.01). No significant differences were observed between moderate and severe OSA subgroups. Moderate-to-severe OSA is associated with increased arterial stiffness and reduced cardiac performance even in patients with controlled hypertension, indicating persistent subclinical cardiovascular risk. These findings reinforce the importance of systematic OSA screening and management as part of cardiovascular risk assessment.

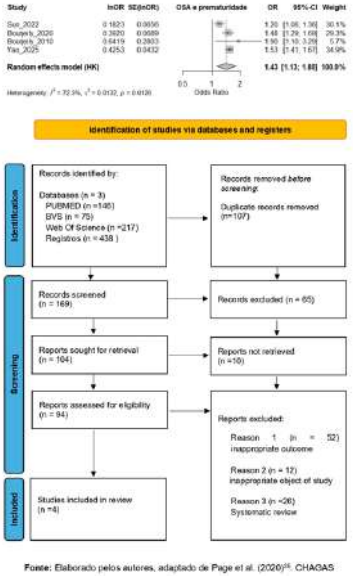
18357

SLEEP DISORDERED BREATHING DURING PREGNANCY AND RISK OF PRETERM BIRTH: A SYSTEMATIC REVIEW WITH META ANALYSIS

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Introdução/Fundamentos: Sleep disordered breathing during pregnancy has been increasingly associated with adverse obstetric outcomes, particularly preterm birth. Physiological changes that occur during pregnancy may favor the onset or worsening of these disorders. In addition, intermittent hypoxia, systemic inflammation, oxidative stress, and endothelial dysfunction may impair maternal cardiovascular adaptation and placental function, thereby contributing to preterm birth. However, the available evidence remains heterogeneous regarding both exposure definition and outcome assessment. Objetivos: To evaluate the pooled association between sleep disordered breathing during pregnancy and the risk of preterm birth. Métodos: A systematic review with meta analysis was conducted in accordance with the PRISMA 2020 statement. Observational studies evaluating sleep disordered breathing during pregnancy and preterm birth, and reporting adjusted measures of association, were included. Meta analysis was performed in R software using a random effects model, with pooled odds ratio and 95 % confidence interval. Heterogeneity was assessed using the I² statistic. Risk of bias was independently evaluated by two reviewers using the Newcastle Ottawa Scale for cohort and case control studies, and the Joanna Briggs Institute critical appraisal tool for cross sectional studies, when applicable. Resultados e Conclusões: The quantitative synthesis demonstrated a significant association between sleep disordered breathing during pregnancy and a higher likelihood of preterm birth, with a pooled odds ratio of 1.43 and a 95% confidence interval from 1.13 to 1.80. Substantial heterogeneity was observed across studies, with an I² of 72.3 % , suggesting relevant clinical and methodological variability. In the forest plot, most individual estimates remained on the side favoring increased risk of preterm birth among exposed pregnant women. Therefore, despite the elevated heterogeneity, the pooled effect remained statistically significant, indicating that sleep disordered breathing during pregnancy may represent an important risk factor for preterm birth.



Fonte: Elaborado pelos autores, adaptado de Page et al. (2026)[16]. CHAGAS

17157

SLEEP DISORDERS AND CARDIOVASCULAR MORTALITY: AN INTEGRATED ANALYSIS OF BIOLOGICAL AND SOCIAL DETERMINANTS

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Introdução/Fundamentos: Sleep disorders have emerged as determinants of cardiovascular health, being associated with increased risk of cardiovascular disease and mortality. Evidence from cohort studies shows that insomnia symptoms, such as difficulty initiating or maintaining sleep and daytime dysfunction, are linked to a higher incidence of cardiovascular events, with a proportional effect according to symptom burden. In addition to biological mechanisms, such as sympathetic activation, inflammation, and metabolic alterations, social factors, including socioeconomic conditions and access to healthcare, influence this risk. Yet, the interaction between biological and social determinants in cardiovascular mortality remains poorly understood. Objetivos: To analyze the association between sleep disorders and cardiovascular mortality, identifying the main biological and social determinants involved, as well as their interaction in modulating cardiovascular risk. Métodos: Systematic review conducted according to PRISMA recommendations, with searches in PubMed, SciELO, and BVS using descriptors related to sleep disorders, cardiovascular mortality, and social determinants. Observational studies evaluating the association between sleep alterations and cardiovascular outcomes were included. Study selection was performed independently by two reviewers, with standardized data extraction and qualitative synthesis. Resultados e Conclusões: Five observational studies, predominantly large-scale cohorts, were included and showed a consistent association between sleep disorders and increased cardiovascular mortality. Insomnia symptoms and obstructive sleep apnea were associated with higher risk of cardiovascular events, with evidence of a dose–response relationship according to severity and number of symptoms. Mechanisms such as sympathetic activation, systemic inflammation, and metabolic dysfunction were implicated. Additionally, sociodemographic factors, including low income, lower educational level, and racial disparities, were associated with poorer sleep quality and higher cardiovascular risk, suggesting a synergistic effect between biological and social factors. Sleep disorders are independent determinants of cardiovascular mortality, resulting from the interaction between biological dysfunctions and social vulnerabilities. Their incorporation into clinical practice and public health strategies is essential to improve risk stratification and reduce inequalities in cardiovascular outcomes.

16911

SLEEP DISORDERS AND CARDIOVASCULAR MORTALITY: DISTINCT CARDIOVASCULAR DISEASE PATTERNS ACROSS SLEEP DISORDER SUBTYPES IN A NATIONWIDE ANALYSIS

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Introdução/Fundamentos: Sleep disorders, including insomnia and obstructive sleep apnea (OSA), are established risk factors for cardiovascular disease (CVD). Although both are associated with multiple cardiovascular outcomes, their risk profiles may overlap. However, data on cardiovascular patterns across sleep disorder subtypes in mortality records remain limited. Objetivos: To assess the association between sleep disorders and cardiovascular mortality and to identify patterns of cardiovascular disease across sleep disorder subtypes in a population-based analysis. Métodos: Cross-sectional study using data from the Brazilian Mortality Information System (2000–2024), including deaths with any mention of sleep disorders and circulatory system diseases (ICD-10 Chapter IX). Sleep disorders were classified as OSA, insomnia, or other sleep disorders. Cardiovascular conditions included hypertension, acute coronary syndrome (ACS), chronic coronary disease (CCD), heart failure (HF), arrhythmias, pulmonary heart disease (PHD), other CVD, and cerebrovascular disease (CBVD). Cardiovascular conditions were not mutually exclusive and were defined by ≥1 ICD-10 code. Group comparisons were performed using Pearson's chi-squared test, with a significance level of 5%. Resultados e Conclusões: A total of 2,094 deaths were analyzed. OSA was the most frequent category (n=1,593), followed by insomnia (n=280) and other sleep disorders (n=221). Hypertension, ACS, and CCD were more frequent in insomnia compared with OSA and other sleep disorders (p<0.001). In contrast, HF, PHD, and CBVD were more prevalent in OSA than in insomnia and other sleep disorders (p≤0.002). No differences were observed for arrhythmias (p=0.128) or other CVD (p=0.986) (Table 1). These findings suggest that, despite overlapping cardiovascular risk profiles described in the literature, sleep disorder subtypes may exhibit distinct patterns of cardiovascular involvement in mortality data. Although limited by the use of secondary data, this heterogeneity may have implications for cardiovascular risk stratification.

Table 1. Comparative distribution of cardiovascular disease groups across sleep disorder categories in a national mortality dataset (Brazil, 2000–2024)

Cardiovascular disease groups	Overall N = 2,094[1]	Insomnia N = 280[1]	OSA N = 1,593[1]	Other sleep disorders N = 221[1]	p-value[2]
Hypertension	958 (45.7%)	186 (66.4%)	650 (40.8%)	122 (55.2%)	<0.001
Acute coronary syndrome	357 (17.0%)	106 (37.9%)	201 (12.6%)	50 (22.6%)	<0.001
Chronic coronary disease	156 (7.4%)	40 (14.3%)	101 (6.3%)	15 (6.8%)	<0.001
Cardiac arrhythmias	177 (8.5%)	15 (5.4%)	141 (8.9%)	21 (9.5%)	0.128
Heart failure	282 (13.5%)	21 (7.5%)	241 (15.1%)	20 (9.0%)	<0.001
Pulmonary heart disease	165 (7.9%)	4 (1.4%)	154 (9.7%)	7 (3.2%)	<0.001
Other cardiovascular diseases	86 (4.1%)	11 (3.9%)	66 (4.1%)	9 (4.1%)	0.986
Cerebrovascular disease	402 (19.2%)	45 (16.1%)	331 (20.8%)	26 (11.8%)	0.002

[1]n (%)

[2]Pearson's Chi-squared test

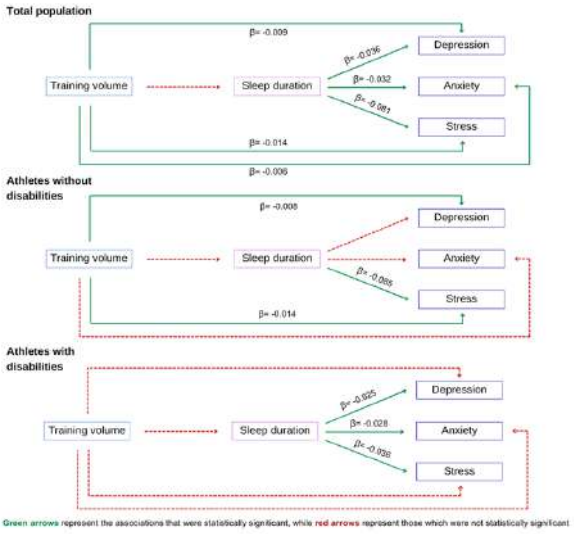
17418

SLEEP DURATION IN ATHLETES WITH AND WITHOUT DISABILITIES: ASSOCIATIONS WITH TRAINING VOLUME AND SYMPTOMS OF PSYCHOLOGICAL DISTRESS

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Introdução/Fundamentos: Although athletes potentially require 9 to 10 hours of slee\33p per night for optimal recovery, many sleep less than 8 hours, which may be associated with higher levels of stress, anxiety and depression. In addition, higher training volume and intensity may impair sleep and exacerbate psychological distress in athletes with and without disabilities. Objetivos: To examine if the relationship between weekly training volume and depressive, anxiety, and stress symptoms in athletes with and without disabilities is mediated by sleep duration. Métodos: Cross-sectional study, including competitive athletes with and without physical disabilities, aged ≥12 years, from different sports modalities, recruited at multiple reference sports institutions in Brazil. Demographic data, self-reported average daily sleep duration and weekly training volume were obtained through a standardized questionnaire. Psychological distress assessment was performed using the Depression, Anxiety and Stress Scale - 21 (DASS-21). Mediation analyses were conducted using structural equation modeling in the total sample and stratified by disability status. Resultados e Conclusões: A total of 1,032 competitive athletes were included (median age 20 years; 66.4% men), of whom 158 (15.3%) had a disability. The median weekly training volume was 14 hours (interquartile range [IQR] 9.5-20.0), the median competitive training duration was 5 years (IQR 2.5-10.0, ranging from 0.5 to 48 years), and the median sleep duration was 7.0 hours (IQR 7.0-8.0, ranging from 3.0 to 12 hours). Longer sleep duration was associated with lower depression [β = −0.036 (−0.039 to −0.033)], anxiety [β = −0.032 (−0.036 to −0.029)], and stress symptoms [β = −0.081 (−0.084 to −0.079)]. Higher training volume was associated with lower depression [β = −0.009 (−0.014 to −0.004)], anxiety [β = −0.006 (−0.011 to −0.002)], and stress [β = −0.014 (−0.020 to −0.007)]. No significant indirect effects via sleep duration were observed. In stratified analyses, training volume predicted lower depression and stress among athletes without disabilities, whereas sleep duration predicted lower depression, anxiety, and stress among athletes with disabilities. Therefore, sleep duration did not mediate the association between training volume and psychological distress. Training volume and sleep duration showed independent associations with mental health outcomes, with distinct patterns according to disability status. The pictographic model of these associations is shown in Figure 1.



Spirituality and Cardiovascular Medicine



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18253

ASSOCIATION BETWEEN ANXIETY SYMPTOMS AND ENDOTHELIAL FUNCTION IN MEDICAL STUDENTS: EVIDENCE OF EARLY CARDIOVASCULAR RISK

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Introdução/Fundamentos: Anxiety disorders are highly prevalent among medical students and have been associated with increased cardiovascular risk. Endothelial dysfunction may represent an early pathophysiological mechanism linking anxiety to atherosclerosis, but this association remains poorly explored in young healthy populations. Objetivos: To evaluate the association between anxiety symptoms and endothelial function in medical students. Métodos: This cross-sectional study included 104 medical students aged ≥18 years, without prior clinical disease and with normal echocardiography and carotid Doppler. Endothelial function was assessed by brachial artery flow-mediated dilation (FMD), with dysfunction defined as FMD <10%. Anxiety symptoms were measured using the Generalized Anxiety Disorder 7-item scale (GAD-7), with scores >10 indicating positive screening. Statistical analyses included t-tests, linear and logistic regression, and bivariate correlation (SPSS 23®), adopting a significance level of 5%. Resultados e Conclusões: Mean age was 23.3±2.9 years, with equal sex distribution. Mean FMD was 11.9%, and endothelial dysfunction was present in 33.7% (n=35), with no association with age or sex. Positive screening for anxiety occurred in 38.5% and was more frequent in females (p<0.001). Higher GAD-7 scores were independently associated with endothelial dysfunction (OR=1.122; 95% CI: 1.028–1.224; p=0.01). Anxiety severity correlated inversely with FMD (r=−0.219; p=0.03). Anxiety symptoms were independently associated with impaired endothelial function, suggesting an early psychophysiological link to cardiovascular risk. These findings support integrating mental health assessment into early cardiovascular risk evaluation in young adults.

18362

INNER PEACE AND LIFE PURPOSE ARE ASSOCIATED WITH ENDOTHELIAL FUNCTION IN HEALTHY ADULTS

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Introdução/Fundamentos: Endothelial dysfunction (ED) is an early marker of cardiovascular disease influenced by biological and psychosocial factors. While depression and anxiety contribute to vascular impairment, higher levels of inner peace and life purpose have been associated with reduced mortality in patients with cardiovascular disease. However, whether these dimensions are linked to vascular function in individuals without overt disease remains unclear. Objetivos: To investigate the association between inner peace and life purpose with endothelial function in clinically healthy adults. Métodos: In this cross-sectional study, 148 individuals aged 18–60 years were assessed using validated instruments. Inner peace and life purpose were evaluated using the FACIT-Sp. Depressive and anxiety symptoms were assessed using the PHQ-9 and GAD-7, respectively. Endothelial function was measured by brachial artery flow-mediated dilation (FMD). Multivariate logistic regression analyses were performed to identify independent predictors of endothelial dysfunction, controlling for mental health variables and cardiovascular risk factors. Discriminant analysis was used to determine which dimensions best distinguished vascular profiles. Resultados e Conclusões: Endothelial dysfunction was identified in 39.2% of participants. Inner peace and life purpose significantly distinguished individuals with and without endothelial dysfunction. Higher levels of these dimensions were associated with preserved endothelial function, independent of anxiety, depression, and conventional risk factors. In multivariate analysis, overall spiritual well-being remained inversely associated with endothelial dysfunction (OR=0.929; p=0.005), while anxiety (OR=2.551; p=0.035), depression (OR=3.740; p=0.038), and body mass index (OR=1.130; p=0.016) were positively associated. Inner peace and life purpose were independently associated with preserved endothelial function, suggesting a potential link between existential well-being and early vascular health, independent of depression and anxiety.

18547

RELATIONSHIP BETWEEN INNER PEACE DIMENSION OF SPIRITUALITY AND BLOOD PRESSURE IN PATIENTS WITH RESISTANT HYPERTENSION

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Introdução/Fundamentos: Resistant hypertension (RH) remains a therapeutic challenge despite optimized pharmacological treatment. Current evidence suggests that psychosocial and spiritual factors may influence neurohormonal mechanisms involved in blood pressure regulation. Among those, the “inner peace” dimension of spirituality, has been associated with better cardiovascular outcomes and may reduce blood pressure levels. Objetivos: Evaluate the correlation between inner peace dimension of spirituality and blood pressure levels in resistant hypertension. Métodos: This cross-sectional study included patients with resistant hypertension receiving optimized pharmacological therapy and followed at a specialized center. Patients with secondary hypertension or pseudoresistance were excluded. Data collection included 7-day home blood pressure monitoring (HBPM) using a validated device, sociodemographic variables, and assessment of the “peace” dimension of spirituality using the Functional Assessment of Chronic Illness Therapy – Spiritual Well-Being (FACIT-Sp) questionnaire. Statistical analysis was performed using SPSS version 26, applying simple and multiple linear regression models, with a significance level set at 5%. Resultados e Conclusões: 56 patients were evaluated, with a mean age of 56 years (range: 38–67), 66.1% female, and using an average of five antihypertensive medications. The peace score ranged from 5 to 16 points (mean: 11). A negative correlation was observed between peace and blood pressure measured by HBPM, both for overall systolic blood pressure (SBP) ($r = -0.397$; $p = 0.002$) and overall diastolic blood pressure (DBP) ($r = -0.383$; $p = 0.004$). Similar results were found for morning and afternoon/evening measurements. In multiple linear regression analysis adjusted for age, sex, and sedentary lifestyle, inner peace remained independently associated with SBP ($\beta = -0.389$; $p = 0.007$; $R^2 = 0.195$) and DBP ($\beta = -0.290$; $p = 0.039$; $R^2 = 0.214$). Each 1-point increase in the peace score was associated with an approximate reduction of 2.3 mmHg in overall SBP. Conclusions: Higher levels of inner peace were associated with lower blood pressure levels measured by HBPM in patients with RH, maintaining statistical significance after adjustment for clinical variables. These findings suggest that inner peace may act as a modulator of blood pressure control, reinforcing the importance of a biopsychosocial-spiritual approach in the management of resistant hypertension.

Sports Cardiology, Exercise, Ergometry and Cardiovascular Rehabilitation



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17773

CARDIO-ONCOLOGY REHABILITATION: INTERVENTION STRATEGIES AND FUNCTIONAL ASSESSMENT IN PATIENTS WITH POST-CANCER CARDIOVASCULAR RISK

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Introdução/Fundamentos: Cardiotoxicity related to oncologic therapies remains an important determinant of morbidity and functional limitation among cancer survivors. Despite its prognostic relevance, structured cardiovascular prevention strategies are still underutilized. Cardio-oncology rehabilitation (COR), particularly in digital formats, emerges as a scalable intervention with potential disease-modifying effects. Objetivos: This study aims to evaluate the potential of cardio-oncology rehabilitation in modifying cardiovascular and functional outcomes in cancer patients. This is a systematic review based on the PICO strategy, conducted using the PubMed and Cochrane databases. Studies involving adult cancer patients undergoing structured COR (either in-person or via telerehabilitation), compared to usual care, were included. The outcomes assessed included left ventricular ejection fraction (LVEF), functional capacity (peak VO□), quality of life, adherence, safety, and cost-effectiveness. Métodos: Of the 31 studies identified, 7 were included, comprising randomized clinical trials and prospective studies, totaling approximately more than 1,000 patients. COR demonstrated consistent and clinically relevant benefits. In a randomized clinical trial, there was a significant attenuation in the decline of LVEF (−1.5% vs. a more pronounced decline in the control group; p=0.006), with no occurrence of significant cardiotoxicity. Telerehabilitation programs promoted a substantial increase in functional capacity (peak VO□: +3.66 vs. +1.09 mL/kg/min; absolute difference ~2.5 mL/kg/min; p=0.02), in addition to a marked improvement in quality of life (+16.25 vs. +1.04 points; p=0.03), as well as reductions in fatigue, anxiety symptoms, and sleep disturbances. Resultados e Conclusões: Adherence rates exceeded 100% in some protocols, with an excellent safety profile and no major adverse events reported. Cardio-oncology rehabilitation should be recognized as a high-impact intervention, capable of preserving ventricular function, improving functional capacity, and optimizing patient-centered outcomes. The incorporation of digital strategies significantly enhances its scalability without compromising efficacy or safety, consolidating its role as an essential component of contemporary oncologic care. In the era of prolonged cancer survival, cardio-oncology rehabilitation emerges as a powerful tool and should be incorporated into standard care plans.

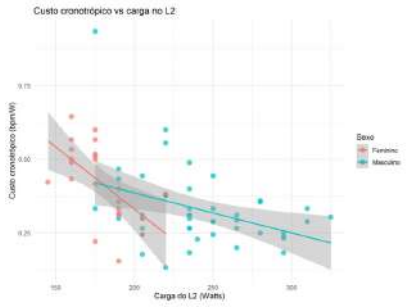
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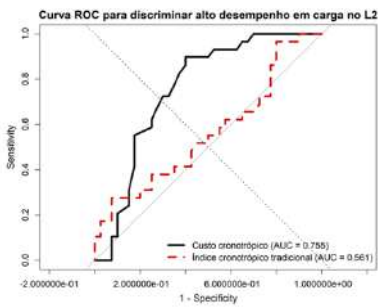
CHRONOTROPIC PHENOTYPING BETWEEN VENTILATORY THRESHOLDS: A DOMAIN-SPECIFIC HEART RATE-TO-POWER DESCRIPTOR OF SUBMAXIMAL CARDIOVASCULAR PERFORMANCE IN ENDURANCE ATHLETES

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Introdução/Fundamentos: Conventional chronotropic metrics were developed for clinical populations and may not adequately characterize submaximal cardiovascular behavior in endurance athletes. The VT1–VT2 domain is a physiologically distinct interval in which performance depends on autonomic regulation, cardiovascular reserve, and metabolic stability. We therefore examined a heart rate-to-power ratio derived specifically from this domain as a threshold-oriented descriptor of submaximal cardiovascular response. Objetivos: To characterize the VT1–VT2 heart rate-to-power ratio in amateur triathletes, assess sex-related differences, examine its association with performance markers, and compare its discriminative performance with that of the traditional chronotropic index. Métodos: In this cross-sectional study, 69 amateur triathletes (46 men, 23 women; age 39.4 ± 9.7 years; VO□max 47.7 ± 7.7 mL·kg□¹·min□¹) underwent maximal cardiopulmonary exercise testing on a cycle ergometer. Ventilatory thresholds were determined by 2 independent blinded evaluators using standardized gas-exchange criteria. The VT1–VT2 heart rate-to-power ratio was calculated as (HRVT2 − HRVT1)/(PowerVT2 − PowerVT1) and expressed in beats per minute per watt. Associations were assessed by Spearman correlation and multivariable linear regression. Discriminative performance was evaluated by ROC analysis with DeLong comparison versus the traditional chronotropic index. Resultados e Conclusões: The mean VT1–VT2 ratio was 0.361 ± 0.137 bpm/W (median 0.333; IQR 0.267–0.433). Women showed significantly higher values than men (0.42 ± 0.13 vs 0.33 ± 0.13 bpm/W; p=0.002), whereas the traditional chronotropic index showed no sex-related difference (p=0.306). The VT1–VT2 ratio correlated inversely with power at VT2 (ρ=−0.546; p<0.001) and peak oxygen pulse (ρ=−0.493; p<0.001). For identifying athletes with above-median power at VT2, the VT1–VT2 ratio outperformed the traditional chronotropic index (AUC 0.755 vs 0.561; DeLong p=0.038), whereas neither metric discriminated dichotomized VO□max. These findings support the VT1–VT2 heart rate-to-power ratio as a sex-sensitive, threshold-oriented descriptor of submaximal cardiovascular performance with potential relevance for sports cardiology and cardiopulmonary phenotyping, refinement of CPET interpretation, and early identification of inefficient submaximal hemodynamic-autonomic responses.





15548

ELECTROCARDIOGRAPHIC FINDINGS IN COMPETITIVE ATHLETES WITH AND WITHOUT DISABILITIES: A COMPARATIVE STUDY

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Introdução/Fundamentos: Electrocardiographic (ECG) adaptations to intensive training are well described in able-bodied athletes but remain poorly characterized in athletes with physical disabilities, a population markedly underrepresented in sports cardiology research. Objetivos: To compare the prevalence of electrocardiographic findings between competitive athletes with and without physical disabilities. Métodos: Cross-sectional study, including competitive athletes ≥12 years, with and without physical disabilities, from different sports modalities, recruited at multiple reference sports institutions in Brazil. The ECG was performed at rest using TEB® equipment and analyzed by a sports cardiologist following standardized criteria. Categorical variables were compared using Chi-square or Fisher's exact test, and continuous variables using the Mann–Whitney U test. A two-sided significance level of 0.05 was adopted. Resultados e Conclusões: A total of 1,237 athletes were included (median age 19 [interquartile range 15-27], 67.4% men, 130 [10.5%] had physical disabilities). The weekly training load was significantly higher in athletes without physical disabilities compared to those with them (median: 14.5h vs. 11.0h, p<0.001), and only 7.5% of athletes with physical disabilities exceeded 20 hours per week, compared to 18.1% of the other group. Athletes with disabilities showed significantly lower prevalence of both sinus arrhythmia (4.6% vs. 22.5%, p<0.001) and sinus bradycardia (3.1% vs. 7.9%, p<0.005) compared to the one without disabilities. The percentages of other electrocardiographic findings were similar among athletes with and without physical disabilities, that being, respectively, 0.8% vs 1.0% for ventricular extrasystole, 1.5% vs 0.9% for supraventricular extrasystole, 0.8% vs 2.6% for first-degree atrioventricular block, 0.8% vs 0.5% for incomplete right bundle branch block, 1.5% vs 0.5% for complete right bundle branch block, 0.0% vs 0.3% for left bundle branch block, 0.8% vs 1.3% for wide QRS complex, 0.8% vs 0.8% for primary repolarization abnormalities and 6.2% vs 7.4% for early ventricular repolarization. Therefore, it can be observed that athletes with physical disabilities showed a lower prevalence of vagally mediated ECG findings, such as sinus bradycardia and sinus arrhythmia. These findings suggest that differences in autonomic adaptation, rather than global cardiac remodeling, may underlie the observed results, potentially influenced by lower training volume.

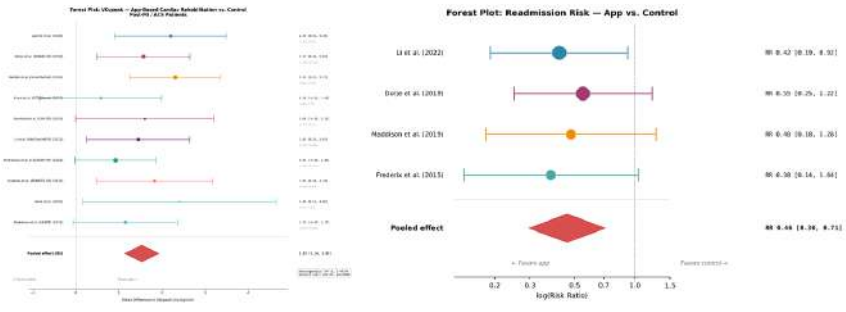
17460

MOBILE APP-BASED CARDIAC REHABILITATION AFTER ACUTE MYOCARDIAL INFARCTION/ACUTE CORONARY SYNDROME: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Cardiac rehabilitation (CR) after acute myocardial infarction (AMI) is a Class I recommendation and is associated with reduced mortality and recurrent cardiovascular events. However, adherence to center-based programs remains below 30% worldwide, mainly due to barriers such as cost, transportation difficulties, and limited access to specialized centers. In this context, mobile health (mHealth) technologies, especially smartphone applications, have emerged as a promising alternative for home-based CR, allowing individualized exercise prescription, remote monitoring, and continuous behavioral support. Objetivos: To evaluate, through a systematic review and meta-analysis, the efficacy of home-based CR delivered through mobile applications on functional capacity, hospital readmissions, and quality of life in post-AMI or acute coronary syndrome (ACS) patients, compared with center-based CR or usual care. Métodos: This systematic review was conducted according to PRISMA 2020 recommendations. PubMed/MEDLINE, Embase, Cochrane CENTRAL, Scopus, Web of Science, LILACS, and SciELO were searched from inception to March 2026. Randomized clinical trials involving adult post-AMI/ACS patients undergoing mobile app-based CR were included. Study selection was performed in two independent stages, with standardized data extraction and risk-of-bias assessment using the RoB 2 tool. Quantitative synthesis used the DerSimonian-Laird random-effects model, with mean difference (MD) and risk ratio (RR) calculations. Heterogeneity was assessed using the I² statistic. Resultados e Conclusões: The search identified 1,847 records, of which 10 randomized clinical trials were included (n = 1,193 patients from 10 countries). App-based CR demonstrated significant improvement in aerobic capacity (VO□peak: MD = 1.53 mL/kg/min; 95% CI: 1.14–1.92; p < 0.001; I² = 0%) and functional capacity (six-minute walk test: MD = 27.51 m; 95% CI: 16.88–38.15; p < 0.001), both exceeding thresholds of clinical relevance. A significant reduction in hospital readmissions was also observed (RR = 0.46; 95% CI: 0.30–0.71; p < 0.001), corresponding to a 54% risk reduction. The results showed high consistency across studies. Home-based CR delivered through mobile applications was associated with improved functional capacity and reduced hospital readmissions in post-AMI/ACS patients, reinforcing the potential of mHealth as a feasible, scalable, and potentially cost-effective alternative to expand access to CR.



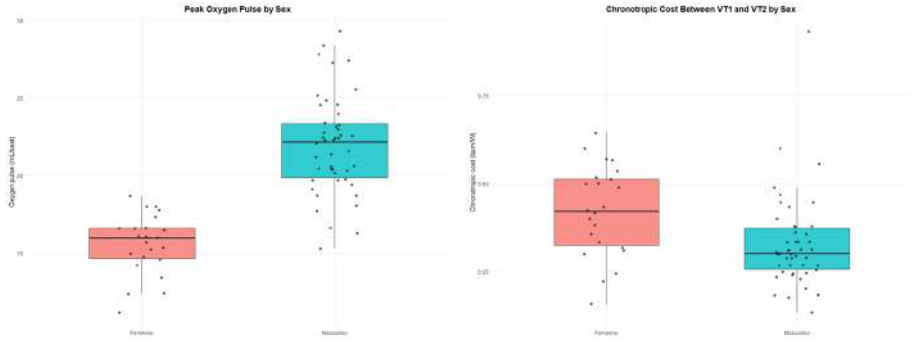
19293

SEX-SPECIFIC CARDIOVASCULAR RESPONSE PHENOTYPES DURING INCREMENTAL EXERCISE IN TRIATHLETES

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Introdução/Fundamentos: Sex-related differences in endurance performance are not explained solely by maximal aerobic capacity and may reflect distinct cardiovascular adjustment strategies during incremental exercise. Chronotropic cost and oxygen pulse may provide clinically relevant insight into sex-specific patterns of submaximal and late-exercise cardiovascular behavior. Objetivos: To investigate sex-specific cardiovascular response patterns during incremental cardiopulmonary exercise testing in amateur triathletes, with emphasis on chronotropic cost, oxygen pulse, and segmental oxygen pulse dynamics across ventilatory thresholds. Métodos: In this cross-sectional study, 69 amateur triathletes (46 men and 23 women) underwent maximal cardiopulmonary exercise testing on a cycle ergometer. Chronotropic cost between the first and second ventilatory thresholds was defined as the increase in heart rate divided by the increase in workload. Oxygen pulse was calculated at the first ventilatory threshold, second ventilatory threshold, and peak exercise as oxygen uptake divided by heart rate. Segmental oxygen pulse slopes and adapted metabolic-chronotropic coupling indices were derived from summarized test data. Between-sex comparisons were performed using Student's t test or Mann-Whitney test, as appropriate. Resultados e Conclusões: Women exhibited higher chronotropic cost between the first and second ventilatory thresholds than men (0.423 vs 0.330 bpm/W; p=0.0016), indicating greater heart rate recruitment per unit of workload. Men showed higher oxygen pulse at peak exercise (21.93 vs 15.56 mL/beat; p<0.001), at the first ventilatory threshold (18.77 vs 13.85 mL/beat; p<0.001), and at the second ventilatory threshold (20.04 vs 15.15 mL/beat; p<0.001). Men also demonstrated steeper oxygen pulse slopes from the first ventilatory threshold to peak exercise and from the second ventilatory threshold to peak exercise, suggesting greater late-exercise oxygen pulse augmentation. No significant sex differences were observed in adapted metabolic-chronotropic coupling indices. These findings support the presence of distinct sex-specific cardiovascular phenotypes during incremental exercise, with men showing a profile more consistent with greater stroke volume-related contribution and women demonstrating greater chronotropic dependence. This pattern may be relevant for sports cardiology, cardiopulmonary phenotyping, and sex-informed interpretation of exercise testing.



19892

SUBSTANCE USE AMONG COMPETITIVE ATHLETES WITH AND WITHOUT DISABILITIES: A CROSS-SECTIONAL STUDY IN BRAZIL

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Introdução/Fundamentos: Competitive sports are often associated with health benefits and improved physical conditioning. However, high-performance athletes may also engage in behaviors that negatively affect cardiovascular health and performance, including alcohol consumption and tobacco use. Although these substances are well recognized as modifiable cardiovascular risk factors in the general population, their use in competitive athletes remains understudied. Objetivos: To analyze the prevalence and patterns of alcohol consumption and smoking among competitive athletes with and without disabilities. Métodos: This cross-sectional study included competitive athletes aged □18 years from sports reference institutions in Brazil. Both able-bodied athletes and athletes with disabilities were eligible. Data were collected through face-to-face structured interviews using a standardized questionnaire covering sociodemographic characteristics, sports practice, and lifestyle behaviors. Tobacco and alcohol use were assessed in terms of frequency and quantity. Descriptive statistical analysis was performed. Resultados e Conclusões: Among 737 athletes included (median age 27 years [interquartile range - IQR 21-33]), 65.5% were men and 19.3% had a disability. Tobacco use was reported by 19 athletes (2.6%). Most smokers used hand-rolled cigarettes (n=12), followed by traditional cigarettes (n=6), and one athlete reported cannabis use. No use of electronic cigarettes was reported. Regarding the frequency of traditional cigarette use, 66.7% of all users had sporadic/low-use (1-5 cigarettes/week), while 16.7% had light (6-10 cigarettes/week) and 16.7% moderate (11-20 cigarettes/week) use. Regarding hand-rolled cigarette use, 90% of users had sporadic/low use, with 10% of users having light use. Regarding alcohol use, 106 athletes used it weekly (n=14.8%). Of these, 78.2% consumed up to 2 doses/week, 12.4% consumed 3-4 doses/week, 8.2% consumed 5-11 doses/week, and 1.2% consumed >12 doses per week. Alcohol and tobacco consumption are present among competitive athletes, inclçuding those with disabilities, although at a low prevalence when compared to the general population. Despite lower rates, these behaviors remain clinically relevant due to their potential negative impact on cardiovascular health and athletic performance. Therefore, initiatives and discussions on this topic should be established within the sporting environment to promote healthier habits among this group and minimize the deleterious effects mentioned before.

17303

VENTILATORY EFFICIENCY (VE/VCO_2) AS A MARKER OF CARDIOVASCULAR INEFFICIENCY AND EXERCISE INTOLERANCE IN PATIENTS WITH PULMONARY HYPERTENSION.

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Introdução/Fundamentos: Pulmonary hypertension is characterized by increased pulmonary vascular resistance, leading to right ventricular overload and impaired capillary perfusion, which results in ventilation/perfusion (V/Q) mismatch. In this context, the VE/VCO□ ratio, when associated with other variables such as peak VO□, acts as a marker of cardiorespiratory interaction and patients' functional limitation, reflecting not only ventilatory but also hemodynamic alterations. Objetivos: To evaluate the association between VE/VCO□ and exercise tolerance parameters in patients with pulmonary hypertension. Métodos: A retrospective cohort study based on the analysis of medical records of patients with pulmonary hypertension (groups 1 and 4) who underwent cardiopulmonary exercise testing and the 6-minute walk test. VE/VCO□ was the main variable, correlated with peak VO□ and distance in the test. Pearson's correlation was used, with a significance level of 5% ($p < 0.05$). The study was approved by the Institutional Research Ethics Committee (CEP). Resultados e Conclusões: A total of 123 patients diagnosed with pulmonary hypertension were included, with a mean age of 50.9 ± 16.4 years and a predominance of females (69.1%). The mean BMI was 27.8 ± 6.8 kg/m², with most patients in functional classes I–II (69.1%) according to the NYHA scale. The mean VE/VCO□ was 47.8 ± 11.2, while the mean peak VO□ was 1.08 ± 0.42 L/min. The mean distance in the 6-minute walk test was 401 ± 118 meters. A negative correlation was observed between VE/VCO□ and the distance in the 6-minute walk test ($r = -0.353$; $p = 0.003$), as well as with peak VO□ ($r = -0.434$; $p < 0.001$), indicating that patients with greater ventilatory inefficiency had worse functional performance. Thus, the increase in VE/VCO□ can be explained by ventilation/perfusion mismatch resulting from reduced effective pulmonary perfusion, leading to an increase in physiological dead space and a greater ventilatory requirement for carbon dioxide elimination. In addition, the limitation in the increase of cardiac output during exercise contributes to reduced oxygen delivery to tissues, which is reflected in decreased peak VO□ and lower exercise tolerance, demonstrated by the reduced distance walked in the 6-minute test. The significant association between VE/VCO□ and objective parameters, such as peak VO□ and distance in the 6-minute walk test, highlights its clinical utility as a noninvasive marker of disease severity and functional limitation.

Cardiologia Experimental (Ciência Básica)



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17354

: IL-1B EXPRESSION AND NF-KB ACTIVATION IN CARDIAC TISSUE IN FATAL CASES OF CHIKUNGUNYA INFECTION.

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Introdução/Fundamentos: Chikungunya virus (CHIKV) infection can present with severe forms and cardiovascular involvement. The exacerbated inflammatory response plays a central role in this process, highlighting interleukin-1 (IL-1) and the transcription factor NF-κB, both fundamental in the regulation of pro-inflammatory genes. Objetivos: To evaluate IL-1 expression and NF-κB activation in the cardiac tissue of fatal CHIKV cases, investigating their association with myocardial damage. Métodos: Cardiac tissue samples from confirmed fatal CHIKV cases were analyzed by immunohistochemistry and/or molecular techniques to detect IL-1 and NF-κB. NF-κB activation was inferred by its nuclear localization, and the findings were correlated with histopathological alterations. Resultados e Conclusões: An increased expression of IL-1 and significant activation of NF-κB in the myocardium were observed, associated with the presence of an inflammatory infiltrate and alterations compatible with myocarditis. The activation of this pathway suggests amplification of the local inflammatory response, contributing to tissue damage. The elevation of IL-1 associated with NF-κB activation in cardiac tissue indicates a central role of this inflammatory pathway in the pathogenesis of myocardial injury in fatal CHIKV cases. These findings reinforce the relevance of inflammatory mechanisms in the severe evolution of the disease and highlight potential therapeutic targets.

21731

AMAZONIAN PALM SPECIES EXHIBITS CARDIOPROTECTIVE EFFECTS AGAINST ISOPROTERENOL-INDUCED MYOCARDIAL INJURY

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Introdução/Fundamentos: Cardiovascular diseases represent a critical global challenge, with high morbidity and mortality linked to acute myocardial infarction (AMI). In parallel, the investigation of natural products has expanded, focusing on the antioxidant and anti-inflammatory properties of plant-derived bioactive compounds. Objetivos: To evaluate the cardioprotective potential of the hydroalcoholic extract of Syagrus cocoides almonds (SYA) in an experimental model of isoproterenol (ISO)-induced myocardial infarction in rats. Métodos: Male Wistar rats were used, distributed into Control, ISO, SYA 100 mg/kg, and SYA 300 mg/kg groups (n=8), subjected to oral pre-treatment for 15 days. On days 14 and 15, AMI was induced via subcutaneous administration of ISO (85 mg/kg). On day 16, biochemical and histopathological analyses were performed. Resultados e Conclusões: The ISO group exhibited intense leukocyte infiltration, marked myonecrosis, and extensive myocardial edema. Treatment with SYA (100 mg/kg) promoted a moderate reduction of these alterations, while the 300 mg/kg dose demonstrated superior efficacy, expressively mitigating edema and necrosis. Histologically, the ISO group presented significantly elevated injury scores compared to the other groups ($p < 0.05$), confirming the severity of tissue damage. AMI induction promoted a severe dyslipidemic profile, marked by elevated total cholesterol, LDL, triglycerides, and non-HDL, in addition to a discrete reduction in HDL. Pre-treatment with SYA (100 and 300 mg/kg) significantly attenuated these metabolic alterations. Both treatments substantially reduced triglycerides and non-HDL cholesterol, bringing lipid parameters closer to the values of the control group (Table 1). Furthermore, the ISO group presented a significant elevation in serum levels of urea, blood urea nitrogen (BUN), creatinine, and globulins, indicating metabolic and systemic impairment associated with myocardial injury. Treatment with S. cocoides was able to reverse these biochemical alterations, restoring values similar to those of the control group (Table 1). These findings demonstrate that Syagrus cocoides extract exerts potent cardioprotective and metabolic modulatory effects against ISO-induced myocardial injury, suggesting potential therapeutic application in the prophylaxis of cardiovascular damage.

Figure 1. Photomicrograph of rat heart tissue, stained with hematoxylin and eosin (H&E), observed under a 20x objective lens. Heart histopathological scores.

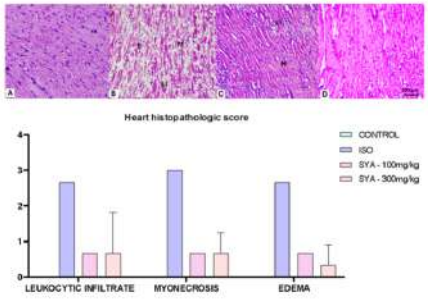


Table 1. Effect of SYA pre-treatment on biochemical parameters following AMI induction.

	Groups			
PARAMETERS	**Control**	**ISO**	**SYA 100 mg/Kg**	**SYA 300 mg/Kg**
Blood glucose (dg/L)	114 ± 1.87	165.2 ± 10.03#	75.17 ± 3.69***	84.88 ± 4.07***
β-ketone (mmol/L)	0.83 ± 0.13	1.5 ± 0.19#	1.27 ± 0.05	1.35 ± 0.04*
Cholesterol	80.4±9.98	105.66±13.18#	79±11.713***	87.16±7.46**
HDL Cholesterol	40.6±3.65	26.5±2.34	38.3±2.42	37.33±4.76
LDL Cholesterol	22.62±3.59	55.9±9.14#	21.3±1.57***	25.5±1.65***
Triglycerides	50.2±3.76	133.75±26.27#	44.16±4.02***	51.5±15.42***
Non HDL Cholesterol	42.48±11.32	81.33±13.88#	54.5±4.23***	55.66±2.73***
Urea	43.54±8.54	78.26±14.56#	52.16±2.31***	53±5.55***
BUN	16.93±8.54	36.52±6.77#	24.34±1.08**	24.73±2.59**
Creatinine	0.344±0.053	0.615±0.056#	0.341±0.036***	0.341±0.026***
Globulin	1.349±0.204	1.940±0.151#	1.349±0.205*** *	1.480±0.215***

*Significantly different. # p<0.001 vs. Control. **p<0.05 vs. ISO; ***p<0.001 vs. ISO. ANOVA, Tukey. Source: Author.

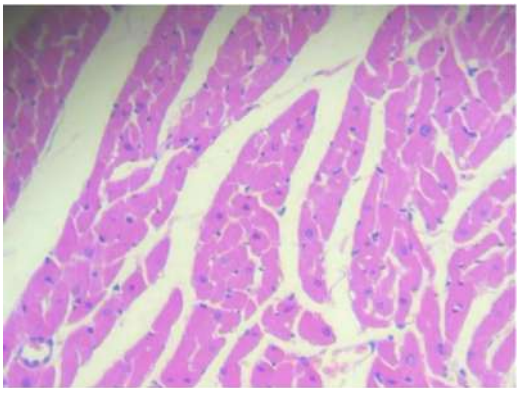
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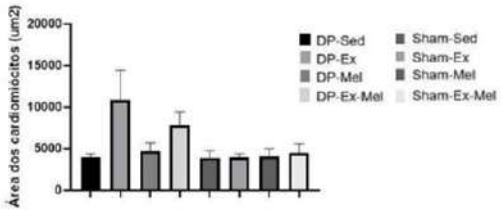
ANALYSIS OF CARDIAC AND PULMONARY TISSUE OF RATS WITH PARKINSON'S DISEASE TREATED WITH MELATONIN AND PROGRESSIVE RESISTANCE EXERCISE

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Introdução/Fundamentos: Parkinson's disease (PD) is a progressive neurodegenerative disorder that contributes to the manifestation of significant dysfunctions in the cardiovascular system, which impair respiratory capacity. Therefore, considering the relationship between reduced levels of melatonin (MLT) in individuals with PD and disease severity, as well as the potential of aerobic exercise in reducing the impacts of PD, it is suggested that the combination of these therapeutic approaches may induce functional and structural changes in the nervous system that are beneficial for mitigating the cardiorespiratory effects of PD. For this study, PD was induced in rats through the administration of the neurotoxin 6-hydroxydopamine (6-OHDA). Objetivos: To examine the impacts of high-intensity progressive resistance exercise combined with melatonin administration on the cardiorespiratory tissues of rats with 6-OHDA-induced PD. Métodos: This is an ex vivo experimental study using rats, divided into a control group (Sham) and a PD group treated with MLT and aerobic exercise in different combinations. The evaluated parameters included histomorphometric analysis of histological sections from heart and lung tissues. Data from this stage were statistically analyzed to compare findings between groups. Figure 1 legend. Photomicrograph of cardiac tissue section stained with H&E at 20× magnification. Resultados e Conclusões: No significant differences were observed in the number of cardiomyocytes in the left ventricle (p=0.0988; F=2.26). However, a significant difference was found in cardiomyocyte area (p<0.0001; F=28.63). Regarding pulmonary analysis, no significant differences were observed in the number of alveoli (F=1.59) or alveolar perimeter (p=0.56; F=0.73). Therefore, high-intensity progressive resistance exercise associated with melatonin administration promotes morphological adaptations favorable to the attenuation of cardiovascular alterations secondary to PD. However, the number of alveoli and alveolar perimeter were maintained, suggesting that PD induction does not cause detectable structural changes in the pulmonary parenchyma. Figure 2 legend. Mean cardiomyocyte area among the experimental groups.





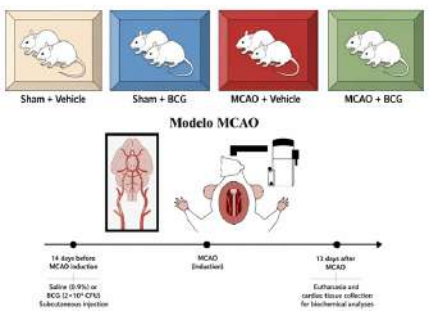
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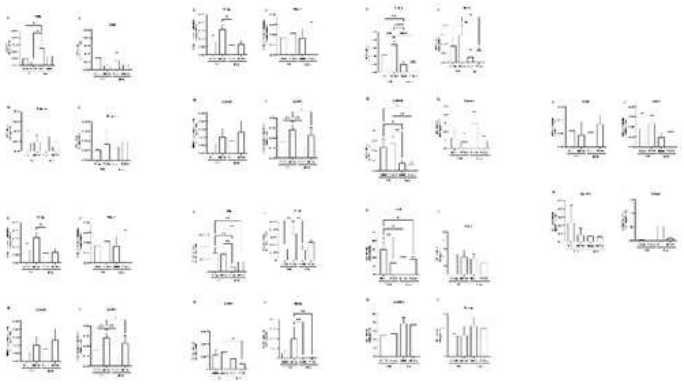
BCG IMMUNE PRECONDITIONING ATTENUATES CARDIAC OXIDATIVE STRESS FOLLOWING EXPERIMENTAL ISCHEMIC STROKE IN RATS

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Introdução/Fundamentos: Ischemic stroke triggers a systemic inflammatory response and oxidative stress that extend beyond the central nervous system, affecting peripheral organs such as the heart. Cardiac injury following cerebral ischemia has been increasingly recognized as part of the brain–heart interaction. Immunomodulatory strategies may represent a potential approach to mitigate these systemic consequences. Objetivos: To investigate whether immune preconditioning with the Bacillus Calmette–Guérin (BCG) vaccine can modulate cardiac oxidative stress in an experimental model of ischemic stroke. Métodos: Male Wistar rats were randomly assigned to four groups: Sham+Vehicle, Sham+BCG, MCAO+Vehicle, and MCAO+BCG. Animals received a subcutaneous injection of BCG (2×10^4 CFU) or saline solution 14 days before focal cerebral ischemia induced by middle cerebral artery occlusion (MCAO). Thirteen days after the procedure, animals were euthanized and cardiac tissue was collected for biochemical analyses of oxidative stress and inflammatory markers. Resultados e Conclusões: Ischemic stroke significantly increased myeloperoxidase (MPO) activity and protein carbonyl levels in cardiac tissue, indicating enhanced inflammation and oxidative damage. BCG preconditioning attenuated both markers, suggesting a protective systemic effect. No significant differences were observed in catalase (CAT), superoxide dismutase (SOD), or nitrite/nitrate levels among the groups. These findings indicate that BCG-induced immune preconditioning may reduce cardiac oxidative injury associated with ischemic stroke, highlighting the potential role of immunomodulation in mitigating cardiovascular complications secondary to cerebral ischemia.





18765

Caspase-1 activation and NALP1 expression in cardiac tissue in fatal cases of Chikungunya infection

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Introdução/Fundamentos: Chikungunya virus (CHIKV) infection can evolve with severe manifestations, including cardiac involvement. Inflammasome activation has been implicated in the pathophysiology of exacerbated inflammation, highlighting the NALP1 complex and the Caspase-1 enzyme, which are responsible for the maturation of pro-inflammatory cytokines. Objetivos: To evaluate Caspase-1 activation and NALP1 expression in the cardiac tissue of fatal CHIKV cases and their association with inflammatory myocardial damage. Métodos: Cardiac tissue samples from confirmed fatal CHIKV cases were analyzed by immunohistochemical and/or molecular techniques to detect NALP1 and Caspase-1. The expression intensity was correlated with histopathological findings. Resultados e Conclusões: An increased expression of NALP1 and activation of Caspase-1 in the myocardium were observed, associated with the presence of an inflammatory infiltrate and alterations compatible with myocarditis. These findings suggest inflammasome activation, with consequent amplification of the local inflammatory response and potential induction of inflammatory cell death. The activation of the NALP1/Caspase-1 axis in cardiac tissue indicates a relevant role of the inflammasome in the pathogenesis of myocardial injury in fatal CHIKV cases. These results reinforce the importance of innate inflammatory pathways as potential therapeutic targets.

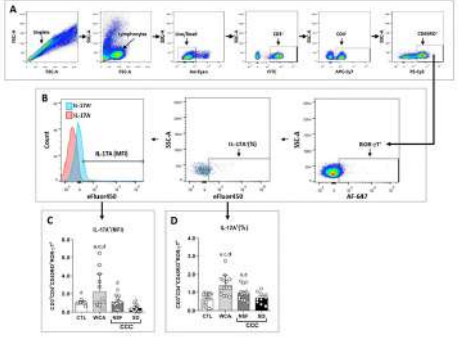
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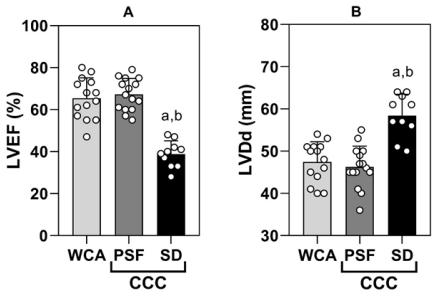
CD4+TH17 CELLS PLAY A CRITICAL ROLE IN CONFERRING RESISTANCE TO TRYPANOSOMA CRUZI INFECTION WHILE ALSO DEMONSTRATING POTENTIAL IN MITIGATING THE DEVELOPMENT OF SEVERE CARDIAC COMPLICATIONS

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Introdução/Fundamentos: Chagas disease (CD), caused by Trypanosoma cruzi, persists as a global health challenge characterized by a complex immunopathogenesis. CD4+ TH17 cells, producers of the pro-inflammatory cytokine IL-17A, have been implicated in various inflammatory and cardiac diseases, but their role in CD remains debated. Objetivos: This study investigated the role of TH17 IL-17A+ cells in Chagasic patients, focusing on their contribution to the immune response and cardiac protection. Métodos: Thus, we conducted an observational study, in which Chagasic patients were stratified according to cardiac function. TH17 IL-17A+ cell responses were evaluated, and IL-17A expression levels were correlated with echocardiographic parameters and intracellular parasite burden. Resultados e Conclusões: Our results demonstrated a distinct and potentially protective role for TH17 IL-17A+ cells in CD, particularly in the absence of dilated cardiomyopathy. In patients without systolic dysfunction, we observed an accentuated TH17 response, with elevated IL-17A expression, associated with favourable echocardiographic parameters, such as left ventricular ejection fraction (LVEF) and left ventricular end-diastolic diameter (LVDd). Furthermore, we observed an inverse correlation between IL-17A expression and intracellular parasite burden, suggesting a role for IL-17A in infection control. This study highlights the complex immunomodulatory role of TH17 cells in chronic Chagas cardiomyopathy (CCC). IL-17A may be a therapeutic target for preserving cardiac function and controlling parasite persistence in Chagasic patients, especially prior to the development of severe cardiac dysfunction.



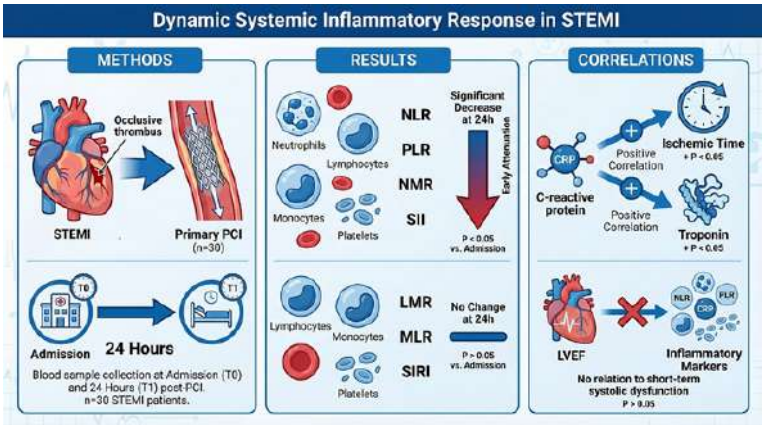


17941

DYNAMIC SYSTEMIC INFLAMMATORY RESPONSE IN ST-SEGMENT ELEVATION MYOCARDIAL INFARCTION: TEMPORAL BEHAVIOR OF HEMATOLOGICAL RATIOS AND THEIR CLINICAL ASSOCIATIONS

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Introdução/Fundamentos: ST-segment elevation myocardial infarction (STEMI) triggers a complex systemic inflammatory response driven by ischemic myocardial injury. Hematological ratios derived from routine blood counts have emerged as accessible inflammatory biomarkers; however, their temporal dynamics and clinical significance in the acute phase remain incompletely characterized. Objetivos: To evaluate systemic inflammatory activity through hematological ratios and C-reactive protein (CRP) in patients with STEMI, and to explore their temporal changes and clinical correlations. Métodos: This observational study included consecutive patients with STEMI undergoing primary percutaneous coronary intervention (PCI) admitted to a tertiary care center in southern Brazil. Neutrophil-to-lymphocyte ratio (NLR), lymphocyte-to-monocyte ratio (LMR), platelet-to-lymphocyte ratio (PLR), monocyte-to-lymphocyte ratio (MLR), neutrophil-to-monocyte ratio (NMR), Systemic Inflammation Response Index (SIRI), and Systemic Immune-Inflammation Index (SII) were assessed at admission and after 24 hours. SIRI and SII were calculated as (neutrophils × monocytes)/lymphocytes and (platelets × neutrophils)/lymphocytes. CRP levels were measured at both time points. Total ischemic time (Δ pain) was defined as the interval between symptom onset and percutaneous coronary intervention. Comparisons were performed using the Wilcoxon test and associations using Spearman's coefficient. Resultados e Conclusões: A total of 30 patients were included (mean age 57.5 ± 9.5 years; 73.3% male). LMR, MLR, and SIRI showed no significant variation over 24 hours. In contrast, NLR, PLR, NMR, and SII significantly decreased at 24 hours compared to admission ($p < 0.0001$), indicating early attenuation of inflammation. No difference in NLR was observed between patients with left ventricular ejection fraction > 40% and ≤ 40% ($p = 0.86$). Admission troponin moderately correlated with CRP at 24 hours ($r = 0.38$; $p = 0.037$). CRP levels at admission and 24 hours correlated with ischemic time ($r = 0.42$; $p = 0.022$ and $r = 0.37$; $p = 0.042$). CRP at 24 hours also correlated with monocyte count ($r = 0.43$; $p = 0.018$). These findings suggest that hematological ratios show early dynamic changes in STEMI, reflecting an acute inflammatory response with partial resolution within 24 hours. Although associated with myocardial injury and ischemic time, these markers were not related to short-term systolic dysfunction, limiting prognostic utility.

22004

EFFECTS OF ACUTE ANTIEPILEPTIC DRUG ADMINISTRATION ON CARDIAC STRUCTURE AND MORPHOMETRY

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Introdução/Fundamentos: Potassium (K+) channel opener drugs have traditionally been used in clinical practice as antihypertensive agents, and more recently, studies have demonstrated a significant anticonvulsant effect that appears superior to that of drugs conventionally used in the treatment of epilepsy. However, there are limited studies investigating the effects of potassium channel openers used as epilepsy treatment on the cardiac system. Objetivos: Therefore, the aim of this study is to evaluate the acute effects of antiepileptic drug administration on cardiac morphometry and structure in experimental models. Métodos: This quantitative and experimental study included 39 male Wistar rats allocated into three groups (n = 13): Negative Control, Positive Control, and Experimental. Following seizure induction with pentylenetetrazol (PTZ), the hearts were collected for histomorphometric analysis using light microscopy and hematoxylin–eosin staining. Resultados e Conclusões: The results demonstrated that the experimental group exhibited a significant increase in coronary vessel area (+126.2%) and vascular perimeter (+42.5%), suggesting a strong selective vascular relaxation effect on smooth muscle. In contrast, left ventricular and interventricular septal thickness remained stable across all groups, with variations below 5%, indicating the absence of immediate myocardial remodelling or cardiotoxicity. These findings suggest that acute administration of the investigated drug is associated with a favourable cardiovascular safety profile, promoting hemodynamic benefits through afterload reduction and improved coronary blood flow without compromising myocardial structural integrity in the anticonvulsant setting.

Table 1. Analysis of the Measurement of Cardiac Vessel Perimeter

Group	Mean ($\bar{X}$) (μm)	Standard deviation (SD)	Implication
Negative Control	120.72	34.00	Baseline for vascular tone
Positive Control	100.28	32.44	Mean is lower than that of the Negative Control, indicating absence of significant vasodilation or, in certain instances, slight vasoconstriction or minimal change
Experimental	172.04	37.76	Mean value is significantly higher than both the Negative Control and Positive Control, confirming strong vasodilation

Source. Authors' own elaboration.
Note. $\bar{X}$ = mean; SD = standard deviation; μm = micrometers.

Table 2. Analysis of the Measurement of Cardiac Vessel Areas

Group	Mean ($\bar{X}$) (μm²)	Standard deviation (SD)	Implication
Negative Control	911.96	622.18	Basal vascular lumen area
Positive Control	785.45	499.71	The mean value is lower than the Negative Control, confirming that there is no lumen enlargement
Experimental	2063.15	942.92	The mean is significantly higher than both the Negative Control and the Experimental group, exceeding twice their respective values

Source. Authors' own elaboration.
Note. $\bar{X}$ = mean; SD = standard deviation; μm² = square micrometers.

19267

EFFECTS OF AEROBIC INTERVAL TRAINING ON ANTIOXIDANT ENZYMES AND REDOX STATE IN CARDIAC PATIENTS.

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Introdução/Fundamentos: Cardiovascular diseases (CVDs) constitute the leading cause of morbidity and mortality worldwide and are closely associated with oxidative stress, characterized by an imbalance between reactive species and antioxidant defense systems. In this context, physical exercise has been widely adopted as a non-pharmacological therapeutic strategy, capable of promoting beneficial physiological adaptations, including modulation of the antioxidant defense system, particularly through the regulation of enzymes such as catalase, superoxide dismutase, and glutathione peroxidase. Objetivos: To evaluate the effects of aerobic interval training on cardiorespiratory fitness, redox status, and antioxidant enzyme activity in patients with cardiovascular disease. Métodos: The study protocol (CEP 4.479.472) was approved by the institutional ethics committee. A non-randomized clinical trial, with a quantitative approach, was conducted in a sample of 14 patients with cardiovascular disease of both sexes, aged 50 to 80 years, all of whom were enrolled in a cardiovascular rehabilitation program. The variables assessed included maximal oxygen consumption (VO□max), biomarkers of oxidative stress (thiobarbituric acid reactive substances, sulfhydryl content, and protein carbonyls), and antioxidant enzyme activities, including catalase, superoxide dismutase, and glutathione peroxidase. In addition, serum biochemical parameters were also analyzed. Participants were subjected to an aerobic interval training protocol. Resultados e Conclusões: A significant improvement in cardiorespiratory fitness was observed, as evidenced by increased VO□max, accompanied by favorable alterations in redox status, including a reduction in markers of oxidative damage and an increase in sulfhydryl levels. Notably, a significant increase in the activity of antioxidant enzymes —catalase, superoxide dismutase, and glutathione peroxidase— was observed, indicating adaptive upregulation of the antioxidant defense system in response to exercise stimulus. Additional benefits observed included improvements in the biochemical profile, particularly a reduction in serum triglyceride levels. It can be concluded that aerobic interval training promotes positive adaptations in cardiorespiratory fitness and redox balance, contributing to the modulation of oxidative stress through enhanced antioxidant enzymatic activity in patients with cardiovascular disease.

19368

ENDOTHELIAL DYSFUNCTION AND RISK OF MAJOR CARDIOVASCULAR EVENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS OF PROSPECTIVE STUDIES

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Introdução/Fundamentos: Endothelial dysfunction represents an early and central step in the pathophysiology of atherosclerosis, preceding clinical and structural manifestations of cardiovascular disease. Functional markers such as flow-mediated dilation (FMD) have been used as early indicators of risk; however, their predictive capacity on a large scale still requires further consolidation. Objetivos: To evaluate the association between endothelial dysfunction and the occurrence of major cardiovascular events in adults. Métodos: A systematic review and meta-analysis conducted according to PRISMA guidelines. PubMed, Embase, Scopus, and Web of Science databases were searched through January 2025. Prospective cohort studies assessing endothelial function using validated methods, including FMD, peripheral reactive hyperemia index, and endothelial biomarkers, with major cardiovascular outcomes (acute myocardial infarction, stroke, and cardiovascular mortality) were included. Methodological quality was assessed using the Newcastle-Ottawa Scale. Statistical analysis was performed using a random-effects model, with calculation of relative risk (RR) and 95% confidence intervals. Heterogeneity was assessed using the I^2 statistic, and publication bias was evaluated using funnel plots and Egger's test. Subgroup analyses were performed according to diagnostic method and population profile. Resultados e Conclusões: A total of 26 studies were included, comprising 1,532,780 individuals, with a mean follow-up of 7.1 years. Endothelial dysfunction was associated with a significant increase in the risk of major cardiovascular events (RR=1.49; 95% CI: 1.34–1.66; p<0.001). In subgroup analyses, individuals with reduced FMD showed higher risk (RR=1.58), especially in the presence of traditional risk factors. The association remained significant in populations without prior cardiovascular disease. Heterogeneity was moderate (I^2=51%), with no consistent evidence of publication bias. In summary, Endothelial dysfunction is independently associated with an increased risk of major cardiovascular events, highlighting its role as a relevant early marker in risk stratification. Its incorporation into clinical practice may enable early identification of high-risk individuals and guide more effective preventive interventions.

21842

EVALUATION OF ALGINATE SCAFFOLD IMPLANTATION FOR MYOCARDIAL INFARCTION TREATMENT IN A RAT MODEL

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(1) PONTIFICIA UNIVERSIDADE CATOLICA PUC - CURITIBA - PR - BRASIL;

Introdução/Fundamentos: Coronary artery disease remains a leading cause of global morbidity and mortality, and myocardial regeneration continues to be a challenge due to the limited efficacy of current therapies. In this context, the use of alginate scaffolds has emerged as a promising alternative to promote myocardial repair. Objetivos: To evaluate the impact of alginate scaffolds on ventricular function and remodeling in a rat model of myocardial infarction (MI). Métodos: Following approval by the Ethics Committee on Animal Use of the UFPR (Process: 23075.046582/2024-88), MI was induced in 20 male Wistar rats via coronary ligation. At 7 days post-MI (D7), left ventricular end-systolic volume (LVESV), end-diastolic volume (LVEDV), and ejection fraction (LVEF) were assessed via the Simpson's method. Survivors (n=19) were randomized into Control (untreated, n=10) or Alginate (3D-printed membrane, n=9) groups. Repeat echocardiography was performed 30 days post-MI (D30) using the same parameters. Resultados e Conclusões: Regarding LVEF, the Alginate group presented a mean of 59.1% at D30 compared to 44.4% in the Control (p=0.065). From D7 to D30, the Alginate group showed a 7.7% mean increase, whereas the Control decreased by 3.1% (p=0.095). Inter-group comparisons for LVESV and LVEDV did not reach statistical significance (p>0.05). However, intra-group analysis revealed a mean LVEDV increase of 102.6 mL (p=0.059) in the Control group versus 40.8 mL in the Alginate group (p=0.594). These data suggest that alginate treatment attenuated adverse ventricular remodeling by promoting volumetric stability and significant intra-group improvement in LVEF over 30 days (p=0.050).

21566

EXPRESSION PROFILE OF ACP1, PTPN1, AND PTPN11 IN HEART FAILURE AND THEIR POTENTIAL AS TRANSLATIONAL BIOMARKERS

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Introdução/Fundamentos: Heart failure (HF) represents a complex syndrome associated with high mortality rates, marked by ventricular remodeling and the progressive loss of myocardial function. In recent years, protein phosphatases have gained prominence as essential regulators of cellular hypertrophy and regeneration, with the roles of ACP1, PTPN11, and PTPN1 being particularly relevant in these mechanisms. Objetivos: The present study evaluated the expression of these phosphatases in the myocardium and investigated their applicability as whole-blood biomarkers. Métodos: Using transcriptomic databases (NIH), we analyzed two cohorts: 1) 64 left ventricular biopsies (14 controls, 37 with dilated cardiomyopathy [DCM], and 13 with ischemic cardiomyopathy [ICM]); and 2) 944 whole-blood samples from patients with HF. Statistical analyses were performed using R and Jamovi software, employing ANOVA and Kruskal-Wallis tests, followed by Tukey and Games-Howell post-hoc tests, with adjustments for clinical and demographic factors. Resultados e Conclusões: Transcriptomic analysis showed that phosphatase expression is strongly modulated by cardiac pathophysiology and demographic variables. In ventricular tissue, PTPN1 behaved as an indicator of myocardial stress, exhibiting significantly elevated expression in both DCM (p=0.009) and ICM (p=0.0029). Conversely, ACP1 exhibited downregulation restricted to DCM (p=0.04), suggesting an etiology-dependent molecular profile. In the whole-blood validation stage (n=944), an evident sexual dimorphism in ACP1 expression was noted, with higher levels in females (p<0.001). Additionally, PTPN11 demonstrated sensitivity to aging, with reduced expression in the 70-79 age group when compared to the 50-59 (p=0.013) and 60-69 (p=0.045) age ranges. Thus, the measurement of PTPN1 and ACP1 indicates tissue impairment, while the peripheral detection of ACP1 and PTPN11 enables clinical stratification adjusted by sex and age.The findings demonstrate that PTPN1 and ACP1 phosphatases integrate a molecular signature intrinsic to cardiac remodeling in HF. The applicability of ACP1 and PTPN11 in whole blood confers high translational value to these markers, consolidating them as biomarkers influenced by demographic characteristics. This discriminatory capacity highlights the promising role of these enzymes in advancing precision medicine, paving the way for more assertive and individualized clinical monitoring of heart failure.

17278

GENE EDITING AS A STRATEGY TO INCREASE THE EFFICACY OF MESENCHYMAL STEM CELLS IN MYOCARDIAL REGENERATION AFTER ISCHEMIA: A SYSTEMATIC REVIEW OF EXPERIMENTAL STUDIES

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Introdução/Fundamentos: Cardiac ischemia is an important factor in the aggravation of cardiovascular diseases and a relevant cause of mortality, due to the limited regeneration of the myocardium. Although mesenchymal stem cells (MSCs) have therapeutic potential, their poor survival in ischemic tissue reduces their effectiveness. The association with gene therapy emerges as a promising strategy to enhance cardiac regeneration. Objetivos: To compile data from the literature to evaluate the feasibility of engraftment of gene therapy-modified MSCs in myocardial tissue regeneration after ischemia. Métodos: Systematic review conducted according to the PRISMA protocol, including experimental studies in mice. The DeCS/MeSH descriptors were combined with the Boolean operators to compose the search strategy. The screening of articles was performed on the Rayyan platform, and the risk of bias was assessed using the SYRCLE protocol. Resultados e Conclusões: We included 4 studies in which different genetic modification strategies were evaluated. The first demonstrated that the addition of Interleukin (IL)-10 to MSCs increased cell survival, improved left ventricular ejection fraction (LVEF) and reduced fibrosis after ischemia. However, not all of them showed similar results. In the study with C-C Motif Chemokine Receptor 1 (CCR1) and C-X-C Motif Chemokine Receptor 2 (CXCR2) overexpression, there was no significant improvement in cardiomyocyte differentiation or proliferation, suggesting paracrine effects, and CXCR2 did not increase cell survival in relation to unmodified MSCs. The third study, with IL-7, also showed a reduction in fibrosis and an improvement in contractile function. Finally, the modification for stem cell factor (SCF) expression activated pathways associated with greater vascularization, lower fibrosis, and improved cardiac function. Risk of bias analysis showed high risk of bias in all studies. Thus, most techniques increased the survival of MSCs in ischemic tissue, except for those with CXCR2 overexpression. In addition, there was an increase in proangiogenic factors in most studies, with the exception of the IL-7 assay. Despite the promising results, the increased risk of bias in all studies indicates the need for more robust and methodologically improved research to evaluate the real contribution of gene therapy to MSC survival and post-ischemia cardiac remodeling.

Figure 1. Flow diagram of study screening and selection for sample inclusion.

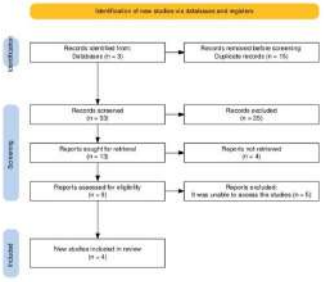
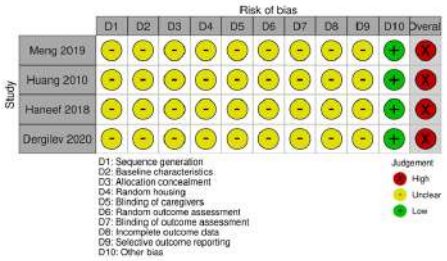


Figure 2. Assessment of the risk of bias using the SYRCLE tool.



20486

GUT MICROBIOTA, LIPID METABOLISM AND HYPERTENSION: A COMPOSITIONAL AND FUNCTIONAL ANALYSIS

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Introdução/Fundamentos: Gut microbiota–host metabolic interactions play a critical role in cardiovascular regulation, modulating inflammation, energy homeostasis, and endothelial function. Microbial metabolites, including short-chain fatty acids (SCFAs), bile acids, and lipopolysaccharides (LPS), influence pathways such as PPAR signaling, lipid metabolism, and oxidative stress. However, whether arterial hypertension is associated with structural dysbiosis or functional alterations independent of microbial diversity remains unclear. Objetivos: To investigate gut microbiota composition and diversity in hypertensive individuals and evaluate associations between specific bacterial genera and lipid parameters compared to normotensive controls. Métodos: In this cross-sectional study, normotensive (NT, n=20) and hypertensive (HT, n=20) participants were analyzed. Fecal samples underwent 16S rRNA gene sequencing (V3–V4 region), processed using QIIME2. Alpha (Chao1, Shannon, Simpson, Faith's PD) and beta diversity (PhILR, PCoA) were assessed. Differential abundance was evaluated using DESeq2, and functional profiling was performed via KEGG. Spearman correlations were used to assess associations between microbial taxa and clinical parameters. Resultados e Conclusões: Results: No significant differences were observed in overall microbial diversity or composition between groups. However, hypertensive individuals showed increased abundance of CAG-873, Oribacterium, Succinivibrio, and Akkermansia, and reduced Lactobacillus. In normotensive individuals, Barnesiella and Phascolarctobacterium positively correlated with total cholesterol, while Fusicatenibacter negatively correlated with VLDL and triglycerides; these associations were absent in hypertensive subjects. In HT, vadinBE97 positively correlated with uric acid. Functional analysis revealed a predominance of upregulated pathways in HT (291 vs. 49 downregulated). Notably, pathways related to PPAR signaling, fatty acid metabolism, peroxisomal function, and oxidative phosphorylation were reduced in HT. Conclusion: Arterial hypertension was not associated with global microbial dysbiosis or reduced diversity but rather with shifts in specific bacterial taxa and functional reprogramming. The disruption of correlations between gut microbiota and lipid parameters observed in normotensive individuals, together with the downregulation of lipid-related metabolic pathways, suggests that impaired microbiota–lipid metabolism interactions may contribute to the pathophysiology of hypertension.

19169

IMPAIRED BIOFILM FORMATION BY STAPHYLOCOCCUS AUREUS FROM HIV-INFECTED INDIVIDUALS: EVIDENCE OF REDUCED VIRULENCE ON MECHANICAL HEART VALVES

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Introdução/Fundamentos: Biofilm formation by Staphylococcus aureus on prosthetic heart valves is a central mechanism in the pathogenesis of infective endocarditis, contributing to bacterial persistence and resistance to antimicrobial therapy. In individuals with HIV infection, the immunosuppressed state may influence host–pathogen interactions and potentially modify bacterial virulence profiles, including the biofilm formation capacity. Objetivos: To evaluate and compare the biofilm formation capacity of Staphylococcus aureus isolates obtained from the nasal microbiota of HIV-positive and HIV-negative individuals on mechanical heart valves. Métodos: This was an in vitro experimental study conducted using previously sterilized mechanical mitral valves. Staphylococcus aureus inocula were adjusted to 10^8 CFU/mL, followed by washing and centrifugation steps. The final bacterial suspension was added to a culture medium containing the prosthetic valve and incubated at 35°C for 24 and 72 hours. After incubation, non-adherent cells were removed, and the remaining biofilm was stained with crystal violet. Biofilm biomass was then detached by sonication and quantified by spectrophotometric analysis at 570 nm. The method was performed a total of eight times. In the HIV-positive group, it was conducted four times—two at 24 hours and two at 72 hours. The same protocol was applied to the HIV-negative group, also totaling four experiments, with two at 24 hours and two at 72 hours. Resultados e Conclusões: Isolates from HIV-negative individuals consistently demonstrated greater biofilm formation at both evaluated time points. At 24 hours, absorbance values were 0.188 and 0.162 in the HIV-negative group, compared to 0.072 and 0.084 in the HIV-positive group. At 72 hours, values reached 0.256 and 0.257 in the HIV-negative group and 0.104 and 0.081 in the HIV-positive group (Figure 1). Overall, isolates from HIV-positive patients exhibited an approximate 55% to 65% reduction in biofilm formation compared to controls, maintaining a consistent pattern across incubation periods. These findings suggest reduced biofilm-associated virulence among isolates from immunocompromised hosts. A possible explanation is that, in a more permissive host environment, there may be reduced selective pressure for the expression of virulence factors, resulting in diminished biofilm formation.

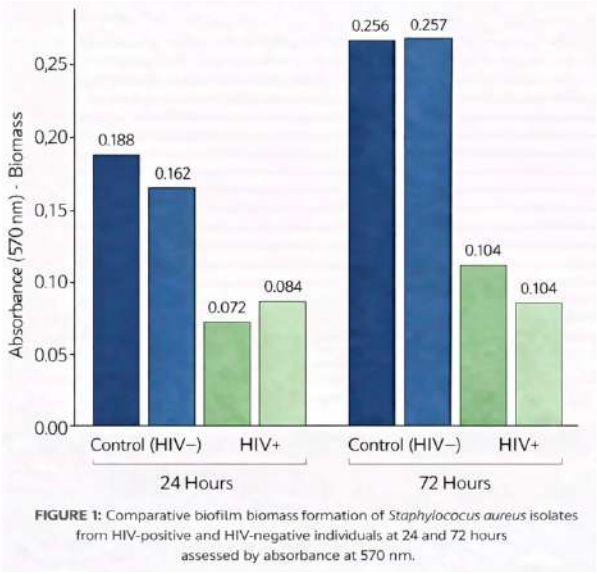


FIGURE 1: Comparative biofilm biomass formation of *Staphylococus aureus* isolates from HIV-positive and HIV-negative individuals at 24 and 72 hours assessed by absorbance at 570 nm.

20607

IN SILICO SCREENING OF TRYPANOSOMA CRUZI CYSTEINE PROTEASES AS IMMUNOGENIC AND PHARMACOLOGICAL TARGETS

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Introdução/Fundamentos: Chagas disease is a clinical condition still marked by deep biopsychosocial vulnerabilities. Although epidemiological indices have shown significant progress due to national initiatives, the disease remains a major challenge among parasitic infections. Therefore, biotechnological approaches investigating pharmacological targets and molecules with immunogenic potential are essential to amplify its therapeutic arsenal. Objetivos: This study aims to determine the viability of select peptide segments derived from cruzipain as potential immunogenic targets. To this end, these peptides were analyzed based on biochemical, conformational and stereoscopic criteria, generating protein fragments that were subsequently subjected to molecular docking simulations to identify new pharmacological targets with promising trypanocidal activity. Métodos: Nucleotide sequences of cruzipain (GenBank: UBT23809.1) were retrieved from the NCBI database, analyzed by homology and translated via BLAST algorithms. Later, the primary protein sequence underwent multiparametric analysis using ProtParam and ProSite, combining a series of eligibility criteria to identify candidate immunogens, including their probability of eliciting an immune response via MHC-I through Immune Epitope Database. Finally, the cysteine protease structure was modeled via I-TASSER and evaluated for its binding capacity to itraconazole using SwissDock. Resultados e Conclusões: Submission of the gene sequence to BLAST determined a 467-amino acid fragment with adequate solubility in the cellular environment, half-life (30 hours in vitro) and pI for prospective docking investigations. Next, the protein was analyzed under various other biochemical criteria, leading to the selection of VDWRARGAVTAVKD as a promising immunogenic peptide, with high probability of eliciting an MHC-I mediated immune response and satisfactory characteristics to serve as a vaccine target. Molecular docking evidenced ionic and hydrogen bonds, as well as hydrophobic interactions between the protease and itraconazole, with estimated affinity of -8.251 kcal/mol, showing high-intensity binding between the ligand and the target. In conclusion, these in silico findings suggest VDWRARGAVTAVKD as a viable immunogen candidate and support itraconazole repurposing as a promising strategy against Chagas disease. Such biotechnological approaches are crucial for developing more accessible and less toxic therapeutic interventions for this neglected pathology when compared to its usual therapeutic arsenal.

15806

INFLUENCE OF RECOMBINANT METALLOPROTEINASE-2 ON AUTONOMIC AND SPONTANEOUS BAROREFLEX FUNCTION IN HEALTHY MICE

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Introdução/Fundamentos: The Baroreflex is responsible for controlling blood pressure (BP) by means of neural mechanisms via mechanoreceptors that change heart rate (HR) to maintain adequate BP levels. In cardiovascular diseases (CVD), there is a dysfunction of this system, associated with the presence of matrix metalloproteinase 2 (MMP-2), which are endopeptidases that destroy the extracellular matrix and generate cardiac remodeling. Objetivos: Thus, the objective of this study was to investigate the influence of recombinant MMP-2 on autonomic and spontaneous baroreflex function in healthy mice. Métodos: Male C57BL/6 (Wild Type) mice were used and divided into two groups: Control group (C, n=6), which received saline solution (i.p.), and MMP-2 group (M, n=5), which received 150 ng/g/day (i.p.) of recombinant MMP-2 for 4 weeks starting from the 7th week of life. After this period, the animals were anesthetized for cannulas implantation in the femoral artery and vein, and 24 hours after these procedures, baseline BP and HR were recorded with the animals unanesthetized for the evaluation of heart rate variability (HRV) and spontaneous baroreflex. Resultados e Conclusões: No significant differences were found in the spontaneous baroreflex gain parameters (5.0±0.67 vs. 4.9±0.58, p=0.7376) and in the Baroreflex Effectiveness Index (BEI) (0.046±0.004 vs. 0.039±0.004, p=0.2076), which illustrates the baroreflex's ability to respond adequately to BP variations. In the HRV analysis, no significant differences were observed between the groups in the time domain (RMSSD: 15.4±2.3 vs. 23.9±6.8, p=0.2362) and frequency domain parameters (high frequency – HF and low frequency – LF which relate to the parasympathetic and sympathetic autonomic nervous system, respectively LF/HF ratio: (0.35±0.14 vs. 0.42±0.14, p=0.7316). In conclusion, the administration of recombinant MMP-2 for 4 weeks does not interfere with the parameters of autonomic function and spontaneous baroreflex in healthy mice.

21567

INTRACEREBROVENTRICULAR INFUSION OF ALAMANDINE-(1-5) REDUCES BLOOD PRESSURE AND IMPROVES BAROREFLEX IN SPONTANEOUSLY HYPERTENSIVE RATS (SHR)

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Introdução/Fundamentos: It is well known that in the central nervous system, peptides of the renin-angiotensin system modulate autonomic and baroreflex activity, while angiotensin (Ang) II and Ang III reduce baroreflex sensitivity (BRS), Ang-(1-7) and alamandine (Ala) enhance it. We have recently shown that Ala-(1-5), a product of Ala, exerts vasodilatory and antihypertensive effects following intravenous administration. Objetivos: In the present study, we evaluated the cardiovascular effects and changes in BRS produced by intracerebroventricular (ICV) infusion of Ala-(1-5) in male and female spontaneously hypertensive rats (SHR). Métodos: SHR (3–4 months; n=5–6/group; IACUC protocol 120/2025) underwent stereotaxic implantation of a cannula into the lateral ventricle, under a mixture of ketamine (50 mg/kg) and xylazine (10 mg/kg) anesthesia. Seven days later, femoral artery and vein were cannulated for arterial pressure (AP) recording and drug administration, respectively. After 24 hours, AP was continuously recorded in conscious animals, with an initial 1-hour stabilization period for cardiovascular parameters. BRS was determined by the bradycardic response to increases in mean AP (MAP) before and 90 minutes after ICV infusion of Ala-(1-5) (4 µg/h). Resultados e Conclusões: In males, Ala-(1-5) infusion significantly reduced MAP by approximately 20 mmHg (155±6 vs. 175±6 mmHg; n=6), without altering baseline heart rate (HR; 327±11 vs. 328±11 bpm), and increased BRS by approximately 70% (0.81±0.08 vs. 0.48±0.08 ms/mmHg). Saline infusion (10 µL/h; n=4) did not alter MAP, HR, or BRS (0.50±0.14 ms/mmHg vs. 0.43±0.06 ms/mmHg). In females, the same infusion rate of Ala-(1-5) did not produce significant changes in MAP (152±7 vs. 162±9 mmHg; n=5), HR (370±10 vs. 342±12 bpm), or BRS (0.78±0.08 vs. 0.81±0.11 ms/mmHg). These findings demonstrate a central antihypertensive effect of Ala-(1-5) associated with improved baroreflex control in male SHR. Future studies should clarify whether the lack of response observed in females is solely attributable to the dose administered.

20745

LOW HYDROSTATIC LOAD IN BATS: RESPIRATORY PUMP–FACILITATED CEREBRAL VENOUS RETURN AND POTENTIAL BRAIN PROTECTION STRATEGIES IN HUMANS

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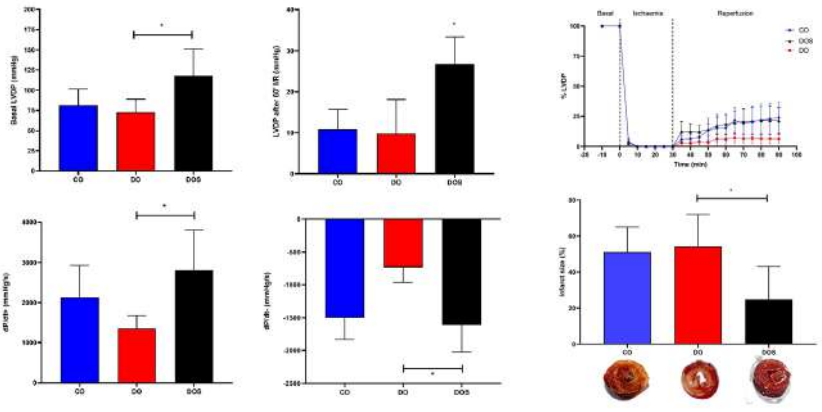
Introdução/Fundamentos: Trendelenburg positioning and other forms of body inversion, in which the head remains below heart level, increase cephalic venous pressure and intracranial pressure (ICP) in humans. In contrast, bats routinely rest upside down with apparent hemodynamic tolerance. Although circulation depends on multiple factors, hydrostatic pressure (HP) remains relevant. Because blood has an approximately constant density (1050–1060 kg/m³) and HP is proportional to the vertical height difference between two points (P=ρgh), body geometry may significantly influence cerebral perfusion and venous drainage. Objetivos: To analyze how the heart-to-head distance in bats, compared with humans, may explain tolerance to inverted posture through hydrostatic principles, and how these findings may inform human brain-protection strategies. Métodos: Comparative theoretical-anatomical study based on an integrative narrative review. PubMed, Scopus, and Google Scholar were searched using descriptors related to bats, body position, hydrostatic pressure, intracranial pressure, venous return, and comparative physiology. Heart-to-head distance was proportionally compared with axial trunk length (cranium to last vertebra). The main hydrostatic determinant was defined as the real vertical distance between heart and brain rather than total anatomical length. The approximation of 1 vertical cm = 0.77 mmHg was applied. Resultados e Conclusões: In humans, heart-to-head distance corresponds to approximately 45–57% of axial body length, whereas in bats it is estimated at 30–45%. In upright humans, the brain lies about 25–35 cm above the heart, implying a pressure reduction of 19–27 mmHg at cerebral level. During inversion, the head shifts below the heart, favoring increased cranial venous pressure and ICP. In resting inverted bats, the short cephalothoracic distance keeps the head only a few centimeters below the heart, producing a low hydrostatic increase of 2–5 mmHg that may facilitate cerebral venous return through the respiratory pump. Bat tolerance to inversion may be largely explained by the reduced vertical heart-to-brain distance, which limits arterial and venous hydrostatic effects. The resulting low hydrostatic load may also optimize venous drainage through thoracic respiratory mechanics. These concepts highlight the relevance of body geometry in cardiovascular physiology and may support novel postural, ventilatory, and circulatory strategies for human brain protection.

17904

MATERNAL SEMAGLUTIDE INDUCES TRANSGENERATIONAL CARDIOPROTECTION: IMPROVED CARDIAC FUNCTION AND REDUCED INFARCT SIZE AFTER ISCHEMIA–REPERFUSION IN OFFSPRING

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Introdução/Fundamentos: Obesity is a chronic, multifactorial disease whose prevalence has increased by 105.93% in Brazil, elevating healthcare costs and the risk of non-communicable diseases, such as diabetes, hypertension, and cardiovascular events. This condition also increases susceptibility to ischemia-reperfusion (I/R) injury due to metabolic, inflammatory, and endothelial dysfunction. Semaglutide, a GLP-1 receptor agonist, promotes glycemic control and weight loss and may exert cardioprotective effects; however, its role in attenuating I/R injury is unclear. Objetivos: This study investigated the transgenerational cardioprotective effect of semaglutide administered exclusively to dams on myocardial function and infarct area in offspring subjected to an I/R injury model using isolated hearts. Métodos: Female rats were allocated to three groups: control offspring (CO, n = 4), diet offspring (DO, n = 5), and diet offspring treated with semaglutide (DOS, n = 4). Dams in the DO and DOS groups received a cafeteria diet from weaning through gestation, whereas semaglutide was administered only to the DOS dams during pregnancy and lactation. After weaning, DO and DOS offspring remained on a cafeteria diet for 12 weeks, whereas CO received a standard diet and vehicle. Cardiac function was assessed using the Langendorff system (30 min ischemia/60 min reperfusion), and left ventricular developed pressure (LVDP), myocardial contractility (dP/dt^+), and relaxation (dP/dt^-) were analyzed. The infarct area was determined using TTC staining. Resultados e Conclusões: The DOS group showed higher basal LVDP than the DO group ($p < 0.05$), indicating improved baseline ventricular function, and exhibited better recovery after reperfusion compared with CO and DO ($p < 0.05$), suggesting greater resistance to I/R injury. The dP/dt^+ was also higher in DOS than in DO ($p < 0.05$), reflecting enhanced systolic performance, while dP/dt^- was more negative ($p < 0.05$), indicating improved diastolic relaxation. The CO group presented intermediate values (Figure 1). In addition, infarct area was reduced in DOS compared to DO ($p < 0.05$), supporting a cardioprotective effect of maternal semaglutide; however, no difference was observed between DOS and CO (Figure 2). In conclusion, maternal semaglutide promoted a transgenerational cardioprotective effect, improving cardiac function after I/R and significantly reducing infarct size.

16531

MILD HYPERHOMOCYSTEINEMIA INDUCES SEX-DEPENDENT CARDIAC INFLAMMATORY CHANGES IN AGED RATS: MODULATION BY SIMVASTATIN AND FOLIC ACID

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Introdução/Fundamentos: Homocysteine (Hcy) is a non-proteinogenic amino acid derived from methionine metabolism. Normal plasma levels range from 5 to 15 µmol/L, and increases in these levels characterize Hyperhomocysteinemia (HHcy). Mild HHcy is described between 15 and 30 µmol/L, and is a known cardiovascular risk factor associated with aging and adverse cardiovascular outcomes through inflammatory processes. Folic acid (FA), a cofactor in Hcy metabolism, and simvastatin (SIM), a statin-class lipid-lowering drug, both with known anti-inflammatory properties, may exert protective effects against HHcy-induced alterations. Objetivos: Evaluate the impact of chronic mild HHcy on the expression of interleukins (IL1a, IL1b, IL6 and IL10) and Rela genes, as well as on cytosolic and nuclear NF-κB p65 protein levels, all involved in inflammatory pathways, in the myocardium of aged rats, and the cardioprotective effects of FA and SIM. Métodos: 365-day-old Wistar rats were administered Hcy (0.03 µmol/g, sc, twice daily) for 30 days to induce chronic mild HHcy. Post-euthanasia, myocardial slices were incubated with SIM (10 µM), FA (100 µM), or respective vehicles, for 60 min. Gene expression was quantified via RT-qPCR, and NF-κB p65 distribution was analyzed by Western blotting. Statistical analysis was performed using two-way ANOVA. (CEUA: 46247). Resultados e Conclusões: In males, HHcy upregulated IL1a, IL1b, and IL6 expression and downregulated IL10 ($p<0.05$). SIM treatment restored inflammatory marker levels, and FA exhibited a partial effect, reversing only IL1b upregulation ($p<0.05$). HHcy increased cytosolic NF-κB p65 in males ($p<0.05$) and both SIM and FA mitigated this cytosolic accumulation ($p<0.05$). HHcy-treated females exhibited reduced expression of IL1b and IL10, with increased IL6 levels ($p < 0.05$). SIM normalized IL1b and IL10 levels, and both SIM and FA attenuated IL6 expression ($p < 0.05$). HHcy upregulated Rela (mRNA) in females, which was reversed by FA and SIM ($p<0.05$). No changes were observed in NF-κB p65 protein content for HHcy-treated females ($p>0.05$). In conclusion, chronic mild HHcy alters the cardiac inflammatory profile of aged rats in a sex-specific manner. These findings suggest a pro-inflammatory environment that worsens age-related cardiac vulnerability. Consequently, pharmacological strategies targeting Hcy metabolism or its inflammatory signaling may represent viable pathways for reducing HHcy-associated cardiovascular risk. Funding: CNPq.

19660

MORPHOMETRIC ANALYSIS OF THE LEFT MAIN CORONARY ARTERY BASED ON A CADAVERIC STUDY IN SOUTHERN BRAZIL: ASSOCIATIONS WITH CORONARY DOMINANCE AND BRANCHING PATTERN

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Introdução/Fundamentos: The left main coronary artery (LMCA) supplies a substantial portion of the left ventricular myocardium through its major terminal branches, usually the left anterior descending and circumflex arteries. Because of its critical role in myocardial perfusion, the LMCA has major relevance in coronary angiography, percutaneous coronary intervention, coronary artery bypass grafting, and structural heart procedures. Anatomical variations involving LMCA length, diameter, coronary dominance, and branching pattern may influence catheter selection, stent sizing, surgical planning, and procedural risk. However, morphometric data remain limited in many populations, particularly in South America, where regional anatomical differences may exist. Cadaveric studies provide direct anatomical assessment and may complement imaging-based investigations. Therefore, further characterization of LMCA morphology in Southern Brazil may contribute to anatomical knowledge and clinical practice. Objetivos: To assess the prevalence of variations on the LMCA branching pattern in a Southern Brazilian population. As well as to investigate associations between different branching patterns. Métodos: This is an observational cadaveric study conducted with a sample of in-life donated bodies through an institutional body donation program. Whole cadavers and heart specimens were analyzed. Specimens with damaged coronary arteries were excluded. The LMCA branching patterns were noted and measurements of dominance, LMCA length (mm), diameter at its origin (mm), diameter at bifurcation (mm) and branching pattern were recorded. Resultados e Conclusões: A total of 40 hearts were analyzed. Mean LMCA length was 11.9 ± 4.13 mm (2.95–19.5 mm). Mean proximal diameter was 5.87 ± 1.28 mm, while mean distal diameter at the branching point was 5.25 ± 1.11 mm, corresponding to an average caliber reduction of 10.0%. No significant associations were found between coronary dominance and any of the morphometric variables analyzed. Similarly, the branching pattern was not associated with LMCA length or diameter. However, a statistically significant difference in caliber reduction was observed between branching patterns, with trifurcating LMCAs presenting a greater mean reduction compared to bifurcation specimens (17.43% vs. 7.85%). These findings remained significant when analyzed using Welch's t-test ($t = -2.86$, $p = 0.013$). The magnitude of the effect was large (pooled Cohen's $d = 1.06$; Hedges' $g = 1.03$), indicating a substantial difference between groups.

18129

NON-ALCOHOLIC FATTY LIVER DISEASE AND RISK OF MAJOR CARDIOVASCULAR EVENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS OF PROSPECTIVE STUDIES

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Introdução/Fundamentos: Non-alcoholic fatty liver disease (NAFLD) has emerged as an important metabolic condition associated with insulin resistance, systemic inflammation, and endothelial dysfunction. Although often considered a liver disease, growing evidence indicates its strong association with cardiovascular outcomes, and it may represent an independent risk marker. Objetivos: To evaluate the association between non-alcoholic fatty liver disease and the occurrence of major cardiovascular events in adults. Métodos: A systematic review and meta-analysis conducted according to PRISMA guidelines. PubMed, Embase, Scopus, and Web of Science databases were searched up to January 2025. Prospective cohort studies evaluating NAFLD diagnosed by imaging (ultrasound, elastography, or magnetic resonance imaging) or clinical criteria, and its association with major cardiovascular outcomes (acute myocardial infarction, stroke, and cardiovascular mortality), were included. Methodological quality was assessed using the Newcastle–Ottawa Scale. Statistical analysis was performed using a random-effects model, with calculation of relative risk (RR) and 95% confidence intervals (95% CI). Heterogeneity was assessed using the I^2 index, and publication bias was evaluated by funnel plot and Egger's test. Subgroup analyses were conducted according to diagnostic method and presence of metabolic syndrome. Resultados e Conclusões: A total of 32 studies were included, comprising 2,214,560 individuals, with a mean follow-up of 7.3 years. The presence of NAFLD was associated with a significant increase in the risk of major cardiovascular events (RR=1.45; 95% CI: 1.32–1.59; p<0.001). In subgroup analyses, individuals with NAFLD associated with metabolic syndrome had a higher risk (RR=1.68), while the association remained significant even in the absence of advanced liver disease. Heterogeneity was moderate (I^2=54%), with no consistent evidence of publication bias. In summary, non-alcoholic fatty liver disease is independently associated with an increased risk of major cardiovascular events, reinforcing its role as a systemic risk marker. Early identification of this condition may contribute to integrated strategies for cardiovascular prevention and metabolic management.

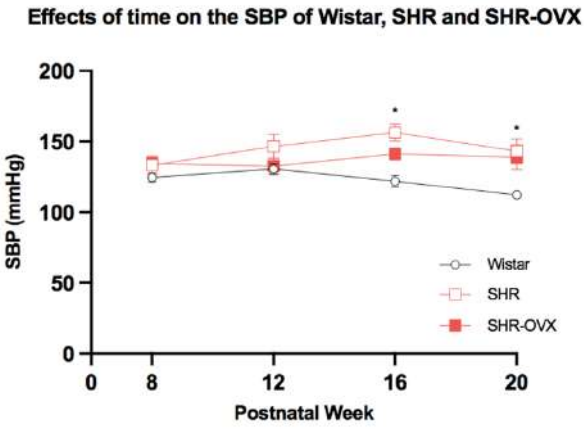
20937

OVARIAN HORMONES IN BLOOD PRESSURE CONTROL: EFFECTS OF OVARIECTOMY ON HYPERTENSION DEVELOPMENT IN FEMALE SPONTANEOUSLY HYPERTENSIVE RATS

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Introdução/Fundamentos: Hypertension is a multifactorial condition with sex-related differences in its pathophysiology. In this context, it is important to understand the role of ovarian hormones in the modulation of blood pressure and cardiovascular protection. Objetivos: To study the effect of ovariectomy (OVX) on the development of hypertension in female Spontaneously Hypertensive Rats (SHR) and its consequences on heart weight. Métodos: SHR and Wistar rats were used as hypertensive and normotensive models. OVX or sham surgery was performed at the 5th postnatal week (PNW), and the rats were randomized into Wistar, SHR, and SHR-OVX groups. The rats' body weight (BW) was monitored weekly and systolic blood pressure (SBP) was measured using tail cuff plethysmography at the 8th, 12th, 16th, and 20th PNW. The heart was collected after euthanasia at the 20th PNW. Data are presented as mean±SD. Resultados e Conclusões: Regarding BW, there was a significant main effect of strain (p<0.001) and time (p<0.001). Lower BW in SHR (p=0.025) and SHR-OVX (p=0.006) were observed only at 8 PNW (Wistar: 169.5±10.33; SHR: 145.87±19.62; SHR-OVX: 142.44±17.85 g). Two-way repeated measures ANOVA showed a significant main effect of strain (p<0,001) on SBP. Post hoc analysis revealed differences between groups at two specific time points. At 16 PNW, SBP was significantly higher in SHR compared to Wistar (Wistar: 120±10.3 vs. SHR: 156±17 mmHg; p<0.001), whereas at 20 PNW, both SHR (p=0.006) and SHR-OVX (p=0.011) exhibited significantly higher SBP compared to the Wistar (Wistar: 112±5.4; SHR: 144±17.6; SHR-OVX: 138±23.5mmHg). No difference in SBP was observed between SHR and SHR-OVX at any time point analyzed. Regarding relative heart weight, only strain had a significant effect (p=0.013), with higher values in SHR compared to Wistar, regardless of OVX (Wistar: 0.37±0.02; SHR:0.41±0.04; SHR-OVX: 0.46±0.13g). This study concludes that in female SHR, OVX at 5 PNW did not affect hypertension development, nor did it alter relative heart weight. These findings suggest that estradiol and progesterone may not play a major role in the development of hypertension in this model.

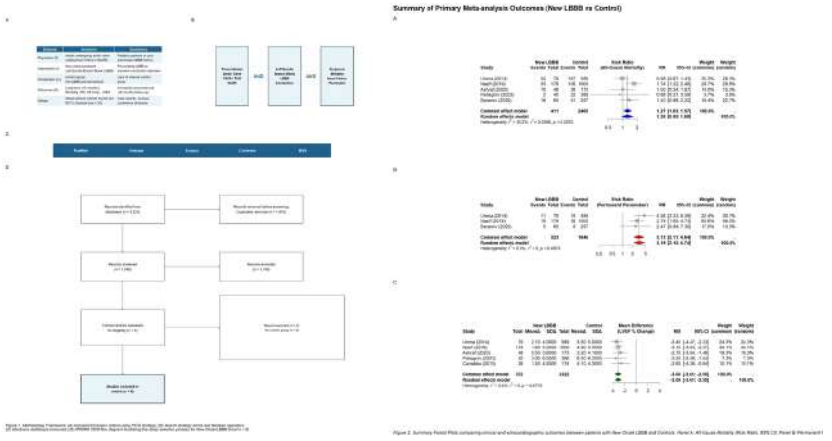


21284

PROGNOSTIC IMPACT OF NEW PERSISTENT LEFT BUNDLE BRANCH BLOCK IN PATIENTS UNDERGOING AORTIC VALVE REPLACEMENT ACCORDING TO THE PROCEDURE PERFORMED: TRANSCATHETER AORTIC VALVE IMPLANTATION (TAVI).

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Introdução/Fundamentos: Left Bundle Branch Block (LBBB) causes ventricular dyssynchrony due to delayed or interrupted electrical conduction. Although Transcatheter Aortic Valve Implantation (TAVI) is an effective treatment for aortic stenosis, conduction disturbances such as persistent LBBB remain frequent complications, especially after the TAVI procedure. Objetivos: To evaluate the clinical impact of new persistent post-TAVI LBBB, analyzing its association with all-cause mortality, need for permanent pacemaker implantation, and worsening of left ventricular ejection fraction (LVEF). Métodos: The study followed the PRISMA 2020 guidelines, with searches conducted in PubMed and Embase via Parsifal, using a study selection performed independently by two reviewers. Funnel plots were used to assess publication bias. Observational studies evaluated using the Newcastle-Ottawa Scale were included, while pediatric and congenital heart disease patients were excluded. A random-effects meta-analysis (DerSimonian-Laird method) was performed, using RR for dichotomous outcomes, MD for LVEF, and I^2 to assess heterogeneity. Resultados e Conclusões: Six observational studies were included, totaling 3,340 patients undergoing TAVI, evaluating the impact of new persistent LBBB on clinical and functional outcomes. The meta-analysis demonstrated a 32% increase in long-term all-cause mortality (RR = 1.32), with 0% heterogeneity. There was a higher need for permanent pacemaker implantation in the LBBB group (RR = 3.05; $p < 0.001$). Impaired recovery of cardiac function after TAVI was also observed, with a reduction in LVEF ranging from 2.8% to 3.2% compared with controls. Additionally, a 37% increase in the risk of hospitalization for heart failure was identified (RR = 1.37). New persistent LBBB after TAVI is associated with an increased risk of all-cause mortality and need for permanent pacemaker implantation. Furthermore, it compromises long-term improvement in ejection fraction, suggesting the need for implantation strategies aimed at minimizing damage to the cardiac conduction system.

19181

REPERCUSSIONS OF MESENCHYMAL STEM CELL THERAPY ON THE MECHANICAL PROPERTIES OF THE INFARCT SCAR

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Introdução/Fundamentos: Myocardial infarction affects thousands of people worldwide each year, reducing the quality of life and life expectancy of survivors and increasing healthcare costs. Myocardial cell death due to ischemia promotes cardiac remodeling and collagen deposition at the site of injury, predisposing patients to heart failure, expansion of necrosis, aneurysms, and ventricular rupture, which may lead to death. Due to these complications, studies have emerged using mesenchymal stem cells in cardiac tissue; however, little is known about the mechanical impact and the structural and functional abnormalities of the infarcted area following the injection of these cells. This is the objective of the present study. Objetivos: The present study aims to analyze the impact of the therapeutic use of adipose tissue-derived mesenchymal stem cells on the mechanical properties of the infarct scar. Métodos: The study was approved by the research ethics committee of UNIFESP (No. 9220050424). Twelve-week-old Fischer rats were infarcted by coronary occlusion. After 28 days, an echocardiogram was performed to confirm the presence of infarction, and the animals were randomly assigned to receive intramyocardial injection of sterile saline (MC) or ADMSC. After 48 hours, the rats were euthanized for scar extraction and storage at −80°C for up to five days. The samples were thawed, fixed in steel rings, and subjected to tension on a loading platform to record maximum tensile strength (Fmax) and maximum deformation capacity (Dmax) of the material. Scar stiffness was defined by the tangent of the angle formed in the linear region of the stress–strain curve. Pro–matrix metalloproteinase-2 (pro-MMP-2) and matrix metalloproteinase-2 (MMP-2) activity were measured by zymography. Data were analyzed using a paired t-test ($p \leq 0.05$) and expressed as mean ± standard error. Resultados e Conclusões: Fmax (MC: 5.1 ± 1.8; ADMSC: 4.6 ± 1.5) and Dmax (MC: 2 ± 0.8; ADMSC: 2.3 ± 0.7) values were not significantly different between the MC and ADMSC groups. The tangent values (MC: 1.02 ± 0.36; ADMSC: 0.84 ± 0.08) and maximum deformation (MC: 1.98 ± 0.34; ADMSC: 2.19 ± 0.21) were also not significantly different between groups. Pro-MMP-2 (MC: 4 ± 0.2; ADMSC: 4 ± 0.5; a.u.) and MMP-2 (MC: 3 ± 0.1; ADMSC: 3 ± 0.2; a.u.) levels were likewise not altered by cell therapy. In summary, ADMSCs do not modify the strength, deformation capacity, or stiffness of the infarct scar.

19191

SARCOPENIA AND THE RISK OF MAJOR CARDIOVASCULAR EVENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS OF POPULATION-BASED STUDIES

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Introdução/Fundamentos: Sarcopenia, characterized by the progressive loss of muscle mass and function, has been recognized as a systemic condition associated with chronic inflammation, insulin resistance, and metabolic dysfunction. Recent evidence suggests its relationship with cardiovascular outcomes; however, the magnitude of this association has not yet been fully established. Objetivos: To evaluate the association between sarcopenia and the occurrence of major cardiovascular events in adults. Métodos: A systematic review and meta-analysis were conducted in accordance with PRISMA guidelines. PubMed, Embase, Scopus, and Web of Science databases were searched up to January 2025. Prospective cohort studies evaluating sarcopenia defined by clinical criteria, anthropometric measures, or imaging methods (DEXA, bioimpedance), and its association with major cardiovascular events (myocardial infarction, stroke, and cardiovascular mortality) were included. Methodological quality was assessed using the Newcastle-Ottawa Scale. Statistical analysis was performed using a random-effects model, with calculation of relative risk (RR) and 95% confidence intervals. Heterogeneity was assessed using the I^2 index, and publication bias was evaluated through funnel plot and Egger's test. Subgroup analyses were conducted according to diagnostic method and age group. Resultados e Conclusões: A total of 29 studies were included, comprising 1,764,320 individuals, with a mean follow-up of 6.5 years. The presence of sarcopenia was associated with a significant increase in the risk of major cardiovascular events (RR=1.51; 95% CI: 1.36–1.67; p<0.001). In subgroup analyses, the risk was higher in older adults (RR=1.62) and in individuals with metabolic comorbidities. Studies using imaging-based methods demonstrated a stronger association. Heterogeneity was moderate (I^2=55%), with no relevant evidence of publication bias. In summary, sarcopenia is independently associated with an increased risk of major cardiovascular events, reinforcing its relevance as a systemic risk marker. Early identification of this condition may contribute to integrated preventive strategies, including nutritional interventions and physical rehabilitation.

20848

SCREENING FOR OBSTRUCTIVE SLEEP APNEA IN THE BRAZILIAN UNIFIED HEALTH SYSTEM USING SIMULTANEOUS MULTIMODAL HOME POLYSOMNOGRAPHY AND HOLTER MONITORING: FEASIBILITY AND ASSOCIATION BETWEEN OXYGEN DESATURATION INDEX AND CARDIAC ARRHYTHMIAS.

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Introdução/Fundamentos: Obstructive Sleep Apnea (OSA) is highly prevalent and has a substantial cardiovascular impact, yet it remains widely underdiagnosed within the Brazilian Unified Health System (SUS). The association between intermittent hypoxia and cardiac arrhythmias highlights the need for accessible and integrated diagnostic strategies. Objetivos: To evaluate the correlation between the Oxygen Desaturation Index (ODI) and cardiac arrhythmias, as well as to assess the feasibility of simultaneous multimodal home portable polysomnography and 24-hour Holter monitoring in a cardiology outpatient clinic within the SUS. Métodos: This cross-sectional observational study was conducted between March 2021 and January 2022 and included adult patients referred for 24-hour Holter monitoring at a secondary care service within the SUS. The Berlin Questionnaire and the Epworth Sleepiness Scale were administered. Participants underwent simultaneous monitoring with Holter and multimodal home portable polysomnography. OSA was defined as an ODI >5 events/hour. Resultados e Conclusões: Of the 69 enrolled patients, 58 successfully completed the protocol. The prevalence of OSA was 70.7%, with 31% of cases classified as moderate or severe. Patients presenting supraventricular tachycardia or non-sustained ventricular tachycardia showed significantly higher ODI values compared with those without these arrhythmias (22.6 vs. 10.6 events/hour; p=0.015). A significant correlation was also observed between ODI and premature ventricular contractions (PVCs). The rate of inadequate examinations was 16.4%, predominantly related to operational difficulties with the mobile application. Patients followed in a cardiology outpatient clinic within the SUS showed a high prevalence of OSA. Higher levels of nocturnal oxygen desaturation were associated with greater cardiac electrical instability. The simultaneous use of home portable polysomnography and Holter monitoring proved feasible within the SUS and may represent a promising strategy to expand integrated screening between sleep medicine and cardiology.

17114

SEX-DEPENDENT IMPACT OF MILD HYPERHOMOCYSTEINEMIA ON REDOX BALANCE IN CARDIAC TISSUE OF WISTAR RATS AND THE PROTECTIVE EFFECTS OF FOLIC ACID AND SIMVASTATIN

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Introdução/Fundamentos: Homocysteine (Hcy) is a non-proteinogenic sulfur containing amino acid derived from methionine metabolism. Normal plasma homocysteine levels range between 5–15 µmol/L, but may increase due to dietary and genetic factors, causing hyperhomocysteinemia (HHcy). Plasma levels between 15–30 µmol/L characterize mild HHcy and have been linked with cardiovascular damage via oxidative stress. In this context, Simvastatin (SIM) and Folic Acid (FA) may modulate these pathways due to their antioxidant effects. Objetivos: To evaluate chronic mild HHcy on oxidative stress and the potential protective effects of SIM and FA in ex vivo cardiac tissue slices from aged male and female Wistar rats. Métodos: Wistar rats (365 post natal days) received Hcy (0.03 µmol/g, sc, twice daily) in the treated group and an equivalent volume of saline in the control group for 30 days. After euthanasia, hearts were sliced using a McIlwain Tissue Chopper and incubated with SIM (10 µM, 90 min) or FA (100 µM, 60 min), or respective controls, followed by biochemical analyses. Statistical analysis was performed using two-way ANOVA (CEUA: 46247). Resultados e Conclusões: In males, Hcy increased reactive oxygen species (ROS) levels and lipid peroxidation (TBARS assay) compared to control (p<0.05), also increasing As a compensatory response, Catalase (CAT) activity (p<0.05) FA and SIM reversed the increase in ROS, TBARS and CAT observed (p<0.05). Hcy reduced cytosolic and nuclear protein content of Nrf2 (p<0.05), both restored with FA and SIM. In females, Hcy reduced nitrite levels and Glutathione Peroxidase (GPx) activity (p<0.05). FA and SIM normalized nitrite levels (p<0.05), and SIM restored GPx activity (p<0.05). No alterations were observed for Nrf2 protein content in females treated with Hcy (p>0.05). Regarding Superoxide Dismutase (SOD), although Hcy did not alter its activity, SIM increased enzyme activity in both sexes (p<0.05). Conclusion: Mild HHcy shows potential to promote oxidative imbalance in cardiac tissue in a sex-dependent manner, associated with cellular damage. This cardiotoxic damage may be related to the pathophysiology leading to dysfunctions characteristic of heart failure, such as fibrosis and remodeling. In this regard, FA and SIM demonstrated antioxidant potential by reversing redox imbalance pathways, supporting further investigation into cardioprotective drugs targeting antioxidant mechanisms. Supported by CNPQ.

16201

SEXUAL DIMORPHISM IN ADIPONECTIN AND LEPTIN RESPONSE TO WEIGHT GAIN: EVIDENCE OF CARDIOMETABOLIC PROTECTION IN WOMEN

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Introdução/Fundamentos: The Adiponectin/Leptin (A/L) ratio reflects the balance between adiponectin (anti-inflammatory, cardioprotective) and leptin (pro-inflammatory). Although women have higher leptin levels, the dynamic behavior of these markers across progressive weight gain and their sex differences have gained increasing interest for early cardiovascular risk stratification. Objetivos: To evaluate sex differences in serum levels of leptin, adiponectin, and the A/L ratio in lean, overweight, and obese individuals, investigating the existence of a cardiometabolic protection pattern associated with sex. Métodos: This cross-sectional study included 100 participants (47 men, 53 women) recruited at two university hospitals, stratified by BMI into 3 groups: lean (M11/F24), overweight (M20/F13), and obese (M16/F16). Leptin (pg/mL) and adiponectin (ng/mL) were measured by ELISA, and the A/L ratio was calculated. Data were expressed as median (IQR) for leptin and adiponectin, and as mean±SD for fold change. For median-based variables, comparisons used Mann-Whitney (2 groups) and Kruskal-Wallis (3 groups). For fold decrease, we used Student's t-test (2 groups) and ANOVA followed by Newman-Keuls post-hoc (3 groups). A p-value <0.05 was considered statistically significant. Resultados e Conclusões: Leptin was significantly higher in lean women. In both sexes, leptin increased from overweight onward; however, in women, levels stabilized in obesity, whereas men showed a progressive increase. Adiponectin decreased by 34% in obese men compared to lean (median 1405, IQR 1154 vs. 2140, IQR 1136 ng/mL) but remained stable in women across all BMI categories. Interestingly, lean men started with a higher A/L ratio. However, the fold decrease of the A/L ratio was markedly greater in obese men (0.057±0.029) than in obese women (0.514±0.133), representing a 94% vs. 49% reduction from lean controls, respectively. These data demonstrate clear sexual dimorphism in adipokine responses to weight gain. Women reveal remarkable cardiometabolic resilience of adipose tissue: stable adiponectin levels and stabilized leptin in obesity. Men, in contrast, lose adiponectin protection and show progressive leptin elevation when becoming obese. These findings indicate that: (1) male obesity represents a critical point of cardiometabolic protection loss; (2) women are metabolically more resilient to weight gain; and (3) A/L ratio cutoffs for cardiovascular risk should be sex specific.

Figure 1. Sex-specific changes in serum leptin, adiponectin, and the adiponectin/leptin (A/L) ratio across BMI categories

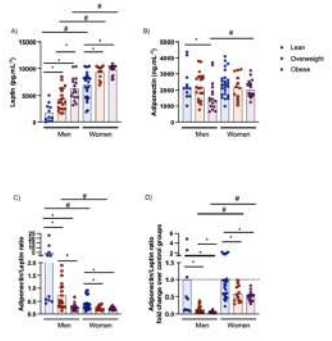


Figure 1. Serum levels of (a) leptin (pg/mL), (b) adiponectin (ng/mL), (c) adiponectin/leptin (A/L) ratio, and (d) adiponectin fold change relative to lean controls in men and women stratified by BMI category (lean, overweight, obese). Data are presented as median [IQR] for (a), (b), (c) and as mean ± SD for (d). *p < 0.05 compared to lean controls within the same sex; #p < 0.05 between sexes within the same BMI category.

Table 1. Demographic and clinical characteristics of the study population stratified by BMI category and sex

Demographic and clinical features	Eutrophic			Overweight			Obese		
	Women (n=24) 68,57 %	Men (n=11) 31,43 %	P, X²	Women (n=13) 39,39 %	Men (n=20) 60,61 %	P, X²	Women (n=16) 50,00%	Men (n=16) 50,00%	P, X²
Age (mean±SE)	39±3	50±4	0,06	49±3	51±3	0,63	50±3	51±3	0,83
BMI (mean±SE)	21,6±0,5	21,8±0,9	0,86	26,9±0,4	27,0±0,4	0,94	34,6±1,6	33,0±0,8	0,40
Abdominal circumference (cm) (mean±SE)	74,6±1,9	81,8±3,3	0,06	91,4±2,3	95,8±2,4	0,22	100,9±3,2	107,0±2,4	0,14
Neck circumference (cm) (mean±SE)	30,3±0,7	35,6±1,1	<0,05	32,8±0,6	37,0 ±0,9	<0,05	34,9 ±1,0	40,6 ±1,2	<0,05
Diabetes (n, %)	0, 0%	0, 0%	-	2, 15,4%	4, 20%	0,71	0, 0%	1, 6,2%	0,31
Hypertension (n, %)	0, 0%	0, 0%	-	6, 46,2%	11, 55%	0,62	6, 37,5%	7, 43,8%	0,72
Menopause (n, %)	4, 16,7%	-	-	3, 23,1%	-	-	7, 43,8%	-	-

Data are mean ± SE or n (%). P-values: Mann-Whitney for continuous variables, chi-square for categorical variables. Menopause % refers to women only.

19510

SUBCLINICAL INFLAMMATION AND RISK OF MAJOR CARDIOVASCULAR EVENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS BASED ON HIGH-SENSITIVITY C-REACTIVE PROTEIN.

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Introdução/Fundamentos: Subclinical inflammation plays a central role in the pathophysiology of atherosclerosis, influencing processes from plaque formation to its destabilization. High-sensitivity C-reactive protein (hs-CRP) has been widely studied as an inflammatory marker; however, its applicability as an independent predictor of cardiovascular risk remains under debate, especially in populations without established disease. Objetivos: To evaluate the association between elevated hs-CRP levels and the occurrence of major cardiovascular events, including acute myocardial infarction, stroke, and cardiovascular mortality Métodos: A systematic review and meta-analysis conducted according to PRISMA guidelines. PubMed, Embase, Scopus, and Web of Science databases were searched through January 2025. Prospective cohort studies assessing baseline hs-CRP levels and their relationship with cardiovascular outcomes were included. Methodological quality was assessed using the Newcastle-Ottawa Scale. Statistical analysis was performed using a random-effects model, with calculation of relative risk (RR) and 95% confidence intervals. Heterogeneity was assessed using the I^2 statistic, and publication bias was evaluated using funnel plots and Egger's test. Subgroup analyses were performed according to hs-CRP levels, presence of prior cardiovascular disease, and follow-up duration. Resultados e Conclusões: A total of 41 studies were included, comprising 2,356,890 individuals followed for a mean period of 6.8 years. Elevated hs-CRP levels were significantly associated with an increased risk of major cardiovascular events (RR=1.58; 95% CI: 1.44–1.73; $p<0.001$). In subgroup analyses, individuals with hs-CRP >3 mg/L showed a higher risk (RR=1.83; 95% CI: 1.62–2.07). In populations without prior cardiovascular disease, the risk remained significant (RR=1.37; 95% CI: 1.22–1.53), suggesting an independent role of the marker. Heterogeneity was moderate (I^2=56%), with no consistent evidence of publication bias. In summary, Elevated hs-CRP levels are consistently associated with an increased risk of major cardiovascular events, independent of traditional risk factors. These findings reinforce the role of subclinical inflammation in risk stratification and suggest that incorporating hs-CRP into clinical practice may contribute to the early identification of high-risk individuals and guide more effective preventive strategies.

19604

TELECARDIOLOGY AS A STRATEGY TO IMPROVE ACCESS TO CARDIOVASCULAR CARE IN REGIONS FAR FROM MAJOR URBAN CENTERS.

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Introdução/Fundamentos: Cardiovascular diseases are among the leading causes of hospitalization and death in Brazil. In this context, the electrocardiogram (ECG) is a fundamental test, widely available in primary care and emergency services, helping in the identification of several cardiac conditions. However, its usefulness depends on adequate interpretation, which may be limited by the high concentration of specialists in major urban centers. According to the Federal Council of Medicine (2026), in the state of Ceará, in the capital there are 3.19 specialists per thousand inhabitants, while in the countryside this number is 0.43 per thousand inhabitants. Thus, telecardiology, through tele-ECG, emerges as a strategy to expand access to diagnosis, especially in regions distant from urban centers. Objetivos: To evaluate indicators related to access to cardiovascular diagnosis through telecardiology in regions far from major urban centers. Métodos: An observational, retrospective, and descriptive study, based on the analysis of data from a telecardiology service in the public health system of Ceará. Electrocardiograms (ECGs) sent for remote reporting from June 2024 to December 2025 were included. Data were obtained from the Business Intelligence (BI) system of the Health Department of the State of Ceará (SESA). Indicators related to the expansion of access to diagnosis were examined by a descriptive statistical analysis, using frequency calculations. The study ensured data anonymization, in accordance with ethical principles. Resultados e Conclusões: Results: During the analyzed period, a total of 6,269 exams were performed, mainly from Maracanaú (51.75%), Russas (28.6%), and Limoeiro do Norte (5.74%), and others (13.91%), regions located in the countryside or metropolitan area of Ceará, which are more distant from well-known specialist centers. An aggregate of 5,102 (81.38%) were requested by nurses and 785 by others who are not physicians (12.52%), showing that, even without a specialist, access to the exam was still possible. Of the total requested exams, 6,081 (97%) received a response, evidencing the increased access to cardiovascular diagnosis. Conclusion: Telecardiology has proven effective in expanding access to cardiovascular diagnosis in regions far from major centers. The high exam volume, reporting rates, and the possibility of requests by non-physician professionals reinforce its role as a clinical support tool. Thus, tele-ECG helps reduce healthcare access inequalities and improves care resolvability.

16949

THE UNDERRECOGNIZED ILE127VAL VARIANT OF TRANSTHYRETIN AMYLOIDOSIS: CLINICAL AND CARDIAC INSIGHTS FROM A RETROSPECTIVE COHORT

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Introdução/Fundamentos: Amyloidosis is a disease characterized by the deposition of abnormal proteins, it can be classified as either systemic or localized. When it affects the heart, it is called cardiac amyloidosis, often caused by the deposition of light chain proteins (AL) or transthyretin (TTR). The main focus of this study, is particularly the Ile127Val variant. Although other variants of amyloidosis due to TTR accumulation, such as Val50Met and Val142Ile, are well described, the genetic variant Ile127Val is still under-researched, especially regarding its clinical behavior and cardiac involvement. Objetivos: The study aims to evaluate the demographic, clinical, and cardiac characteristics of patients with familial amyloidosis (Ile127Val variant) in a real-world cohort. contributing to improved recognition and management of the disease. Métodos: A retrospective observational cohort study was conducted, analyzing data from 2018 to 2023. A convenience sample was used, including 19 patients diagnosed with familial amyloidosis (Ile127Val variant). Data were collected from electronic medical records using the Smart system and analyzed with SPSS version 14. Variables were categorized into demographic, clinical, and cardiac examination groups. Descriptive statistics were applied, with qualitative variables expressed as absolute (n) and relative (%) frequencies. For quantitative variables, measures of central tendency (mean and median) and dispersion (standard deviation and interquartile range) were used. The study was self-funded by the researchers, with no conflicts of interest declared, and was approved by an institutional Ethics Committee. Resultados e Conclusões: Results: ATTRv Ile127Val primarily manifests in brown-skinned women over 40 years old, with a family history of amyloidosis. Regarding presentation patterns, 9 patients (47.4%) had heart disease and peripheral nervous system involvement was observed in 100% of patients, all presenting with polyneuropathy. The most significant cardiac findings on echocardiogram were Left Ventricular Hypertrophy (LVH) and septal thickening, observed in 11 (57.9%) and 8 (42.1%) patients, respectively. Conclusion: The Ile127Val variant demonstrates a mixed phenotype of transthyretin amyloidosis, with predominance of neurological manifestations. Cardiac involvement, characterized by an infiltrative pattern, tends to occur in later stages, potentially delaying diagnosis

Table 1. Epidemiological and Clinical Profile.

Variable	Category	n	%
Sex	Male	7	36.8
	Female	12	63.2
Ethnicity	White	3	15.8
	Brown	12	63.2
	Black	4	21.0
Age group (years)	40–59	7	36.8
	60–79	12	63.2
	≥80	0	0.0
Mean (SD)	63.8 (9.83)		
BMI (kg/m²)	<18.5	2	10.5
	18.5–24.9	7	36.8
	25–29.9	5	26.3
	30–34.9	3	15.8
	35–39.9	0	0.0
	≥40	1	5.3
	Not evaluated	1	5.3
Mean (SD)	26.17 (8.56)		
Family history	Yes	14	73.7
	No	5	26.3
NYHA class	I	2	25.0
	II	2	25.0
	III	1	12.5
	IV	4	50.0
CAF	Yes	9	47.4
	No	10	52.6
PAF	Yes	19	100.0
	No	0	0.0

Table 2. Cardiological Profile.

Variable	Category	n	%
ECG	Normal	5	26.3
	Low QRS voltage	3	15.8
	Extrasystoles	4	21.0
	RBBB	2	10.5
	LV overload	1	5.3
	SAD	3	15.8
	1st-degree AV block	2	10.5
	Repolarization abnormalities	2	10.5
	Abnormal R progression	3	15.8
Echocardiogram	Normal	4	21.0
	LVH	11	57.9
	RVH	2	10.5
	Septal thickening	8	42.1
	Apical sparing	1	5.3
	Atrial enlargement	5	26.3
	Diastolic dysfunction	6	31.6
	Pericardial effusion	3	15.8
	Valve thickening	6	31.6
	Pulmonary hypertension	1	5.3
	Not performed	2	10.5
Scintigraphy	Positive	4	21.0
	Negative	4	21.0
	Not performed	11	57.9
Cardiac MRI	Normal	3	15.8
	LVH	1	5.3
	Atrial enlargement	1	5.3
	Valve thickening	1	5.3
	Not performed	14	73.7

20436

TRANSCRIPTOMIC AND PROTEIN INTERACTION NETWORK ANALYSIS REVEALS A POTENTIAL THERAPEUTIC TARGET IN AORTIC STENOSIS BEYOND TAVI

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Introdução/Fundamentos: There is still no pharmacological treatments that slow aortic stenosis (AS) progression or replace valve replacement (VR). Randomized controlled trials have demonstrated that calcification-targeting and lipid-lowering therapies don't prevent progression or VR need. In this context,transcriptomic and bioinformatics approaches may identify new gene expression patterns. Our study delineated molecular signatures and genetic associations, highlighting potential non-invasive therapeutic targets for AS. Objetivos: Investigate the differences in the gene expression patterns between casecontrol relative to aortic valvulopathies and perform bioinformatic analysis of enrichment and clusterization in the protein-protein interaction(PPI) networks produced from it. Métodos: The dataset used in this research was GSE153555 (GEO) and patients were divided into three groups: normal, Severe Aortic Stenosis (AS) and Severe Aortic Insufficiency (AI). The expression profiles analysis was performed by GEO2R program and the log2fold change results were exported from the VennDiagram for analysis. The PPI network, clusterization and functional enrichments analysis were performed using STRING v12 software. Resultados e Conclusões: The positive values of log2fold change indicates a overexpression in the respective genes, this analysis shown 259 genes overexpress when comparing normal vs severe AI patients, 374 genes overexpress when comparing normal vs Severe AS and only 2 genes (KCNA5 e TP53I11) were overexpressed in both comparisons (normal vs severe AI and normal vs Severe AS). This two genes were used to produced the PPI network in String generating 102 nodes and 1643 edges, the clusterization was performed using kmeans clustering and resulted in 3 different clusters: (I) containing 78 genes, (II) containing 15 genes and (III) containing only 9 genes. The enrichment analyses were performed in all clusters and the (I) had the most correlation with cardiac alterations in the analysis, as one of the most central genes in this cluster was KCNA5. The identification of KCNA5 as a hub gene in aortic valve diseases extends its relevance beyond atrial fibrillation, where it modulates voltage-gated potassium channels, influencing action potential and refractory period. These in silico results highlight this mechanism as a promising target for drug repurposing, offering a potential non-surgical approach to AS and AI and suggesting a possible shift in clinical management.

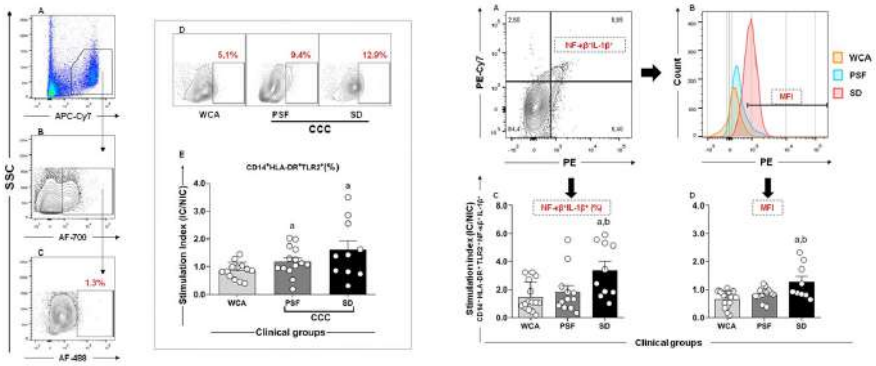
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TRYPANOSOMA CRUZI TRYPOMASTIGOTE INFECTION DRIVES TLR2-NF-KSS-IL-1SS AXIS ACTIVATION ASSOCIATED WITH SYSTOLIC DYSFUNCTION IN CHRONIC CHAGAS CARDIOMYOPATHY

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Introdução/Fundamentos: Chagas disease (CD), caused by the protozoan Trypanosoma cruzi, affects millions worldwide, with a high prevalence in Latin America, representing a significant public health burden. The transition from the asymptomatic acute phase to the chronic stage, where about 30% of individuals develop cardiomyopathy, poses a scientific challenge. Objetivos: This study explored the role of Toll-like receptor 2 (TLR2) and interleukin-1β (IL-1β) in the pathogenesis of systolic dysfunction in chronic Chagas cardiomyopathy (CCC). Métodos: Through flow cytometry analysis of CD14 + HLA-DR+ cells, after trypomastigote infection assays, we observed higher TLR2 expression and activation in patients with preserved systolic function and systolic dysfunction (SD) compared to those without cardiac abnormalities. Resultados e Conclusões: Notably, patients with SD exhibited higher percentages of NF-κβ + IL-1β+ cells and of mean fluorescence intensity of IL-1β in CD14 + HLA-DR + TLR2 + NF-κβ+ cells. A significant negative correlation was observed between left ventricular ejection fraction and IL-1β expression. These findings suggest that higher TLR2-mediated IL-1β production, likely through NF-κβ activation, plays a critical role in the development of systolic dysfunction in CCC. This study provides clinical evidence supporting the TLR2-NF-κβ-IL-1β axis as a potential therapeutic target for mitigating cardiac damage in CCC, considering the progression to chronic and symptomatic cases.



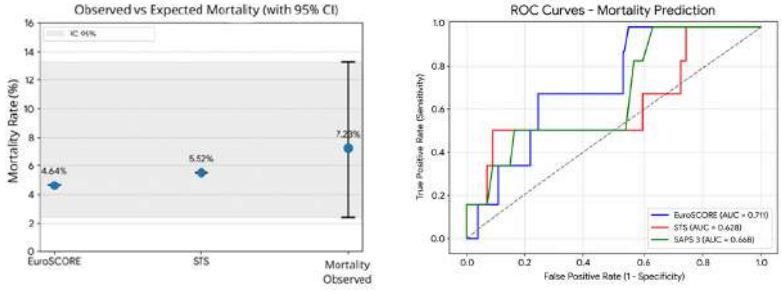
17027

VALIDATION OF EUROSCORE II, STS, AND SAPS 3 SCORES FOR MORTALITY PREDICTION IN VALVULAR CARDIAC SURGERY AND MYOCARDIAL REVASCULARIZATION IN A BRAZILIAN PUBLIC UNIVERSITY HOSPITAL

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Introdução/Fundamentos: Cardiovascular diseases remain the leading cause of mortality worldwide, accounting for approximately 31% of global deaths and more than 30% of national deaths. In the context of cardiac surgery, adequate risk stratification is essential to estimate mortality and complications, guide clinical decision-making, and optimize hospital resources. Scores such as EuroSCORE II, STS Score, and SAPS 3 are widely used internationally; however, their applicability in Brazilian populations, particularly in public healthcare settings, still requires local validation. Objetivos: To evaluate the performance of EuroSCORE II, STS, and SAPS 3 in predicting in-hospital mortality among patients undergoing valvular and coronary artery bypass graft (CABG) surgery at a Brazilian public university hospital, analyzing model calibration and discrimination. Métodos: This retrospective observational study included 83 patients who underwent cardiac surgery with complete data available for score calculation. Continuous variables were expressed as mean ± standard deviation or median (interquartile range), and categorical variables as absolute and relative frequencies. Calibration was assessed using the Observed/Expected (O/E) ratio with 95% confidence interval (95% CI), considering good calibration when the CI included 1.0. Discrimination was evaluated using receiver operating characteristic (ROC) curves and the area under the curve (AUC). A significance level of 5% was adopted. Resultados e Conclusões: Mean age was 62.7±9.6 years, and 61.4% were male. Hypertension was the most prevalent comorbidity(73.5%), followed by dyslipidemia(43.4%) and diabetes(38.6%). Emergency surgeries accounted for 55.4%. In-hospital mortality was 7.23%. EuroSCORE II predicted a mean mortality of 4.64% (O/E = 1.56; 95% CI: 0.70-3.47) and STS predicted 5.52% (O/E = 1.31; 95% CI: 0.59-2.91), showing acceptable calibration despite underestimating absolute mortality. EuroSCORE II had the best discrimination (AUC = 0.711), followed by SAPS 3 (AUC = 0.668) and STS (AUC = 0.628). For secondary outcomes, prolonged mechanical ventilation (>24 hours) occurred in 26.76% of patients, exceeding the 12.32% predicted by STS. Prolonged ICU stay (>14 days) was lower than estimated (7.41% vs. 20.60%). EuroSCORE II demonstrated superior performance in predicting in-hospital mortality after cardiac surgery in a Brazilian public hospital, showing adequate calibration and moderate discrimination. STS and SAPS 3 provided complementary but lower discriminatory accuracy.



Women's Cardiology



81º CONGRESSO BRASILEIRO DE CARDIOLOGIA together with WORLD CONGRESS OF CARDIOLOGY





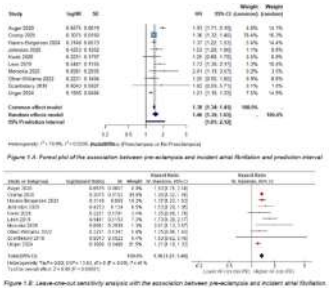
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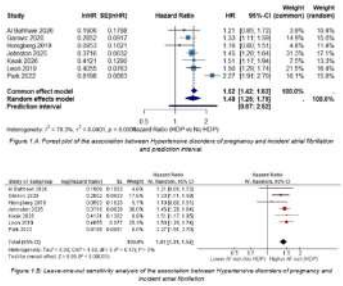
ADVERSE PREGNANCY OUTCOMES AND LONG-TERM RISK OF ATRIAL FIBRILLATION: A SYSTEMATIC-REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Adverse pregnancy outcomes (APOs) are established female-specific cardiovascular risk factors, yet their association with incident atrial fibrillation (AF) – the most prevalent sustained cardiac arrhythmia – remains unclear. Obstetric history is absent from current AF risk stratification models, representing a critical gap in sex-specific cardiovascular prevention. Objetivos: To estimate the association between individual APO subtypes and long-term risk of incident AF in women without prior AF diagnosis. Métodos: A systematic review and meta-analysis was conducted according to PRISMA guidelines. Observational cohort and registry-based studies reporting hazard ratios (HR) for incident AF after APOs were eligible. Random-effects models (REML) were applied across pre-specified exposure subgroups. Heterogeneity was assessed using I^2, Cochran's Q, and prediction intervals (PI). Sensitivity analyses employed a leave-one-out approach. Exploratory meta-regression tested follow-up duration and FA diagnostic method as heterogeneity moderators. Resultados e Conclusões: Sixteen observational studies were included, comprising 12.813.579 women, of whom 1.520.140 (11.9%) had adverse pregnancy outcomes. Preeclampsia was associated with increased incident AF risk (HR 1.46; 95% CI 1.30-1.65; I^2=80%), with a prediction interval above unity (95% PI: 1.01-2.12). Hypertensive disorders of pregnancy showed a similar association (HR 1.48; 95% CI 1.25-1.75; I^2=79.3%); leave-one-out analysis identified a single influential study as the primary driver of heterogeneity in this subgroup, with I^2 reducing to 0% upon its exclusion while the pooled estimate remained significant (HR 1.41; 95% CI 1.31-1.52). Gestational hypertension was also significantly associated with AF (HR 1.38; 95% CI 1.19-1.59; I^2=70%). Gestational diabetes mellitus (HR 1.20; 95% CI 1.03-1.39; I^2=72%) and preterm birth (HR 1.28; 95% CI 1.06-1.55; I^2=86%) were additionally significant, though prediction intervals crossed unity for both. Exploratory meta-regression identified no significant moderator of the association between preeclampsia and AF. In this meta-analysis, adverse pregnancy outcomes were consistently linked to an increased long-term risk of incident AF, with the strongest associations observed for hypertensive disorders of pregnancy and preeclampsia. These findings suggest that obstetric history may be relevant to AF risk assessment in women, though prospective studies are needed to clarify the independence and clinical utility of these associations.





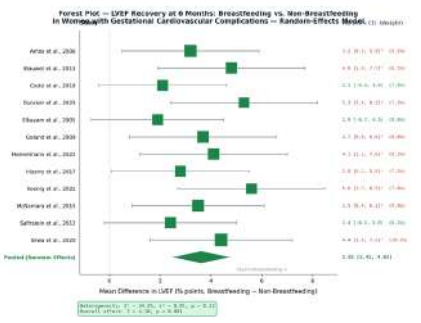
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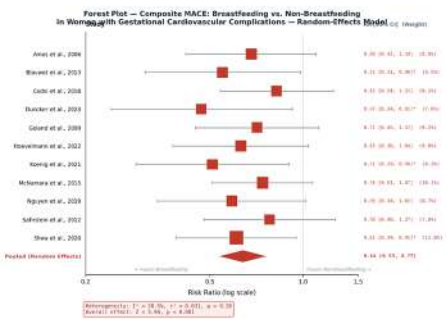
BREASTFEEDING AND POSTPARTUM CARDIOVASCULAR RECOVERY IN WOMEN WITH GESTATIONAL CARDIOVASCULAR COMPLICATIONS: IMPACT ON LEFT VENTRICULAR FUNCTION AND MAJOR ADVERSE CARDIOVASCULAR EVENTS — A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Women with gestational cardiovascular complications—such as peripartum cardiomyopathy (PPCM) and hypertensive disorders—are often advised against breastfeeding due to potential medication risks. However, lactation may offer long-term cardiovascular protection. No systematic synthesis has yet evaluated its impact on cardiac recovery specifically in this high-risk population. Objetivos: To systematically review and meta-analyze the effect of breastfeeding on (1) left ventricular ejection fraction (LVEF) recovery at 6 months postpartum and (2) composite major adverse cardiovascular events (MACE) incidence in women with gestational cardiovascular complications, comparing those who breastfed versus those who did not. Métodos: Systematic review following PRISMA 2020 guidelines, searching PubMed/MEDLINE, Embase, Cochrane CENTRAL, LILACS, Web of Science, and CINAHL from inception to March 2026. Observational studies and clinical trials evaluating postpartum cardiovascular outcomes in women with PPCM, HDP, or structural heart disease, stratified by breastfeeding status, were included. Random-effects meta-analysis (DerSimonian-Laird) calculated pooled mean differences (MD) for LVEF and pooled risk ratios (RR) for MACE with 95% CI. Quality assessed by NOS. Resultados e Conclusões: Twelve studies (n = 3,218 women with gestational cardiovascular complications; 1,687 breastfed and 1,531 non-breastfed) met inclusion criteria. Meta-analysis demonstrated that breastfeeding was associated with significantly greater LVEF recovery at 6 months postpartum (MD = +3.62 percentage points; 95% CI: 2.41-4.83; p < 0.001; I-squared = 34.2%). Additionally, breastfeeding was associated with a significant 36% reduction in composite MACE risk (RR = 0.64; 95% CI: 0.53-0.77; p < 0.001; I-squared = 28.5%). Subgroup analysis in PPCM women showed an even more pronounced benefit (LVEF MD = +5.1 points; MACE RR = 0.52). Breastfeeding is associated with significantly superior cardiovascular recovery in women with gestational cardiac complications, both in ventricular function and adverse event reduction. These findings challenge the current practice of discouraging lactation in this population and support reassessment of the cardiovascular risk-benefit balance of breastfeeding, with direct implications for postpartum management guidelines in obstetric cardiology.





20167

CARDIOVASCULAR RISK AND ASSISTED REPRODUCTION IN LESBIAN WOMEN IN BRAZIL: REGIONAL INEQUALITIES AND EPIDEMIOLOGICAL PROFILE

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Introdução/Fundamentos: The expansion of assisted reproduction (AR) techniques, including intrauterine insemination, in vitro fertilization, and the ROPA method, has increased reproductive possibilities for female same-sex couples. However, significant gaps persist regarding the cardiovascular health of this population, which may be exposed to a higher burden of cardiometabolic risk factors and structural barriers to healthcare access. Objetivos: This study aims to evaluate the relationship between access to AR and cardiovascular health indicators in lesbian women in Brazil, considering clinical, sociodemographic, and regional disparities. Métodos: An ecological, retrospective epidemiological study was conducted using secondary data from DATASUS, IBGE, the National Health Survey (PNS), CNES, and SisEmbrio/ANVISA. The study covered the period from 2014 to 2024. Variables analyzed included AR availability and utilization, cardiovascular risk factors, hospitalizations, and mortality in women aged 20–49 years. Absolute and relative frequencies, rates, time-series analyses, thematic maps, and Pearson's correlation were employed for data analysis. Resultados e Conclusões: Between 2015 and 2025, a total of 5,792 hospitalizations for female infertility related to AR were recorded in the Brazilian public health system. Most occurred in the Southeast (53.4%), with the lowest proportion in the North (3.2%). Public AR availability remained restricted to fewer than 10 states, indicating significant regional care gaps, particularly in the North and Midwest. Female same-sex marriages increased by more than 200% between 2013 and 2022, mainly in the Southeast and South, without proportional expansion in AR services. In the Northeast, cardiovascular hospitalizations among women aged 20–49 years increased after 2019, mainly due to hypertension, stroke, and heart failure. States with higher AR rates showed lower mean cardiovascular mortality ($r = -0.41$; $p < 0.05$). The 2019 National Health Survey showed high rates of obesity, physical inactivity, smoking, and low screening adherence among lesbian women. Public AR availability in Brazil remains limited and uneven, with regional barriers that may disproportionately affect this population, highlighting the need for screening, prevention, equitable AR expansion, improved data systems, and inclusive care guidelines.

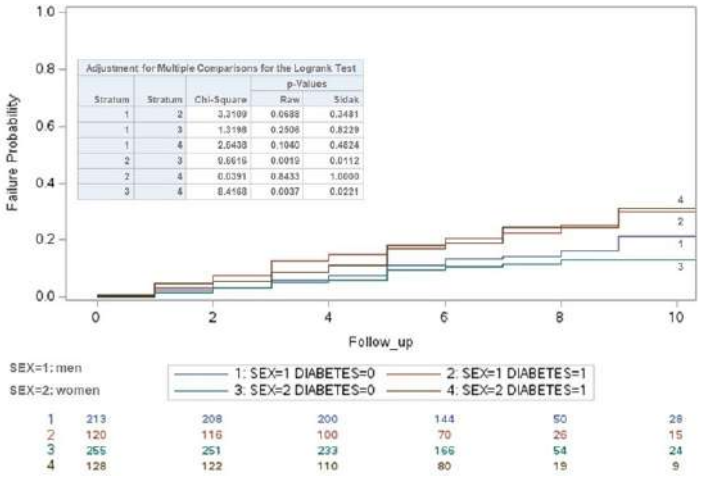
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CARDIOVASCULAR-RENAL-METABOLIC SYNDROME AND MORTALITY IN NON-OBSTRUCTIVE CORONARY ARTERY DISEASE: PROGNOSTIC IMPACT OF DIABETES IN WOMEN

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Introdução/Fundamentos: In non-obstructive coronary artery disease (NOCA), the absence of significant epicardial stenosis shifts the prognostic focus to structural, functional, and systemic mechanisms. In this context, interactions among left ventricular remodeling, renal dysfunction, and metabolic disorders reflect activation of common pathways, including chronic inflammation, oxidative stress, and endothelial dysfunction, that together comprise the cardiovascular-renal-metabolic syndrome (CRMS). Understanding these interactions, particularly by sex, is fundamental for risk stratification and clinical management. Objetivos: To determine the main predictors of mortality in patients with NOCA, with emphasis on sex differences. Métodos: Observational study of 716 patients with NOCA confirmed by coronary angiography, stratified by sex and clinical stage (survivors and non-survivors). Clinical variables, comorbidities, laboratory tests, echocardiographic parameters, and renal function were examined. Multivariate Cox regression models were constructed for the total population and for each sex. Resultados e Conclusões: Death was associated with advanced age and the most severe markers of CRMS, including lower left ventricular ejection fraction (LVEF), higher left ventricular mass index (LVMI), and worse renal function. Kaplan-Meier curves showed that diabetes significantly affects mortality only in females (p=0.022) (Figure). In the overall multivariate analysis, myocardial infarction (HR 1.010; 95% CI: 1.007–1.013), creatinine clearance <60 mL/min (HR 2.272; 95% CI: 1.852–2.786), age (HR 1.021; 95% CI: 1.011–1.031), and diabetes mellitus (HR 1.414; 95% CI: 1.160–1.724) were independent predictors of death. Among men, creatinine clearance <60 mL/min (HR 2.380; 95% CI: 1.750–3.145), LVEF (HR 0.978; 95% CI: 0.968–0.989), and LVMI (HR 1.008; 95% CI: 1.003–1.012) were associated with mortality. In women, LVMI (HR 1.012; 95% CI: 1.008–1.016), creatinine clearance <60 mL/min (HR 2.328; 95% CI: 1.746–3.104), and diabetes mellitus (HR 1.455; 95% CI: 1.096–1.932) were the main independent determinants.In patients with NOCA, diabetes mellitus acts as a critical and sex-specific determinant of mortality, being an independent predictor of death exclusively in women. In these patients, diabetes is the central axis of the CRMS, increasing systemic vulnerability and the risk of death. These results reinforce the need for preventive strategies and personalized therapy specifically for the management of diabetes in the female population with NOCA.



13880

COMBINED USE IN POSTMENOPAUSE: SYNERGISTIC EFFECTS BETWEEN GLP-1 RECEPTOR AGONISTS AND MENOPAUSAL HORMONE THERAPY (MHT)

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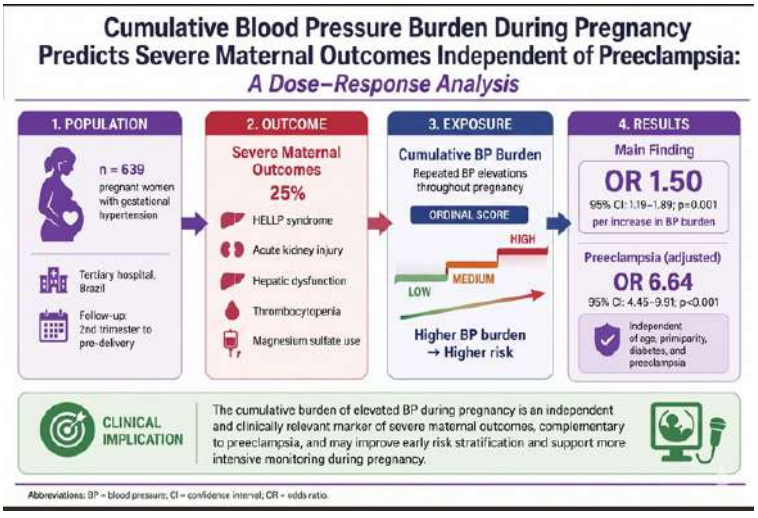
Introdução/Fundamentos: Postmenopausal women experience increased cardiometabolic risk related to estrogen deficiency, adverse fat redistribution, and greater insulin resistance. Glucagon-like peptide-1 receptor agonists (GLP-1 RAs) improve weight, glycemic control, and cardiovascular risk markers. However, it remains uncertain whether these effects are modified by menopausal hormone therapy (MHT), including route of administration and timing relative to menopause, highlighting an important gap in current evidence. Objetivos: To evaluate whether the clinical effects of GLP-1 RAs differ according to MHT use and time since menopause, focusing on cardiometabolic outcomes. Métodos: Systematic review following PRISMA guidelines was conducted using PubMed, Embase, and the Cochrane Library. Two independent reviewers screened titles, abstracts, and full texts, with disagreements resolved by a third reviewer. Most studies were excluded for not assessing concomitant GLP-1 RA and MHT use or for being narrative reviews, reflecting the scarcity of randomized trials. Studies including postmenopausal women treated with GLP-1 RAs alone or combined with MHT were included. Primary outcomes were changes in body weight, body mass index (BMI), and body composition. Secondary outcomes included glycemic control, lipid profile, cardiovascular risk markers, quality of life, and adverse events; randomized cardiovascular outcome data were limited. Resultados e Conclusões: R: Three retrospective cohorts published in 2024, totaling 119,817 participants (all from the United States), met the inclusion criteria. Studies evaluated transitions between BMI categories and percentage of total body weight loss (TBWL%). One study reported an 8% transition from obesity to overweight or normal BMI among GLP-1 analog users. Two studies showed greater TBWL% in women receiving concomitant MHT compared with non-users (17% vs 14% and 16% vs 12%). Combined GLP-1 RA and MHT therapy was consistently associated with greater weight reduction, suggesting additive or synergistic metabolic effects. Data on glycemic control, lipids, and cardiovascular biomarkers were limited but suggested improvement, without increased serious adverse events. C: GLP-1 RAs reduce weight and BMI in postmenopausal women. Concomitant MHT may enhance these effects and improve cardiometabolic risk modulation. However, current evidence is observational, and prospective randomized trials are needed to confirm causality and guide clinical practice.

19894

CUMULATIVE BLOOD PRESSURE BURDEN DURING PREGNANCY PREDICTS SEVERE MATERNAL OUTCOMES INDEPENDENT OF PREECLAMPSIA: A DOSE–RESPONSE ANALYSIS

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Introdução/Fundamentos: Hypertension during pregnancy is a major contributor to maternal morbidity and mortality. However, the cumulative burden of elevated blood pressure (BP) throughout gestation remains poorly characterized as a marker of maternal risk beyond preeclampsia. Objetivos: To evaluate the association between cumulative BP burden during pregnancy and severe maternal outcomes, and to investigate the presence of a dose–response relationship independent of preeclampsia. Métodos: This retrospective cohort included 639 pregnant women with gestational hypertension followed at a tertiary hospital in Brazil. Women aged ≥18 years were monitored from the second trimester to the pre-delivery period. Data were obtained from electronic medical records. The exposure was the cumulative burden of elevated BP episodes across pregnancy, derived from repeated measurements in routine care and analyzed as an ordinal score. The outcome was a composite of severe maternal complications, including HELLP syndrome, acute kidney injury, impaired liver function, thrombocytopenia, severe hypertension and use of magnesium sulfate. Multivariable logistic regression was used to estimate odds ratios (ORs) and 95% confidence intervals (CIs), adjusting for age, primiparity, diabetes, and preeclampsia. Resultados e Conclusões: Among the 639 women, 25% developed severe maternal complications. A graded increase in risk was observed with increasing BP burden, indicating a dose–response relationship. Each increment in BP burden was associated with a 50% increase in the risk of severe maternal outcomes (OR=1.50; 95% CI: 1.19–1.89; p=0.001), independent of covariates. Preeclampsia remained strongly associated with the outcome (OR=6.64; 95% CI: 4.45–9.91; p<0.001). The cumulative burden of elevated BP during pregnancy, capturing longitudinal BP patterns, is an independent and clinically relevant marker of severe maternal outcomes, complementary to preeclampsia, and may improve early risk stratification and support more intensive monitoring during pregnancy.

20447

CUMULATIVE IMPACT OF MULTIPLE ADVERSE PREGNANCY OUTCOMES ON LONG-TERM STROKE AND ISCHEMIC HEART DISEASE RISK: A SYSTEMATIC REVIEW AND META-ANALYSIS.

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(1) UNIVERSIDADE FEDERAL DO CEARA - FORTALEZA - CE - BRASIL;

Introdução/Fundamentos: Adverse pregnancy outcomes (APOs), such as preeclampsia and preterm delivery, are established risk enhancers for cardiovascular disease (CVD). Current clinical guidelines acknowledge the impact of isolated APOs, but there is a lack of quantified evidence about the cumulative effect of multiple APOs occurring in the same pregnancy. Understanding this relationship is critical for refining long-term risk stratification and primary prevention strategies for women. Objetivos: To quantify the dose-response relationship between the number of APOs and the long-term risk of ischemic heart disease (IHD) and stroke. Métodos: A meta-analysis and systematic review using retrospective and prospective cohorts was conducted following Cochrane guidelines. A systematic search of Embase, Pubmed and the Cochrane database was made for studies having multiple APOs and future IHD and/or stroke. Hazard ratios (HR) were pooled using random-effects models, comparing pregnancies with APOs to those without. Resultados e Conclusões: Full-text of 26 articles was analysed and five studies (N=6,096,351) from Sweden, Denmark, France, Wales and Korea with a median follow-up of 10.5 years were included in the final analysis. Meta-analysis demonstrated a graded increase in IHD risk, for 1, 2 and 3+ APOs, respectively (hazard ratio [HR] 1.55;95% confidence interval [CI] 1.30-1.85;p<0.0001;I²=91.7%), (HR 1.95;95%CI 1.43-2.66;p<0.0001;I²=89.6%), and (HR 2.31;95%CI 2.05-2.60;p<0.0001;I²=0%). Furthermore, 4 studies provided data regarding cumulative APO burden for stroke risk, showing for 1, 2 and 3+ APOs, respectively (HR 1.37;95%CI 1.22-1.55;p<0.0001;I²=71.9%), (HR 1.75;95%CI 1.36-2.24;p<0.0001;I²=80%), and (HR 1.99;95%CI 1.35-2.94;p=0.0005; I²=77.8%). Despite substantial heterogeneity in most APO categories, the direction of effect was consistent among all studies. A clear dose-response relationship exists between the number of APOs and long-term IHD and stroke risk. Women with 3+ APOs face more than double the risk of IHD with remarkable consistency across populations (I²=0%). These findings support incorporation of cumulative obstetric history in IHD risk calculators to trigger early, targeted primary prevention.

Figure 1: Forest plot showing the meta-analysis of ischemic heart disease.

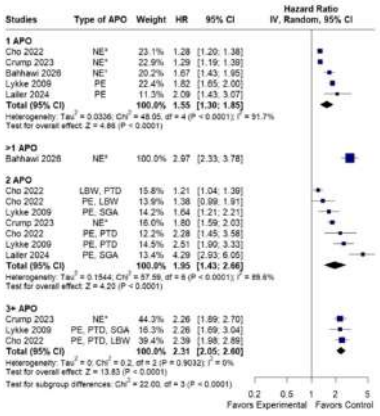
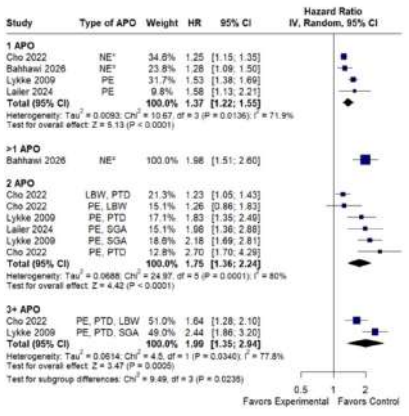


Figure 2: Forest plot showing the meta-analysis of the risk of stroke.



17783

ECLAMPSIA-RELATED HOSPITALIZATIONS AND LETHALITY IN BRAZIL (2018–2024): A NATIONAL COMPARISON OF THE PRE-, DURING, AND POST-PANDEMIC PERIODS.

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Introdução/Fundamentos: Eclampsia is a hypertensive emergency in pregnancy and a major cardio-obstetric cause of maternal morbidity and lethality. During the COVID-19 pandemic, beyond cardiovascular stress due to the pathophysiology of SARS-CoV-2, disruptions in prenatal care and healthcare access may have delayed recognition and management of preeclampsia, potentially increasing severe maternal outcomes. Evaluating temporal and epidemiological patterns may help identify vulnerable groups and guide cardiovascular and obstetric risk surveillance. Objetivos: To describe the epidemiological profile of eclampsia-related hospitalizations and lethality in Brazil from 2018 to 2024, comparing pre-, intra-, and post-pandemic periods. Métodos: Cross-sectional study using secondary national data from SIH/SUS (hospitalizations) and SIM (deaths) for ICD-10 code O15 (eclampsia), from 2018 to 2024. In-hospital case fatality rate was estimated by dividing deaths by hospitalizations. Temporal comparisons were performed between pre-pandemic (2018–2019), intra-pandemic (2020–2022), and post-pandemic (2023–2024) periods using the Two-Proportion Z-test ($p < 0.05$). Resultados e Conclusões: Between 2018 and 2024, Brazil recorded 10,170 eclampsia-related hospitalizations and 951 deaths, corresponding to an overall in-hospital case fatality rate of 10.69%. This ratio increased from 9.27% in 2018–2019 to 10.70% in 2020–2022, a 15.4% relative increase (p=0.042), then declined to 7.5% in 2023–2024 (p<0.0001 vs. 2020–2022), representing a 30.1% reduction. Most deaths occurred among women aged 30–39 years (40.9%; n=389) and 20–29 years (35.4%; n=337), totaling 76.3%. Lethality was higher in the 30–39 group resulting in 40,9% (Z=2.45; p=0.014). Regarding ethnicity, Women of mixed race (Pardo) accounted for 57.2% of deaths (n=544), a higher burden compared to White women (22.9%; n=218; Z=15.24; p<0.001). The Northeast concentrated the highest lethality burden (39.3%). A 42.5% decline in hospitalizations occurred in the Northeast, while the Southeast showed a 12.5% increase, suggesting regional differences in access, detection, or referral. The increase in case fatality during the pandemic likely reflects delayed diagnosis, reduced prenatal surveillance, and limited access to specialized care, while the post-pandemic decline may indicate recovery of healthcare services. Eclampsia remains a major cause of maternal morbidity and mortality in Brazil, requiring improved prenatal surveillance and cardiovascular care.

19516

EFFECTS OF MENOPAUSAL HORMONE THERAPY ON HEART FAILURE OUTCOMES: A SYSTEMATIC REVIEW

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(1) UNIVERSIDADE SANTO AMARO (UNISA) - SÃO PAULO - SP - BRASIL; (2) INSTITUTO DANTE PAZZANESE DE CARDIOLOGIA - SAO PAULO - SP - BRASIL;

Introdução/Fundamentos: Heart failure (HF) is a highly prevalent syndrome with significant morbidity and mortality, particularly among women, in whom the preserved ejection fraction phenotype predominates. The menopausal transition, characterized by estrogen deficiency, is associated with adverse metabolic and cardiovascular changes, increasing HF risk. The role of menopausal hormone therapy (MHT) in modifying HF outcomes remains controversial. Objetivos: To evaluate the effects of MHT on heart failure–related outcomes in peri- and postmenopausal women. Métodos: A systematic review was conducted according to PRISMA guidelines and Cochrane recommendations. Searches were performed in PubMed, Embase, Scopus, and Cochrane Library (2000–2025), using MeSH and Emtree terms related to menopause, hormone therapy, and heart failure (Table 1). Eligible studies followed PICOS criteria: peri- or postmenopausal women (Population), systemic MHT (Intervention), placebo or no therapy (Comparison), and HF-related outcomes including incidence, hospitalization, and mortality (Outcomes). Randomized controlled trials and observational studies were included. Study selection was performed independently by two reviewers, with disagreements resolved by consensus. Data extraction included study design, population characteristics, type and route of MHT, follow-up, and outcomes. Risk of bias was assessed using RoB 2, and overall quality of evidence using the GRADE approach. Resultados e Conclusões: A total of 1,943 records were identified, and 10 studies met eligibility criteria (Table 2). Significant heterogeneity was observed regarding study design, population characteristics, and hormonal regimens. Large randomized clinical trials consistently demonstrated a neutral effect of menopausal hormone therapy (MHT) on heart failure incidence and hospitalization. In contrast, observational studies and secondary analyses suggested potential benefits, including reduced mortality and improvement in diastolic function. These discrepancies may be explained by differences in patient profiles, timing of therapy initiation, and type of hormonal formulation. Overall, current high-quality evidence indicates a predominantly neutral effect of MHT on heart failure outcomes, with no consistent benefit in hard clinical endpoints. Therefore, MHT should not be used for cardiovascular prevention, and its indication must remain individualized, further studies needed to identify subgroups that may benefit, particularly considering timing of initiation and patient risk profile.

Base de Dados	Estratégia de Busca
PubMed	("Menopause"[Mesh] OR menopause OR menopausal OR perimenopaus* OR postmenopaus* OR climacteric) AND ("Hormone Replacement Therapy"[Mesh] OR hormone replacement therapy OR HRT OR menopausal hormone therapy) AND ("Heart Failure"[Mesh] OR heart failure OR cardiac failure OR ventricular dysfunction OR cardiomyopath* OR "left ventricular dysfunction" OR HFpEF OR HFrEF) AND (female OR women OR woman)
Embase	(menopause/exp OR menopause OR menopausal OR perimenopaus* OR postmenopaus* OR climacteric) AND ('hormone replacement therapy'/exp OR hormone replacement therapy OR HRT OR menopausal hormone therapy) AND ('heart failure'/exp OR heart failure OR cardiac failure OR ventricular dysfunction OR cardiomyopath* OR 'left ventricular dysfunction' OR HFpEF OR HFrEF) AND (female OR women OR woman)
Cochrane Library	menopause OR menopausal OR perimenopaus* OR postmenopaus* OR climacteric AND hormone replacement therapy OR HRT OR menopausal hormone therapy AND heart failure OR cardiac failure OR ventricular dysfunction OR HFpEF OR HFrEF AND women OR female

Study (Year)	Design	Population	Outcome	Result
WHI (2002)	RCT	16,608 postmenopausal women	HF incidence	Neutral (HR 0.95)
HERS (2002)	RCT	2,763 women with CAD	HF hospitalization	Neutral (HR 1.02)
ELITE (2006)	RCT	643 postmenopausal women	Diastolic function	↑ E/A
Kronenberg (2005)	Cohort	397 women	HF mortality	HR 0.59 ↓
Najar (2010)	Observational	241 women with HF	Echo parameters	Improved
Grodstein (2012)	Cohort	14,526 women	HFpEF	Neutral (HR 0.97)
Jankowska (2014)	Secondary	1,188 women	Mortality	HR 0.68 ↓
Shufelt (2016)	RCT	70 women	Diastolic function	↓ E/e'
Manson (2017)	Secondary WHI	Postmenopausal women	HF hospitalization	Neutral (HR 0.98)
Regitz-Zagrosek (2020)	Review	Experimental/clinical data	Mechanisms	Protective (theoretical)

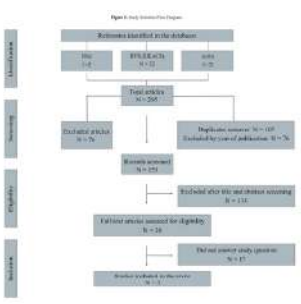
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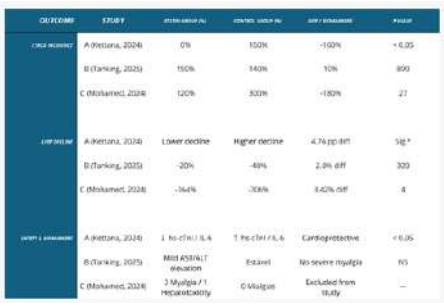
EFFICACY AND SAFETY OF STATINS IN PREVENTING CARDIOTOXICITY IN WOMEN WITH BREAST CANCER: A SYSTEMATIC REVIEW OF CLINICAL TRIALS.

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(1) UFC - FORTALEZA - CE - BRASIL;

Introdução/Fundamentos: Breast cancer chemotherapy, specifically anthracyclines and trastuzumab, increases cardiotoxicity risk, impacting patient survival and quality of life. Consequently, statins are being investigated for their anti-inflammatory and antioxidant properties to mitigate therapy-related cardiac damage. Objetivos: To evaluate, through a systematic review of clinical trials, the efficacy and safety of statins in preventing cardiotoxicity in women undergoing treatment for breast cancer. Métodos: A systematic review was conducted following PRISMA guidelines across PubMed, LILACS, and Scopus databases. Randomized controlled trials (RCTs) published in the last 10 years analyzing the efficacy and safety of statins in the prevention of cardiotoxicity in women with breast cancer were included. Study selection and data extraction were performed independently by three reviewers and the risk of bias was assessed using the Cochrane Risk of Bias 2 (RoB 2) tool. Resultados e Conclusões: The analysis of 3 RCTs, involving 210 female patients with breast cancer undergoing anthracycline-based regimens, demonstrated significant efficacy in the prophylactic use of statins to reduce chemotherapy-induced cardiotoxicity in patients with cardiovascular risk. One of the trials evaluated, comprising a population with moderate to high cardiovascular risk, showed the maintenance of higher levels of Left Ventricular Ejection Fraction (LVEF) after 6 months in the intervention group (56.22%) compared to the control group (52.92%), p=0.008. The study conducted with low cardiovascular risk patients showed an absence of significant benefit for the same analyzed period. Regarding the safety of prophylactic therapy, the studies showed a low incidence of adverse events. Biochemical monitoring showed no significant findings. In the cardiovascular risk trial, 5% of the intervention group developed myalgia and 1.8% had elevated transaminases, though both were statistically insignificant (p>0.05). In breast cancer patients undergoing cardiotoxic chemotherapy, prophylactic statins significantly reduced cardiotoxicity, particularly in moderate-to-high cardiovascular risk subgroups. While LVEF was preserved in these higher-risk patients compared to controls, no significant benefit was observed in low-risk patients. Given the low incidence of adverse events, these findings support individualized preventive strategies based on baseline cardiovascular risk.





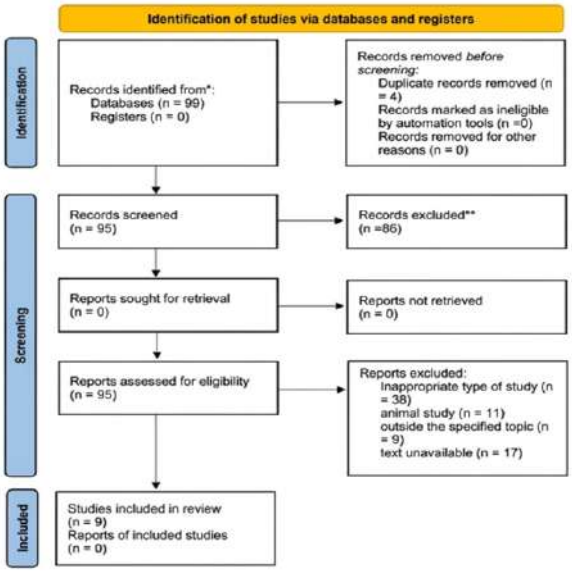
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ENDOMETRIOSIS AS A MARKER OF CARDIOVASCULAR RISK: A SYSTEMATIC REVIEW

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(1) UNIVERSIDADE MUNICIPAL DE SAO CAETANO DO SUL - SÃO PAULO - SP - BRASIL;

Introdução/Fundamentos: Endometriosis is a chronic, estrogen-dependent, inflammatory gynecological disease affecting 10% of women. It is associated with an increased risk of cardiovascular disease due to chronic inflammation and increased atherosclerotic risk. Objetivos: In this context, the present study aimed to investigate the association between endometriosis and the risk of cardiovascular diseases in women. The guiding question was: “Is there an association with increased cardiovascular risk in patients with endometriosis?” Métodos: This study is a systematic review following the PRISMA flow diagram. A search was conducted in the PubMed database using the previously defined descriptors. A total of 99 articles were identified, of which 7 were duplicates and 4 were excluded, resulting in 95 articles for initial screening. Article selection was performed using the Rayyan application, with blinded assessment by three researchers. Duplicate studies, reviews, meta-analyses, editorials, letters to the editor, and case reports were excluded. Observational studies and clinical trials evaluating women with confirmed endometriosis associated with cardiovascular outcomes were included. The search identified 99 articles, of which 95 were selected for screening after removal of duplicates and initial exclusions. At the end, 9 studies were included in the review. Resultados e Conclusões: The results demonstrated a consistent association between endometriosis and increased cardiovascular risk. Women with the condition showed higher incidence of acute myocardial infarction (HR≈1.4–1.6; p<0.05), stroke (HR≈1.2–1.3; p<0.05), hypertension (OR≈1.3–1.5; p<0.05), arrhythmias, and heart failure (HR≈1.2–1.4; p<0.05). Alterations in metabolic and inflammatory markers were also observed, including increased LDL (↑10–20%; p<0.05), triglycerides (↑15–25%; p<0.05), C-reactive protein (↑30–50%; p<0.01), and homocysteine (↑10–15%; p<0.05), as well as reduced folate and vitamin B6 (↓10–20%; p<0.05). These findings indicate increased cardiovascular risk and a pro-atherogenic profile associated with endometriosis. Endometriosis is associated with increased cardiovascular risk, requiring follow-up similar to that of high-risk patients, highlighting the importance of early diagnosis and control of modifiable risk factors.



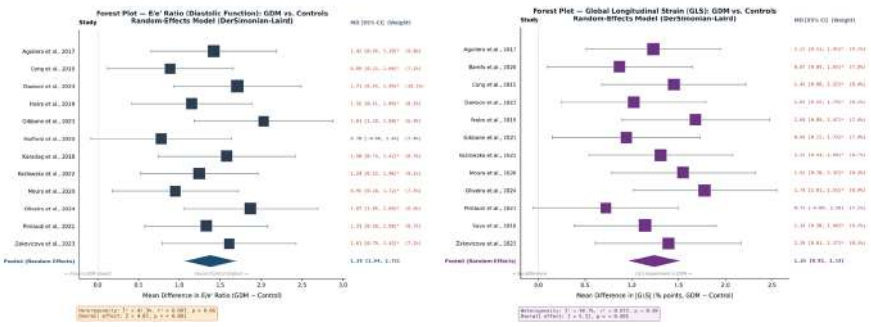
19182

GESTATIONAL DIABETES MELLITUS AND MATERNAL CARDIOMETABOLIC REMODELING: DIASTOLIC DYSFUNCTION, MYOCARDIAL STRAIN IMPAIRMENT, AND THE METABOLIC-CARDIOVASCULAR SYNDROME — A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introdução/Fundamentos: Gestational diabetes mellitus (GDM) affects up to 18% of pregnancies and is an independent risk factor for maternal cardiovascular disease. While the link to type 2 diabetes is clear, specific cardiac changes—such as diastolic dysfunction and myocardial strain impairment—remain poorly synthesized. This represents a critical gap in cardio-obstetric knowledge regarding the metabolic-cardiovascular syndrome. Objetivos: To meta-analyze maternal echocardiographic changes (E/e’ ratio, global longitudinal strain [GLS], and left ventricular mass [LVMi]) in GDM pregnancies compared to normoglycemic controls. Métodos: Systematic review per PRISMA guidelines across PubMed, Embase, Cochrane, LILACS, and Web of Science (inception to March 2026). Studies comparing echocardiographic parameters in GDM vs. controls were included. Random-effects meta-analysis (DerSimonian-Laird) calculated pooled mean differences (MD) with 95% confidence intervals (CI). Quality was assessed via Newcastle-Ottawa Scale. Resultados e Conclusões: Twelve studies (n = 2,847 pregnant women; 1,412 with GDM and 1,435 controls) met inclusion criteria. Meta-analysis demonstrated that GDM pregnancies had significantly higher E/e’ ratios compared to controls (MD = 1.38; 95% CI: 1.04-1.72; p < 0.001; I-squared = 42.3%), indicating subclinical diastolic impairment. Absolute GLS was significantly reduced in the GDM group (MD = 1.24 percentage points; 95% CI: 0.95-1.53; p < 0.001; I-squared = 38.7%), suggesting subclinical systolic dysfunction detected by speckle tracking. LVMi showed a trend toward elevation in the GDM group (MD = 4.2 g/m-squared; 95% CI: 1.8-6.6; p = 0.001). Subgroup analysis revealed that GDM pregnancies with concomitant metabolic syndrome (obesity + insulin resistance + dyslipidemia) showed greater GLS impairment compared to isolated GDM. GDM is associated with significant changes in maternal diastolic function and myocardial strain, consistent with adverse cardiometabolic remodeling. These findings support that advanced echocardiographic assessment — including GLS by speckle tracking — should be integrated into cardiovascular follow-up of GDM pregnancies, particularly those with metabolic syndrome components. GDM pregnancy represents a window of opportunity for early identification of women at elevated cardiovascular risk.



17946

HYPERTENSION IN PREGNANCY AND ITS ASSOCIATION WITH DEPRESSION THROUGHOUT LIFE

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Introdução/Fundamentos: “There is no health without mental health”, according to the international call to action by the WHO. About 14% of the global disease burden, largely due to depression. Psychosocial risk factors in the workplace can be a determining factor in maintaining health. The association between hypertensive disorders of pregnancy (HDP), such as pre-eclampsia, and long-term risk of depression remains underexplored, despite shared mechanisms including angiogenic biomarkers and oxidative stress. Objetivos: This study aimed to assess women who had hypertension during pregnancy and their risk of developing depression over their lifetime among public service employees participating in ELSA-Brasil, a multicenter study on chronic diseases in adults conducted by public institutions of education and research in six Brazilian capitals. Métodos: This was a cross-sectional study, in which a sample of 6.559 female workers was evaluated. Psychosocial factors in the workplace were measured using the Job Stress Scale (JSS) and analyzed within the framework of the Demand-Control Model (DCM). Depressive symptoms were assessed using the Clinical Interview Schedule–Revised (CIS-R). Statistical analysis was conducted in multiple stages: crude prevalence ratios (PR) were estimated, establishing the relationship between occupational stressors and depression. Poisson regression with robust variance adjusted the PRs for sociodemographic factors. Model fit was verified using the Hosmer-Lemeshow test and the ROC curve. Resultados e Conclusões: Women with hypertension during pregnancy had a significantly higher prevalence of depressive episodes (PR = 1.62; 95% CI: 1.23–2.14; p<0,01), representing a 62% increased risk compared to those without HDP. This risk magnitude is comparable to that observed for myocardial infarction and stroke in women with gestational hypertension. No significant effect modification was found for social support in the DCM. Hypertensive disorders of pregnancy are associated with increased lifetime risk of depression, comparable to major cardiovascular outcomes. Integrating psychosocial interventions into non-communicable disease management is essential. Mental health awareness must be embedded in health system planning, particularly in developing countries.

17206

HYPERTENSIVE DISORDERS IN PREGNANCY AMONG WOMEN WITH GESTATIONAL DIABETES MELLITUS AT A BRAZILIAN REFERENCE CENTER

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Introdução/Fundamentos: Hypertensive disorders in pregnancy (HDP) are related to increased morbimortality outcomes for mothers and their newborns. When presented with gestational diabetes (GD), these risks of adverse outcomes may be enhanced. Objetivos: To evaluate the prevalence of HDP among women with GD and its influence in clinical presentations and outcomes of both mother and newborn. Métodos: Prospective Cohort study examining patients with GD (WHO 2013) from 2nd to 3rd trimester of pregnancy attending a public health care facility in northeast Brazil. Sociodemographic, clinical and obstetric data were obtained through interviews, structured questionnaires and chart reviews. The hypertensive group includes patients diagnosed before pregnancy and during pregnancy. The pregnancy outcomes were collected at the follow-up visit after delivery, with the sources of information being the mother’s discharge report, the live birth certificate, and the newborn’s vaccination card. P>0.05 was considered significant. Data was analyzed using SPSS, v23. The study was approved by the local Ethics Committee, approval number 6.195.677. Resultados e Conclusões: Out of 362 patients with GD, aged 33+-5.6 years old, 73 (20.1%) presented HDP (12,4% diagnosed before 20th week). Patients with HDP were older (P<0.01), had similar education level (P=0.34) and stable marital status. Before pregnancy, they had higher pre-gestational BMI (P<0.001), higher prevalence obesity (P<0.001), higher parity (P=0.06) and more prevalent history of abortion (P=0.02). Maternal blood glucose levels in the OGTT or glycaemic control by HbA1C were statistically similar between the groups, but HDP patients showed a greater need for pharmacological treatment to control diabetes (p<0.01). Regarding pregnancy outcomes, data from 293 deliveries and 287 newborns were evaluated (Table 2). There was no difference in average birth weight and pre-term delivery, but the HDP group had shorter duration of pregnancy (p<0.01), higher frequency of preeclampsia (P<0.001) and a greater need for neonatal ICU admission(P=0.02). Postpartum glucose tolerance was reassessed in 152 patients. Diabetes was diagnosed in 9.4% of the patients, with similar numbers among the groups. However, we observed that the mean fasting glucose was higher in HDP patients(fasting glucose = 94.8 mg/dl versus 87.6 mg/dl, P=0.01). These findings highlight the critical need for preventive interventions during pregnancy and careful postpartum follow-up, which may contribute to maternal and fetal long-term health.

TABLE 1: Clinical and obstetric characteristics of patients with gestational diabetes mellitus according to the presence hypertensive disorders in pregnancy (HDP)

	TOTAL	No-HD	HD	p-Value
N(%)	362	287 (70.3%)	73 (20.1%)	
Clinical and Obstetric Data				
Gestational Age (weeks)	28.7 (6.18)	28.3 (6.3)	30.1 (5.3)	0.07¹
Parity (N)	1.0 (0.98)	0.9 (0.9)	1.3 (1.1)	0.021*
Abortions (N)	0.5 (0.98)	0.4 (0.7)	0.8 (1.5)	0.05*
Pre-Pregnancy BMI	29.8 (5.5)	29.9 (5.4)	32.2 (5.7)	< 0.001¹
BMI	32.8 (12.8)	33.3 (15.6)	33.1 (3.8)	0.35¹
Fasting Glucose OGTT	99.4 (18.5)	99.5 (19.5)	99.2 (13.8)	0.18¹
Mean systolic blood pressure	115 (11.8)	112.7 (10.5)	124.2 (12.1)	< 0.001¹
Mean diastolic blood pressure	73.1 (8.7)	71.8 (7.9)	78.2 (9.8)	0.001¹
Insulin use	31 (8.6%)	21 (7.3%)	10 (13.7%)	< 0.09¹
Pharmacological treatment	127 (46.9%)	92 (42.4%)	35 (64.8%)	0.02¹

Abbreviations: BMI: Body Mass Index; OGTT: Oral Glucose Tolerance Test; Student's t-test (¹), Fisher's Exact Test (²) *p<0.05, Pearson test (³), Mann-Whitney test (⁴).

TABLE 2: Pregnancy outcomes in women and their offspring with gestational diabetes mellitus according to the presence of hypertensive disorders in pregnancy (HDP).

Maternal Outcomes				
	TOTAL	GD		p-Value
		No-HDP¹	HDP	
Weight gain during pregnancy	7.4 (6.59)	7.4 (6.83)	7.4 (5.7)	0.9¹
Cesarean Delivery	67.1	(65.9%)	53 (72.6)%	0.4¹
Preeclampsia	38 (9.7%)	16 (5.6%)	19 (26%)	< 0.001²
Pharmacological treatment for DM	127 (46.9%)	92 (42.4%)	35 (64.8%)	0.003²
Postpartum glucose intolerance	34 (9.4%)	24 (8.4%)	10 (13.7%)	0.3¹
Head circumference	34.6 (1.9)	34.7 (1.7)	34.3 (1.7)	0.81
Birth weight (g)	3281.8	3280.4	3193.4	0.54¹
APGAR score (1')	8.3 (1.3)	8.4 (1.06)	8.1 (1.37)	0.16¹
APGAR score (5')	9.0 (0.7)	9.1 (0.55)	8.9 (1.07)	0.34¹
SGA	6.1%	5.6%	8.2%	0.66²
LGA	16.6%	17.4%	13.7%	0.63²
Macrosomia	6.6%	6.6%	6.8%	0.66²
Neonatal ICU	7.2%	5.6%	13.7%	0.02²
Prematurity	10.2%	9.1%	15.1%	0.45²

Data expressed as range and frequency (%). Abbreviations: SGA: Small for Gestational Age; LGA: Large for Gestational Age; ICU: Intensive Care Unit. Student's t-test (¹), Fisher's Exact Test (²) *p<0.05. Pearson test (³), Mann-Whitney test (⁴). Pink: Women Yellow: Offspring

17113

IMPACT OF MENOPAUSAL HORMONE THERAPY ON CARDIOVASCULAR MARKERS IN WOMEN WITH PREMATURE MENOUPAUSE

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Introdução/Fundamentos: Premature menopause, defined as the cessation of ovarian function before the age of 45, is associated with an increased cardiovascular risk, largely driven by prolonged estrogen deficiency. In this context, menopausal hormone therapy (MHT), when initiated early, has been proposed as a potential risk-modifying strategy through its effects on endothelial function and atherosclerotic progression. Objetivos: In light of these considerations, this study aims to evaluate the impact of MHT on cardiovascular markers in women with premature menopause. Métodos: To this end, a systematic review was conducted in accordance with PRISMA recommendations, encompassing the stages of identification, screening, eligibility, and inclusion. Initially, a structured search was performed in PubMed, Cochrane Library, Embase, and Scopus using descriptors and related terms for premature menopause, hormone therapy, and cardiovascular markers, combined with Boolean operators. Subsequently, randomized controlled trials and observational studies were included, involving women with premature menopause (<45 years) receiving early-initiated MHT, compared with late initiation or no therapy. Accordingly, case reports, case series, reviews, and studies with insufficient data were excluded. Resultados e Conclusões: Following eligibility assessment, nine studies evaluating subclinical cardiovascular outcomes were included. Consistently, the absence of MHT was associated with greater progression of aortic valve calcification, whereas its use was independently associated with slower progression. Additionally, a lower prevalence of carotid plaques was observed among estrogen users. From a functional perspective, early MHT was associated with improved left ventricular diastolic function and reduced blood pressure in hypertensive women. In parallel, reductions in endothelial and thrombotic biomarkers were observed, along with improvements in lipid profile. However, no significant changes in arterial stiffness were detected in the short term. Overall, these findings suggest that early initiation of MHT is associated with favorable subclinical cardiovascular effects; nevertheless, methodological heterogeneity limits causal inference

18484

IMPACT OF SEX ON OUTCOMES IN PATIENTS WITH REFRACTORY HYPERTENSION: A RETROSPECTIVE LONGITUDINAL STUDY.

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Introdução/Fundamentos: Refractory hypertension (RefHTN) represents a severe phenotype of hypertension (HTN) with high cardiovascular risk. Women have a lower prevalence of HTN for a given age stratum and better blood pressure (BP) control compared to men. However, sex differences among patients with RefHTN remain poorly understood. Objetivos: To evaluate the influence of sex on BP control, target organ damage, and clinical outcomes in patients with RefHTN. Métodos: This was a single-center, retrospective, longitudinal cohort study conducted in a public tertiary hypertension outpatient clinic. We included patients who attended the service from 2021 to 2025 with RefHTN defined as office BP ≥140/90 mmHg and 24h ambulatory BP ≥130/80 mmHg, taking at least 5 classes of antihypertensive medication. BP control at follow-up was defined as 24h ambulatory systolic BP (SBP) <130 mmHg and diastolic BP <80 mmHg. Patients with signs of poor medical adherence or secondary hypertension were excluded from the study. The associations between sex and changes in 24h ambulatory SBP (delta SBP), BP control, and outcomes, as well as estimated marginal means, were evaluated by multivariable linear and logistic regression models. Resultados e Conclusões: We analyzed 180 patients (mean age 62.6±11.4 years, 76% female, 29% with Stages 3 or 4 chronic kidney disease [CKD], 61% with left ventricular hypertrophy [LVH] at baseline), with a median follow-up of 3.6 (interquartile range 2.6-4.3) years. In analyses adjusted for age, baseline 24h SBP, and follow-up time, sex was not significantly associated with delta SBP. However, estimated marginal means of delta SBP increased with age and were numerically lower in females than in males (11.0 [95% CI: 8.1 to 13.8] mmHg vs 13.5 [95% CI: 8.2 to 18.7] mmHg at the mean age of 63 years, (Figure 1A). In multiadjusted analyses, sex, was not significantly associated with a higher chance of BP control at follow-up, but the estimated probability of BP control was numerically lower in females than males (0.23 [95% CI: 0.16 to 0.32] vs 0.28 [95% CI: 0.16 to 0.45]) for patients at the mean age of 63 years (Figure 1B). After adjustment for age and baseline outcome values, sex was not associated with LVH, CKD, or abnormal urine albumin-creatine ratio at follow-up (Table 1). In this predominantly female RefHTN cohort, women did not show better BP control or a more favorable profile of HTN-mediated organ damage compared to men, contrasting with known sex differences in other HTN scenarios.

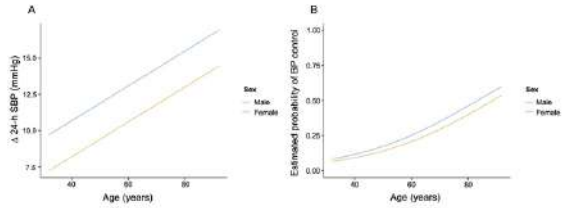


Figure 1. Estimated marginal means of delta 24h SBP (A) and estimated probability of BP control at follow-up (B), according to age and sex.

Table 1. Outcomes during follow-up according to sex

Outcome during follow-up	Frequency		Adjusted OR (female vs male)	95% CI	p-value
	Female	Male			
Clinical event	11 (8.1%)	2 (4.5%)	1.82	0.39 to 8.56	0.45
LVH	40 (55.6%)	8 (38.1%)	1.40	0.45 to 4.32	0.56
CKD	63 (46.3%)	23 (52.3%)	0.82	0.33 to 2.07	0.68
Abnormal uACR	54 (40.3%)	16 (39.0%)	1.17	0.48 to 2.83	0.73

Values are presented as n (%). ORs were adjusted for age, follow-up time and baseline values of each outcome (LVH, eGFR, and uACR). Incident events: acute coronary syndrome (ACS); stroke or transient ischemic attack (TIA); myocardial revascularization; hospitalization for heart failure; all-cause mortality. LVH: left ventricular mass index (LVMI) >115 g/m² in men and >95 g/m² in women. CKD: estimated glomerular filtration rate (eGFR, CKD-EPI) <60 mL/min/1.73 m². Abnormal uACR: urine albumin-to-creatinine ratio >30 mg/g.

18032

MATERNAL ATOPIC DISEASES AND RISK OF HYPERTENSIVE DISORDERS OF PREGNANCY: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Hypertensive disorders of pregnancy (HDP), including gestational hypertension and preeclampsia, remain leading causes of maternal morbidity and mortality worldwide. Emerging evidence suggests that the inflammatory and immunological profile associated with maternal atopic diseases may contribute to endothelial dysfunction and abnormal placentation. Objetivos: To evaluate the association between maternal atopic diseases (asthma, allergic rhinitis, and eczema) and the risk of developing gestational hypertension and preeclampsia. Métodos: This systematic review was conducted according to the PECO framework and reported following PRISMA guidelines. Searches were performed in PubMed, Web of Science, LILACS, and BVS databases. Observational studies and randomized controlled trials published within the last six years, in English, Portuguese, or Spanish, with sample sizes greater than 10 participants were included. Reviews, meta-analyses, editorials, case reports, and studies involving pediatric populations were excluded. The quality of evidence for clinical outcomes was assessed using the GRADE system. Resultados e Conclusões: Of 288 identified studies, 9 were included in the qualitative synthesis, demonstrating moderate to high quality of evidence. Maternal asthma emerged as the main risk factor, increasing the likelihood of preeclampsia by 20% to 30%, particularly in cases of severe or uncontrolled disease. Shared gene expression signatures (e.g., CXCL10 and ARG1) and elevated IgE levels were identified as potential biomarkers of risk. Maternal atopy, especially active asthma, appears to be an independent risk factor for HDP. Adequate control of allergic inflammation may play a key role in reducing adverse obstetric outcomes.

Article Title	Author and Year	Study Design	Sample Size / Population	Key Findings	GRADE Evidence Level
Association between asthma and hypertensive disorders of pregnancy	Maisán et al. (2023)	Secondary analysis of a prospective cohort (nuMom2b)	8,741 nulliparous individuals (1,521 with asthma)	Asthma was associated with a significantly higher risk of HDP (aOR: 1.23) and preeclampsia (aOR: 1.21). Active asthma (medication use) increased the risk of preeclampsia to aOR 1.27.	LOW ⊕⊕◯◯
Association of Maternal Asthma and Total Serum IgE levels with Obstetric Complications	Murata et al. (2020)	Prospective birth cohort (JECS)	77,131 women with singleton live births	Pregnant women with asthma and high IgE levels (>331 IU/mL) had a higher risk of HDP (aOR 1.33). Total IgE serves as a useful prognostic biomarker.	MODERATE ⊕⊕⊕◯ (Upgrade: dose-response gradient)
Asthma and risk of adverse pregnancy outcomes: A Mendelian randomization study	Han et al. (2024)	Mendelian Randomization (UVMR and MVMR)	GWAS data (UK Biobank and FinnGen)	Confirmed genetic links between asthma, abortion, and gestational diabetes. Did not confirm a direct causal genetic correlation with preeclampsia (p=0.297).	LOW ⊕⊕◯◯
Early pregnancy transcriptome signatures of preeclampsia: from peripheral blood to placenta	Yadama et al. (2026)	Nested case-control (transcriptome study)	157 pregnant women (discovery) plus replication cohorts	Identified genetic signatures and common inflammatory pathways (genes: CXCL10 and ARG1) shared between maternal asthma and preeclampsia.	LOW ⊕⊕◯◯
Effect of asthma exacerbation during pregnancy in women with asthma	Abdullah et al. (2026)	Longitudinal population cohort	103,424 pregnancies in women with asthma	Asthma exacerbation increased the odds of preeclampsia by 30% (OR 1.30) and pregnancy-induced hypertension by 17% (OR 1.17).	LOW ⊕⊕◯◯
Effects of Pregnancy-Onset Asthma on Perinatal Outcomes	Gu et al. (2024)	Retrospective cohort	336 pregnant women with asthma (36 pregnancy-onset)	Severe exacerbation was a strong independent risk factor for gestational hypertension and preeclampsia (aOR: 3.58).	MODERATE⊕⊕⊕◯ (Upgrade: magnitude of effect)
Maternal and perinatal outcomes of asthma exacerbation in a Chinese population	Li et al. (2024)	Retrospective cohort	226 patients with asthma (195 with exacerbations)	Women with exacerbation had an HDP risk of 12.4% vs 3.5% in those without. Exacerbation was an independent risk factor (aOR 3.35).	MODERATE ⊕⊕⊕◯ (Upgrade: magnitude of effect)
Pregestational maternal risk factors for preterm and term preeclampsia	Sande et al. (2023)	National population cohort	1,044,860 births registered in Norway	Confirmed asthma as a risk factor for both preterm preeclampsia (RPR 1.20) and term preeclampsia (RPR 1.29).	LOW ⊕⊕◯◯
Pregnancy Outcomes among Women with Intermittent Asthma	Chaiprom et al. (2021)	Retrospective cohort	364 cases of intermittent asthma and 3,640 controls	Controlled intermittent asthma did not increase the risk of preeclampsia or adverse outcomes; the risk is concentrated in cases with active attacks.	LOW ⊕⊕◯◯

19461

MATERNAL MORTALITY DUE TO HYPERTENSIVE DISORDERS IN BRAZIL: TEMPORAL TRENDS AND REGIONAL INEQUALITIES (2010–2024)

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Introdução/Fundamentos: Hypertensive disorders of pregnancy are among the leading causes of maternal mortality worldwide and represent major cardiovascular complications, reflecting endothelial dysfunction and long-term risk. Despite advances in care, maternal mortality remains unevenly distributed, particularly in low- and middle-income settings. In Brazil, regional disparities in healthcare access and socioeconomic conditions may contribute to unequal outcomes, but nationwide temporal analyses integrating cardiovascular and structural determinants remain limited. Objetivos: To analyze temporal trends in maternal mortality due to hypertensive disorders in Brazil and to evaluate regional inequalities in relation to socioeconomic development. Métodos: Ecological time-series study using national data from SIM and SINASC (2010–2024). Maternal deaths due to hypertensive disorders (ICD-10 O10–O16) were analyzed. The maternal mortality ratio (MMR) per 100,000 live births was calculated. Temporal trends were assessed using Prais–Winsten regression, estimating annual percent change (APC) and 95% confidence intervals. Regional averages were calculated, and the Human Development Index (HDI) was used as a socioeconomic indicator. Resultados e Conclusões: A total of 5,197 maternal deaths due to hypertensive disorders and 42,053,253 live births were recorded, corresponding to an MMR of 12.36 per 100,000 live births. Temporal analysis showed a non-significant downward trend (APC -0.41% per year; 95% CI -1.07 to +0.26; p=0.204), indicating relative stability. Marked regional disparities were observed. The highest mortality rates occurred in the Northeast (17.21/100,000) and North (15.19/100,000), while the lowest were in the South (7.03/100,000) and Southeast (10.42/100,000), representing a 2.45-fold difference. Regions with lower HDI values consistently showed higher mortality rates, supporting the influence of socioeconomic factors. Maternal mortality due to hypertensive disorders remained stable in Brazil, but with substantial regional inequalities. The coexistence of stable national trends with pronounced regional disparities suggests that aggregate indicators may obscure critical inequities in maternal outcomes. The association between lower socioeconomic development and higher mortality reinforces the role of structural determinants. Targeted strategies integrating obstetric and cardiovascular care are essential to reduce preventable maternal deaths

16655

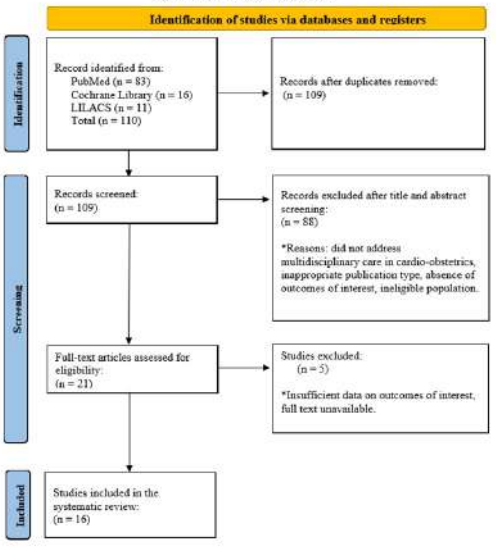
MULTIDISCIPLINARY CARE IN CARDIO-OBSTETRICS AND MATERNAL OUTCOMES IN PREGNANT WOMEN WITH CARDIOVASCULAR DISEASE

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Introdução/Fundamentos: Cardiovascular disease is the leading cause of maternal mortality in developed countries and is increasing in middle-income settings due to advanced maternal age and comorbidities. In this context, cardio-obstetrics has emerged as a multidisciplinary model associated with improved maternal and perinatal outcomes. Objetivos: To evaluate the impact of multidisciplinary cardio-obstetric care on maternal outcomes in pregnant women with cardiovascular disease, as well as to identify the main cardiovascular and obstetric complications associated with pregnancy in this population and the barriers to effective implementation of this care model. Métodos: A systematic review was conducted according to PRISMA guidelines. Searches were performed in PubMed, Cochrane Library, and LILACS, including primary studies from the last five years in English, Portuguese, or Spanish. Studies involving pregnant women with cardiovascular disease receiving multidisciplinary care and reporting at least one relevant maternal outcome were included. After screening and eligibility assessment, 16 studies were selected. Resultados e Conclusões: Pregnant women with cardiovascular disease showed a high incidence of adverse events, particularly heart failure (up to 41.1% in patients with pulmonary hypertension), thromboembolic events (up to 13.1%), and high rates of preterm birth (≈42.3%). Maternal mortality ranged from 0% to 8.5%, reflecting disparities across healthcare settings. Advanced maternal age, hypertensive disorders, and complex heart disease (WHO classes III–IV) were associated with worse prognosis. Multidisciplinary care was consistently associated with improved outcomes, including therapeutic success rates of up to 96.2%, improved preconception planning, and reduced severe complications. However, its implementation remains heterogeneous due to structural barriers, unequal access to specialized centers, and gaps in professional training. Pregnant women with cardiovascular disease represent a high-risk group with a significant burden of morbidity and mortality. Multidisciplinary cardio-obstetric care plays a central role in improving maternal outcomes by promoting integrated and individualized management throughout the pregnancy–puerperal cycle. Expanding access to specialized care, adapting strategies to different healthcare contexts, and conducting further prospective studies are essential to strengthen the evidence and support broader implementation of this care model.

Figure 1. PRISMA 2020 flow diagram.



Prepared by the authors, 2026.

20663

POLYCYSTIC OVARY SYNDROME AS A RISK FACTOR FOR ACUTE MYOCARDIAL INFARCTION: A SYSTEMATIC REVIEW

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Introdução/Fundamentos: Polycystic ovary syndrome (PCOS) is the most common endocrine disorder in women of reproductive age. Its pathophysiology involves hyperandrogenism, ovulatory dysfunction, and insulin resistance. PCOS is associated with a higher risk of cardiovascular diseases, such as acute myocardial infarction (AMI), since hyperinsulinemia contributes to obesity, glucose intolerance, and endothelial dysfunction. However, the scientific literature presents variations regarding this risk, as well as its manifestation in different phenotypes and age groups. Objectives: This study aims to analyze the risk of myocardial infarction in women with PCOS. Objetivos: This study aims to analyze the risk of myocardial infarction in women with PCOS. Métodos: This review was conducted in accordance with the PRISMA guidelines, registered on the PROSPERO platform under number CRD420261386778. A search was performed in the PubMed, Scopus, and Web of Science databases using the descriptors “Polycystic Ovary Syndrome,” “Myocardial Infarction,” and “Risk” between 2006 and 2026. The identified studies were exported to Rayyan, where they were screened by title and abstract. Duplicate studies, those unavailable in full text, or those unrelated to the topic were excluded. The risk of bias was assessed using the Newcastle-Ottawa Scale (NOS), and the certainty of evidence was assessed using the GRADE system. Resultados e Conclusões: The search resulted in 294 articles, of which 8 were selected, totaling a sample of over 2.7 million women. The NOS assessment indicated high methodological rigor (scores of 5 to 9; average of 6.8). The certainty of the evidence, according to GRADE, was moderate. Dwivedi et al. (2023), Berni et al. (2021), and Okoroh et al. (2016) demonstrated a positive association between PCOS and MI risk, with Dwivedi reporting an OR of 1.30. Zhao et al. (2024) highlighted that this vulnerability persists in young, non-obese women. In contrast, Ollila et al. (2023), Forslund et al. (2022), and Iftikhar et al. (2013) did not observe an increased risk of MI, while Schmidt et al. (2011) indicated that the metabolic risk profile in pre-menopause did not result in an increase in this event in post-menopause.
The data show that PCOS is a risk marker for MI, although it did not translate into deaths in post-menopausal women, but it reinforces the need to integrate PCOS into cardiovascular stratification protocols to mitigate the risk of early MI in this population.

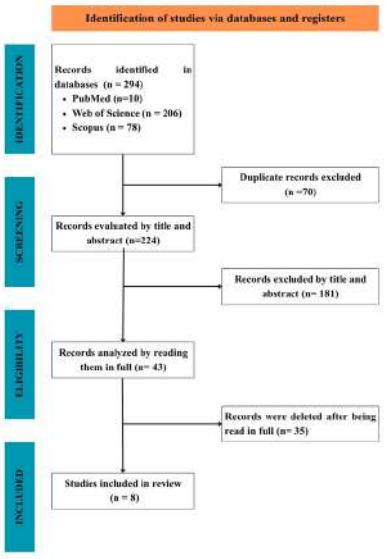


Table 1. Methodological quality of the studies based on the Newcastle-Ottawa Scale (NO)

Studies	Selection				Comparability		Exposure/Outcome			Total Score
	item 1	item 2	item 3	item 4	item 1a	item 1b	item 1	item 2	item 3	
Okoroh et al.(2016)	*	*	*		*	*	*			6
Forslund et al.(2022)		*	*		*		*	*	*	6
Iftikhar et al. (2013)		*	*		*	*	*	*		6
Schmidt et al. (2011)		*	*		*		*	*		5
Zhao et al. (2024)	*	*	*	*	*	*	*	*	*	9
Dwivedi et al. (2023)	*	*		*	*	*	*			6
Ollila et al. (2023)	*	*	*	*	*	*	*	*		8
Berni et al. (2021)	*	*	*	*	*	*	*	*	*	9

18998

PRE-ECLAMPSIA AS A PREDICTOR OF CARDIOVASCULAR EVENTS IN BRAZILIAN WOMEN: A PROJECTION BASED ON INTERNATIONAL EVIDENCE

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Introdução/Fundamentos: Pre-eclampsia (PE) is a well-documented risk factor for future cardiovascular (CV) disease internationally. However, its magnitude remains unknown in the Brazilian context. Under this rationale, the present study proposes a statistical projection of CV events attributable to PE in Brazilian women in light of the international meta-analysis by Inversetti et al., 2024. Objetivos: This projection aims to estimate the Population Attributable Fraction (PAF) and the absolute number of CV events attributable to PE in Brazilian women over the last decade (2015–2024), in order to estimate the relevance of this association and highlight its importance. Métodos: The central reference is the meta-analysis by Inversetti et al. 2024, selected through a systematized search of PubMed/MEDLINE (AMSTAR-2 criteria), for extraction of Relative Risks (RR) between PE and CV death (RR: 2.08), heart failure (HF) (RR: 2.47), and acute myocardial infarction (AMI) (RR: 1.75). A clinical latency interval of 1 to 16 years was established between gestational exposure (PE) and the occurrence of CV events, based on the weighted mean follow-up time from the meta-analysis. For the national projection, data from SINASC and SIH/DATASUS were used, cross-referencing the mean age at PE diagnosis in Brazil (26.5 years) with the latency period to define the target population age range (30–59 years) at the time of the outcome. The time window was adjusted for latency and data availability: exposure (PE-related hospitalizations) between 2008–2014 was analyzed to project CV outcomes occurring from 2015 to 2024. The calculated prevalence of PE during the initial period resulted in 2.65%, and finally, the PAF was estimated to assess the impact of PE on CV events in Brazilian women. Resultados e Conclusões: Based on these data, an estimated 18,972 CV events (95% CI: 12,463–26,895; combined PAF: 3.07%) are attributable to a prior history of PE. Of these, 7,087 CV disease deaths (95% CI: 4,640–9,993; PAF: 2.78%), 4,222 AMI-related hospitalizations (95% CI: 3,103–5,561; PAF: 2.68%), and 7,663 HF-related hospitalizations (95% CI: 4,720–11,341; PAF: 3.75%). It is concluded that approximately 1 in every 33 CV events (95% CI: 1 in every 23 to 1 in every 50) in Brazilian women aged 30–59 years over the last decade may be attributable to prior PE. These findings support the recognition of PE as a female-specific CV risk factor and underscore the urgent need for post-gestational CV prevention and surveillance strategies in Brazil.

17725

SEX DIFFERENCES IN HOSPITAL MORBIDITY AND CASE FATALITY FROM ACUTE MYOCARDIAL INFARCTION IN BRAZIL (2015–2024): EVIDENCE OF PERSISTENT HEALTHCARE INEQUITIES

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Introdução/Fundamentos: Acute Myocardial Infarction remains one of the leading causes of cardiovascular morbidity and mortality in Brazil, representing a substantial burden on the public health system. Evidence indicates relevant sex-based differences in clinical presentation and prognosis, with women showing poorer hospital outcomes despite a lower incidence of events. This phenomenon may reflect inequalities in clinical recognition, atypical presentations, and delays in the initiation of reperfusion therapies. Objetivos: To analyze sex differences in hospital morbidity and in-hospital mortality due to Acute Myocardial Infarction in Brazil between 2015 and 2024, as well as their temporal trends. Métodos: This was a descriptive epidemiological time-series study using data from the Hospital Information System of the Brazilian Unified Health System (SIH/SUS). Hospital admissions and deaths due to Acute Myocardial Infarction (ICD-10: I21) were analyzed according to sex. In-hospital mortality rates were calculated as the ratio between deaths and hospital admissions ×100. Descriptive statistics and temporal trend assessment were performed. Resultados e Conclusões: During the study period, 1,358,587 hospital admissions and 130,155 deaths due to Acute Myocardial Infarction were recorded in Brazil. A 78.7% increase in hospital admissions was observed, rising from 101,208 in 2015 to 180,876 in 2024. Men accounted for 63.5% of hospital admissions (863,663), while women represented 36.5% (494,924). Regarding deaths, 72,980 occurred among men and 57,175 among women. Despite the higher absolute number of events among men, women presented higher in-hospital mortality rates (11.6% vs. 8.5%), indicating proportionally worse outcomes in this group. These findings suggest persistent healthcare inequities in the management of myocardial infarction among women, possibly associated with lower diagnostic suspicion, atypical clinical presentations, and delays in reperfusion therapy. The results demonstrate a consistent disparity in hospital outcomes by sex, with poorer prognosis among women hospitalized for myocardial infarction. These findings reinforce the need for strategies aimed at earlier recognition of myocardial infarction in women and reduction of barriers to timely and qualified cardiovascular care.

18365

SUBCLINICAL CAROTID ATHEROSCLEROSIS AND CORPORAL ADIPOSITY IN POSTMENOPAUSAL WOMEN WITH METABOLIC DYSFUNCTION-ASSOCIATED STEATOTIC LIVER DISEASE

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Introdução/Fundamentos: Metabolic dysfunction-associated steatotic liver disease (MASLD) is the most prevalent chronic liver disease worldwide and is closely linked to increased cardiovascular risk. Women with MASLD represent an underexplored population, and hormonal transitions, particularly menopause, may amplify cardiometabolic vulnerability by promoting visceral adiposity, dyslipidemia, and a pro-atherogenic state. Sex-specific data on subclinical carotid atherosclerosis and visceral adiposity in this population remain scarce. Objetivos: This study aimed to describe the frequency of carotid plaques, carotid intima-media thickness (cIMT) abnormalities, fat mass, and visceral adiposity in postmenopausal women with MASLD. Métodos: This observational, cross-sectional study with prospective data collection was conducted between April 2022 and December 2025. It received prior approval by the Institutional Research Ethics Committee. The study included only postmenopausal women with MASLD who had not received estrogen therapy. Liver steatosis and fibrosis were assessed via ultrasound and liver elastography, respectively. Carotid atherosclerosis was examined through carotid ultrasound, cIMT measurements, and Vascular Age. Quantitative assessment of fat mass was performed using anthropometric measurements and dual-energy X-ray absorptiometry (DXA), including fat mass index (FMI = total fat mass kg/height m²), abdominal visceral adipose tissue (VAT, cm³), and android-to-gynoid (A/G) percent fat ratio. Data are presented as mean ± standard deviation (SD) or median (Interquartile Range, p25–p75) as appropriate. Resultados e Conclusões: Among the 84 women, carotid plaques were observed in 26.2%. Vascular age was markedly elevated compared to chronological age (72.5 ± 23.9 vs. 66.0 ± 8.2 years), indicating early vascular aging in this population and 34.5% had a cIMT value above the 75th percentile. The frequency of obesity (BMI > 30 kg/m²), high fat mass percentage (>40%), and A/G >1 was 60.7%, 78.6%, and 85.7%, respectively. The population data are described in Table 1. Postmenopausal women with MASLD presented high rates of subclinical carotid atherosclerosis, early vascular aging, and android fat distribution, with fat mass percentage notably increased. These findings highlight the cardiometabolic burden in postmenopausal women with MASLD and support the integration of adiposity distribution assessment and carotid evaluation into cardiovascular risk stratification in this population.

Table 1: Baseline characteristics of patients (N = 84)

Data	Value
Demographic Data	
Age (years)	66.0 ± 8.2
BMI (kg/m²)	32.5 ± 6.5
DXA Evaluation	
FMI (kg/m²)	14.8 ± 5.3
Total fat mass (kg)	35.9 ± 12.9
VAT (cm³)	1560 (1090-2380)
A/G	1.13 ± 0.18
Anthropometric measurements	
Waist-to-height ratio	0.68 ± 0.11
Waist circumference (cm)	105.7 ± 17.8
Neck circumference (cm)	37.4 ± 7.8
Carotid Assessment	
cIMT(mm)	0.699 ± 0.141
cIMT >p75	29 (34.5%)
Carotid plaque	22 (26.2%)
Vascular Age (years)	72.5 ± 23.9
Frequencies in the sample	
Significant fibrosis (F≥2)	20 (23.8%)
Obesity	51 (60.7%)
High fat mass % (>40%)	66 (78.6%)
A/G >1	72 (85.7%)

Data in mean ± standard deviation (SD) or median (p25–p75) or number (n) percentag
BMI: Body Mass Index; FMI: Fat Mass Index; VAT: Visceral adipose tissue;
A/G: Android-to-gynoid fat ratio; cIMT: Carotid Intima-Media Thickness.

SCIENTIFIC INITIATION POSTER – CASE REPORT



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17408

ACUTE CORONARY SYNDROME AND PERIPHERAL ARTERIAL OCCLUSION SECONDARY TO RIGHT NATIVE CORONARY SINUS THROMBOSIS

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Introduction: Sinus of Valsalva thrombosis is a rare presentation and is scarcely described in the literature. Possible etiological factors include hypercoagulability, structural abnormalities, congenital conditions, inflammatory processes of the aorta, procedure-related complications, and idiopathic cases. The most frequent clinical presentations are myocardial infarction and systemic embolization. The cusp most commonly involved is the non-coronary sinus and less frequently the right. A high index of suspicion is required, especially in cases of infarction in the absence of obstructive coronary artery disease. Case Description: A 60-year-old female patient sought medical attention due to precordial pain. The electrocardiogram showed ST-segment elevation in the inferior wall and right-sided leads, and she was transferred for primary angioplasty. During catheterization, coronary arteries without stenoses were observed, along with a thrombus in the right coronary sinus, extending to the proximal and mid segments of the right coronary artery (figure 1). During the procedure, she presented ventricular fibrillation, promptly reverted, followed by progressive hemodynamic instability. Tirofiban associated with heparin was administered, and thrombectomy with an aspiration catheter was performed. A significant amount of thrombotic material was retrieved (figure 2), restoring coronary flow, however, a large amount of thrombus persisted in the right coronary sinus. Arterial Doppler revealed acute arterial occlusion of the left lower limb. Embolectomy was performed at the level of the left iliac artery using a Fogarty catheter. The patient evolved with progressive hemodynamic deterioration, refractory shock, multiple organ dysfunction, and death. Conclusions: Thrombosis in the sinus of Valsalva represents an uncommon cause of systemic embolism. When manifested as an acute coronary syndrome, it constitutes an important therapeutic dilemma, as selective coronary catheterization may dislodge the thrombus, resulting in systemic embolization with potentially catastrophic consequences. Thrombosis in a native aortic valve is an uncommon diagnosis with an estimated in-hospital mortality of 20%. The ideal treatment remains uncertain due to the scarcity of studies. Surgical thrombectomy and antithrombotic therapy are available options. Depending on the clinical presentation, surgical risk, and embolization potential, surgical exploration of the aortic valve may be considered.

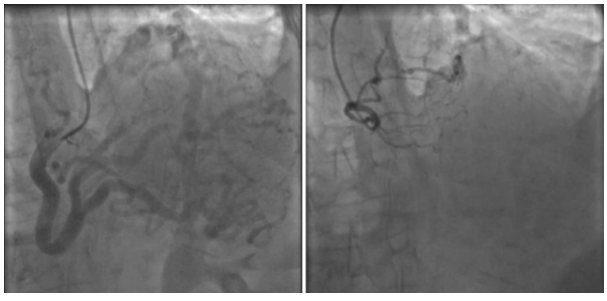
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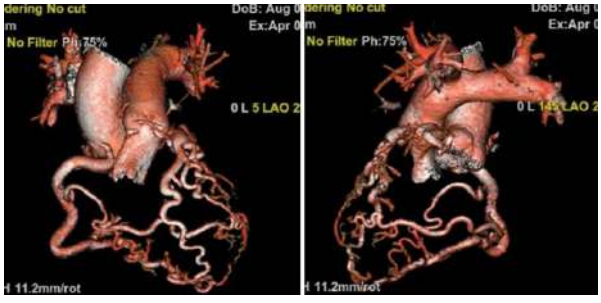
ANOMALOUS LEFT CORONARY ARTERY FROM THE PULMONARY ARTERY (ALCAPA) IN A 64-YEAR-OLD PATIENT: A DIAGNOSTIC CHALLENGE

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Introduction: ALCAPA, or Bland–White–Garland syndrome, is a rare congenital coronary anomaly (~1:300,000 live births), with high infant mortality if untreated. Adult survival is uncommon and depends on collateral circulation from the right coronary artery (RCA). Case Description: A 64-year-old woman presented with acute constrictive chest pain and exertional dyspnea. Her history included hypertension and obesity. She received acetylsalicylic acid and clopidogrel for suspected acute coronary syndrome, with partial relief. She was hemodynamically stable, and physical examination was unremarkable. Electrocardiography showed subendocardial ischemia in anterolateral leads and signs of prior inferoseptal infarction. Troponin levels were elevated (54,102–822,90 ng/mL). Coronary angiography revealed a dominant RCA with a dilated posterior descending branch supplying collaterals to the left coronary system, without obstructive lesions. The left coronary artery was not visualized from the aortic root, and a fistulous connection to the pulmonary artery was suspected. Coronary computed tomography angiography confirmed ALCAPA, demonstrating anomalous origin of the left main coronary artery from the pulmonary trunk with extensive collateral circulation. Myocardial perfusion scintigraphy demonstrated mild-to-moderate transient hypoperfusion in the anterior, anterolateral, and basal segments of the left ventricle during stress, with a left ventricular ejection fraction of 58% under stress conditions and rest. Given the high surgical risk, optimized medical therapy was chosen. Conclusions: This case highlights the central role of multimodality imaging in diagnosing ALCAPA in adulthood when angiography is inconclusive. Coronary computed tomography and myocardial perfusion imaging defined anatomy and ischemia, guiding clinical decision-making. Imaging findings supported a tailored, non-surgical approach in a high-risk patient.





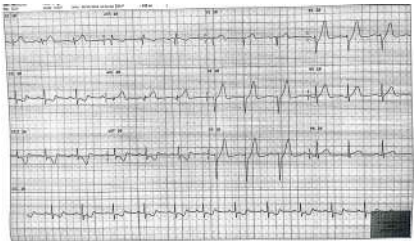
16159

Atypical Presentation of Acute Myocardial Infarction in a Young Patient Secondary to Blunt Sports Trauma

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Introduction: Acute myocardial infarction (AMI) secondary to blunt chest trauma is rare, and its sequelae remain poorly explored. Distinct from the usual atherosclerotic etiology, an AMI is reported in a young athlete without cardiovascular risk factors. The clinical presentation was notable for atypical and delayed symptoms. This case highlights the need to consider AMI in chest trauma despite delayed onset. Furthermore, it underscores the therapeutic dilemma between conservative antithrombotic management and percutaneous intervention. Case Description: A 27-year-old male amateur athlete with no cardiovascular risk factors or illicit drug use sustained a high-impact blunt anterior chest trauma at 3:00 PM during an American football match. He remained active in the game until 5:00 PM. At night, during postprandial rest, he developed sudden severe precordial pain, diaphoresis, and nausea. He presented to the emergency department hemodynamically stable: BP 120/70 mmHg, HR 75 bpm, and SpO2 98%. The electrocardiogram revealed hyperacute T waves in V2-V5. He received ASA 300 mg, clopidogrel 600 mg, and subcutaneous enoxaparin 60 mg prior to referral for primary angioplasty. Coronary angiography (5-hour ischemia time) demonstrated a patent left anterior descending artery with a proximal intraluminal filling defect suggestive of a thrombus, and a coronary tree free of atherosclerosis. A conservative approach with full anticoagulation was chosen. Ten days later, repeat angiography revealed complete thrombus resolution and no atherosclerotic lesions. Left ventriculography measured an ejection fraction (EF) of 43.7%. The patient was discharged on an ACE inhibitor, beta-blocker, antiplatelet therapy, and a statin. Cardiac magnetic resonance performed six months later evidenced a 19% myocardial fibrosis mass and an EF recovery to 49%. Conclusions: This case illustrates the diagnostic challenge of coronary syndromes triggered by sports-related impacts, in which severe blunt force causes endothelial injury and disruption of the arterial muscular layer, leading to subsequent thrombosis and occlusion. It emphasizes the need for high clinical suspicion in the emergency setting, even in young patients who are asymptomatic in the immediate post-trauma period and lack atherosclerotic risk, making an initial ECG indispensable. Furthermore, conservative antithrombotic management proved safe and effective for thrombus resolution, ensuring partial recovery of ventricular function.





18256

IMPORTANCE OF ENDOTYPE CLASSIFICATION IN PATIENTS WITH ANGINA/ISCHEMIA WITHOUT SIGNIFICANT CORONARY OBSTRUCTION

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Introduction: Angina and ischemia without obstructive coronary arteries (ANOCA/INOCA) represent a growing and non-benign clinical challenge. The pathophysiology involves coronary alterations such as microvascular dysfunction, epicardial or microvascular spasm and endothelial dysfunction. Invasive coronary functional assessment, perfusion positron emission tomography (PET), stress cardiac magnetic resonance imaging and acetylcholine testing allow identification of pathophysiological endotypes, enabling personalized management and symptomatic improvement. Case Description: Case description 1 71-year-old female, with chronic obstructive pulmonary disease, hypothyroidism and dyslipidemia. Two years ago, she presented angina, diaphoresis and dyspnea. Submaximal exercise stress test was negative for myocardial ischemia; myocardial scintigraphy showed apical ischemia of the left ventricle with preserved ejection fraction; coronary angiography revealed no lesions. Due to unavailability of acetylcholine testing, clinical diagnosis of INOCA was established. Beta-blocker therapy improved symptoms. Case description 2 67-year-old female, hypertensive and dyslipidemic, with anginal chest pain. Positive exercise stress test and coronary computed tomography angiography (CCTA) suggested moderate lesion in the left anterior descending artery (LAD). Cardiac catheterization confirmed 50% eccentric lesion in the mid LAD. Functional assessment showed resting full-cycle ratio (uFR) negative for ischemia, indicating obstruction was not the main cause of mismatch; microvascular resistance index (MR) was positive, confirming microvascular dysfunction. Beta-blocker therapy improved angina. Case description 3 61-year-old male, hypertensive, dyslipidemic, with family history of coronary artery disease. Presented atypical chest pain. Myocardial scintigraphy showed ischemia in the anterior and inferolateral walls; CCTA revealed mild calcified plaques in the LAD and the circumflex artery (CX); catheterization confirmed mild non-obstructive plaques. Functional assessment showed resting full-cycle ratio (uFR) negative in both arteries (0.98 LAD, 0.97 CX), but microvascular resistance index (MR) was 251 (reference up to 250). Beta-blocker therapy improved symptoms. Conclusions: ANOCA/INOCA requires a comprehensive and individualized approach guided by endotypes. Complementary methods and coronary functional assessment are essential to define phenotype, improving quality of life and overall cardiovascular risk.

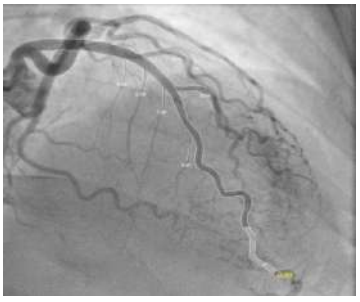
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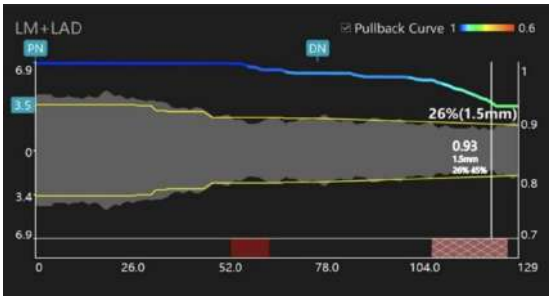
MYOCARDIAL ISCHEMIA WITH NON-OBSTRUCTIVE CORONARY ARTERIES (INOCA) ASSOCIATED WITH CORONARY-CAVITARY MICROFISTULAS IN A PATIENT WITH SYSTEMIC LUPUS ERYTHEMATOSUS: A CASE REPORT

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Introduction: Ischemia with non-obstructive coronary arteries (INOCA) is a frequently underdiagnosed condition, affecting approximately 50–70% of those with angina undergoing coronary angiography. Coronary-cavitary microfistulas, although rare, may contribute to ischemia through a coronary steal mechanism. This report describes a case of chest pain with findings of myocardial ischemia in a patient with systemic lupus erythematosus (SLE) and non-obstructive coronary arteries. Case Description: A 54-year-old woman with a diagnosis of SLE and hypertension, on olmesartan/amlodipine (40/5 mg), naltrexone 1.5 mg, duloxetine 30 mg, and metoprolol 25 mg/day, was admitted for progressive chest pain. She reported an episode of chest pain three years earlier, when she underwent coronary angiography that showed no obstructive lesions but identified coronary-cavitary microfistulas, complicated by an anaphylactic reaction to contrast. Symptoms recurred with progressive worsening over the past two months, characterized by constrictive chest pain on minimal exertion and at rest, radiating to the back and left arm, associated with dyspnea and diaphoresis. Exercise stress testing showed chest pain on exertion with ST-segment depression in V5–V6. Myocardial perfusion scintigraphy revealed stress-induced ischemia in the posterior wall of the left ventricle, with preserved function. Laboratory tests were unremarkable, and troponin was negative. Due to persistent symptoms a coronary angiography was repeated, not demonstrating significant obstructive coronary lesions. Post-procedural analysis using artificial intelligence showed uFR of 0.93 in the left anterior descending artery (reference >0.80) and an index of microcirculatory resistance (MR) of 315 mmHg·s/m, suggestive of microvascular dysfunction (values >250 mmHg·s/m), likely related to coronary-cavitary microfistulas. The patient remained hemodynamically stable. Beta-blocker therapy was maintained, and she was discharged with outpatient follow-up. Conclusions: This case reinforces the importance of recognizing INOCA as a cause of chest pain, particularly in patients with inflammatory conditions such as SLE. It highlights the need for investigation beyond coronary angiography for accurate diagnosis and management.





19964

PERCUTANEOUS CLOSURE OF A LARGE POST-INFARCTION VENTRICULAR SEPTAL DEFECT: FROM CARDIOGENIC SHOCK AND ACUTE RENAL FAILURE TO HEMODYNAMIC OPTIMIZATION

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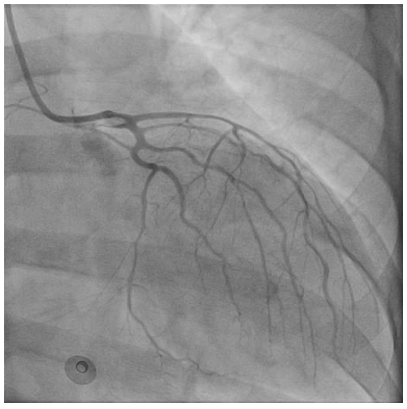
Introduction: Ventricular Septal Defect (VSD) is a devastating mechanical complication of acute myocardial infarction. Despite the reduction in its incidence due to primary reperfusion therapies, it still carries high mortality. The managenement of low cardiac output and severe pulmonary hypertension is important to prognostic. Case Description: A male patient with anterior ST-elevation myocardial infarction underwent thrombolysis with alteplase within the 12-hour window, following with a stent in the anterior coronary. Ten days post-procedure, he presented with severe anasarca and dyspnea. With a loud holosystolic murmur, loudest at the left lower sternal border on cardiac auscultation.. Echocardiography confirmed a large 4-cm VSD and a Pulmonary Artery Systolic Pressure (PASP) of 80 mmHg. A pulmonary artery catheter was inserted, showing a baseline Cardiac Index of 1.3 L/min/m². Pharmacological optimization was initiated with milrinone (inodilator) and sodium nitroprusside (vasodilator) to reduce systemic vascular resistance and left-to-right shunting. The strategy resulted in a significant hemodynamic shift: Cardiac Output rose from 1.3 to 2.9 L/min, and PASP dropped to 42 mmHg. With improved renal perfusion and aggressive diuretic therapy. Consequently, serum creatinine decreased from 4.2 mg/dL to 1.3 mg/dL over six days. Following clinical and hemodynamic stabilization, the patient underwent successful percutaneous VSD closure without complications. Conclusions: The “standard” murmur of an acquired VSD is holosystolic because the pressure gradient between the left and right ventricles persists throughout the entire contraction phase. In this case, the severity of the shunt led to “congestive” acute renal failure (cardiorenal syndrome type 1), which was reversed not by volume, but by optimizing forward flow and reducing afterload. The use of milrinone and nitroprusside was pivotal to “pre-condition” the pulmonary vascular bed and the right ventricle before the percutaneous intervention. The 10-day delay from the MI likely allowed for some degree of myocardial fibrosis at the edges of the defect, facilitating the anchoring of the percutaneous device.This case illustrates that even large post-infarction VSDs associated with severe pulmonary hypertension and multisystemic dysfunction can be successfully managed. Hemodynamic monitoring and aggressive pharmacological optimization are essential to bridge these high-risk patients to definitive percutaneous therapy.

20854

PERIPARTUM SPONTANEOUS CORONARY ARTERY DISSECTION WITH MULTIVESSEL INVOLVEMENT PRESENTING AS ANTEROLATERAL STEMI, SEVERE LV DYSFUNCTION, APICAL THROMBUS, AND EPISTENOCARDIAC PERICARDITIS: A CASE REPORT

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Introduction: Spontaneous coronary artery dissection (SCAD) is a non-atherosclerotic separation of the coronary artery wall creating a false lumen that compromises the true lumen. It accounts for up to 35% of acute coronary syndromes in women under 50 and is strongly associated with the peripartum period, yet remains underrecognized. Case Description: A 30-year-old woman (G3P3A0, vaginal delivery 15 days ago, no comorbidities) sought care with chest pain, Killip I. ECG showed ST elevation in DI, aVL, and V2 with reciprocal depression in DIII. After receiving aspirin and clopidogrel (300 mg each) at the referring hospital, she was transferred to a tertiary center where she had a urgent coronary angiography the following day, revealing type 2 spontaneous dissection of the LAD at mid-1/3, diagonal branches (Dg1, Dg2), circumflex (Cx), marginal branches (MgE1-3), and posterior ventricular branch of the RCA, without obstructive lesions. Echocardiography on that same day showed LVEF 35% with akinesis of the anterior wall, apex, and mid-anterolateral segment; eight days later, LVEF was 29%, with eccentric LV hypertrophy, moderate-to-severe mitral regurgitation, and pericardial effusion - sign of pericarditis epistenocardica. Cardiac MRI performed 13 days after initial presentation confirmed LVEF of 30%, transmural late gadolinium enhancement across anteroseptal, anterior, anterolateral, inferoseptal, and apical segments, microvascular obstruction, and a 9mm apical LV thrombus. Coronary CTA corroborated diffuse luminal reduction in LAD and Cx from the ostium with pericoronary fat attenuation. Calcium score was zero. Given the LV thrombus, dual antiplatelet therapy was replaced at discharge by rivaroxaban for 6 months — a clinically relevant decision, since antiplatelet choice (aspirin, clopidogrel, or dual) remains contested in uncomplicated SCAD. Heart failure therapy, statin, and colchicine (pericarditis epistenocardica) were also prescribed. A follow-up echocardiogram two months later showed partial LVEF recovery to 36%. Conclusions: This case illustrates the complexity of peripartum SCAD presenting as a severe anterolateral STEMI with multivessel involvement, severe LV dysfunction, apical thrombus, and pericarditis. The LV thrombus determined an anticoagulation-based strategy, bypassing the contested debate on antiplatelet therapy in SCAD. Conservative management achieved partial LVEF recovery so far. High clinical suspicion is essential in young postpartum women with acute coronary syndrome (ACS).

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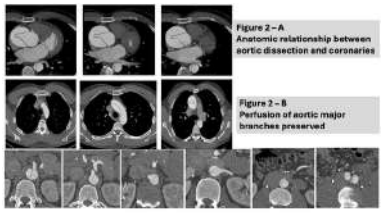
ACUTE TYPE A AORTIC DISSECTION OF A YOUNG MALE ULTRAMARATHON RUNNER DURING AN INTENSE RUNNING SESSION – AN ATYPICAL PRESENTATION OF A FIRST CASE REPORT IN LITERATURE.

ALÉSSIA ALENCAR ARARIPE GURGEL[1]; MARIA LUIZA REIS SARAIVA FALCAO[2]; JOSE CARLOS JUCA POMPEU NETO[2]; ISABELLA FEITOSA PITA ULISSES[2]; NICOLAS ALMEIDA FERREIRA BARREIRA[3]; CAUÊ BARROS DE SOUSA NOBRE[3]; FRANCISCA GRAZYELE CARDOSO BEZERRA SOARES[3]; FRANCISCO ERIVALDO JORGE SILVA[3]; HILANE SNILLE DINIZ SANTOS[3]; FRANCISCO SAMUEL RODRIGUES DIAS[3]; JOAO LUIZ ALENCAR ARARIPE FALCAO[3]; SANDRA NIVEA REIS SARAIVA FALCAO[2];

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Introduction: Introduction: Acute type A aortic dissection is a clinical emergency that usually presents with tearing chest pain and hemodynamic instability. The immediate mortality is as high as 1%/hour over the first several hours, making early diagnosis and treatment critical for survival. High index of clinical suspicion is important as delay in diagnosis can have dreadful consequences. Aortic dissection in athletes was reported but is rare and often associated with weightlifting. Otherwise, a high prevalence of ascending aorta dilation in competitive endurance athletes has been reported - possibly related to a long-term increased stroke volume. Case Description: Case report: A 40-year-old male ultramarathon runner developed Type A aortic dissection during an intense running session. He presented dizziness associated with an intense mandibular pain during intense running. Pain relieved after resting for 5 minutes. He ran a 40-minute treadmill recovery session next day and a 26km long run workout 3 days after, without symptoms. During a weightlifting exercise, 5 days after, he reported a short duration light mandibular pain - wearable watch data in Figure 1. He looked for medical attention. He was asymptomatic and physical examination was unremarkable: normal heart sounds, symmetric pulses, blood pressure 90x60mmHg, heart rate 48bpm. EKG: sinus bradycardia. A cardiac CT to discard coronary heart disease was performed in the next day. It was diagnosed a type A aortic dissection that started beside left coronary ostium and caused a discrete compression of initial portion of left main (Figure 2-A). There was an associated 5.6cm diameter ascending aortic aneurysm. Aortic valve was spared. Dissection extended to the initial portion of iliac arteries. No major aortic branch was occluded (Figure 2-B). An urgent open surgical to replace the diseased ascending aorta with a 26mm Dacron graft was performed. After a hospital stay of 6 days, patient was discharged. Genetic profile was negative for Marfan and Loeys-Dietz syndrome. Conclusions: Conclusions: We report, to the best of our knowledge, the first case of a type A acute aortic dissection in a young male ultramarathon runner during an intense training session. Clinical course followed an atypical presentation. It's remarkable that initial pain was completely relieved after 5-minute rest and that patient ran 26km without symptoms 3 days after dissection. Preparticipation screening for ascending aorta aneurysm may be relevant for endurance runners.





19160

AORTIC COARCTATION ASSOCIATED WITH A RUPTURED MIDDLE CEREBRAL ARTERY ANEURYSM IN AN ADOLESCENT. A CASE REPORT

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Introduction: Aortic coarctation (CoA) Eventually remains undiagnosed until adolescence or adulthood, presenting only after severe, potentially life-threatening complications. Intracranial aneurysms and subarachnoid hemorrhage (SAH) are well-recognized, yet rare, associations. We present a case of previously undiagnosed aortic coarctation revealed by the rupture of a middle cerebral artery aneurysm in an adolescent. Case Description: A previously healthy 15-year-old male was admitted with sudden-onset headache and lower-limb weakness during physical activity. Cerebral angiography revealed subarachnoid hemorrhage due to a ruptured, 6 mm saccular aneurysm of the left middle cerebral artery. Aortography performed during the diagnostic workup revealed severe aortic coarctation with reversed flow in the left vertebral artery, suggesting significant collateral circulation. The patient underwent successful endovascular embolization of the cerebral aneurysm without complications. Following neurological stabilization, a cardiologic evaluation confirmed severe coarctation of the aorta (CoA), with a peak gradient of 56 mmHg, as well as a bicuspid aortic valve without functional impairment. During the same hospitalization, the coarctation was successfully treated percutaneously using a covered stent. The procedure achieved complete angiographic success with a reduction in the trans-stenotic gradient from 34 mmHg to 0 mmHg. At follow-up, the patient remains asymptomatic with normal blood pressure and symmetric peripheral pulses. Conclusions: This case highlights the rare presentation of previously asymptomatic aortic coarctation, which was diagnosed following the rupture of an intracranial aneurysm. The case reinforces the well-established association between coarctation of the aorta (CoA) and cerebral aneurysms, emphasizing the need for a high index of suspicion. A staged, multidisciplinary endovascular approach addressing both the cerebral and aortic lesions proved safe and effective.

16156

Patent Foramen Ovale and Paradoxical Embolism Complicated by Confirmed Chronic Thromboembolic Pulmonary Hypertension: A Therapeutic Dilemma Between Embolic Risk and Right Ventricular Overload

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Introduction: Patent foramen ovale (PFO) is a residual interatrial communication present in 14.7–31.3% of adults. Paradoxical embolism through a PFO is a well-established mechanism for cryptogenic stroke and transient ischemic attack (TIA). The simultaneous occurrence of systemic ischemic events and chronic pulmonary thromboembolism (CPTE) represents a highly complex clinical scenario, as the management of one condition often conflicts with the hemodynamic requirements of the other. Case Description: A 47-year-old woman with hypertension presented in 2023 with a transient focal neurological deficit, consistent with a TIA. Initial investigation revealed a PFO with a 5 mm opening and a 10 mm tunnel. Subsequent imaging confirmed left popliteal deep vein thrombosis and right common and internal carotid artery obstruction, supporting a diagnosis of paradoxical embolism. During follow-up, the patient developed right ventricular (RV) dilation and hypokinesia, with an estimated pulmonary artery systolic pressure (PASP) of 60 mmHg.An initial chest CT angiography (CTA) was negative for acute pulmonary thromboembolism. However, subsequent chest CT findings showed chronic lesions suggestive of CPTE, leading to the clinical suspicion of chronic thromboembolic pulmonary hypertension (CTEPH). Based on this suspicion, percutaneous PFO closure was deferred, as the defect could serve as a necessary “pop-off” valve for the right ventricle. The patient remained on anticoagulation while awaiting definitive hemodynamic assessment. Right heart catheterization subsequently confirmed severe pre-capillary pulmonary hypertension, revealing a mean pulmonary artery pressure (mPAP) of 46 mmHg, a pulmonary capillary wedge pressure (PCWP) of 11 mmHg, and a pulmonary vascular resistance (PVR) of 5.4 Wood units. Pulmonary arteriography definitively identified bilateral chronic thromboembolic disease with occlusions, webs, and stenoses. The procedure also confirmed the PFO with an absence of a spontaneous shunt (Qp/Qs 1.02). Conclusions: This case highlights the importance of maintaining high clinical suspicion for CTEPH in PFO patients with unexplained RV dysfunction. The decision to postpone PFO closure, although it prolonged the risk of systemic embolism, was validated by the invasive confirmation of severe pulmonary hypertension. This chronological management underscores the necessity of a multidisciplinary approach and definitive hemodynamic stratification before considering structural interventions in complex embolic scenarios.

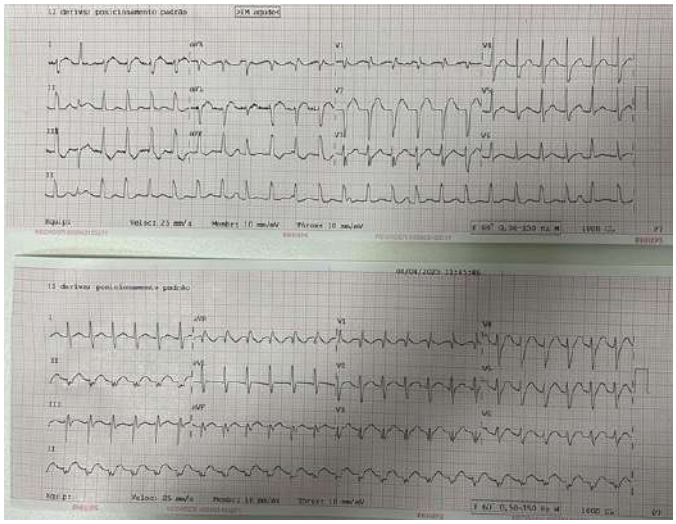
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PHEOCHROMOCYTOMA-INDUCED TAKOTSUBO SYNDROME PRESENTING AS CARDIOGENIC SHOCK AND ST-ELEVATION MYOCARDIAL INFARCTION MIMIC: A CASE REPORT

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Introduction: Takotsubo syndrome (TTS) is an acute stress-induced cardiomyopathy characterized by transient left ventricular dysfunction, often mimicking acute myocardial infarction. Pheochromocytoma is a rare catecholamine-secreting tumor and an uncommon trigger of TTS, frequently associated with severe clinical presentations, including cardiogenic shock. Case Description: A 60-year-old woman with long-standing refractory hypertension presented with acute dyspnea and hemodynamic instability. Initial electrocardiogram showed supraventricular tachycardia (Figure 1), successfully reverted with adenosine. Shortly thereafter, she developed cardiac arrest with pulseless electrical activity, requiring resuscitation and mechanical ventilation. Computed tomography angiography ruled out aortic dissection. During intensive care unit stay, she experienced recurrent cardiac arrest. A subsequent electrocardiogram demonstrated anterior ST-segment elevation, raising suspicion for acute myocardial infarction. However, coronary angiography revealed no obstructive coronary artery disease, with apical ballooning and a left ventricular ejection fraction of approximately 20%. Given the clinical context, secondary causes were investigated. Laboratory evaluation revealed markedly elevated metanephrine and normetanephrine levels (532 pg/mL and 3413 pg/mL, respectively). Follow-up echocardiography on day five showed rapid recovery of ventricular function (left ventricular ejection fraction >50%), consistent with Takotsubo syndrome. Conclusions: Pheochromocytoma-induced Takotsubo syndrome is a reversible yet life-threatening condition that may mimic ST-elevation myocardial infarction and cardiogenic shock. In patients with unexplained hemodynamic collapse and non-obstructive coronary arteries, catecholamine excess should be actively considered. Early recognition is essential to guide appropriate management and improve clinical outcomes.



15224

USE OF CONTRAST PERICARDIOGRAPHY IN SUPERIOR VENA CAVA PERFORATION: A CASE REPORT

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Introduction: A 52-year-old male, presented with Chronic Kidney Disease (CKD) in dialysis since September 2023, also presents with urethral obstruction secondary to colon neoplasm. In January 2024, a tunneled hemodialysis catheter (Permcath) was placed following the removal of a previous hemodialysis catheter. During insertion of the Permcath via the Right Subclavian Vein, a Superior Vena Cava (SVC) perforation occurred, leading to intra pericardial hemorrhage and cardiac tamponade. Subsequently, the patient developed severe hypotension (blood pressure 48/28 mmHg) and oxygen desaturation while still in the Intensive Care Unit (ICU). Given the clinical presentation, a norepinephrine infusion was initiated at 30 mL/h, in an attempt to achieve hemodynamic stabilization. The cardiovascular surgery team conducted a Contrast Pericardiography (CPCG) in the ICU, which revealed the Permcath in contact with the intrapericardial space, as well as hematic hyperdensities in the pericardium and mediastinum. This allowed for the localization of the SVC perforation and identified the communication between the Permcath and the water-seal chest tube that controlled the shock. Consequently, the patient was taken to the operating room for a Sternotomy to remove the Permcath and perform an SVC Venorrhaphy. Case Description: CPCG is an uncommon procedure, as it has been replaced by non-invasive methods such as Echocardiography and Computed Tomography (CT), due to risks associated with the puncture. However, it remains relevant in specific clinical scenarios that require a more detailed assessment of the pericardial cavity, as in the case described, being essential for a prompt diagnosis. The procedure involves the introduction of contrast into the pericardial cavity, which can be negative (pneumopericardiography, using air, carbon dioxide, or nitrous oxide) or positive (water-soluble iodinated contrast), followed by radiography. As demonstrated by Cohn et al., CPCG allows for the assessment of pericardial surfaces, identification of masses, effusions, adhesions and thickenings. In this case, positive pericardiography was used, enabling the precise identification of the Permcath's path and confirmation of the pericardial sac invasion. Conclusions: Contrast Pericardiography is a procedure that has fallen into disuse, yet it remains fundamental for diagnoses involving the pericardial cavity. The clinical presentation described emphasizes the current importance of this examination in ensuring early and accurate diagnosis.



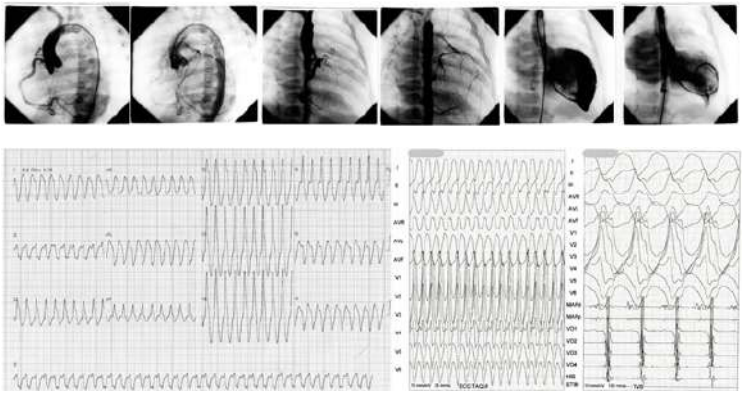


14766

CASE REPORT OF BLAND-WHITE-GARLAND SYNDROME PROGRESSING TO VENTRICULAR TACHYCARDIA AND IMPLANTABLE CARDIOVERTER-DEFIBRILLATOR (ICD) IMPLANTATION IN A YOUNG PATIENT

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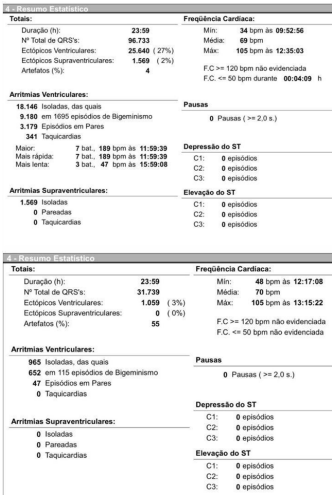
Introduction: Bland-White-Garland syndrome, a rare congenital heart disease characterized by anomalous origin of the left coronary artery (LCA) from the pulmonary trunk (PT). It results in hypoperfusion of the left chambers and myocardial ischemia. It has an incidence of 1:300,000 live births (0.5% of congenital heart diseases) and a mortality rate of 90%. This report highlights its association with significant late arrhythmic events. Case Description: Male, 4 months old, born in Sertãozinho-SP. Pregnancy and delivery without complications. Presented with crying and sweating during feeding, and physical exam revealed a cardiac murmur due to mitral regurgitation (MR). The electrocardiogram (ECG) during crying showed ST segment depression. Echocardiogram reported marked dilation of left chambers, moderate/severe MR and ejection fraction (EF) of 46%. Cardiac catheterization showed marked dilation of the left ventricle (LV), diffuse hypocontractility of the anterolateral wall, dilation of the right coronary artery and retrograde filling of the LCA originating from the PT. Scintigraphy showed fibrosis of the anterior LV wall. Surgical correction was performed with LCA translocation to the aorta. At 8 months, EF increased to 80%, confirming procedural success. The patient remained under cardiologic follow-up with preserved EF and no exercise-induced ischemia. At 16 years old, he presented palpitations, dizziness and dyspnea during boxing training. ECG showed monomorphic ventricular tachycardia (VT) with right bundle branch block morphology, reverted by electrical cardioversion. Etiological investigation with cardiac magnetic resonance showed thinning of the anterior apical wall, suggesting VT origin. Coronary CT angiography showed LCA anastomosis without stenosis. Electrophysiological study (EPS) induced VT by stimulation of the fibrotic area (pace mapping), confirming its origin. Ablation of the arrhythmogenic focus was attempted without success, and an implantable cardioverter-defibrillator (ICD) was indicated. The patient is currently 32 years old, with two events successfully reverted by the device. Conclusions: This case highlights the rarity of therapeutic success in Bland-White-Garland syndrome associated with late arrhythmic manifestations. It emphasizes the need for long-term clinical follow-up after surgical correction due to the risk of late arrhythmias. The report has informed consent, ensuring anonymity and confidentiality.

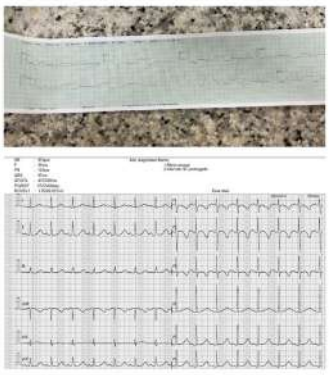
18986

CATHETER ABLATION OF LEFT VENTRICULAR SUMMIT PVC IN REFRACTORY ELECTRICAL STORM IN CONGENITAL LONG QT SYNDROME - A CASE REPORT

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Introduction: Long QT Syndrome (LQTS) is an inherited channelopathy characterized by QT interval prolongation and increased risk of malignant ventricular arrhythmias, particularly Torsades de Pointes (TdP), which may lead to syncope and sudden cardiac death. Standard therapy is based on beta-blockers (BB), with implantable cardioverter-defibrillator (ICD) in selected cases. However, some patients develop refractory TdP, progressing to electrical storm. In this context, additional strategies such as cardiac sympathetic denervation and catheter ablation of triggering premature ventricular complexes (PVCs) may be required. Case Description: We report the case of a previously healthy 9-year-old male who experienced syncopal episode without prodromes in April 2025 after emotional stress. In November 2025, he was found unconscious with myoclonic movements. At an emergency unit, he was diagnosed with cardiac arrest in polymorphic ventricular tachycardia consistent with TdP, reverted after chest compressions and six defibrillation shocks. He was admitted the following day. Admission electrocardiogram showed corrected QT interval (QTc) of 650 ms, suggestive of LQTS type 1. Transthoracic echocardiography revealed left ventricular ejection fraction of 42%. The patient continued to have multiple daily self-terminating TdP episodes despite high-dose propranolol (5 mg/kg). A temporary pacemaker was implanted without success. Due to refractory arrhythmia, right stellate ganglion block followed by bilateral thoracic sympathectomy was performed, with partial reduction of events. A 24-hour Holter revealed more than 25,000 polymorphic PVCs and frequent TdP episodes up to seven beats, with repetitive triggering pattern. The patient underwent electrophysiological study, which identified PVC originating from the left ventricular summit, successfully treated with radiofrequency catheter ablation. Post-ablation Holter monitoring demonstrated significant reduction in PVC burden (1,059 beats) and no further TdP episodes. Cardiac magnetic resonance imaging showed no structural heart disease. The patient subsequently underwent subcutaneous ICD implantation for secondary prevention and was discharged on beta-blocker therapy and magnesium supplementation. During follow-up, QTc decreased to 520 ms, and genetic testing is pending. Conclusions: This case highlights challenges of managing electrical storm in congenital LQTS. Favorable response to catheter ablation of triggering PVCs underscores its potential role in refractory cases.

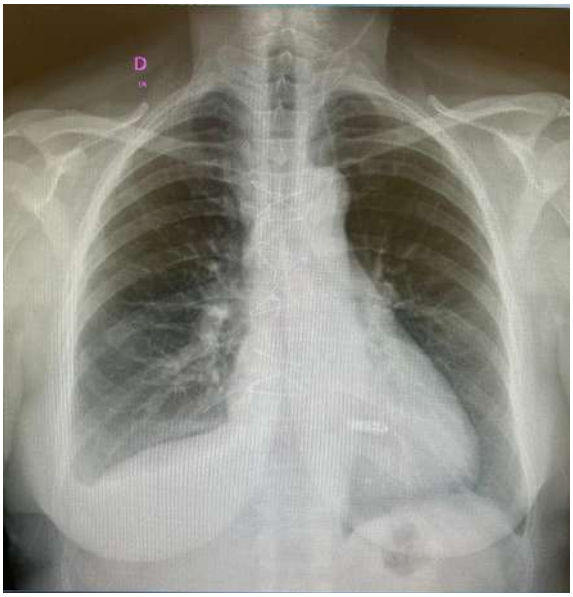
19274

RECURRENT PACEMAKER POCKET INFECTIONS MANAGED WITH LEADLESS PACEMAKER IMPLANTATION: A CASE REPORT

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Introduction: Pacemaker (PM)-related infection is an uncommon complication (0.8–5.7%), but remains a significant clinical challenge, due to its association with increased morbidity, repeated hospitalizations, and healthcare costs. The most common source of infection is perioperative contamination by skin-colonizing bacteria. Despite adherence to guideline recommendations, including complete device removal and appropriate antimicrobial therapy, conventional transvenous systems may still carry a risk of recurrent infection, particularly in patients with a history of prior device infection. In this context, leadless pacemakers have emerged as an important alternative, as they eliminate the need for a subcutaneous pocket and transvenous leads, thereby reducing potential sites for bacterial colonization. Consequently, leadless systems may be considered in patients at high risk of reinfection, especially those with recurrent PM infections. Case Description: A 63-year-old female patient with second-degree atrioventricular block (Mobitz II) underwent pacemaker implantation in January 2023. In January 2024, she was admitted with a pacemaker pocket infection; the generator and all transvenous leads were removed, and, after appropriate antimicrobial therapy, a new pacemaker was implanted on the contralateral side. In April 2024, she returned with inflammatory signs at the initial pocket site, requiring surgical debridement. Culture results were positive for Staphylococcus warneri. In March 2025, she was readmitted with swelling at the current pacemaker pocket, which had been evolving over the previous 15 days, without fever or other systemic symptoms. Ultrasound examination revealed a fluid collection of approximately 20 mL in the generator region. Further evaluation with 18F-FDG PET/CT demonstrated hypermetabolic activity within the collection, extending along the leads up to their insertion near the subclavian vein, confirming the diagnosis of pacemaker system infection. Drainage was performed, yielding purulent material. Given the history of recurrent infections involving multiple sites, implantation of a leadless pacemaker was indicated. Conclusions: This case underscores that, in patients with recurrent PM infections, conventional reimplantation strategies may be insufficient. Early consideration of leadless pacing systems should be part of the therapeutic decision-making process, particularly in those at high risk for reinfection.



19913

TRAUMATIC TOTAL ATRIOVENTRICULAR BLOCK IN THE EMERGENCY DEPARTMENT: THE IMPORTANCE OF EXPECTANT MANAGEMENT GIVEN ITS TRANSITORY NATURE

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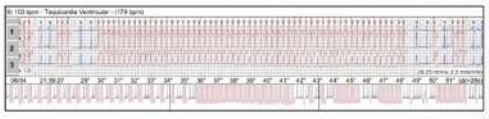
Introduction: Total atrioventricular block (TAVB) resulting from blunt chest trauma is a rare manifestation of myocardial contusion. In motor vehicle accidents involving sudden deceleration, the conduction system may suffer direct injury. The clinical challenge lies in differentiating the need for definitive intervention from spontaneous functional recovery, thereby avoiding unnecessary invasive procedures in patients who are frequently young. Case Description: A 28-year-old male was admitted to the emergency department following a high-energy frontal collision. He was hemodynamically stable, complaining of mild retrosternal pain. The initial ECG revealed TAVB with a junctional escape rhythm, narrow QRS complex, and a heart rate of 38 bpm. Myocardial necrosis markers (Troponin I) showed a slight elevation. The echocardiogram ruled out ventricular dysfunction or acute valvular lesions. The clinical team opted for continuous monitoring in the coronary care unit with bedside transcutaneous pacemaker support (on standby). After 48 hours of observation and hemodynamic stability, the patient experienced spontaneous reversal to sinus rhythm, with 1:1 AV conduction and a normal PR interval. He was discharged without sequelae after 5 days. Conclusions: Discussion: The pathophysiology of traumatic TAVB involves edema, hematoma, or hemorrhage in the AV node or the Bundle of His. Literature emphasizes the transient and benign nature of these cases, with most reverting within 7 days as the inflammatory process resolves. According to SBC, ESC, and AHA/ACC guidelines, conduction disorders associated with potentially reversible causes (such as acute trauma) require expectant management. Permanent pacemaker implantation should only be considered after an observation period of 5 to 7 days if there is no recovery of the conduction system. The priority in the acute phase is rigorous monitoring of rhythm and hemodynamic status, reserving artificial pacing only for symptomatic or unstable cases. Conclusion: Post-traumatic TAVB is frequently reversible. Recognizing its transitory nature and adhering to guideline-recommended timelines for definitive pacing are crucial for safe and conservative management, prioritizing active surveillance over early intervention.

21886

ANTHRACYCLINE CARDIOTOXICITY MIMICKING ARRHYTHMOGENIC CARDIOMYOPATHY: A CASE REPORT

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Holter tracing demonstrating sustained monomorphic ventricular tachycardia

Variable	Initial Holter	Post-treatment Holter
Mean heart rate	94 bpm	Bradycardic tendency
Supraventricular ectopy	512 isolated SVEs	Rare isolated SVEs
Ventricular ectopy	84,974 monomorphic PVCs	Absent
Ventricular tachycardia	13,210 episodes	Absent
Non-sustained VT	Present	Absent
Supraventricular tachycardia	1 episode	4 episodes
Maximum heart rate	167 bpm	120 bpm
QTc interval	Within normal range	Prolonged (479 ms)

Comparison of Holter Findings Before and After Treatment

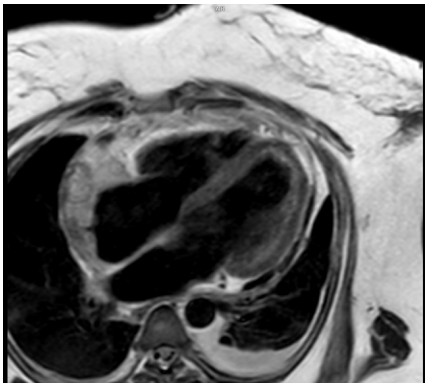
Introduction: Anthracyclines remain among the main chemotherapeutic agents used in solid and hematologic malignancies; however, they are associated with significant cardiotoxic potential. Anthracycline-induced myocardial injury may range from subclinical ventricular dysfunction to heart failure and severe cardiovascular events. Diagnosis may be particularly challenging in predominantly electrical presentations, since electrocardiographic abnormalities can precede ventricular dysfunction detectable by conventional imaging modalities. Case Description: A 69-year-old woman with no previous cardiovascular disease was referred for preoperative cardiologic evaluation after completing 12 cycles of doxorubicin-based chemotherapy for malignancy treatment. She remained asymptomatic from a cardiovascular standpoint. Transthoracic echocardiography demonstrated preserved left ventricular ejection fraction (56%), grade I diastolic dysfunction, moderate left atrial enlargement, and mild aortic regurgitation, without significant structural abnormalities. Coronary angiography showed no obstructive coronary lesions. Twenty-four-hour Holter monitoring revealed ectopic atrial rhythm, mean heart rate of 94 bpm, 512 isolated supraventricular ectopic beats, a high burden of monomorphic ventricular ectopy (84,974 premature ventricular contractions), and one episode of non-sustained ventricular tachycardia lasting three beats. Amiodarone 200 mg every 8 hours was initiated for seven days. Repeated Holter monitoring demonstrated complete suppression of ventricular ectopy, heart rate tendency toward bradycardia, rare isolated supraventricular ectopy, four episodes of supraventricular tachycardia with maximum heart rate of 120 bpm, and QTc prolongation (mean 479 ms). After exclusion of coronary artery disease and structural cardiomyopathies, anthracycline-induced cardiotoxicity with predominantly arrhythmogenic presentation was considered the most likely diagnosis. The patient remains asymptomatic during outpatient follow-up. Conclusions: This case highlights an atypical presentation of anthracycline cardiotoxicity characterized by severe ventricular arrhythmias despite preserved ventricular function, mimicking arrhythmogenic cardiomyopathy. Early recognition of predominantly electrical manifestations enabled appropriate treatment and complete arrhythmia control, reinforcing the importance of electrocardiographic surveillance in patients exposed to anthracyclines, even with preserved left ventricular ejection fraction.

21142

DIFFERENTIAL DIAGNOSIS OF PERICARDIAL EFFUSION IN A YOUNG PATIENT: PRIMARY CARDIAC EPITHELIOID ANGIOSARCOMA MIMICKING TUBERCULOUS PERICARDITIS

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Introduction: Pericardial effusion (PE) consists of fluid accumulation between the visceral and parietal pericardium. In Western nations, the most common etiology is acute idiopathic or viral pericarditis, whereas in developing countries tuberculosis (TB) accounts for more than 70% of the cases. Primary cardiac neoplasms are rare causes of PE, representing 0.001% to 0.007% of cases. Among these, angiosarcoma stands out as the most aggressive and fatal malignant cardiac neoplasm, with infiltrative characteristics and early metastases, which makes its diagnosis and treatment challenging in clinical practice. Case Description: Female patient, 33 years old, no comorbidities, admitted with dyspnea and chest pain for 9 days. Admission echocardiogram demonstrated significant diffuse PE (up to 39 mm), with incipient signs of hemodynamic repercussion (plethoric vena cava and mild right ventricular diastolic collapse), and preserved biventricular systolic function. She was submitted to pericardiocentesis, whose pericardial fluid analysis indicated an exudate (pH 8, proteins 7g/dL, glucose 25mg/dL, leukocytes 4,980 [67% lymphocytes], RBCs 2,296,000). Serologies and autoimmune panel were normal; rapid molecular test for TB in the fluid was positive (traces), initiating the RIPE regimen. Cardiac magnetic resonance imaging evidenced diffuse pericardial thickening and an irregular nodular formation adjacent to the visceral pericardium in the right atrium topography, with peripheral enhancement and intermediate T2 signal, corresponding to organized pericardial hematoma or neoplastic involvement. The primary oncological screening was negative. With hemodynamic worsening, surgery was indicated for hemorrhagic PE drainage, partial tumor resection and patch placement (on direct inspection: tumor invading the right atrium and right ventricular outflow tract). Anatomopathological examination confirmed primary cardiac epithelioid angiosarcoma. The RIPE regimen was suspended and chemotherapy initiated, with clinical improvement and hospital discharge. Conclusions: Pericardial effusion has a wide range of etiologies with frequently overlapping clinical presentations. Among the possibilities, angiosarcoma stands out, a rare primary cardiac neoplasm of high lethality if not addressed early. Thus, an assertive and comprehensive diagnostic investigation regarding differential diagnoses is fundamental, especially in the young population, aiming to change the natural history of the disease and achieve a more favorable prognosis.

15807

HYPERTENSIVE-ENDOTHELIAL ENCEPHALOPATHY IN PEDIATRIC ACUTE MYELOID LEUKEMIA: TOXIC-METABOLIC BRAIN INJURY AS A CARDIOVASCULAR EMERGENCY — A CARDIO-ONCOLOGY CASE REPORT

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Introduction: Chemotherapy-induced toxic-metabolic encephalopathy represents a cardiovascular emergency when triggered by the convergence of endothelial injury, acute arterial hypertension, and severe electrolyte disturbances. In pediatric oncohematology, intensive chemotherapy establishes a pathogenic substrate through direct vascular toxicity and systemic inflammatory activation. High-dose cytarabine induces cerebral endothelial dysfunction and disrupts cerebrovascular autoregulation. Hypertension occurs in 59% of children during induction chemotherapy, while electrolyte disturbances amplify cardiovascular risk. These overlapping mechanisms produce acute neurological deterioration that requires urgent cardiovascular management. The syndrome shares pathophysiological features with posterior reversible encephalopathy syndrome but may present with atypical imaging findings. Case Description: A 13-year-old male with high-risk hyperleukocytic myelomonocytic acute myeloid leukemia developed progressive neurological deterioration following high-dose cytarabine chemotherapy: tonic-clonic seizure, transient aphasia, bilateral visual loss, vertical nystagmus, papilledema, and pre-macular hemorrhage. Arterial hypertension was documented alongside simultaneous hyponatremia, hypokalemia, and hypomagnesemia. Cranial computed tomography was unremarkable on two occasions. Brain magnetic resonance imaging demonstrated diffuse signal abnormalities in bilateral nucleocapsular regions with restricted diffusion, consistent with toxic metabolic encephalopathy. Early cardiovascular management was implemented as the primary therapeutic strategy: gradual blood pressure reduction with angiotensin- converting enzyme inhibitor targeting 10-15% mean arterial pressure decrease within 24 hours, dual antiepileptic therapy, and aggressive intravenous electrolyte replacement for three concurrent disturbances. Continuous electroencephalography confirmed absence of epileptiform activity. At four weeks, complete visual recovery, aphasia resolution, marked nystagmus reduction, and serial electroencephalography normalization were achieved with complete hematological recovery. Conclusions: Toxic-metabolic encephalopathy is a cardiovascular emergency in pediatric oncology. The substrate is cardiovascular: autoregulation failure, hypertension, endothelial injury, and electrolyte disturbances. Blood pressure and electrolyte monitoring are essential. Cardiovascular management determines outcome.

19412

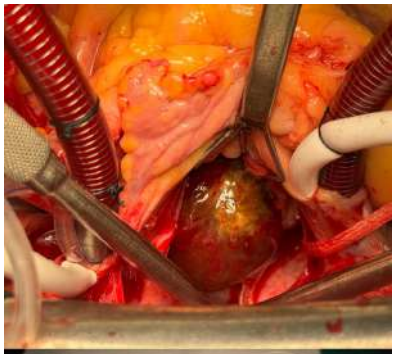
LEFT ATRIAL MYXOMA ASSOCIATED WITH A CORONARY FISTULA ARISING FROM AN ATRIAL BRANCH OF THE CIRCUMFLEX ARTERY AND THE POSTERIOR VENTRICULAR CORONARY ARTERY: A CASE REPORT

DAVID EVANGELISTA BARROS DE OLIVEIRA[1]; NICOLE AIRES PERAZOLO[2]; ISADORA MÔNICA PONTE DE OLIVEIRA[1]; DENYSE DE OLIVEIRA MORAES SAUNDERS[1]; MARIANNE MENDES PINTO[1]; MARIA EDUARDA BORGES LINHARES[3]; BIANCA ARAGÃO DE OLIVEIRA[4]; VITOR TEIXEIRA BOSCOV[1]; CARLOS GUSTAVO ALVES LEITÃO[1]; JULIA ALENCAR MENDONÇA PIMENTA FREITAS[2]; ADRIANO SIQUEIRA DOS SANTOS[5]; FRANCISCO DANIEL DE SOUSA[5];

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Introduction: Myxoma is the most common benign primary cardiac tumor, although rare, with a predilection for the left atrium. Its clinical presentation is heterogeneous and may include constitutional symptoms, embolic phenomena, and intracardiac obstruction. Tumor neovascularization with arteriocavitary fistulas is an angiographic finding present in 33% of cases, with the left circumflex artery frequently described as the feeding vessel. However, involvement of the posterior coronary artery is uncommon and of relevant anatomical and clinical interest. Case Description: A 64-year-old woman with a history of systemic arterial hypertension, insulin-treated diabetes mellitus, and dyslipidemia was admitted after recurrent episodes of constrictive chest pain and dyspnea at rest, lasting 10 to 20 minutes, over approximately one month. Transthoracic echocardiography demonstrated a mobile nodular mass attached to the interatrial septum in the left atrium, measuring 5.6 × 2.7 cm, suggestive of myxoma. A repeat echocardiogram confirmed preserved left ventricular ejection fraction, mild chamber remodeling, and an intracavitary left atrial structure protruding through the mitral valve, with a mean transmitral gradient of 5 mmHg, consistent with functional obstructive hemodynamic impact. Coronary angiography showed no significant obstructive coronary lesions; however, it demonstrated a coronary fistula arising from an atrial branch of the circumflex artery and from the posterior ventricular coronary artery supplying the atrial mass, characterizing tumor vascularization. The patient underwent surgical resection of the left atrial myxoma combined with ligation of the coronary fistula, with good postoperative recovery. Conclusions: This case demonstrates an uncommon presentation of left atrial myxoma due to tumor vascularization through a coronary fistula, without concomitant obstructive coronary artery disease. Echocardiography was essential for the initial diagnosis and for demonstrating the hemodynamic impact, whereas coronary angiography provided important anatomical definition for surgical planning. Surgical treatment was effective, with a favorable postoperative outcome.







21042

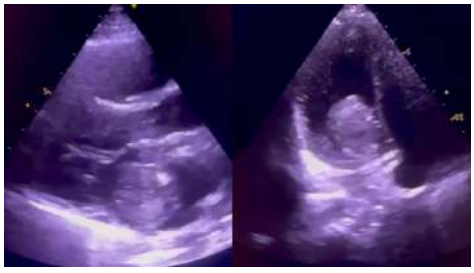
PRIMARY CARDIAC OSTEOSARCOMA WITH CEREBRAL METASTASIS AND RECURRENCES IN AN ADOLESCENT: A CASE REPORT

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Introduction: Primary cardiac tumors are uncommon, they can be benign (75%) or malignant (25%). Malignant cardiac neoplasms are rare, aggressive, infiltrative, and highly metastatic. Primary cardiac osteosarcoma is a rarer subtype of cardiac sarcomas, representing 3–9% of cases, and has a poor prognosis. Cerebral metastases and remission-recurrence dynamics in young patients pose significant clinical challenges. This case describes a rare, complex evolution, emphasizing vigilance and a multidisciplinary approach. Case Description: A 14-year-old male, previously healthy. He presented with prolonged cough, progressing to respiratory discomfort and ICU admission for extensive pneumonia and pleural effusion. Echocardiogram revealed a voluminous left atrial mass mobilizing into the left ventricle, which we thought was a myxoma. He underwent left atrial tumor resection, posterior mitral annuloplasty, mitral cleft closure, and thymectomy on April 23, 2025 (105 min cardiopulmonary bypass, 95 min circulatory arrest). Cranial tomography showed ischemic areas without neurological manifestations, and he was discharged 8 days post-admission. Immunohistochemistry confirmed high-grade osteoblastic osteosarcoma with smooth muscle differentiation (SATB2+, Desmin D33+, high Ki-67). Post-discharge,hospitalizations were limited to chemotherapy and for oncological examinations. Methotrexate and leucovorin were used in July 2025. In September, doxorubicin and cisplatin were administered, associated with ondansetron, carvedilol, and furosemide for symptom relief. Subsequently, 8 cycles of etoposide and ifosfamide were performed, associated with mesna, ondansetron, dexamethasone, furosemide, and carvedilol.Initial complete remission was followed by cardiac recurrence and a 0.8 cm frontal cerebral metastasis, plus ischemic lacunar infarcts, after three months. Subsequent radio and chemotherapy achieved another remission. One year post-surgery, he experienced a convulsive episode, recovering without sequelae, leading to hospital monitoring and therapeutic adjustment. Conclusions: This case illustrates the highly aggressive nature of primary cardiac osteosarcoma, with cerebral metastasis, ischemic events, and recurrence-remission patterns despite intensive treatment. A late convulsive crisis reinforces the need for rigorous neurological follow-up. Complex management requires an individualized, continuous therapeutic strategy to optimize treatment and patient quality of life.





18268

RIGHT-SIDED HEART FAILURE DUE TO PULMONARY HYPERTENSION ASSOCIATED WITH METASTATIC PANCREATIC NEUROENDOCRINE NEOPLASM: A CASE REPORT

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Introduction: Right heart failure can result from multiple etiologies, with pulmonary hypertension being a relevant cause. Identifying etiology is essential for therapeutic definition. The association with malignant neoplasms is rare and represents a diagnostic challenge. We report a case of right heart failure attributed to pulmonary hypertension associated with metastatic pancreatic neuroendocrine neoplasia. Case Description: A 37-year-old male patient presented to the emergency department after developing dyspnea on effort, fatigue, weight loss and ascites. Regarding his past medical history, he had been diagnosed with hypertension at age 35, denied smoking and alcohol consumption. He presented with pulmonary hypertension (PASP 77 mmHg and pulmonary artery trunk with a 3.7 cm caliber) with dilation of the right chambers and right ventricular systolic dysfunction on echocardiography, in addition to elevated NT-proBNP. Right heart catheterization was performed, which showed pre-capillary hypertension. Investigation revealed multiple liver metastases and a mass in the head of the pancreas, confirming metastatic pancreatic neuroendocrine neoplasia. It is worth pointing out that the 24-hour urinary 5-HIAA level was normal in two measurements and there was no right valvular heart disease, ruling out classic carcinoid syndrome. The right heart failure was attributed to pulmonary hypertension associated with the neoplasm, possibly through microvascular mechanisms, after excluding other causes, including Budd-Chiari syndrome and liver cirrhosis (portopulmonary hypertension). The patient's right heart failure improved clinically after oncological treatment. Conclusions: This case stands out due to the multidisciplinary approach involved in a situation of oncological symptomatology that began with cardiopulmonary manifestations, products of right heart failure caused by pulmonary hypertension. Possible mechanisms explaining the association between cancer and the condition include carcinoid heart disease and pulmonary tumor thrombotic microangiopathy. Metastatic pancreatic neuroendocrine neoplasia is a rare malignant neoplasm, representing less than 5% of pancreatic tumors. The late onset of symptoms can also lead to late diagnosis of the disease. It is important to consider neoplasms as causes of pulmonary hypertension and heart failure when the pathophysiological origin is not elucidated.

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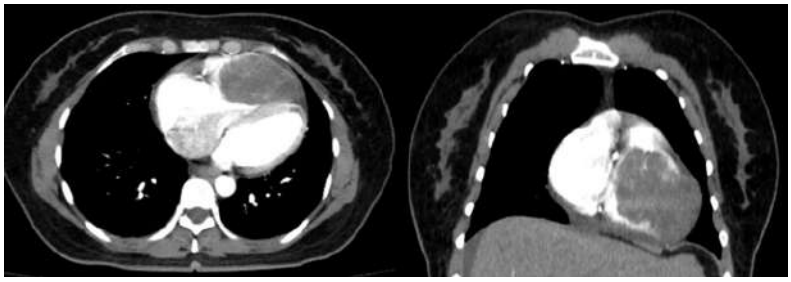
SUPRAVENTRICULAR TACHYCARDIA AS THE INITIAL PRESENTATION OF A PRIMARY RIGHT VENTRICULAR CARDIAC SARCOMA: A CASE REPORT

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Introduction: Primary cardiac sarcomas are rare malignant tumours whose presentation depends mainly on location and haemodynamic impact. Right-sided masses are diagnostically challenging and often require multimodality imaging. We report a young woman whose first manifestation was new-onset supraventricular tachycardia. Case Description: A 38-year-old woman with no prior structural heart disease presented with progressive exertional dyspnoea, palpitations, and diaphoresis. Electrocardiography showed regular narrow-complex supraventricular tachycardia at 166 b.p.m. without haemodynamic instability. Sinus rhythm was restored with adenosine and amiodarone. Because symptoms persisted, transthoracic echocardiography was performed and revealed a large infiltrative right ventricular mass causing right ventricular outflow tract obstruction, severe tricuspid regurgitation, right-sided chamber dilatation, and right ventricular systolic dysfunction. Contrast-enhanced computed tomography demonstrated a 50 × 74 mm right ventricular mass with enhancement and small pericardial effusion. Cardiac magnetic resonance confirmed a 61 × 39 × 52 mm heterogeneous mass attached to the apical anterior right ventricular wall, with loss of interface with adjacent structures, severe outflow obstruction, severe tricuspid regurgitation, right ventricular ejection fraction of 25%, and mild pericardial effusion. Endomyocardial biopsy demonstrated a low-grade primary intracardiac sarcoma. After multidisciplinary discussion, the patient was referred for oncological care and systemic chemotherapy with doxorubicin. Conclusions: New-onset supraventricular tachycardia may be the first sign of a major structural cardiac lesion, including primary cardiac sarcoma. In patients with new supraventricular arrhythmia and progressive dyspnoea, structural heart disease should be actively investigated. Multimodality imaging is essential, but histopathological confirmation remains required for definitive diagnosis.





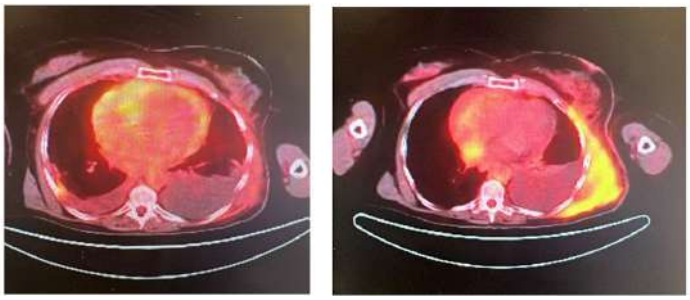
17631

“DRY” CONSTRICTIVE PERICARDITIS: AN UNUSUAL PRESENTATION OF METASTATIC INVASIVE LOBULAR BREAST CARCINOMA

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Introduction: Pericardial involvement occurs in 5-15% of advanced malignancies, typically presenting as effusion. Invasive lobular carcinoma (ILC) is distinguished by its unique metastatic tropism to atypical sites; however, pericardial metastasis from ILC presenting as diffuse infiltrative pericardial thickening with constrictive physiology without significant effusion is an exceptionally rare and diagnostically challenging manifestation. Case Description: A female patient diagnosed with invasive lobular breast carcinoma (ER+, PR+, HER2 2+/3+) presented ten years later systemic recurrence. PET-CT revealed an extensive soft tissue mass in the left flank, multiple osseous metastases with fracture risk, and left pleural effusion. Biopsy confirmed metastatic lobular carcinoma (HR+, HER2 1+, Ki-67 25%), and first-line treatment with ribociclib and fulvestrant was initiated, achieving metabolic response in bone and soft tissue lesions. However, the patient developed progressive dyspnea; transthoracic echocardiography demonstrated no pericardial effusion but rather diffuse pericardial thickening with signs of restrictive ventricular filling, predominantly affecting the right ventricle, along with significant inferior vena cava dilatation. Cardiac magnetic resonance imaging confirmed marked infiltrative thickening of the pericardial layers (up to 1.9 cm adjacent to the right ventricular lateral wall), restrictive diastolic physiology with interventricular septal flattening, and right ventricular lateral and inferior wall hypokinesis. The patient underwent left video-assisted thoracoscopic pleuroscopy with talc pleurodesis and pericardial and pleural biopsy, which confirmed metastatic lobular breast carcinoma in the pericardium (ER−, PR−, HER2−). Progressive clinical deterioration followed, characterized by overt right-sided heart failure, marked by jugular venous distension, peripheral edema, and congestive hepatopathy, confirming the hemodynamics of rigid constrictive pericarditis. Diuretic therapy with furosemide was initiated with good clinical response. Treatment was transitioned to carboplatin-based chemotherapy with favorable initial response. Conclusions: This case illustrates an atypical presentation of malignant pericardial disease. Notably, the receptor discordance between the primary tumor and the pericardial metastasis further highlights the biological complexity of ILC, underscoring the importance of multimodal cardiac imaging and immunohistochemical reassessment in guiding treatment decisions.

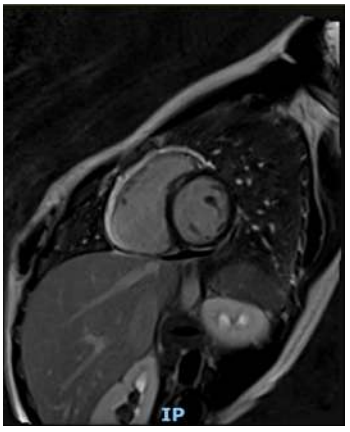


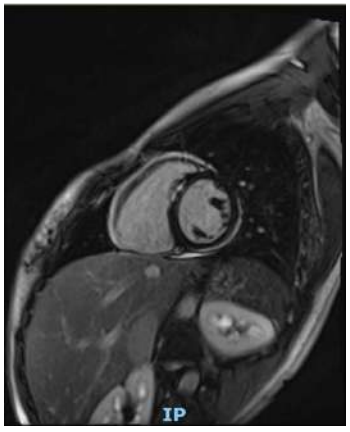
18114

ARRHYTHMOGENIC CARDIOMYOPATHY RELATED TO A PATHOGENIC VARIANT OF DSG2 WITH "MYOCARDITIS-LIKE" PRESENTATION: DIAGNOSTIC AND THERAPEUTIC CHALLENGES

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Introduction: Arrhythmogenic cardiomyopathy (ACM) is a genetic disease defined by fibrofatty replacement of the myocardium and an increased risk of ventricular arrhythmias and sudden death. Variants in desmosomal genes, including DSG2, are associated with heterogeneous phenotypes and inflammatory episodes referred to as "myocarditis-like." These episodes present with chest pain and elevated troponin levels in the absence of coronary artery disease, representing a significant diagnostic challenge and a potential marker of disease progression. Case Description: A 22-year-old female presented to the emergency with chest pain radiating to the jaw and left upper limb. She reported an episode of syncope following orthostatism three days prior to hospitalization. Since then, she had experienced recurrent dizziness, especially with postural exertion. She has a positive family history for arrhythmogenic cardiomyopathy, with a brother who has presented myocarditis-like episodes and angina. On admission, laboratory tests showed elevated troponin with dynamic pattern, peaking at 12,000. The electrocardiogram revealed sinus rhythm, heart rate of 72 bpm, and T-wave inversion from V1 to V4. The patient was admitted to the intensive care unit, with significant improvement in angina following nitrate administration, although the dizziness persisted. Holter monitoring revealed 2% ventricular extrasystoles and 4 paired episodes. Cardiac magnetic resonance imaging was consistent with biventricular perimyocarditis. Prior genetic testing (2022) identified a pathogenic DSG2 variant, strongly associated with the arrhythmogenic disease. Thus, the main diagnostic hypothesis was a myocarditis-like flare secondary to biventricular arrhythmogenic cardiomyopathy with vasospastic angina. Pulse therapy and corticosteroid treatment were initiated, along with calcium channel blockers and nitrates. The patient showed clinical improvement and declining troponin levels, reaching 50 ng/mL (reference value <57), at the time of discharge. Conclusions: DSG2-related arrhythmogenic cardiomyopathy poses a diagnostic challenge due to its phenotypic variability. Early genetic testing is essential for diagnosis, risk stratification, and targeted therapy, especially to prevent heart failure and ventricular arrhythmias. In a myocarditis-like presentation, which may reflect an inflammatory phenotype associated with disease progression, immunosuppression emerges as a potentially outcome-modifying strategy.

21458

CARVAJAL SYNDROME DUE TO DESMOPLAKIN CARDIOMYOPATHY IN A FAMILY DIAGNOSED THROUGH CASCADE GENETIC SCREENING

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Introduction: Carvajal syndrome is a rare cardiocutaneous disorder with autosomal recessive inheritance characterized by dilated cardiomyopathy, congenital woolly hair, and palmoplantar keratoderma. It is associated with biallelic variants in the desmoplaquin (DSP) gene and can lead to severe heart failure (HF) with high morbidity and mortality even in the first years of life. Case Description: Index case was a male, born at term with no prenatal abnormalities, presenting with dilated cardiomyopathy (DCM), woolly hair and palmoplantar keratoderma. At age 3, he developed HF symptoms. Echocardiogram at that time showed dilated left chambers, left ventricular (LV) dysfunction, LV ejection fraction of 30%, mild mitral and tricuspid regurgitation, and a normal right ventricle. Symptoms progressed, leading to a heart transplant at age 5; pathological examination of the explanted heart revealed idiopathic dilated cardiomyopathy and extensive interstitial fibrosis. In family history, both siblings had DCM in the first decade of life (aged 6 and 5), they evolved to severe symptoms of HF and died as a result of cardiogenic shock, before any genetic testing could be performed. Their ancestry was marked by consanguinity, as his parents were first cousins. Genetic testing (whole-exome sequencing) was performed, revealing a homozygous variant in the DSP gene (NM 004415.4:c.4849:p.Gln1617Ter) classified as likely pathogenic. Sanger family sequencing for cascade screening revealed both parents carried the familial variant in heterozygous state. Additional screening was performed in 10 relatives and identified 3 heterozygotes (mean age 44.7 years, 33% male). All heterozygotes underwent electrocardiogram (EKG), echocardiograms and Holter monitoring due to the risk of autosomal dominant DSP-related arrhythmogenic cardiomyopathy. In two of them, all exams were normal, but the other relative with a positive genetic test showed frequent ventricular arrhythmia on Holter and EKG with inverted T wave in leads V1-V3, fulfilling the diagnostic criteria for arrhythmogenic cardiomyopathy. Conclusions: A challenging case highlighting the severity of Carvajal syndrome in a family with a history of DCM in children, underscoring the importance of genetic testing for diagnosis and cascade screening to identify at-risk family members.

17630

FIRST REPORT OF GLYCOGEN STORAGE DISEASE TYPE IB DUE TO A SLC37A4 GENE VARIANT WITH ECOCHARDIOGRAPHIC ABNORMALITIES IN A YOUNG ADULT

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Introduction: Glycogen Storage Diseases (GSD) comprise a heterogeneous group of rare inborn errors of metabolism, presenting with fasting hypoglycemia, cardiomyopathy and neutropenia. Regarding Cardiac involvement, certain GSD variants can manifest concentric hypertrophy, mimicking restrictive cardiomyopathy phenotypes. This makes differential diagnosis an essential step for treatment. While tissue hyper-reflectivity and concentric hypertrophy are well-documented particularly in subtypes III and IV, GSD type Ib has no previous report of cardiac involvement in the literature. The findings of this case demonstrate hyper-reflectivity and eccentric hypertrophy in this form of the disease, revealing a potentially underdiagnosed manifestation in the current medical literature. Case Description: A 39-year-old male patient, diagnosed with Glycogen Storage Disease type Ib since childhood. The diagnosis was confirmed by biopsy and genetic testing, presented with the pathogenic variant rs3130453 in the SLC37A4 gene. The condition has progressed to chronic liver disease (Child-Pugh A5) with associated portal hypertension. In 2025, following a suspected transient ischemic attack (TIA), a cardiological investigation revealed significant structural findings. The transthoracic Echocardiogram demonstrated eccentric left ventricular hypertrophy (mass: 137g/m2) and myocardial hyper-reflectivity pattern suggestive of infiltration or storage. Left ventricular diastolic dysfunction (E/E': 16) was also one of the findings. The systolic function was slightly reduced (LVEF: 47%, via Simpson method), with a significant reduction in Global Longitudinal Strain (GLS: 10%). The electrocardiogram revealed left ventricular overload and supra supraventricular extrasystoles. GSD type Ib typically presents with severe hypoglycemia, neutropenia and inflammatory bowel disease. The presence of eccentric hypertrophy and hyper-reflectivity are atypical findings for the Ib variant, suggesting that the myocardium might serve as a direct site for glycogen deposition in this particular mutation. Conclusions: The cardiac involvement evidenced by hyper-reflectivity and eccentric hypertrophy supports the hypothesis of direct myocardial glycogen deposition, a cardiac manifestation that remains undocumented in the literature concerning the SLC37A4 variant. In this clinical context, establishing an etiological diagnosis and identifying the specific mutation are essencial to ensure effective therapeutic approach for the patient.

19344

UNDERSTANDING THE MYH7 GENE AS A CAUSE OF HYPERTROPHIC CARDIOMYOPATHY THROUGH ITS CARRIERS: A CASE SERIES.

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Introduction: Hypertrophic cardiomyopathy (HCM) is one of the most common inherited heart diseases, and more than 50% of cases show a tendency towards familial aggregation. The myosin heavy chain 7 (MYH7) gene is a sarcomeric gene that encodes the myosin heavy chain (myosin-7), correlating with HCM or dilated HCM and skeletal myopathy. Carriers of the MYH7 variant are diagnosed between 31 and 40 years of age, with moderate hypertrophy and fibrosis (higher concentration in the anterior and inferior septum of the basal and medial regions), representing a moderate risk of sudden cardiac death. Objective: To analyze the clinical characteristics and complementary examination findings of carriers of the MYH7 variant related to cardiomyopathy and its supposed “red flags”. Methods: This was a descriptive and retrospective observational study (case series) conducted in an outpatient clinic of a university hospital dedicated to monitoring patients with HCM, from January 2025 to January 2026. Case Description: It was 211 patients records from the period were retrospectively evaluated, with information regarding genetic test results. Of these, 8 patients were found to have the pathogenic MYH7 variant, with 1 excluded (no information in the record). The remaining patients were predominantly female (71.42%); aged 48.66 ± 3.05 years; white (42.85%); sedentary (71.42%); hypertensive (85.71%); and had heart failure or previous arrhythmia (71.42%). Symptoms of altered sensitivity and motor function (42.85%) and dysautonomia (hypotension, 85.71%). Systolic blood pressure, 110±17.32 mmHg; heart rate, 86±22.51 bpm. Electrocardiogram: sinus rhythm, 42.85%; pacemaker, 57.14%. Transthoracic echocardiogram: left atrium, 45.23±3.05 mm; interventricular septum, 13.33±10.11 mm; left ventricular (LV) posterior wall, 9±2.65 mm; LV ejection fraction, 38±15.71%; systolic dysfunction, 57.14%; moderate to severe diastolic dysfunction, 42.85%. Presence of trabeculations in the left ventricle (28.57%) and diagnosis of non-compaction myocardium (14.28%). Cardiac magnetic resonance imaging is in progress. Conclusions: In this case series, a relatively young age range was observed for the numerous cardiological conditions detected, including severe arrhythmias requiring pacemakers and frequent autonomic symptoms. The trabeculations observed on TTE, despite not being considered a marker of the disease, represent a relevant phenotypic finding within the spectrum of the pathology.

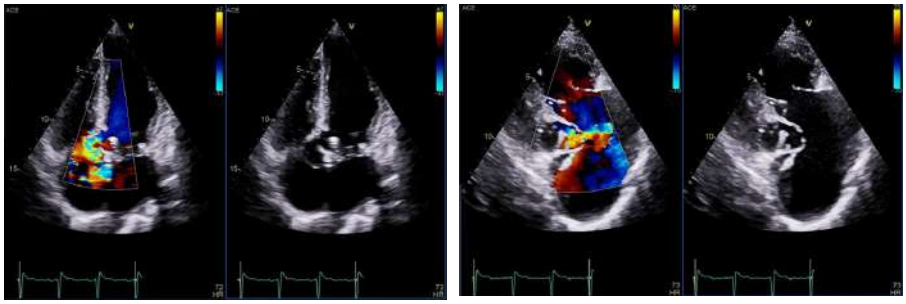
16696

ACQUIRED GERBODE DEFECT IN THE CONTEXT OF ENDOCARDITIS: A RARE POST-SURGICAL COMPLICATION OF VALVE REPLACEMENT

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Introduction: The Gerbode defect is a rare abnormal communication between the left ventricle (LV) and right atrium (RA), resulting in an intracardiac shunt. This condition occurs due to the apical insertion of the tricuspid valve relative to the mitral valve. With a prevalence below 1%, its origin can be congenital or acquired (resulting from processes that damage the septum, such as trauma, myocardial infarction, surgical iatrogenesis, or endocarditis). Diagnosis is challenging, as high-velocity shunts are often misinterpreted as pulmonary hypertension or functional tricuspid regurgitation (TR). While transthoracic echocardiography is the screening tool, transesophageal echocardiography (TEE) is definitive for identifying flow origin and complications such as abscesses. Case Description: A 58-year-old female with rheumatoid arthritis, paroxysmal atrial fibrillation, hypothyroidism, and dyslipidemia underwent aortic and mitral valve replacement in 2024 for rheumatic mixed valve disease. The procedure included aortic root enlargement and left atrial appendage exclusion. Eight months later, she presented with progressive dyspnea. TEE revealed a mitral annular aneurysm in the posteroseptal region (18x21mm), with a wall discontinuity leading to a fistulous tract (5mm ostium). Predominantly systolic flow was observed between the LV and RA, characterizing a Type I (supravalvular/direct) Gerbode defect secondary to a perivalvular abscess. The exam detailed torrential TR due to coaptation failure (vena contracta 9.4mm; effective regurgitant orifice area 1.3cm²; regurgitant volume 138ml/beat), with systolic hepatic vein flow reversal and a pulmonary artery systolic pressure of 41 mmHg (underestimated due to the severity of the valvular failure). Marked right chamber dilation, ascites, and bilateral pleural effusion were observed. Given the diagnosis of infective endocarditis complicated by an intracardiac fistula, the patient remained hospitalized for antibiotic therapy pending surgical reintervention for valve replacement and defect repair. Conclusions: This case highlights the diagnostic complexity of the Gerbode defect in patients with prosthetic valves and endocarditis. Differentiating LV-RA shunts from massive TR is vital, as both cause right heart overload. A multimodal approach was decisive in identifying the septal abscess as the cause of the fistula. Clinical suspicion remains paramount for atypical murmurs or refractory heart failure post-surgery to ensure timely diagnosis and appropriate management.



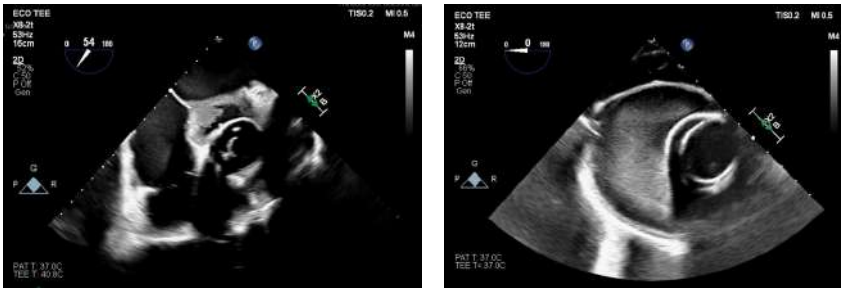
21636

COMPLICATED PROSTHETIC INFECTIVE ENDOCARDITIS WITH PERIVALVULAR AND PERIAORTIC ABSCESSES AND STERNAL FISTULA

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Introduction: Prosthetic infective endocarditis (PIE) is a complication following valve replacement, characterized by high mortality and diagnostic and therapeutic complexity. Progression to periaortic collections and mediastinal fistulization is a rare manifestation, associated with significant tissue destruction and the need for complex surgical reinterventions. Case Description: A 59-year-old male patient with a surgical repair of an ascending aortic aneurysm associated with aortic and mitral valve replacement with biological prostheses on January 17, 2024. Presented with an abscess in the anterior cervical region, near the sternal furcula, associated with episodes of spontaneous cutaneous drainage since January 2026. In April 2026, he developed fever and chills, associated with an ulcerated lesion in the sternal furcula region with drainage of purulent secretion; empirical antimicrobial treatment with meropenem, vancomycin, and gentamicin was initiated, based on suspicion of infective endocarditis. Transesophageal echocardiography revealed a biological mitral prosthesis with multiple heterogeneous, mobile masses, the largest measuring 11 × 6.6 mm, consistent with vegetations, with no bioprosthesis dysfunction; A normally functioning aortic bioprosthetic valve was noted; a hyperechoic structure adjacent to the aortic valve apparatus, measuring 29 × 22 mm at its greatest diameters, was observed, suggestive of an abscess. A Dacron prosthesis positioned within the aortic lumen was visualized; an extensive infectious collection was evident adjacent to the aortic wall. Chest CT angiography confirmed the presence of hypodense material surrounding the aortic lumen, with soft tissue density (30 HU), suggestive of a thick collection with a maximum diameter of up to 10.2 cm; at the level of the 3rd costal arch, a disruption in continuity between the mediastinal collection and the subcutaneous tissue can be identified. Conclusions: This case illustrates the high severity of prosthetic infective endocarditis with perianular extension, periaortic abscess, and mediastinal fistulization in a patient with aortic and valvular prostheses, presenting a scenario of high clinical and surgical complexity. Cardiovascular imaging methods were fundamental for diagnosis and treatment planning, reinforcing the importance of multimodal imaging in invasive prosthetic endocarditis.



18117

DYNAMIC FUNCTIONAL ATRIAL MITRAL REGURGITATION UNMASKED BY EXERCISE IN A PATIENT PREVIOUSLY DIAGNOSED WITH HFPEF

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Introduction: Heart failure with preserved ejection fraction (HFpEF) is a heterogeneous syndrome and often poses a diagnostic challenge. Exercise stress echocardiography is an important tool not only for diagnosing this condition but also for identifying underlying pathophysiological mechanisms that may not be evident at rest, including dynamic valvular disease. Case Description: MMS, a 76-year-old woman with hypertension, presented with progressive worsening of functional class over the past year (currently NYHA class III). She had been clinically diagnosed with HFpEF and remained symptomatic despite optimized treatment with an SGLT2 inhibitor and diuretics. Cardiac magnetic resonance imaging with pharmacological stress was negative for ischemia or infiltrative disease. Resting echocardiography showed a left ventricle with preserved dimensions and function (ejection fraction 71%), left atrial enlargement (indexed volume 44.7 mL/m²), and mild mitral regurgitation (effective regurgitant orifice area 13 mm²; regurgitant volume 21.5 mL per beat). Diastolic dysfunction with borderline filling pressures (septal E/e' 17; mean 13) and an estimated pulmonary artery systolic pressure (PASP) of 29 mmHg were also observed. She underwent exercise stress echocardiography on a cycle ergometer (Astrand protocol), which was terminated early due to severe dyspnea during stage 2 (50 W, 3:58 min, VO□ 8.6 mL/kg/min, 2.4 METs). At peak exercise, there was a marked increase in mitral regurgitation, which became significant, with a broad jet reaching the roof of the left atrium and extending into the pulmonary veins. This was accompanied by a significant increase in filling pressures (septal E/e' 30; mean 19) and PASP (65 mmHg), as well as subclinical pulmonary congestion detected by lung ultrasound (score 16/40). These findings led to a revised diagnosis of dynamic functional atrial mitral regurgitation, explaining the patient's reduced exercise tolerance. The patient is currently undergoing cardiopulmonary rehabilitation and is being evaluated by the heart team for therapeutic decision-making. Conclusions: This case highlights the value of physical stress echocardiography in evaluating patients with suspected HFpEF, allowing for objective assessment of functional limitation and identification of underlying dynamic mechanisms, such as functional atrial mitral regurgitation.

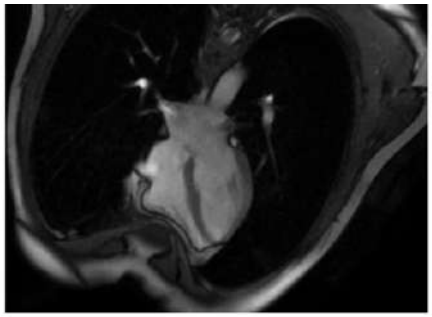
15124

BEYOND VALVULAR AND AORTIC ANOMALIES: A CASE REPORT OF ARRHYTHMOGENIC RIGHT VENTRICULAR DYSPLASIA IN A YOUNG WOMAN WITH TURNER SYNDROME.

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Introduction: Turner Syndrome (TS) is a genetic condition resulting from total or partial loss of an X chromosome. The diagnosis is suspected in women with short stature or delayed puberty and confirmed by karyotyping. Congenital anomalies, such as bicuspid aortic valve and aortic coarctation, and hypertension (HT) contribute to a reduction in life expectancy of approximately 10 years due to cardiovascular (CV) death. Arrhythmogenic right ventricular dysplasia (ARVD) is a rare, progressive genetic disease characterized by the replacement of heart muscle with adipose and fibrous tissue and is one of the causes of severe arrhythmias and sudden death in young people. In this report, we will describe the unreported association of ARVD and TS. Case Description: A 35-year-old woman has been under follow-up since the age of 10 for short stature (height SDS −3.7) and hypergonadotrophic hypogonadism. TS was confirmed by 45,X [30] karyotype. The initial CV evaluation by echocardiogram was normal. At age 21, HT was diagnosed and controlled with losartan and propranolol. Magnetic resonance angiocardiography (MRA) was performed to assess pregnancy risk. MRA revealed dyskinesia of the posterobasal wall of the right ventricle with reduced ejection fraction and areas suggestive of myocardial fibrosis, consistent with ARVD. The electrocardiogram showed sinus rhythm, negative T wave from V1 to V5, and incomplete right bundle branch block. The exercise stress test was normal and the 24-hour Holter monitoring revealed rare supraventricular extrasystoles and no ventricular arrhythmias. The patient was advised to engage in moderate physical activity while monitoring her heart rate to 110 bpm, to continue taking propranolol and losartan, and to undergo regular cardiological follow-up. Conclusions: The diagnosis of ARVD requires integration of clinical data and imaging studies, particularly MRA, to assess of ventricular morphology and function. To date, 15 autosomal genes have been implicated in ARVD and alterations in genes on the X chromosome may modulate the expression of autosomal genes involved in the regulation of cardiac ion channels. To our knowledge, there are no previous reports in the literature of an association between ARVD and TS. This case illustrates the importance of MRA in CV evaluation in patients with TS.



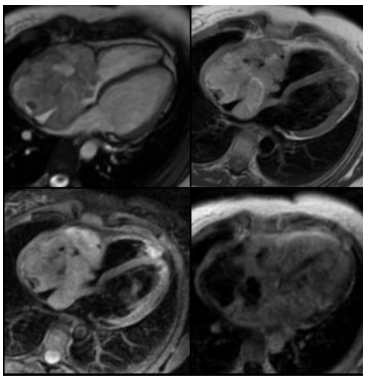
Picture 1: Magnetic resonance angiography (MRA) applied to the morphofunctional characterization of the heart and thoracic aorta.

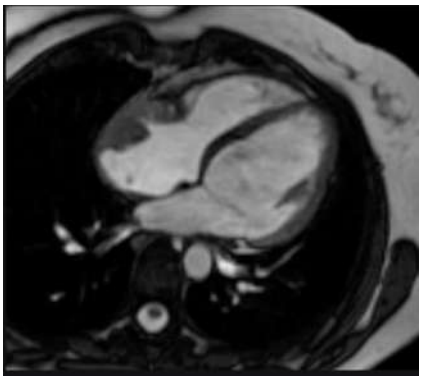
18270

GIANT CARDIAC ANGIOSARCOMA IN A PUERPERAL WOMAN: A CASE REPORT

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(1) UNIVERSIDADE ESTADUAL DE MARINGA - MARINGÁ - PR - BRASIL;





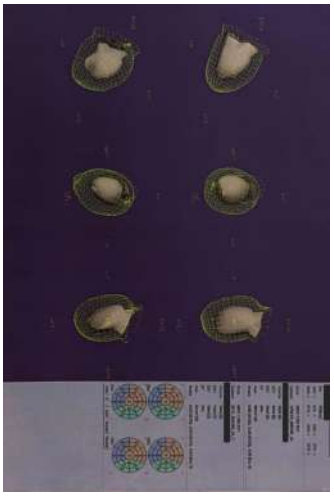
Introduction: Primary cardiac tumors are rare, with most being benign, particularly myxomas. Cardiac angiosarcoma is an uncommon malignant neoplasm of endothelial origin, characterized by aggressive behavior and a high metastatic potential. Its occurrence during the puerperium is exceedingly rare, with only a few cases reported in the literature, making early diagnosis and appropriate management particularly challenging. A case of giant cardiac angiosarcoma in a puerperal patient is presented, emphasizing diagnostic challenges, therapeutic strategies, and key clinical aspects. Case Description: A 28-year-old woman presented with progressive dyspnea during the third trimester of pregnancy. Transthoracic echocardiography revealed a right atrial mass, initially suspected to be a cardiac myxoma. A joint decision was made to defer further investigation until after delivery. In the immediate puerperium, the patient experienced clinical deterioration with worsening dyspnea. Cardiac magnetic resonance imaging demonstrated a large right atrial mass with an estimated volume of 258 mL (Image 1). A percutaneous biopsy via the superior vena cava was performed, and histopathological analysis confirmed cardiac angiosarcoma. Systemic chemotherapy with doxorubicin was initiated, resulting in approximately 70% tumor reduction on follow-up imaging (Image 2). However, after five months of treatment, significant left ventricular systolic dysfunction developed, with a decline in ejection fraction from 64% to 35%, consistent with chemotherapy-induced cardiotoxicity. Consequently, the treatment regimen was switched to paclitaxel, with poor therapeutic response and subsequent metastatic progression, predominantly involving the liver. Due to progressive hepatic failure associated with heart failure, death occurred approximately 11 months after the definitive diagnosis. Conclusions: This case highlights not only an extremely rare condition but also underscores the diagnostic challenges imposed by physiological changes during pregnancy and the puerperium. Furthermore, it emphasizes the importance of close monitoring for chemotherapy-induced cardiotoxicity, which may significantly impact prognosis and survival, as illustrated in the present case.

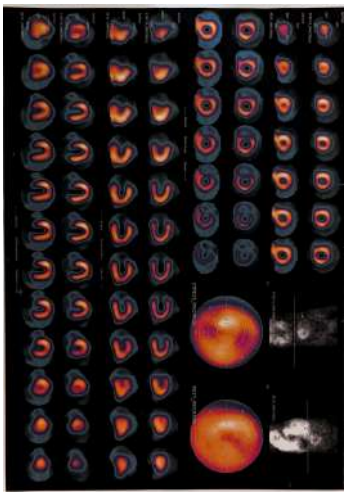
16618

LATE MYOCARDIAL ISCHEMIA AFTER TAKEUCHI REPAIR FOR ALCAPA: SYNERGISTIC EFFECT OF TUNNEL STENOSIS AND CORONARY STEAL FROM AN AORTO-PULMONARY FISTULA

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Introduction: Anomalous origin of the left coronary artery from the pulmonary artery (ALCAPA) is a rare congenital anomaly requiring early surgical correction. The Takeuchi procedure remains an alternative when direct reimplantation is not feasible, but late complications may arise. The integrated hemodynamic consequences of these complications are of key interest. Case Description: A 10-year-old girl with ALCAPA repaired in infancy using the Takeuchi technique presented with chest pain. Myocardial perfusion imaging revealed moderate reversible ischemia involving the anterior, anterolateral, and inferior walls, despite preserved left ventricular function and a normal exercise stress test. Transthoracic echocardiography demonstrated moderate supravalvular pulmonary stenosis. Coronary computed tomography angiography and invasive coronary angiography identified significant tunnel stenosis, a hypoplastic and poorly opacified left coronary system, extensive collateralization from the right coronary artery, and contrast passage into the pulmonary artery consistent with an aorto-pulmonary fistula. These findings indicated a complex interplay between reduced antegrade coronary flow and coronary steal physiology. The patient underwent surgical correction of the fistula and pulmonary artery reconstruction, with favorable early postoperative evolution. Conclusions: This case illustrates a dual and synergistic mechanism of late myocardial ischemia after Takeuchi repair, combining structural obstruction and hemodynamic diversion of coronary flow. It emphasizes the critical role of multimodality imaging in detecting clinically relevant ischemia and supports the need for lifelong surveillance in this population.

15892

ATYPICAL HEPATIC PRESENTATION OF FAMILIAL HYPOBETALIPOPROTEINEMIA DETECTED AFTER TWIN DEATH: IMPLICATIONS FOR CARDIOVASCULAR AND METABOLIC RISK

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Introduction: Familial hypobetalipoproteinemia (FHBL) is a rare genetic disorder characterized by markedly reduced LDL-cholesterol and apolipoprotein B levels. Although often considered cardioprotective, FHBL may be associated with hepatic steatosis and progressive liver disease, posing diagnostic and management challenges. Case Description: A 29-year-old asymptomatic woman was referred to cardiology due to extremely low LDL-cholesterol identified during family screening after the death of her monozygotic twin sister from advanced cryptogenic liver disease following two failed liver transplants. She had no cardiovascular disease, diabetes, obesity, or alcohol misuse. Laboratory evaluation revealed profound hypolipidemia (LDL-C 4 mg/dL, ApoB <40 mg/dL) with mild transaminase elevation. Abdominal MRI showed moderate hepatic steatosis, and liver biopsy demonstrated chronic active hepatitis with fibrotic changes. Genetic analysis identified two heterozygous APOB variants in trans, confirming FHBL. The patient remains under multidisciplinary care, receiving fat-soluble vitamin supplementation and metabolic monitoring. Low-dose GLP-1 receptor agonist therapy was initiated to address hepatic steatosis, with follow-up elastography planned. Conclusions: This case highlights that extremely low LDL-cholesterol is not always benign and may indicate underlying genetic disorders with significant hepatic involvement. FHBL should be considered in patients with unexplained hypolipidemia. The challenge lies in balancing cardiovascular protection with the risk of progressive liver disease and defining optimal management strategies.

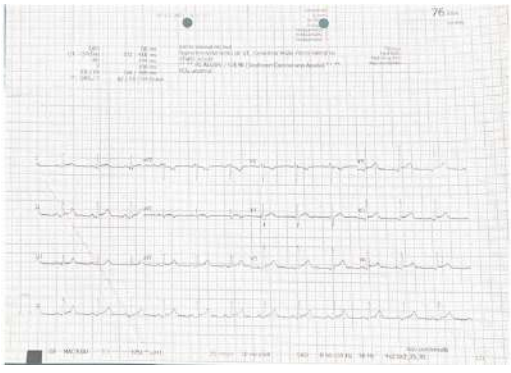
14227

CARDIOVASCULAR EVENTS FOLLOWING COVID-19 VACCINATION: A CASE REPORT

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Introduction: Myocarditis is an inflammatory infiltrate in the myocardium that damages cardiomyocytes in a non-ischemic manner and may have an infectious or non-infectious cause. Following vaccination against SARS-CoV-2, rare cases of myocarditis associated with mRNA vaccines have been reported, primarily in young men. Thus, this study reports the case of a young, healthy male patient who experienced two episodes of myocarditis following administration of the mRNA vaccine against SARS-CoV-2. Case Description: A 19-year-old male patient, previously healthy, was hospitalized in September 2021 with constricting retrosternal pain. Forty-one days earlier, he had received the first dose of the mRNA vaccine against COVID-19. Laboratory tests revealed a significant elevation in markers of myocardial necrosis, such as troponin I at 8.73 ng/ml and CK-MB at 120.60 U/L, as well as an increase in C-reactive protein. Cardiac magnetic resonance imaging demonstrated late enhancement with a non-ischemic pattern, suggestive of myocarditis. The patient underwent medical treatment with a favorable outcome. Approximately two months later, following the second vaccine dose, he presented with a new episode of chest pain associated with ST-segment elevation on the electrocardiogram. A new MRI revealed progression of areas of late enhancement consistent with myocardial inflammation. Management included anti-inflammatory drugs, a beta-blocker and colchicine, with progressive clinical improvement. During four years of outpatient follow-up, the patient remains asymptomatic, with preserved ventricular function and normal laboratory results. Conclusions: This report describes a case of recurrent myocarditis associated with COVID-19 vaccination in a young patient. Although events of this nature are rare, such recognition is important for appropriate diagnosis and management. However, current evidence demonstrates that the benefits of vaccination far outweigh the potential risks, remaining one of the main strategies for public health protection.



21876

ERUPTIVE XANTHOMA IN A PATIENT WITH METABOLIC DISORDER: A CASE REPORT

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Introduction: Xanthomas are skin lesions from lipid accumulation in macrophages, signaling metabolic disorders. Eruptive xanthomas arise when triglycerides exceed 3,000 mg/dl, linked to hyperlipoproteinemia and diabetes. They appear as yellow papules on extensor surfaces and can cause pain or pruritus. Their clinical value lies in signaling acute pancreatitis risk, allowing for early diagnosis and dyslipidemia management. Case Description: A male patient, 44 years old, presents with a complaint of yellowish, occasionally suppurative lesions on the elbows for several years, which evolve in outbreaks when overindulging in fatty and carbohydrate-rich foods and decrease when following a diet. He reported having type 2 Diabetes Mellitus (DM), under regular treatment with Metformin 1g twice daily. In his family history, he mentioned a mother with DM, a father who died of Acute Coronary Syndrome at age 73, and a sister who died young from sudden death. Upon inspection, he presented multiple papular and papulo-nodular lesions, either isolated or coalescing into plaques, with an erythematous-yellowish coloration, located on the extensor surfaces of the upper and lower limbs. No other particularities were noted. Laboratory tests revealed: Fasting glucose 281 mg/dl (Reference Value (RV) >99 mg/dl), Total cholesterol 717 mg/dl (RV >190 mg/dl), Triglycerides 3473 mg/dl (RV >150 mg/dl), and Uric acid 15.2 mg/dl (RV >7.2 mg/dl). Others were unremarkable. The anatomopathological study of a skin lesion biopsy (skin and hypodermis of the left knee) showed morphological findings suggestive of xanthoma, confirming the clinical diagnosis of tuberous xanthoma associated with hyperlipoproteinemia, aggravated by the association with DM; treatment for dyslipidemia and DM was then initiated. Thirty days after diagnostic confirmation, the patient returned to the office with regression of the lesions and laboratory tests within normal limits. Conclusions: This case illustrates the significance of xanthomas as cutaneous markers of severe metabolic disorders. The exuberance of the lesions, coupled with critical triglyceride and glucose levels, reinforces the interdependence between Diabetes Mellitus management and lipid metabolism. The rapid clinical and laboratory response following therapeutic intervention underscores that early diagnosis, based on dermatological inspection, is decisive in mitigating acute risks (such as pancreatitis) and reducing long-term cardiovascular risk, proving essential for a favorable patient prognosis.





21518

FAMILIAL EXTREME HYPOCHOLESTEROLEMIA AND EARLY ISCHEMIC STROKE: A CLINICAL PARADOX IN CARDIOVASCULAR PREVENTION

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Introduction: Familial Hypobetalipoproteinemia (FHBL) is a rare genetic dyslipidemia characterized by residual levels of LDL-cholesterol, theoretically conferring protection against atherosclerosis. The occurrence of severe ischemic events in these individuals challenges classical cardiovascular risk stratification. We report a case of early ischemic stroke in a patient with an FHBL phenotype, identified through cascade screening in Primary Health Care. Case Description: A 49-year-old male presented with a history of two early ischemic strokes (the first at age 40 and a cerebellar event at age 47, leaving him with residual dyslalia). He has a high cardiometabolic risk profile due to systemic arterial hypertension, insulin-dependent type 2 diabetes mellitus, smoking, and obesity. Despite being on a minimal dose of simvastatin, his lipid profile revealed extreme hypocholesterolemia with an LDL-cholesterol of 20 mg/dL, an atypical pattern strongly suggestive of a primary dyslipidemia. The etiological investigation ruled out cardioembolism, as both the echocardiogram and the 24-hour Holter monitor were unremarkable. Brain Magnetic Resonance Angiography (MRA) demonstrated microangiopathy and supratentorial ischemic lacunae, without large vessel occlusion. During family cascade screening, three sisters presented with LDL-cholesterol levels between 32 and 38 mg/dL in the absence of lipid-lowering therapy, all remaining free of cardiovascular events. The mother (with a history of hemorrhagic stroke) and the remaining three siblings showed lipid profiles without a protective pattern. Clinical screening validated the familial phenotypic aggregation, even though genetic confirmation is unavailable within the Brazilian public health system (SUS). Conclusions: A clinical paradox is evident: while relatives with the extreme hypocholesterolemia phenotype maintain atherosclerotic protection, the index patient suffered recurrent early ischemic events. The pathophysiological hypothesis assumes that chronic microvascular endothelial injury, induced by severe blood pressure and glycemic decompensation, overcame the hypolipidemic protection, leading to a lacunar rather than atherothrombotic etiology. Innate protection from low LDL-cholesterol does not waive the strict control of other risk factors for effective secondary prevention. This report highlights the importance of clinical investigation in Primary Health Care for managing cardiovascular risk.

19175

ST-SEGMENT ELEVATION MYOCARDIAL INFARCTION IN A TESTOSTERONE USER

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Introduction: The use of anabolic-androgenic steroids without clinical indication and without medical supervision has increased substantially, particularly for aesthetic purposes. This practice is associated with an elevated cardiovascular risk, even among previously healthy individuals. Synthetic testosterone derivatives have been implicated in deleterious pathophysiological mechanisms, including endothelial dysfunction and the promotion of a prothrombotic state. This state is characterized by increased platelet aggregability, favoring thrombus formation and the occurrence of acute cardiovascular events such as myocardial infarction. Case Description: A 45-year-old male, previously healthy and with no known cardiovascular risk factors, had been using testosterone for aesthetic purposes for two years. He presented with chest pain, and an electrocardiogram revealed ST-segment elevation in the anterior wall. Following the diagnosis of ST-segment elevation myocardial infarction (STEMI), dual antiplatelet therapy was initiated with a loading dose, and the patient was referred to the hemodynamics unit. Coronary angiography revealed total thrombotic occlusion of the proximal segment of the left anterior descending artery. The patient underwent percutaneous coronary intervention with stent implantation, achieving restoration of TIMI 3 flow. Laboratory findings showed markedly elevated cardiac biomarkers, with troponin levels exceeding 30,000 pg/mL. During hospitalization, the patient remained hemodynamically stable, although persistent electrocardiographic changes compatible with electrically inactive areas in the anteroseptal and high anterolateral walls were observed. Transthoracic echocardiography performed prior to discharge demonstrated a left ventricular ejection fraction of 41%, with hypokinesia of the apical, mid-anterior, and anteroseptal segments. The patient was discharged on guideline-directed medical therapy for secondary prevention and reduction of cardiovascular morbimortality: dual antiplatelet therapy, a high-intensity statin, a beta-blocker, and an angiotensin-converting enzyme inhibitor, with subsequent clinical improvement. Conclusions: This case illustrates and highlights the thrombogenic potential of testosterone as a precipitating factor for cardiovascular events in individuals without traditional risk factors. Furthermore, the absence of obstructive atherosclerotic plaques following recanalization suggests a thrombotic mechanism determined by the use of androgenic steroids.

17513

TWO-DECADE FOLLOW-UP OF ATHEROSCLEROSIS ASSOCIATED WITH HOMOZYGOUS MTHFR C677T MUTATION AND HYPERHOMOCYSTEINEMIA IN A YOUNG PATIENT

PEDRO HENRIQUE MENDONÇA CARVALLHO MADEIRA[1]; IVAN LUCAS PICONE BORGES DOS ANJOS[2]; LAIS DE SOUZA RODRIGUES[3]; LIVIA LIBERATA BARBOSA BANDEIRA[4]; ANA CAROLINA PORTO DA HORA[1]; CAIO TEIXEIRA DOS SANTOS[5]; MARIA APARECIDA DE ALMEIDA SOUZA RODRIGUES[3]; ALEXANDRE AUGUSTUS BRITO DE ARAGÃO[1]; IVANA PICONE BORGES DE ARAGÃO[1];

(1) FACULDADE DE CIENCIAS MEDICAS DE MARICA - MARICÁ - RJ - BRASIL; (2) UNIVERSIDADE FEDERAL FLUMINENSE - NITEROI - RJ - BRASIL; (3) UNIVERSIDADE DE VASSOURAS (UNIVASSOURAS) - VASSOURAS - RJ - BRASIL; (4) NORFOLK AND NORWICH UNIVERSITY HOSPITAL, UNIVERSITY OF EAST ANGLIA - UNITED KINGDOM; (5) HOSPITAL UNIVERSITARIO PEDRO ERNESTO - RIO DE JANEIRO - RJ - BRASIL;

Introduction: Homocysteine is an intermediate amino acid in methionine metabolism whose plasma accumulation, known as hyperhomocysteinemia (Hhcy), is associated with increased cardiovascular risk. Although hyperhomocysteinemia has been associated with increased cardiovascular risk, the clinical relevance of MTHFR mutations and the long-term benefit of targeted vitamin supplementation remain debated. Genetic alterations, such as mutations in the methylenetetrahydrofolate reductase (MTHFR) gene, may elevate serum homocysteine levels and contribute to thrombotic, atherosclerotic, and neurological events, particularly in young individuals.The aim of this study was to report the clinical case of a patient with hyperhomocysteinemia due to a homozygous MTHFR gene mutation associated with cardiovascular and cerebrovascular disease with extended longitudinal follow-up. Case Description: A 65-year-old male suffered an ischemic stroke at age 45 due to left vertebral artery dissection and acute thrombosis, resulting in persistent visual deficits and vertigo. Initial risk factors included hypertension and dyslipidemia, yet the event's precocity prompted an etiological screening that identified hyperhomocysteinemia (16.6 µmol/L) and a homozygous MTHFR C677T mutation. Treatment was established with folic acid, B-complex vitamins, statins, and antiplatelet therapy. In 2017, a brief period of non-adherence to vitamin supplementation led to a homocysteine rebound, directly coinciding with subclinical atherosclerotic progression: imaging revealed a new carotid fibrolipid plaque and an increase in the coronary calcium score (CAC). Strict reintroduction of folic acid stabilized these findings. Between 2013 and 2025, longitudinal follow-up showed no myocardial ischemia or ventricular dysfunction. Coronary CTA and Doppler ultrasound of the carotids and lower limbs confirmed stable, mild-to-moderate obstructions with preserved distal triphasic flow. During this 12-year monitoring period, the CAC score remained between 450 and 749, with no new ischemic events recorded. Conclusions: MTHFR-related hyperhomocysteinemia is a critical driver of early-onset atherosclerosis. Sustained vitamin therapy and rigorous monitoring are essential to halt disease progression and prevent recurrent macrovascular events over decades. The association between folic acid interruption and plaque progression underscores homocysteine as a modifiable driver of atherosclerosis, requiring strict biochemical adherence for long-term stabilization.

17089

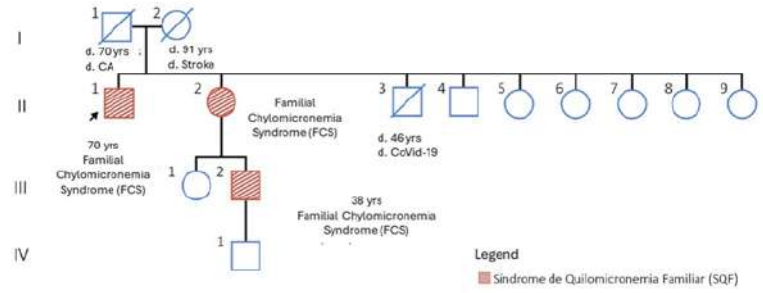
VOLANESORSEN FOR FAMILIAL CHYLOMICRONEMIA SYNDROME: THERAPEUTIC DISPARITIES AND CLINICAL RESPONSE IN A FAMILY LINEAGE — A CASE REPORT

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Introduction: Familial Chylomicronemia Syndrome (FCS) is a rare genetic disorder causing severe, persistent hypertriglyceridemia (HTG) due to defects in the lipoprotein lipase (LPL) pathway or its cofactors. Lack of LPL activity impairs triglyceride (TG) breakdown, so chylomicrons (CM) remain in plasma even after fasting. HTG carries a high risk of recurrent acute pancreatitis. Conventional therapies – diet, fibrates, and omega-3s – often fail to control TG levels in genetically affected patients. Targeted inhibition of apolipoprotein C-III (ApoC3), such as with volanesorsen, offers sustained TG reduction. Case Description: This report describes two siblings with the same compound heterozygous variants in APOA5 (Figure 1), associated with type V hyperlipoproteinemia and recurrent pancreatitis. Patient II.1: Male, 68 years, critical lipids despite gemfibrozil and simvastatin: TG 2,620 mg/dL; total cholesterol 345 mg/dL; HDL 26 mg/dL. Genetic testing confirmed type V hyperlipoproteinemia and found APOA5 variants: c.758T>C (likely pathogenic) and c.490G>C (Variant of Unknown Significance). Volanesorsen was requested from the public health system (SUS), leading to a significant reduction in TG. Patient II.2: Sister, 65 years, HTG 530 mg/dL and a pancreatitis episode. Genetic studies showed the same diagnosis. She awaits volanesorsen. Patient III.2: Son of II.2, 38 years. Asymptomatic despite no medication. TG: 924 mg/dL; total cholesterol: 282 mg/dL; HDL: 34 mg/dL. Submitted to genetic panel to assess pathogenic variants. Conclusions: Both siblings had severe HTG despite optimized therapy, highlighting the limits of conventional strategies for genetic cases. Compound heterozygous APOA5 variants likely contributed to severe disease, as such genotypes often yield more serious phenotypes. The siblings' contrasting outcomes showed that volanesorsen provided robust TG control, reducing patient II.1's risk of acute pancreatitis.

Figure 1. Familial history



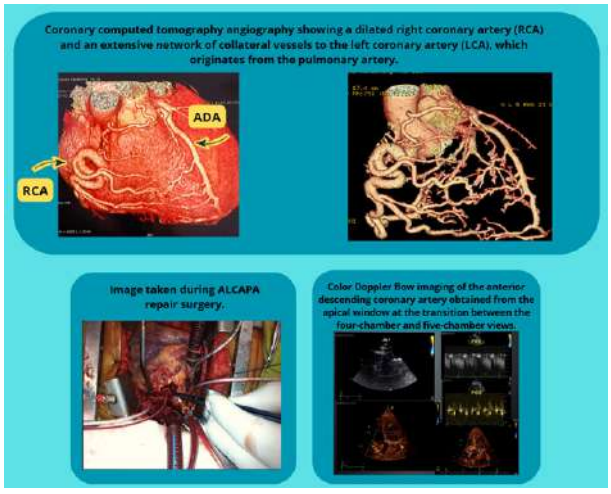
16127

LATE PRESENTATION OF ALCAPA SYNDROME: DIAGNOSIS AT 32 YEARS AND FAVORABLE POSTOPERATIVE EVOLUTION

RODRIGO ALEXANDRE SANTOS DE JESUS[1]; INGRID GONÇALVES SIQUEIRA BROWN[1]; ALEXANDRE DO COUTO CHAGAS DE GOES[1]; TATIANA REGINA AMARAL[1]; GIULIA HONÓRIO PADIGLIONE TEXEIRA[2]; MARCIA CRYSTINA DE MIRANDA GUIMARÃES[1]; LUAN ALVIM MOREIRA[1]; ROBERTA DO CARMO LOPES[1]; DIOGO MOREIRA THOMAZ PEREIRA[1]; RAFAEL RABISCHOFFSKY[3]; THAISSA MONTEIRO[4]; ARNALDO RABISCHOFFSKY[3];

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Introduction: Anomalous Left Coronary Artery from the Pulmonary Artery (ALCAPA) is a rare congenital heart defect (estimated incidence 1:300,000 live births) in which the left coronary artery originates from the pulmonary artery. Clinical presentation ranges from severe heart failure in infancy to oligosymptomatic forms in adulthood, depending on collateral circulation. Survival into the third decade without surgical correction is exceptional, underscoring the clinical relevance of this case. Case Description: A male patient with a prenatal diagnosis of unspecified congenital heart disease was treated with hydrochlorothiazide and digoxin until age 13, then discharged from cardiology follow-up. He remained asymptomatic for 19 years, including during military service. At 32 years, he developed recurrent symptoms, including precordial pain, frequent extrasystoles, and exertional fatigue. On May 1, 2013, echocardiography revealed mild left ventricular and atrial dilation, preserved systolic function with grade II diastolic dysfunction, apical hypokinesia, dilation of the right coronary artery, reverse turbulent flow in the anterior descending artery, and mild mitral regurgitation. Computed tomography confirmed anomalous origin of the left coronary artery from the pulmonary artery, an extensive collateral network, right coronary artery hypertrophy, and apical anterior subendocardial hypoperfusion with spherical remodeling of the left ventricle. On May 27, 2013, he underwent surgical correction via median thoracotomy with cardiopulmonary bypass and normothermic cardioplegia. Coronary translocation was performed by excising the coronary ostium from a posterolateral right position and reimplanting it end-to-side into the aortic coronary sinus. The pulmonary artery was reconstructed using bovine pericardium. Postoperative course was satisfactory, with adequate hemodynamic recovery. At present, 12 years after surgery, the patient is asymptomatic and studying Medicine, demonstrating excellent quality of life and full social reintegration. Conclusions: This case highlights the adaptive capacity of the coronary system through collateral circulation, allowing prolonged survival in uncorrected ALCAPA. The late diagnosis at 32 years and favorable postoperative course following coronary translocation underscore the importance of maintaining clinical suspicion in young adults with atypical cardiovascular symptoms. Direct reimplantation proved effective even in late presentations, providing an excellent long-term prognosis.



16634

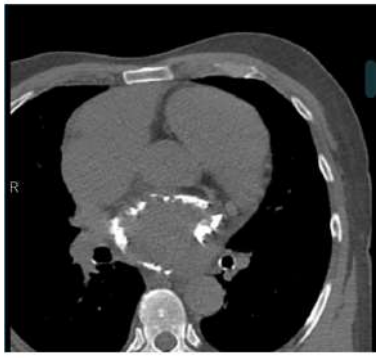
PORCELAIN LEFT ATRIUM AS A LIMITING FACTOR FOR SURGERY IN SEVERE MITRAL STENOSIS

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Introduction: Rheumatic mitral stenosis remains a major cause of structural valvular heart disease that in advanced stages may progress to extensive left atrial calcification, known as 'porcelain left atrium', a rare condition (estimated prevalence of 0.8-2.2%) that increases surgical risk and influences treatment strategy. We report a case of a patient with severe rheumatic mitral stenosis complicated by porcelain left atrium, precluding surgical intervention. Case Description: A 64-year-old male with a history of severe rheumatic mitral stenosis, chronic atrial fibrillation, and stable coronary artery disease was on Losartan (50 mg twice daily), Atenolol (25 mg twice daily), Warfarin, and Omeprazole (20 mg/day). The patient presented with dyspnea on mild-to-moderate exertion and episodes of seizures. Transthoracic echocardiography demonstrated a mitral valve with typical features of chronic rheumatic heart disease (valve area 1.17 cm² by planimetry; mean gradient 14 mmHg). There was marked left atrial enlargement (left atrial diameter = 5.8 cm; left ventricular ejection fraction = 50%) associated with atrial fibrillation, as well as pulmonary hypertension (estimated pulmonary artery systolic pressure 46 mmHg) and right ventricular dysfunction involvement with functional tricuspid regurgitation (reduced TAPSE - 16 mm). In correlation with exertional dyspnea, these findings supported an indication for mitral valve intervention. Pre-procedural cardiac catheterization revealed calcification requiring further evaluation.The chest computed tomography revealed an enlarged left atrium with extensive diffuse laminar calcifications involving its walls, with sparing of the interatrial septum and left atrial appendage, along with calcific involvement of the mitral leaflets, findings consistent with porcelain left atrium. Surgical intervention would necessitate left atriotomy through extensively calcified tissue. Therefore, surgical intervention was contraindicated given the anticipated high perioperative morbidity and mortality, and the patient was managed with optimized medical therapy. Conclusions: The presence of a porcelain left atrium is a clinically significant finding that limits conventional surgical approaches due to elevated operative risk of cardioembolic events and increased susceptibility to atrial arrhythmias. This case underscores the essential role of multimodality imaging in risk stratification and demonstrates how specific anatomical features critically influence therapeutic decision-making.





20724

ACUTE PEDIATRIC CHAGAS DISEASE ASSOCIATED WITH CARDIOGENIC SHOCK AND SEVERE BIVENTRICULAR DYSFUNCTION: A CASE REPORT

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Introduction: Chagas Disease is an infection caused by Trypanosoma cruzi and may present with severe cardiac involvement, especially during the acute phase. Case Description: A previously healthy 4-year-old male patient from Belém was admitted in September 2025 with persistent fever for one week, abdominal distension, and severe cardiovascular impairment. Initial evaluation revealed a large pericardial effusion causing ventricular filling restriction and low cardiac output, requiring surgical drainage and admission to the pediatric intensive care unit. There was a relevant epidemiological history of a family member presenting with febrile illness and cardiopathy leading to death without a definitive diagnosis. During hospitalization, the patient developed cardiogenic shock, severe heart failure, and required vasoactive drugs. Serial echocardiograms demonstrated significant biventricular systolic dysfunction, with a lowest ejection fraction of 20%. On September 18, 2025, the second thick blood smear confirmed acute Chagas disease, and benznidazole therapy previously initiated was maintained. The patient experienced a critical clinical course, including cardiorespiratory arrest, dialysis-dependent renal failure, sepsis, and prolonged mechanical ventilation. Severe gastrointestinal complications developed, including cecal perforation, requiring ileoappendicocectomy and terminal ileostomy. Multiple antimicrobial and antifungal regimens, prolonged intensive support, and tracheostomy were necessary. Despite the initial severity, there was progressive recovery of cardiac function, with improvement of the ejection fraction to 60% by December 2025. Significant sequelae persisted, including severe malnutrition, neurological abnormalities compatible with leukoaraiosis and diffuse cerebral volume loss, as well as inferior vena cava thrombosis. The child was discharged from the hospital and remains under follow-up with cardiology, pediatrics, and infectious disease specialists. Conclusions: Acute Chagas Disease in childhood may present with a fulminant course, especially when associated with severe myocarditis and hemodynamic instability. This case highlights the importance of early recognition in endemic areas when febrile syndromes are associated with cardiac manifestations. The rapid progression to heart failure and multisystem dysfunction demonstrates the high severity of acute Trypanosoma cruzi infection, reinforcing the need for early intensive and multidisciplinary management.

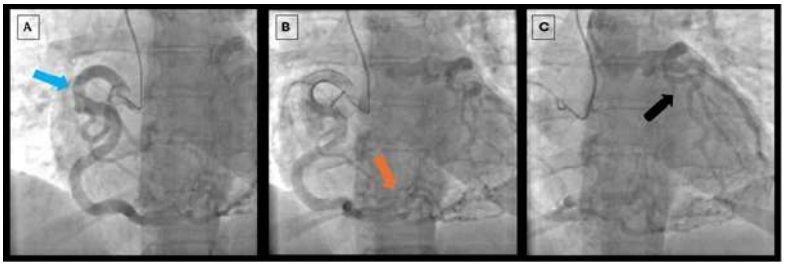
15763

ALCAPA SYNDROME IN ADULT: LATE PRESENTATION OF A RARE CONGENITAL HEART DISEASE

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Introduction: The Bland-White-Garland syndrome, also known as ALCAPA (Anomalous Left Coronary Artery from the Pulmonary Artery), is a rare congenital heart disease characterized by the anomalous origin of the left coronary artery from the pulmonary artery. Typically diagnosed in infancy, it carries high mortality when left untreated. Adult presentation is uncommon and depends on the progressive development of a well-developed collateral circulation between the right coronary artery and the left coronary system. We present a case of ALCAPA diagnosed in adulthood, highlighting its clinical and diagnostic features. Case Description: A 48-year-old female patient, without traditional cardiovascular risk factors, presented with exertional dyspnea, typical chest pain triggered by physical activity, and episodes of syncope. Echocardiography demonstrated dilation of the left chambers, with preserved systolic function and evidence of diastolic dysfunction of the left ventricle. Myocardial perfusion scintigraphy revealed anterior wall ischemia. Coronary angiography was performed, showing aneurysmal dilation and tortuosity of the right coronary artery (Figure 1A), in addition to an extensive network of fistulas with collateral circulation to the left coronary artery (Figure 1B). Absence of the origin of the left coronary artery from the sinus of Valsalva was observed, with retrograde filling from the right coronary collateral network and draining into the main pulmonary artery (Figure 1C), establishing the diagnosis of ALCAPA. Coronary computed tomography angiography confirmed the anomalous origin of the left coronary artery from the pulmonary artery. Given the ischemic burden and risk of adverse events, surgical correction was indicated and successfully performed. Conclusions: ALCAPA syndrome in adults is a rare and potentially severe condition. The combination of coronary angiography and coronary computed tomography angiography was crucial for diagnosis and appropriate anatomical characterization of the anomaly, reinforcing the role of multimodality imaging in the diagnostic refinement of coronary malformations. Figure 1: Coronary angiography. (A) Right coronary artery (RCA) with diffuse aneurysmal dilation. (B) Extensive network of fistulas with well-developed collateral circulation to the left coronary artery (LCA). (C) Flow through the anomalous LCA occurring via retrograde filling from the collateral network arising from the RCA and draining into the main pulmonary artery.



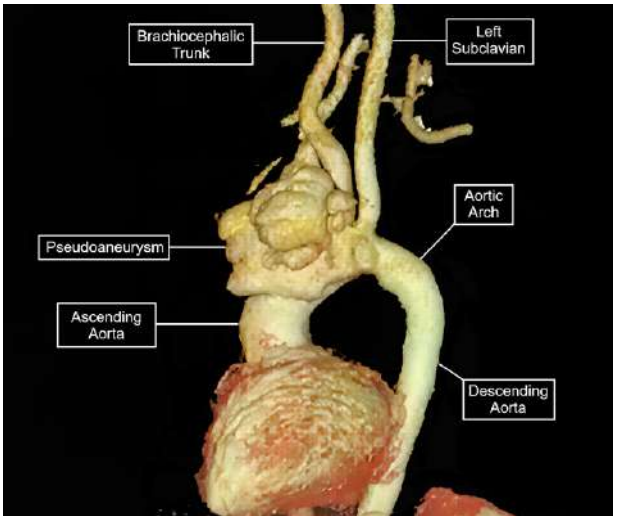
16351

ASCENDING AORTA AND ARCH REPLACEMENT IN A 6-YEAR-OLD CHILD DUE TO PSEUDOANEURYSM: A CASE REPORT.

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Introduction: Aortic pseudoaneurysm is a transmural disruption with dilation of the aortic wall. It is a rare complication of cardiac surgery, with an incidence of <0.5%. In pediatrics, it is even less common and usually secondary to aortic coarctation repair, valvular surgeries or ventricular septal defect (VSD) repair. Its pathogenesis is associated with surgical manipulation, due to cannulation and suture sites representing points of vulnerability. Because it is often asymptomatic, diagnosis depends on clinical suspicion and imaging studies. This abstract highlights a pediatric aortic pseudoaneurysm as a late complication of prior cardiovascular surgery. Case Description: The patient is a 6-year and 2-month-old female, weighing 20.5 kg. At birth, was diagnosed with aortic coarctation, VSD, atrial septal defect, bicuspid aortic valve and mitral regurgitation. A coarctation repair, a patent ductus arteriosus ligation, a pulmonary artery banding, and a definitive VSD repair were successfully performed in her first months of life, with satisfactory evolution, adequate development and clinical progress in weight and height. At 6 years, began experiencing pain and paresthesia in both lower limbs, exacerbated by ambulation. Initially interpreted as “growing pains,” the increasing symptoms led to hospitalization. Lower limb Doppler Ultrasound identified thromboembolism in the right and left superficial femoral arteries. Extensive research was initiated to define the origin of the event, and an angio-CT scan revealed a lobulated and irregular pseudoaneurysm in the proximal third of the aortic arch, measuring 6.9 cm in its transverse axis and 4.3 cm in the anteroposterior axis, with a mural thrombus causing stenosis of the brachiocephalic trunk. The aortic pseudoaneurysm was resected, followed by complete reconstruction of the vessels interposing a Dacron tube over the ascending aorta and arch, with reimplantation of the brachiocephalic trunk and left carotid artery. The procedure occured uneventfully, the patient had a favorable postoperative recovery and was discharged in good clinical conditions. Conclusions: Aortic pseudoaneurysm following cardiac surgery is a rare complication. Complete reconstruction of the ascending aorta and arch constitutes an effective surgical approach, yielding favorable outcomes. The asymptomatic nature underscores the longitudinal surveillance and extensive diagnostic investigation in clinically suspicious cases as essential tools for early diagnosis and successful treatment.



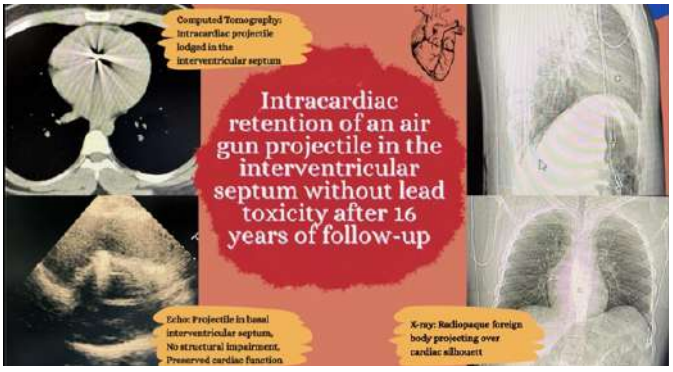
19202

INTRACARDIAC RETENTION OF A LEAD PELLET FROM AN AIR GUN IN THE INTERVENTRICULAR SEPTUM: 16-YEAR FOLLOW-UP

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Introduction: Cardiac injuries caused by projectiles are rare, especially in childhood. The intracardiac retention of metallic foreign bodies raises concerns regarding mechanical complications and the risk of lead intoxication. The management of such cases remains controversial. Case Description: A 19-year-old male with a history of penetrating thoracic trauma caused by an air gun lead pellet at the age of 3 years. Following the injury, he developed three episodes of cardiorespiratory arrest, was successfully resuscitated, and transferred via aeromedical transport. Upon admission, a tension hemothorax was identified, and urgent chest drainage was performed. Imaging studies revealed a projectile lodged in the basal interventricular septum, near the aortic valve, and a conservative management approach was adopted. The patient remains asymptomatic, without complications. Imaging exams confirm stability of the projectile, with no structural repercussions. There has been no elevation in serum lead levels at any point during follow-up, with a current value of 0.7 µg/dL (reference value: up to 10 µg/dL), and no clinical signs of lead intoxication. Conclusions: Retention of lead-containing projectiles may be associated with the risk of systemic intoxication, particularly in locations with greater exposure to body fluids. In theory, continuous exposure may lead to gradual absorption of the metal and development of lead poisoning. However, projectiles encapsulated within fibrous tissue, especially in stable intracardiac locations without direct contact with turbulent blood flow or significant tissue erosion, may present a low risk of systemic leaching. International recommendations suggest periodic monitoring of serum lead levels. Levels below 5 µg/dL are considered low risk, with no indication for intervention beyond surveillance.



17371

RECOVERY OF VENTRICULAR FUNCTION AFTER OFF-LABEL USE OF SACUBITRIL/VALSARTAN IN A PRESCHOOL-AGED CHILD WITH SEVERE HEART FAILURE SECONDARY TO NON-COMPACTED MYOCARDIUM ASSOCIATED WITH TRPM4 AND TNNT2 GENES MUTATIONS.

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Introduction: Sacubitril/valsartan is used in the management of patients with Heart Failure (HF). Unlike Europe and the United States, Brazil has regulatory approval only for adults due to the lack of large prospective randomized clinical trials in pediatric populations. We report the off-label use of sacubitril/valsartan in a patient with mutations in the TRPM4 and TNNT2 genes who did not respond satisfactorily to other therapeutic classes, supporting the potential use of this medication in the treatment of pediatric HF. Case Description: A 2-year-old male patient diagnosed with complete atrioventricular block during gestation and fetal bradycardia at birth. On the first day of life, he underwent implantation of an external pacemaker and, after 16 days, a unichamber epicardial pacemaker. During the etiological investigation, maternal lupus was ruled out; karyotype and CGH-array showed no abnormalities. Whole-exome sequencing identified mutations in TRPM4 and TNNT2. An echocardiogram suggested non-compacted left ventricle. The patient had been receiving Enalapril, Carvedilol, Hydrochlorothiazide, and Furosemide, and was under cardiological and arrhythmological follow-up due to significant biventricular systolic dysfunction, with a left ventricular ejection fraction (LVEF) of 25–30%. He experienced hospitalizations following vaccinations, including a severe episode after the MMRV vaccine, which progressed to cardiopulmonary arrest. Subsequently, his LVEF deteriorated to 10%, at which point sacubitril/valsartan in a compounded formulation was introduced to replace Enalapril and Hydrochlorothiazide. Serial echocardiograms demonstrated progressive recovery of ventricular function, with clinical improvement and an LVEF higher than the phase of treatment when conventional therapy was being used. Conclusions: In childhood, HF is potentially fatal, and proper treatment is essential. Several drug classes are used, but in some cases they are not sufficiently effective, requiring consideration of agents such as sacubitril/valsartan, which has shown efficacy in severe HF refractory to conventional therapy. However, in Brazil, its use in pediatrics remains off-label. The progressive improvement in LVEF and NT-proBNP levels, along with better clinical and hemodynamic status, highlights the drug's promising potential. Therefore, disseminating clinical evidence on its pediatric use is important to help reduce barriers to access.

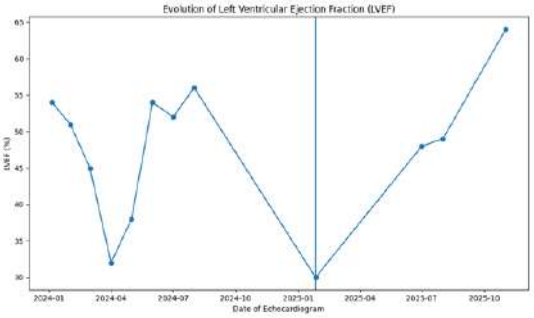
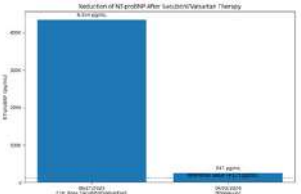


Figure 1. Evolution of left ventricular ejection fraction during follow-up, demonstrating improvement after initiation of sacubitril/valsartan. Source: author's own work.



16636

RECURRENT PERICARDITIS AND CARDIOGENIC SHOCK AS MANIFESTATIONS OF FAMILIAL MEDITERRANEAN FEVER TRIGGERED BY CHIKUNGUNYA VIRUS: A PEDIATRIC CASE REPORT

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Introduction: Familial Mediterranean Fever (FMF) is a rare autoinflammatory disorder characterized by recurrent episodes of fever and serositis. While pericarditis occurs in less than 5% of patients, its progression to cardiogenic shock is an exceptional and life-threatening manifestation in the pediatric population. This report describes a severe cardiac presentation of FMF likely triggered by a preceding arbovirus infection. Case Description: A 11-year-old male native to Espírito Santo, Brazil, with a documented history of Chikungunya virus infection in August 2024 presented with recurrent abdominal pain, fever, and progressive dyspnea. In May 2025, he developed cardiogenic shock with a significantly reduced left ventricular ejection fraction (LVEF) of 32% and moderate pericardial effusion. Management required intensive care support, including inotropes (dobutamine and noradrenaline) and intravenous immunoglobulin. Based on the Tel Hashomer clinical criteria—recurrent fever, chest pain, abdominal pain, and serositis—a clinical diagnosis of FMF was established. The patient showed a dramatic response to a combined regimen of corticosteroids and colchicine, with LVEF recovering to 78.9% within days. However, several relapses of serositis (pericardial and pleural effusions) occurred in July and November 2025, and most recently in March 2026, whenever medication was tapered or the colchicine dose was reduced. These recurrences confirmed the autoinflammatory nature of the disease and the requirement for continuous therapy. Follow-up in March 2026 demonstrated clinical stabilization and a preserved LVEF of 61.4% under a maintained therapeutic dose of colchicine. Conclusions: This case highlights that FMF-related serositis can present as severe, life-threatening cardiogenic shock in children. It also suggests that arboviruses, such as Chikungunya, may act as potent inflammatory triggers for FMF in genetically predisposed individuals. The application of clinical criteria (Tel Hashomer) and the dramatic response to colchicine remain the gold standard for diagnosis when genetic testing is unavailable, emphasizing the need for high clinical suspicion in cases of recurrent pediatric serositis.

21676

SCORPION STING: A DIAGNOSTIC AND THERAPEUTIC CHALLENGE THAT CAN BE FATA.

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Introduction: Scorpionism is a major public health problem in tropical regions. In Brazil, among the associated severe forms, the *Tityus* genus stands out, whose neurotoxins act on sodium, potassium, and calcium channels, promoting the release of catecholamines and acetylcholine, resulting in myocardial dysfunction and acute heart failure. This report presents a case of scorpionism in a child, illustrating that the greater the venom load per kilogram, the greater the severity. In the diagnostic approach, it is essential to rule out differential diagnoses, mainly diabetic ketoacidosis, cardiac arrhythmias, and cardiovascular dysfunctions of other causes. Case Description: A 4-year-old female patient, previously healthy, was admitted with sudden and intense pain in her right knee during school activity, vomiting, pallor, profuse sweating, and drowsiness. In the emergency room, she presented with sialorrhea and ocular deviation, being treated as a seizure with diazepam, without clinical improvement. Subsequently, capillary blood glucose ranged from 150 to 250 mg/dL and was treated as diabetic ketoacidosis. The patient developed tachypnea, thermal gradient, cold extremities, weak pulses, and hypertension. Laboratory tests revealed leukocytosis, hyperglycemia, metabolic acidosis, and elevated lactate. Due to the lack of clinical improvement and the epidemiological context, after six hours, specific antivenom for moderate scorpion envenomation was administered, along with fluid restriction. Due to acute heart failure and elevated cardiac enzymes (troponin: 6,098 ng/mL and CK-MB: 31.9 ng/mL), an echocardiogram was performed, which demonstrated significant left ventricular systolic dysfunction, an ejection fraction of 32%, and mitral and tricuspid regurgitation. After confirming the suspicion with the identification of the etiological agent at the school, a dose of antivenom for severe scorpion stings was administered, following a specific therapeutic protocol, and the child showed progressive overall improvement. Conclusions: This is a case of pediatric and cardiological emergency, in which the uncertain diagnosis delayed appropriate clinical treatment, increased morbidity, and potentiated the risk of death for the child. Fatality in these cases results mainly from early and severe cardiac compromise; therefore, immediate diagnosis and treatment are essential, even before investigating laboratory and imaging abnormalities, and it is always necessary to consider the possibility of a tropical disease.

20683

SINGLE RIGHT CORONARY ARTERY IN AN ELDERLY PATIENT WITH CHAGAS CARDIOMYOPATHY: A CASE REPORT

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Introduction: Coronary artery anomalies represent a heterogeneous group of congenital abnormalities with variable clinical implications. Single right coronary artery is an extremely rare variant in which the entire coronary circulation arises from a single right-sided artery and may, depending on its course, cause ischemic symptoms or sudden cardiac death. Chagas disease, endemic in Latin America, may progress to chronic cardiomyopathy with diffuse myocardial fibrosis, ventricular dysfunction, and substantial arrhythmic risk. The coexistence of these conditions has not been previously reported and represents a rare, highly complex clinical scenario. Case Description: A 65-year-old woman under long-term follow-up for chronic Chagas cardiomyopathy presented with new-onset fatigue, palpitations, dyspnea, and exertional chest pain. Comorbidities included hypothyroidism, obesity, systemic arterial hypertension, dyslipidemia, and type 2 diabetes mellitus. Prior cardiac evaluation showed right bundle branch block and left anterior fascicular block on electrocardiography, 1,943 premature ventricular contractions, three episodes of non-sustained ventricular tachycardia, and 13 pauses up to 2.2 seconds on Holter monitoring, and a left ventricular ejection fraction (LVEF) of 52%, apical aneurysm without thrombus, and mild systolic dysfunction on echocardiography. Given the new symptoms and prior findings, further investigation was performed. Myocardial perfusion scintigraphy revealed significant reversible ischemia in the apical and apical inferior segments (Summed Difference Score = 10; LVEF drop from 57% to 41% under stress). After multiple catheterization attempts, coronary angiography showed absence of the left coronary trunk and a dominant, large, non-atherosclerotic right coronary artery supplying the left coronary territory via the posterior ventricular branch, consistent with single right coronary artery. Conclusions: This case describes the coexistence of single right coronary artery and chronic Chagas cardiomyopathy in a patient surviving into the seventh decade, highlighting late survival despite adverse prognostic features. Ischemia was likely multifactorial, involving Chagas-related microvascular dysfunction, multiple cardiovascular risk factors, and a possible contribution from the coronary anomaly. This case reinforces the need for additional workup in patients with Chagas cardiomyopathy and ischemic symptoms, since these findings should not be automatically attributed to the underlying disease.

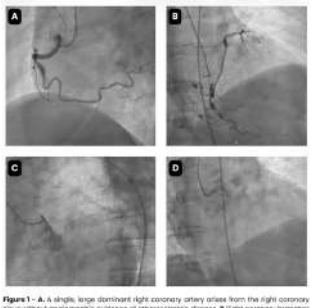
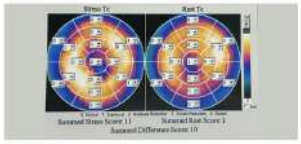


Figure 1 - A. A single, large dominant right coronary artery arises from the right coronary sinus without angiographic evidence of atherosclerotic disease. **B** Right coronary branches extended toward the anterior heart region. **C–D** Repeated attempts to identify or selectively catheterize the left coronary artery were unsuccessful.

Figure 2: Myocardial perfusion scintigraphy



Myocardial perfusion scintigraphy. Stress and rest polar maps showing reversible perfusion defects predominantly in the apical and apical-inferior segments. The summed stress score was 11, the summed rest score was 1, and the summed difference score was 10, consistent with reversible ischemia.

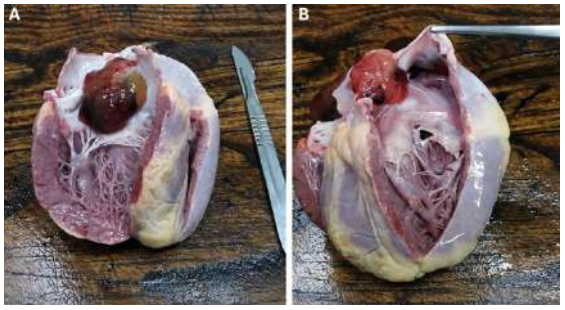
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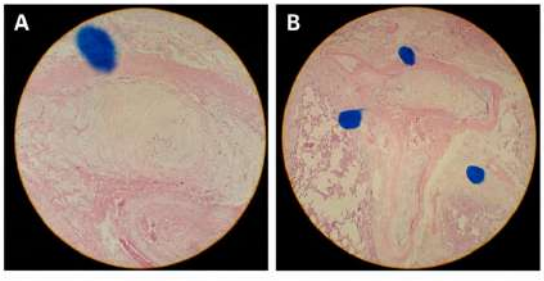
SUDDEN DEATH FROM BILATERAL ATRIAL MYXOMA IN A 15-YEAR-OLD PATIENT: A POST-MORTEM CASE REPORT.

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Introduction: Atrial myxomas are the most common primary cardiac tumors, typically appearing as solitary masses in the left atrium. Bilateral involvement is exceedingly rare, occurring in less than 5% of cases, and is often associated with familial syndromes like Carney Complex. Due to their obstructive and embolic potential, they can cause syncope and sudden death, occasionally mimicking neurological disorders. Case Description: A 15-year-old female with a reported five-year history of epilepsy, treated with valproate, was admitted following an acute onset of intense headache followed by a seizure and syncope. She arrived at the hospital in cardiorespiratory arrest and did not respond to resuscitation maneuvers. Post-mortem examination revealed two large vegetating masses, one in each atrium, both measuring approximately 5.0 x 3.0 cm. Microscopy confirmed tumoral masses in both atria composed of spindle cells within a rich myxoid stroma and areas of hemorrhage. Emboli of myxoid material were identified in the pulmonary artery parenchyma. Additional findings included mild pulmonary and cerebral edema, as well as sinusoidal liver congestion. The cause of death was determined to be bilateral atrial myxoma. The mechanism of sudden death likely involved direct cardiac blood flow obstruction by the tumors or potential coronary embolization. Conclusions: This case underscores the lethal potential of bilateral atrial myxoma in pediatric populations. The reported history of epilepsy may have been a clinical manifestation of previous embolic events or transient low cardiac output rather than a primary neurological condition. High clinical suspicion and early echocardiographic screening are essential in young patients presenting with atypical syncope or seizures to prevent fatal outcomes.



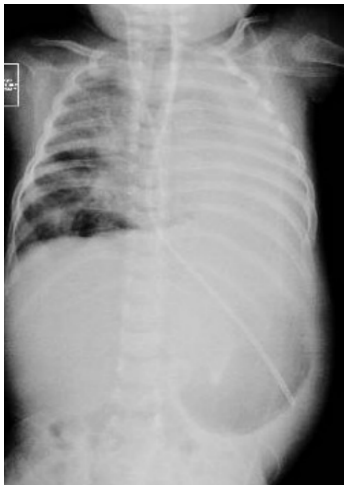


17765

TOPSY-TURVY HEART WITH AORTOPULMONARY WINDOW: MANAGEMENT AND CLINICAL COURSE OF AIRWAY COMPRESSION IN THE POSTOPERATIVE PERIOD

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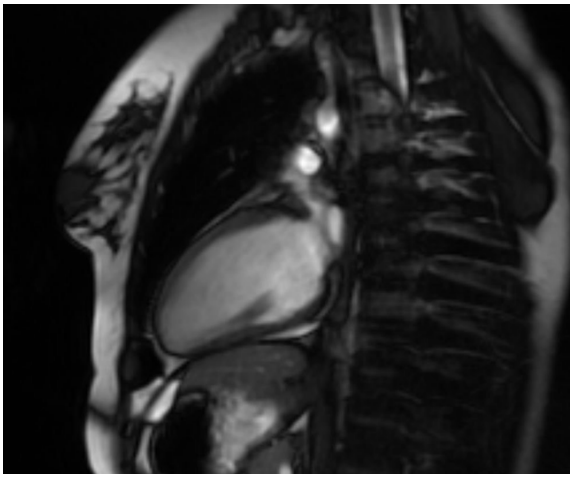
Introduction: Aortopulmonary window (APW) is a rare congenital heart defect, accounting for less than 0.2% of cardiac malformations. Its association with Topsy-Turvy Heart (TTH), a complex anomaly involving rotation of the cardiac axis and great vessels, is exceptionally uncommon and poses significant diagnostic and therapeutic challenges, especially regarding respiratory and hemodynamic complications related to the postoperative period. Case Description: A male infant was diagnosed with type I APW associated with atrial septal defect, patent ductus arteriosus, and TTH, characterized by a right aortic arch and dextroposition of the ascending aorta. At three months of age, the patient underwent successful surgical correction of intracardiac shunts using bovine pericardial patches. In the postoperative period, he developed persistent pulmonary hypertension (PH) and recurrent left-sided atelectasis. Further investigation with computed tomography angiography and bronchoscopy revealed extrinsic compression of the left main bronchus due to anomalous vascular anatomy, associated with tracheobronchomalacia. Concurrently, cardiac catheterization confirmed persistent PH (systolic pulmonary artery pressure of 58 mmHg). Management included optimization of pulmonary vasodilator therapy and intensive nutritional support. Over time, the patient showed progressive clinical improvement, with resolution of oxygen dependency, stabilization of respiratory function, and appropriate weight gain at 13 months of age. Conclusions: This case highlights the complex interaction between anomalous cardiovascular anatomy and airway mechanics in TTH. In complex positional congenital heart diseases, surgical correction represents only the initial step toward reducing morbidity and achieving clinical stabilization. Persistent ventilatory dependence should raise suspicion of extrinsic airway compression resulting from the abnormal relationship between the great vessels and the bronchial tree. This report demonstrates that favorable clinical outcomes, including independence from

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TTN-ASSOCIATED DILATED CARDIOMYOPATHY: SUSTAINED FUNCTIONAL RECOVERY AND MYOCARDIAL FIBROSIS IN A PEDIATRIC PATIENT FOLLOWING FAMILIAL SUDDEN DEATH

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Introduction: Dilated cardiomyopathy (DCM) is a leading cause of heart failure in children and adolescents. Loss-of-function variants in the TTN gene are among the most common genetic causes of familial DCM, with variable clinical expressivity. Etiological diagnosis is essential for clinical management and family screening, particularly given the risk of severe presentations. Case Description: A previously healthy 10-year-old female presented with progressive dyspnea, daily palpitations, and 10 kg (22.05 lb) weight loss over four months. During pre-operative cardiac evaluation for adenoidectomy, echocardiography revealed severe biventricular systolic dysfunction (left ventricular ejection fraction, LVEF, 22%), diffuse hypokinesia, significant mitral regurgitation, and chamber dilation. Acute myocarditis secondary to household COVID-19 exposure was initially suspected. She was admitted to the PICU and treated with dobutamine, diuretics, captopril, spironolactone, and hydralazine, achieving clinical stabilization; cardiac transplantation evaluation was initiated. Three years later, her 18-year-old brother died suddenly without prior cardiac investigation, prompting familial screening. Genetic sequencing identified a heterozygous splicing variant c.56648-1G>A in the TTN gene, classified as likely pathogenic. The patient demonstrated progressive ventricular recovery: LVEF 31% (2021), 48% (2022), 57% (2023), and 60% (2025). Cardiac MRI revealed non-ischemic midmyocardial fibrosis in the basal and mid-basal inferolateral wall of the left ventricle. Currently aged 15 years, she remains asymptomatic on carvedilol, enalapril, and spironolactone, with preserved systolic function. Conclusions: This case underscores the importance of genetic investigation in pediatric DCM of undetermined etiology. Sustained LVEF recovery over four years demonstrates the therapeutic potential of guideline-directed medical therapy in TTN-associated DCM. However, the presence of myocardial fibrosis and familial sudden death history raise critical concern regarding ventricular arrhythmia risk despite functional recovery.

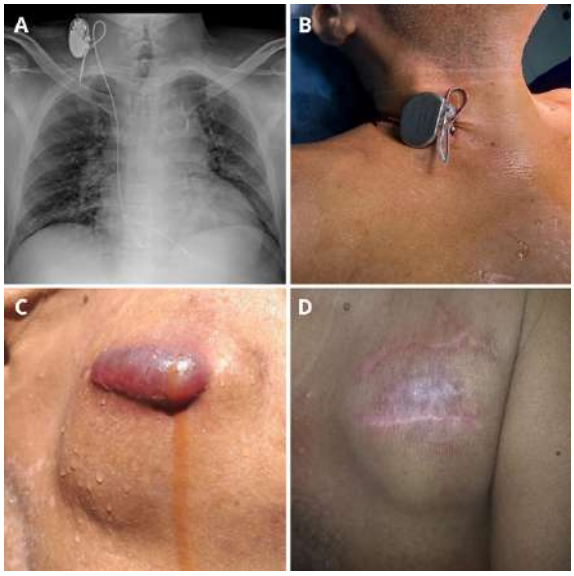
18893

BRIDGING STRATEGY IN CARDIAC DEVICE INFECTION IN A PACING-DEPENDENT PATIENT WITHOUT CONTRALATERAL ACCESS

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Introduction: Infection of cardiac implantable electronic devices (CIEDs) requires complete system extraction. In patients who are pacing-dependent and have limited venous access, management becomes particularly challenging, requiring safe and innovative alternative strategies. Case Description: A 60-year-old male patient with heart failure with reduced ejection fraction of ischemic etiology, worsened by pacemaker-induced dyssynchrony, was on optimized medical therapy at maximum doses and progressed to NYHA functional class IV. He had a history of complete atrioventricular block and was dependent on ventricular pacing, in addition to having chronic kidney disease on dialysis. He had previously undergone cardiac resynchronization therapy with an implantable cardioverter-defibrillator (CRT-D), with initial clinical improvement. Subsequently, he developed a device pocket infection, with persistent purulent drainage and failure of antibiotic therapy. Given the indication for complete system extraction and considering pacing dependence, an aggressive bridging strategy was chosen, consisting of implantation of a single-chamber pacemaker via the transvenous route, with an active-fixation lead and an externalized generator positioned in the cervical region, performed during the same surgical procedure as removal of the infected system. The patient evolved with hemodynamic stability, adequate ventricular capture, and no need for admission to the intensive care unit, showing progressive clinical improvement. After complete treatment of the infection, definitive device reimplantation was performed at the same previously infected site, with good wound healing. Contralateral reimplantation was not performed due to the presence of an arteriovenous fistula in the right upper limb, essential for hemodialysis. Conclusions: In patients with CIED infection, pacing dependence, and limited venous access, the use of a pacemaker with an active-fixation lead and an externalized generator represents an effective bridging strategy. Furthermore, reimplantation at a previously infected site, after complete infection control, may be a safe and feasible alternative in selected cases.



21764

CASE REPORT: INFLIXIMAB IN REFRACTORY TAKAYASU ARTERITIS WITH SEVERE NON-ISCHEMIC CARDIOMYOPATHY IN A PATIENT WITH SEVERE METABOLIC COMORBIDITIES

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Introduction: Takayasu Arteritis (TA) is a large-vessel vasculitis with an incidence of 1.11/1,000,000 person-years. Heart failure (HF) affects 20% of cases, with a five-year event-free survival rate of 54.7%. Although TA-associated cardiomyopathy is typically attributed to hemodynamic overload, histopathological evidence confirms inflammatory myocarditis as an independent and reversible mechanism. Disease activity shows poor clinical-laboratory correlation; vascular progression occurs in 61% of patients in apparent remission. We report the management of refractory TA with concomitant non-ischemic HFrEF. Informed consent was obtained. Case Description: A 40-year-old female patient with Takayasu Arteritis (TA) diagnosed in 2011 exhibited refractoriness to multiple regimens. In 2022, during the postpartum period, she presented with disease reactivation (aortic arch syndrome), aortic root thickening (10 mm), and pulmonary hypertension (38 mmHg). Pulse therapy and cyclophosphamide were initiated, with the latter discontinued in 2023 due to therapeutic failure. Aortic thickening regressed to 6 mm; luminal stability sustained the decision not to intensify immunosuppression (ACR 2021). In April 2025, cardiovascular evaluation revealed HFrEF (EF 29%). Coronary angiography ruled out obstructive disease; ventriculography confirmed diffuse hypokinesia. The absence of coronary artery disease and the responsiveness to corticosteroids suggest inflammatory myocarditis as the determinant of HF. In June 2025, a biopsy of lung nodules (<1 cm) confirmed rheumatoid nodules, evidencing extravascular manifestations. In December 2025, headache and cervicalgia prompted further pulse therapy, but CTA/MRA demonstrated anatomical stability, configuring clinico-radiological dissociation. Lipid decompensation and ventricular dysfunction restricted the use of tocilizumab (risk of LDL >160 mg/dL in 10% of cases). Despite the ATTACH trial associating infliximab (10 mg/kg) with HF mortality, prior failure of cyclophosphamide and leflunomide necessitated its maintenance under monitoring. Current management: infliximab, azathioprine (200 mg/day), prednisone (20 mg/day), and optimized HFrEF therapy (metoprolol, SGLT2 inhibitors, and ARNI). Comorbidities: epilepsy, fibromyalgia, and previous DVT. Conclusions: Management of TA with HFrEF requires strategies beyond inflammatory suppression. In restriction scenario, infliximab under cardiovascular surveillance was viable for inflammatory control and stabilization of ventricular dysfunction.

20609

CHRONIC ENDOMYOCARDIAL FIBROSIS ASSOCIATED WITH PERSISTENT AF AND TACHYCARDIOMYOPATHY: A THERAPEUTIC CHALLENGE

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Introduction: Endomyocardial fibrosis (EMF) is a rare restrictive cardiomyopathy that progresses from an acute inflammatory phase to a chronic fibrotic phase. In the latter, the deposition of fibrous tissue in the ventricular endocardium leads to apical obliteration and severe diastolic dysfunction. More than 30% of EMF patients present with atrial fibrillation (AF), which is associated with embolic complications and tachycardiomyopathy. EMF is endemic to certain regions, carries a guarded prognosis and has a 2-year mortality rate of 75% with medical treatment alone. This study aims to report a therapeutic challenge involving chronic-stage EMF associated with AF. Case Description: A 72-year-old male with left ventricular endomyocardial fibrosis and heart failure with reduced ejection fraction (HFrEF) of mixed etiology (EMF/tachycardiomyopathy due to AF) was diagnosed in 2022 after presenting with severe ventricular dysfunction (LVEF 26%). His ejection fraction has been oscillating, improving to 56% in 2023 following cardioversion, but dropping again in 2026 during a hospitalization for decompensated HF. He was admitted with a “cold and wet” hemodynamic profile, NYHA class IV dyspnea, orthopnea, and exertional chest pain. He also exhibited wasting syndrome (13 kg weight loss in three months), however, screening for occult malignancy was negative. Echocardiography and Chest Computed Tomography revealed that the apical region was completely obliterated (25% of the cavity) by a hyperechoic and calcified structure, consistent with chronic-phase EMF and an LVEF of 38%. The ECG showed AF and left bundle branch block, while coronary angiography revealed no obstructive lesions. During hospitalization, due to arterial hypotension and signs of hypovolemia, losartan and furosemide were discontinued, and a cautious fluid challenge was performed, resulting in improved perfusion. The patient showed clinical improvement and was discharged for outpatient follow-up, with a planned ablation. Conclusions: Heart failure management in EMF patients is complex, as AF can drastically worsen systolic function. Identifying the fibrotic stage through imaging is essential to avoid unnecessary immunosuppression and focus on hemodynamic optimization. Although surgical endomyocardectomy is the definitive option for cavitary deobliteration, its use is limited by high operative risk and perioperative morbidity and mortality. Thus, strict rhythm control and outpatient follow-up remain the primary strategies for this patient profile.

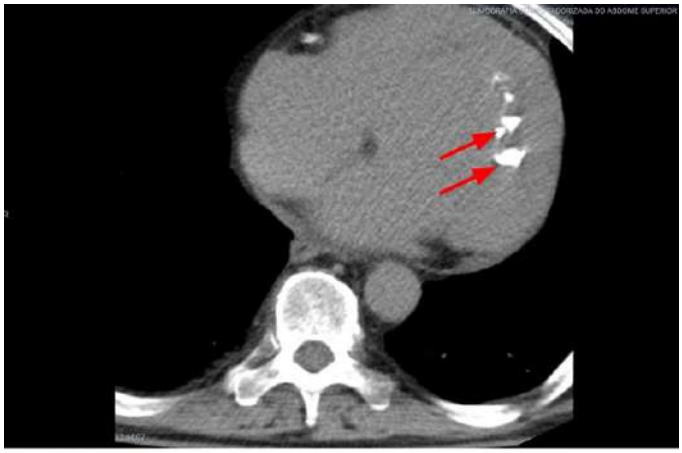


Figure 1: Computed tomography of the chest, mediastinal window, showing coarse endocardial calcifications.

18819

COCAINE-INDUCED CARDIOTOXICITY LEADING TO DILATED CARDIOMYOPATHY AND CARDIOEMBOLIC STROKE: A CASE REPORT

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Introduction: Cardiotoxicity is defined as structural or functional damage to the myocardium caused by exogenous substances. This condition is frequently associated with the use of antineoplastic drugs; however, recreational drugs such as cocaine have increasingly been recognized as important contributors. Cocaine can induce cardiotoxicity through direct myocardial injury, coronary vasospasm and prothrombotic effects. The aim of this case report is to demonstrate how cocaine use contributes to cardiotoxicity, highlighting its role as a cause of Dilated Cardiomyopathy. Case Description: A 43-year-old female patient, with a past medical history of hypertension, smoking and cocaine use presented to the emergency department with a history of progressive dyspnea over 3 weeks, which had progressed to dyspnea at rest, associated with orthopnea and bilateral lower limb edema, bilateral diffuse rales on lung auscultation, O2 saturation of 92% and BNP 6.180 pg/mL. Chest CT revealed bilateral diffuse consolidations with ground-glass opacities and cardiomegaly. She was admitted for treatment of decompensated heart failure (HF) secondary to a respiratory tract infection. There was no family history of HF. Further evaluation included cardiac magnetic resonance imaging, which demonstrated eccentric hypertrophy and global systolic dysfunction in both ventricles, with a left ventricular ejection fraction (LVEF) of 20%. Two thrombi were identified in the apical region of the left ventricle, suggesting dilated cardiomyopathy. Coronary angiography revealed no evidence of atherosclerotic disease. During hospitalization, the patient initially showed clinical improvement but unexpectedly experienced two consecutive cardiac arrests, with return of spontaneous circulation after 8 and 12 minutes, respectively. During recovery in the intensive care unit, she developed focal motor neurological deficits, and brain MRI findings were consistent with an embolic stroke in the territory of the right middle cerebral artery. Despite these complications, the patient gradually improved and was discharged after 36 days of hospitalization. Conclusions: This report describes a severe case of dilated cardiomyopathy complicated by cardiac arrest, left ventricular thrombus formation, and progression to cardioembolic stroke, likely secondary to cocaine-induced cardiotoxicity. It also underscores the importance of investigating substance use in cases without a clearly defined etiology, given its significant impact on management and prognosis.

18409

DIFFERENTIAL DIAGNOSIS OF INFILTRATIVE CARDIOMYOPATHY IN A POST-RENAL TRANSPLANT PATIENT: A CASE REPORT

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Introduction: Infiltrative cardiomyopathies represent a diverse group of pathologies characterized by the deposition of substances in the interstitium or in myocytes. Although amyloidosis is the most frequent cause, differential diagnosis with phenocopies, such as Fabry disease and dialysis-related beta-2-microglobulin (B2M) amyloidosis, is fundamental, especially in patients with multiple systemic comorbidities. This report aims to describe the complexity involved in the differential diagnosis of hypertrophic cardiomyopathies. Case Description: A 56-year-old male patient with a history of hypertension and chronic kidney disease (CKD) underwent a kidney transplant in 2022 after 17 years of hemodialysis. He presented with chronic atrial fibrillation and bilateral hearing loss and was hospitalized due to recurrent falls preceded by objective vertigo and diplopia. Cardiologic evaluation revealed an echocardiogram demonstrating left ventricular hypertrophy, with an interventricular septum measuring 20 mm and a posterior wall of 22 mm, biatrial enlargement, and diffuse myocardial hyperreflectivity with a granular appearance, suggestive of infiltrative cardiomyopathy. The electrocardiogram showed high-amplitude QRS complexes, diverging from the low-voltage pattern typically associated with amyloidosis. However, electroneuromyography demonstrated involvement of the sensorimotor fibers of the median nerves in the wrist segment, of a demyelinating nature with secondary axonal loss, compatible with chronic bilateral carpal tunnel syndrome of at least moderate severity, more pronounced on the right side, a characteristic finding of amyloidosis. Myocardial pyrophosphate scintigraphy was negative for transthyretin amyloidosis, and serum immunofixation did not detect a monoclonal component, thus reducing the likelihood of AL amyloidosis. Given the combination of myocardial hypertrophy, early-onset CKD, and axonal neuropathy confirmed by electroneuromyography, hypotheses of Fabry disease and β2M amyloidosis secondary to prolonged hemodialysis were raised, and active investigations into these conditions are currently underway. Conclusions: In this case, the discrepancy between echocardiographic and electrocardiographic findings made it necessary to investigate rare etiologies. It is important to emphasize that, in kidney transplant recipients with a history of prolonged dialysis, the recognition of extracardiac warning signs is essential to avoid diagnostic errors and guide specific therapeutic management.

15726

DILATED CARDIOMYOPATHY ASSOCIATED WITH A TTN GENE MUTATION IN AN ADOLESCENT

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Introduction: Heart failure in young patients poses a diagnostic challenge, particularly in non- ischemic etiologies such as genetic cardiomyopathies. TTN truncating variants are among the most common causes of dilated cardiomyopathy, with presentations ranging from subclinical disease to acute heart failure. Multimodality imaging combined with genetic testing is essential for accurate etiological diagnosis and management. Case Description: A previously healthy 16-year-old adolescent presented with a 20-day history of nausea, vomiting, and progressive dyspnea, which progressed to orthopnea and lower extremity edema, with no evidence of current or previous infectious disease. Physical examination revealed a gallop rhythm with a grade II/VI systolic murmur in the mitral area, blood pressure of 80/60 mmHg, and a heart rate of 112 bpm, with signs of low cardiac output. The electrocardiogram showed ventricular bigeminy. Transthoracic echocardiography revealed biventricular and biatrial enlargement, diffuse systolic dysfunction with a left ventricular ejection fraction (LVEF) of 30%, severe mitral regurgitation, and moderate tricuspid regurgitation. The patient was hospitalized and treated with vasoactive and decongestive therapy with intravenous dobutamine and furosemide, showing progressive symptomatic improvement. Cardiac magnetic resonance imaging demonstrated enlargement of the atrial chambers and left ventricle (LVEDV 228 mL / LVEFV 126 mL), with severe systolic dysfunction due to diffuse hypokinesia (LVEF 20%) and absence of late gadolinium enhancement. Right heart catheterization (using milrinone at 0.3 mcg/kg/min) showed a cardiac output of 5.8 L/min, a cardiac index of 3.04 L/min/m², and post- capillary pulmonary hypertension characterized by a low transpulmonary gradient (PAPm of 31 mmHg and transpulmonary gradient of 4 mmHg). After stabilization of cardiogenic shock, guideline-guided drug therapy was initiated, including amiodarone 200 mg, carvedilol 3,125 mg, dapagliflozin 10 mg, valsartan 80 mg, and furosemide 40 mg. The patient was discharged after clinical improvement. Genetic testing identified a heterozygous pathogenic mutation in the TTN gene. After two months of outpatient follow-up, he remains clinically stable under therapeutic optimization. Conclusions: This case highlights an acute presentation of TTN gene-related dilated cardiomyopathy in an adolescent, mimicking myocarditis, highlighting the importance of early etiological investigation and immediate guideline-guided therapy.

16569

EARLY HEART RETRANSPLANTATION AND IMMUNO-HEMATOLOGICAL CHALLENGE: THE ROLE OF MONOCLONAL GAMMOPATHY IN CARDIAC ALLOGRAFT VASCULOPATHY

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Introduction: Cardiac Allograft Vasculopathy (CAV) is the leading cause of late heart transplant failure, affecting 30 to 50% of patients within 5 years. Retransplantation in these scenarios is exceptional, reserved for selected patients with severe systolic dysfunction. The coexistence of Monoclonal Gammopathy of Undetermined Significance (MGUS) adds extreme complexity to this management, as MGUS is an independent risk factor for cardiovascular events and chronic inflammatory dysregulation. Its association with an accelerated progression of CAV raises the strong hypothesis of an overlapping and significant pathophysiological mechanism, making this clinical scenario unique and underexplored in the literature. Case Description: We report the case of a 51-year-old male patient with ischemic cardiomyopathy, type 2 diabetes mellitus and MGUS, who underwent a primary heart transplant in 2022. He had an atypically rapid progression to severe CAV (ISHLT CAV 3) and biventricular dysfunction after 3 years. Catheterization in 2025 confirmed the distal occlusion of the left anterior descending (LAD) and posterior descending (PDA) coronary arteries. He was referred for retransplantation, with preoperative exams revealing global bone marrow hypoplasia on the myelogram. The procedure took place in June 2025, and the postoperative period required intensive management, marked by bradycardia, pneumonia, and secondary pancytopenia, evidencing profound hematological fragility to immunosuppression and infection. Despite the development of chronic kidney disease, the rigorous adjustment of the immunosuppressive therapy, using tacrolimus, mycophenolate, and prednisone, enabled an excellent recovery. 3 months after the surgery, the patient is asymptomatic, with preserved biventricular function (LVEF 72%) and endomyocardial biopsies negative for rejection. Conclusions: Graft failure due to severe CAV in just 3 years is an early outcome, and this case suggests a possible interaction between the chronic inflammatory state inherent to MGUS and the pathogenesis of the vasculopathy, configuring a manifestation of monoclonal gammopathy of cardiovascular significance. The therapeutic success in the face of severe bone marrow hypoplasia and infectious complications demonstrates the viability of high-risk retransplantation. This reinforces the need for intensive cardiovascular surveillance in transplant recipients with plasma cell dyscrasias and highlights the importance of individualization of the immunosuppressive protocol.

21986

EFFICACY OF MAVACAMTEN IN THE DRAMATIC REDUCTION OF OUTFLOW TRACT GRADIENT IN REFRACTORY HYPERTROPHIC CARDIOMYOPATHY

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Introduction: Hypertrophic cardiomyopathy (HCM) is an autosomal dominant genetic disorder characterized by left ventricular hypertrophy. In symptomatic patients, left ventricular outflow tract (LVOT) obstruction—often exacerbated by systolic anterior motion (SAM) of the mitral valve—is the primary driver of clinical symptoms. Without relief of this mechanical obstruction, patients face an increased risk of progression to limiting heart failure, arrhythmias, and sudden cardiac death. Case Description: A 40-year-old male was diagnosed with severe obstructive asymmetric septal HCM. During follow-up, he exhibited high-risk criteria for sudden cardiac death: a positive family history, recurrent syncope, myocardial fibrosis on magnetic resonance imaging, and exertional hypotension. Despite maximally tolerated beta-blocker therapy, the patient remained highly symptomatic and functionally limited. Echocardiographic evaluation revealed a severe worsening of the resting LVOT gradient, increasing from 40 mmHg to 71 mmHg. Given the high arrhythmic and hemodynamic risk, a prophylactic implantable cardioverter-defibrillator (ICD) was considered, and targeted therapy with Mavacamten (5 mg/day) was initiated. Following treatment optimization, the patient experienced remarkable symptomatic improvement, accompanied by a drastic reduction in the LVOT gradient to 10 mmHg at rest and 19 mmHg during the Valsalva maneuver. Conclusions: Mavacamten, a first-in-class cardiac myosin inhibitor, directly targets the underlying pathophysiology of HCM by reducing dynamic LVOT obstruction. In this patient with refractory symptoms and high clinical risk, Mavacamten safely and effectively relieved the outflow gradient and improved functional capacity. This case underscores the transformative role of targeted myosin inhibition in the medical management of severe obstructive HCM, providing an effective pharmacological alternative to invasive septal reduction therapies.

21644

ENDOMYOCARDIAL FIBROSIS AND BIVENTRICULAR THROMBOSIS: A DIAGNOSTIC CHALLENGE IN HYPEREOSINOPHILIC SYNDROME

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Introduction: Hypereosinophilic Syndrome (HES), whether primary or secondary, is a rare disorder characterized by eosinophil overproduction, potentially causing severe multiorgan damage. Cardiac involvement is frequent, typically progressing from an acute inflammatory phase to a thrombotic stage, and ultimately to chronic endomyocardial fibrosis marked by intracavitary obliteration. This report highlights the importance of early diagnosis and clinical management during the acute phase to alter the disease's natural history. Case Description: A 49-year-old female with no previous comorbidities was admitted with lower limb edema, hepatomegaly, and jugular venous distention. Laboratory tests revealed anemia (hemoglobin 9.4 g/dL), thrombocytopenia (platelets 99,000/mm³), and eosinophilia (57% in the myelogram and 683 eosinophils/mm³ in peripheral blood). Echocardiography showed right ventricular (RV) hypertrophy and dilation, accompanied by diffuse hypokinesia and systolic dysfunction. After transfer to a reference center, Cardiac Magnetic Resonance (CMR) imaging confirmed endomyocardial fibrosis (Figure 1), revealing biventricular subendocardial late gadolinium enhancement, moderate pericardial effusion, and extensive images suggestive of intracavitary thrombi, findings characteristic of the inflammatory and thrombotic stages. Following safety protocols, management prioritized empirical antiparasitic therapy (essential in endemic areas) to treat concomitant subclinical parasitosis, major secondary causes of eosinophilia, and prevent Strongyloides hyperinfection syndrome. Subsequently, prednisone (1 mg/kg/day) and rivaroxaban were initiated, guided by the CMR findings. The patient showed clinical stabilization and resolution of congestion, being discharged for joint outpatient follow-up by cardiology and hematology. Conclusions: This case illustrates the severity of acute cardiac involvement in HES and reinforces that identifying the initial inflammatory stage through CMR is essential to guide immunosuppressive therapy. While the chronic phase offers few options beyond symptom management and high-risk surgeries, early intervention in the acute phase enables heart failure compensation and halts myocardial damage, drastically improving the patient's prognosis.

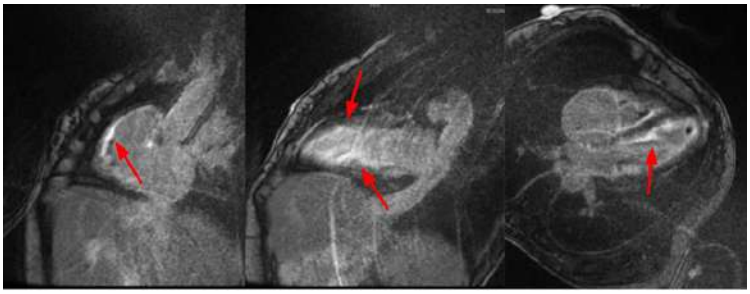


Figure 1: Cardiac magnetic resonance (CMR) findings demonstrating diffuse biventricular subendocardial late gadolinium enhancement (LGE) and a resting subendocardial perfusion deficit in the left ventricle (LV). Extensive hypointense masses, highly suggestive of intracavitary thrombi, are observed adhering to the endocardial surface of both ventricles

15930

EOSINOPHILIC MYOCARDITIS AS A SEVERE CLINICAL PRESENTATION OF A CASE OF EOSINOPHILIC GRANULOMATOSIS WITH POLYANGIITIS

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Introduction: Eosinophilic myocarditis is a rare and potentially fatal condition, characterized by infiltration of eosinophils into the myocardium and associated with varying degrees of inflammatory damage, and may present as severe acute heart failure. One of the causes of this clinical entity is eosinophilic granulomatosis with polyangiitis, which is a small-vessel vasculitis with systemic involvement, marked by eosinophilia in the peripheral blood. We report a case with this diagnosis, highlighting the role of interdisciplinary integration in diagnostic investigation. Case Description: A 58-year-old female patient, with late-onset asthma and subacute peripheral sensory neuropathy, was admitted with a clinical picture of heart failure, presenting dyspnea on minimal exertion, orthopnea, paroxysmal nocturnal dyspnea and peripheral edema. Laboratory tests revealed significant and persistent eosinophilia (11,410/µL). Echocardiography showed severe systolic dysfunction of the left ventricle (LVEF 15%), extensive segmental akinesia and an apical thrombus (2.1 × 0.9 cm). Cardiac MRI demonstrated diffuse pericardial thickening and enhancement, with mesoepicardial non-ischemic fibrosis, consistent with inflammatory myopericarditis. Endomyocardial biopsy showed myocarditis in a resolving phase, with a lymphoplasmacytic infiltrate and rare eosinophils. The association of asthma, eosinophilia, and peripheral neuropathy allowed the diagnosis of eosinophilic granulomatosis with polyangiitis with cardiac involvement. After pulse therapy with corticosteroids and cyclophosphamide, there was clinical improvement, with partial recovery of ventricular function (LVEF 30%). Conclusions: This case highlights the diagnostic complexity of eosinophilic myocarditis in the context of eosinophilic granulomatosis with polyangiitis, especially in the setting of multisystem presentation. The absence of eosinophilia in endomyocardial biopsy does not exclude the diagnosis, emphasizing that integration of clinical, laboratory, and imaging data are essential for early diagnosis and timely initiation of immunosuppression, with potential reversal of cardiac involvement.

Image 1: Endomyocardial biopsy (hematoxylin–eosin staining) showing myocardial tissue with interstitial inflammatory infiltrate predominantly composed of lymphocytes, associated with focal myocyte injury. Rare eosinophils are identified, and findings are consistent with myocarditis in a resolving phase, possibly limited by sampling variability.

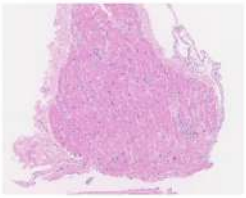
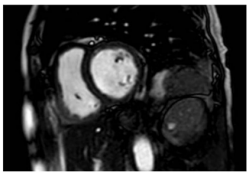


Image 2: Cardiac magnetic resonance imaging demonstrating late gadolinium enhancement with a mesoepicardial pattern involving the left ventricle.



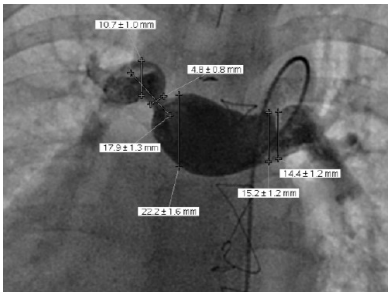
19566

HEART TRANSPLANTATION IN A CHILD WITH COMPLEX CONGENITAL HEART DISEASE: A CASE REPORT

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Introduction: Heart transplantation (HTx) is gold standard for end-stage heart failure and a viable strategy for patients with complex congenital disease (CHD), failure to thrive, severe arrhythmias, or restrictive cardiomyopathy. Decision-making weighs quality of life, alternative treatments, and life expectancy. This report details a pediatric patient, twice palliated, listed as a national priority for HTx. Case Description: 16-year-old female with heterotaxy (situs ambiguus, dextrocardia, unbalanced AVSD and double-outlet left ventricle) underwent neonatal aortic coarctation repair/PA banding and bilateral Glenn procedure at 8. Presented with worsening cyanosis and progressive functional decline. Hemodynamic evaluation revealed right pulmonary artery stenosis, continued with dyspnea, severe malnutrition and medical therapy intolerance due to hypotension persisted even after angioplasty. Onset of refractory supraventricular arrhythmias in January 2023 prompted a national priority listing for HTx. The procedure (CPB time 285'; cross-clamp 118'; total ischemia 325') required extensive anatomical reconstruction, including redirection of suprahepatic veins to the right atrium, innominate vein reconstruction with donor iliac vein graft, reversal of bilateral Glenn shunt and pulmonary trunk anastomosis. Immediate postoperative course was complicated by right-sided chamber dysfunction and acute rejection, requiring inotropic support, hemodialysis and successful treatment with corticosteroids and intravenous immunoglobulin. The patient was discharged26 days after the HTX; at 15-month follow-up, she remains clinically stable with preserved graft function and no evidence of rejection. Conclusions: While HTx in patients with complex CHD and univentricular physiology is well-established, it remains a scarcely discussed topic in literature due to extreme anatomical heterogeneity and high burden of prior palliative surgeries. These complexities often lead to exclusion from transplantation lists and there is a notable lack of high-level evidence regarding the exact indications and optimal timing for HTx in this population. This case demonstrates that the indication for HTx can be successfully driven by a severe decline in functional class, malnutrition and refractory arrhythmias rather than primary ventricular dysfunction alone. Despite the high risk of early mortality associated with complex CHD transplantation, survivors who overcome the critical perioperative period can achieve excellent long-term outcomes.





17985

HEREDITARY TRANSTHYRETIN AMYLOIDOSIS PRESENTING MAINLY WITH CARDIOMYOPATHY IN A PATIENT WITH A PREDOMINANTLY NEUROLOGIC VARIANT (P.ILE127VAL): CASE REPORT

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Introduction: Hereditary transthyretin amyloidosis (ATTRv) is a systemic, genetic, deposition disease that may present with cardiomyopathy. The p.Ile127Val variant is associated with a predominantly neurologic phenotype, with sensorimotor polyneuropathy and cranial nerve involvement, and a late cardiac phenotype, which may be underdiagnosed in clinical practice. This report describes the case of a patient with an atypical, primarily cardiac presentation of transthyretin amyloidosis due to the p.Ile127Val variant. Case Description: A 68-year-old White male patient from Rio Grande do Norte presents to cardiology due to incidental findings on imaging studies, without cardiac complaints or comorbidities and an unremarkable family history. No cardiovascular or neurologic abnormalities were found on physical examination. The electrocardiogram was also normal. A transthoracic echocardiogram revealed significant concentric left ventricular hypertrophy and right ventricular hypertrophy, with preserved function, and an interventricular septum measuring 13 mm. Subsequently, a cardiac magnetic resonance imaging study demonstrated predominantly septal myocardial hypertrophy; thickening of the interatrial septum; diffuse coarse foci of nonischemic-pattern myocardial fibrosis; and a marked increase in native T1 time and myocardial extracellular volume; findings that raised cardiac amyloidosis as the leading diagnostic hypothesis. Serum protein immunofixation showed no monoclonal protein, and the kappa/lambda ratio was of 1.31, within the normal range; thus ruling out light-chain amyloidosis. Myocardial scintigraphy with pyrophosphate showed grade 3 radiotracer uptake (Perugini scale), confirming transthyretin amyloidosis (ATTR). Genetic testing by next-generation sequencing of the TTR gene identified the pathogenic p.Ile127Val variant in heterozygosity, establishing the diagnosis of ATTRv cardiomyopathy. On neurologic evaluation, limb electroneuromyography showed no evidence of polyneuropathy, and a complaint of chronic watery diarrhea was interpreted as a probable dysautonomic symptom. The patient remains on treatment with tafamidis 20 mg/day, with favorable clinical course. Conclusions: This case combines a rare genetic disease, an uncommon mutation, and an atypical presentation, describing a patient with ATTRv due to the p.Ile127Val variant with an exclusively cardiac phenotype. Also, a discrepancy is noted between the high degree of abnormalities on imaging studies and the absence of cardiac symptoms.

21503

LEFT VENTRICULAR MYOCARDIAL INVOLVEMENT IN SYSTEMIC SCLEROSIS–DERMATOMYOSITIS OVERLAP: BEYOND PULMONARY HYPERTENSION

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Introduction: Systemic sclerosis (SSc) is an autoimmune disease characterized by vasculopathy and progressive multisystem fibrosis. Cardiac involvement in SSc is described in a minority of cases and carries significant prognostic impact, with a 5-year survival rate close to 25% Case Description: A 69-year-old hypertensive female former smoker reported progressive dyspnea during follow-up for systemic sclerosis–dermatomyositis overlap syndrome, diagnosed by skin biopsy and electroneuromyography, while receiving methotrexate and prednisone. Initial echocardiography demonstrated a Pulmonary Artery Systolic Pressure of 54 mmHg and right chamber dilation. Right heart catheterization confirmed mixed pulmonary hypertension (mean pulmonary artery pressure 29 mmHg; pulmonary vascular resistance 2.4 WU; pulmonary capillary wedge pressure 18 mmHg after fluid challenge). Due to lack of clinical improvement, methotrexate was replaced with azathioprine. During follow-up, myocardial perfusion scintigraphy performed for dyspnea investigation showed transient anterolateral hypoperfusion, with no obstructive lesions on coronary angiography. Repeat echocardiography revealed left chamber dilation, severe tricuspid regurgitation, and moderate mitral regurgitation secondary to apical tethering of the posterior leaflet. Cardiac magnetic resonance imaging demonstrated biventricular dilation with severe dysfunction (RVEF 26%; LVEF 38%) and anterolateral subendocardial late gadolinium enhancement, consistent with SSc-related myocardial involvement. At the last clinical evaluation, the patient was no longer receiving immunosuppressive therapy due to stable cutaneous and esophageal disease, but remained symptomatic with NYHA functional class II dyspnea despite optimized heart failure therapy. Conclusions: Although cardiac involvement in SSc is most commonly associated with myocardial remodeling secondary to pulmonary hypertension, approximately 20% of patients may present primary myocardial involvement resulting from microvascular disease with recurrent ischemia-reperfusion injury, inflammation, and fibrosis. Given the poorer prognosis in these cases, regular follow-up with early identification of this presentation is essential for appropriate risk stratification and optimization of medical therapy.

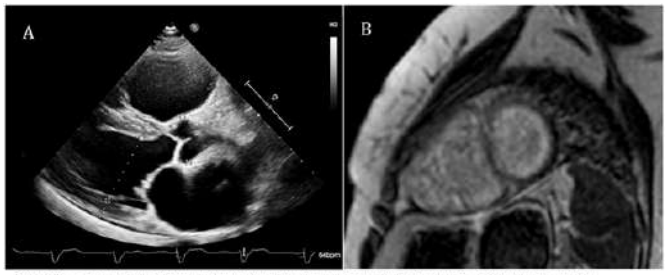


Figura A - Ecocardiograma transtorácico com tracionamento apical de cúspide posterior determinando insuficiência mitral moderada secundária.
Figura B - Ressonância magnética com evidência de realce subendocárdico circunferencial em parede anterolateral.

19581

PROGRESSION OF HYPERTROPHIC CARDIOMYOPATHY TO A DILATED PHASE ASSOCIATED WITH AN ALPK3 GENE MUTATION: A CASE REPORT

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Introduction: Heart failure is a highly prevalent clinical syndrome, affecting more than 50 million people worldwide. Among its various etiologies, hypertrophic cardiomyopathy (HCM) stands out as a genetic disease characterized by ventricular hypertrophy, which classically progresses to heart failure with preserved ejection fraction. The genes most frequently involved genes include MYH7, MYBPC3, and TNNT2. More recently, mutations in the ALPK3 gene have been associated with both hypertrophic and dilated forms, often with a more aggressive clinical course. This study aims to report a case of hypertrophic cardiomyopathy progressing to a dilated phase, leading to advanced heart failure, associated with an ALPK3 gene mutation. Case Description: A 35-year-old male patient with previous diagnosis of congenital hypertrophic cardiomyopathy has been under follow-up since childhood. Approximately five years ago presented with clinical decompensation, progressing to heart failure with reduced ejection fraction (HFrEF). His symptoms have worsened two years ago following a dental infection. The last transthoracic echocardiography revealed left ventricular dilation (55/48 mm), severe systolic dysfunction (ejection fraction 25–30%) and septal hypertrophy. Additionally, biatrial enlargement, along with findings suggestive of noncompacted myocardium and grade III diastolic dysfunction (restrictive pattern), as well as mild mitral and tricuspid regurgitation. These findings indicated progression to a dilated phenotype, and a diagnosis of dilated cardiomyopathy of initially undefined etiology was established. Despite optimized medical therapy, the patient remains in New York Heart Association (NYHA) functional class III and was therefore referred for evaluation and listing for heart transplantation. To investigate the etiology of this atypical progression, further etiological assessment with exome sequencing was performed, revealing a mutation in the ALPK3 gene. Conclusions: This case highlights the importance of genomics in the investigation of heart failure, particularly when facing atypical disease progression. It emphasizes the relevance of identifying mutations associated with more aggressive phenotypes, such as those observed in this patient, which involved the ALPK3 gene, heading the progression from hypertrophic cardiomyopathy to a dilated phase. The integration of genetic, clinical, and imaging findings is essential for accurate diagnosis, prognostic stratification, and appropriate therapeutic management.

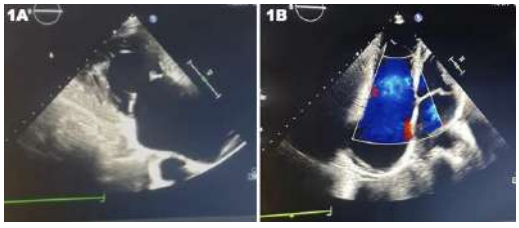
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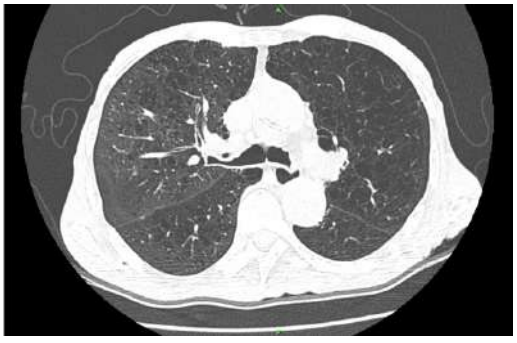
RIGHT-SIDED HEART FAILURE WITH AN OVERLAPPING PHENOTYPE BETWEEN CARCINOID HEART DISEASE AND COR PULMONALE: A DIAGNOSTIC CHALLENGE

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Introduction: Right heart failure (RHF) has multiple etiologies, including cor pulmonale and carcinoid heart disease. Cor pulmonale results from increased pulmonary vascular resistance, leading to right ventricular (RV) overload and tricuspid regurgitation due to annular dilation. In contrast, carcinoid heart disease is caused by vasoactive substances from neuroendocrine tumors, leading to fibrotic thickening and retraction of the valve leaflets, resulting in tricuspid regurgitation. Despite overlapping features, their distinct mechanisms require accurate differential diagnosis. Case Description: An 88-year-old male, heavy smoker, presented with significant weight loss, evolving with lower limb edema, dyspnea and chronic diarrhea. Physical examination revealed sarcopenia, systemic venous congestion and expiratory wheezing. Transthoracic echocardiography showed RV dilation with its dysfunction, associated with thickened tricuspid leaflets and severe coaptation failure, resulting in a single-chamber appearance. These findings, along with chronic diarrhea and a consumptive syndrome, raised suspicion for carcinoid heart disease. However investigation for neuroendocrine tumors with computed tomography (CT) and upper gastrointestinal endoscopy was negative, making the diagnosis less likely, although 5-hydroxyindoleacetic acid testing, the gold standard, was unavailable. Notably, although valvular abnormalities were suggestive, there was no unequivocal evidence of typical structural involvement, and these findings were interpreted with caution in the clinical context. Chest CT demonstrated centrilobular and paraseptal emphysema, consistent with chronic obstructive pulmonary disease (COPD), potentially explaining the right heart involvement. The patient showed significant clinical improvement after decongestion and bronchodilator therapy, being discharged for outpatient follow-up. Conclusions: In this case, echocardiographic findings and systemic symptoms suggested carcinoid heart disease, whereas pulmonary imaging, together with clinical improvement after COPD-targeted therapy, supported cor pulmonale as the most likely diagnosis. This overlap of clinical and imaging features highlights the complexity of RHF etiologies and reinforces the importance of integrating clinical, laboratory, and imaging data to guide appropriate management.





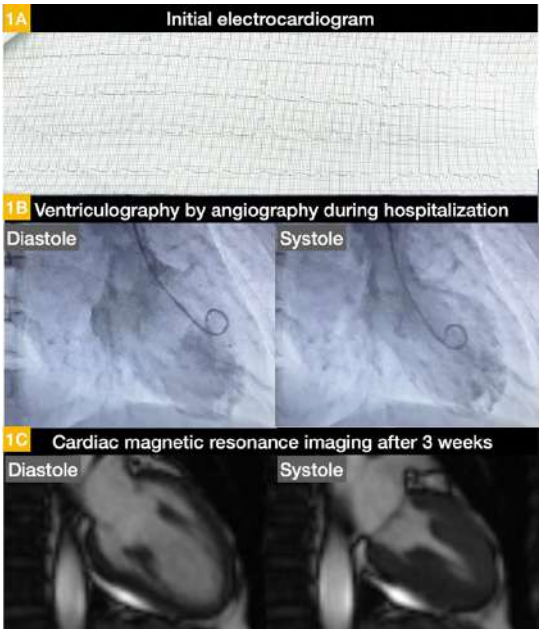
20681

SEVERE CLINICAL PRESENTATION OF TAKOTSUBO SYNDROME WITHOUT AN APPARENT PRECIPITATING FACTOR: A CASE REPORT

EDUARDA TANIGUCHI RODRIGUES FIGUEIRA[1]; WASFI NASSER SHAHIN[1]; MARIA EDUARDA CASARINI DA COSTA[1]; JÚLIA PEDRISA AFARELLI[1]; ISABELA ROBERTO BARION[1]; JÚLIA LOPES RAVAGNANI[1]; JÚLIA BARBATI SPROESSER[1]; ISABELA FERRO[1]; GIULIO CHECCHINATO FACCHINI[1]; ALCIDES ROCHA DE FIGUEREDO JÚNIOR[1]; HÉLDER JORGE DE ANDRADE GOMES[1];

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Introduction: Takotsubo cardiomyopathy is characterized by acute left ventricular (LV) systolic dysfunction, typically involving dyskinesia of the mid-apical segments and hyperkinesia of the basal portions, of non-coronary origin. Non-significant findings on invasive coronary angiography, combined with the usual fast and complete recovery of LV function, may have created a false perception of benignity within the medical community. Therefore, we present a case report illustrating the potential severity of Takotsubo cardiomyopathy. Case Description: A 46-year-old female patient was admitted with sudden retrosternal chest pain starting 1 hour prior, described as pressure, intensity 10/10, radiating to the left upper limb, with no apparent triggering factor. She has a 40 pack-year smoking history and peripheral obstructive arterial disease (chronic total aorto-iliac occlusion), with intermittent claudication during moderate exertion, under medical treatment. In the emergency room, she suffered a cardiopulmonary arrest (CPA) with an initial rhythm of ventricular fibrillation, reversed with standard care. Vasoactive drugs were required due to progression to circulatory shock following resuscitation. The post-CPA ECG showed ST-segment elevation in multiple leads, without correlation to a particular coronary territory (Figure 1A). The first attempt at emergency coronary angiography failed due to access issues (aorto-iliac occlusion and radial puncture made impossible by the shock state). After 4 days of stabilization in the ICU, a second attempt revealed non-obstructive coronary artery disease (without involvement of the left anterior descending artery) and the typical appearance of Takotsubo syndrome on ventriculography (Figure 1B). From then on, the patient showed good clinical and neurological progress and was discharged to the hospital ward. As an outpatient (26 days after admission), the patient underwent cardiac magnetic resonance imaging, which showed normal LV systolic function and absence of late gadolinium enhancement (Figure 1C), accentuating the distinction between Takotsubo and STEMI as the patient's final diagnosis. Conclusions: Takotsubo syndrome is a clinical condition of increasing recognition, responsible for up to 6% of cases of women with acute coronary syndrome, and presents in-hospital mortality comparable to STEMI in current registries (~4%). Up to 28% of patients do not present an evident triggering event, as was the case with the patient in our report.



19564

SHOULD ALL CASES OF MYOCARDITIS BE CONSIDERED VIRAL IN ORIGIN? DIAGNOSTIC CHALLENGES OF LUPUS MYOPERICARDITIS IN A PATIENT WITH SYSTEMIC LUPUS ERYTHEMATOSUS—A CASE REPORT

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Introduction: Lupus myocarditis is a serious condition found in 1.6% to 5.7% of patients with systemic lupus erythematosus (SLE). Its pathophysiology involves immune-mediated and ischemic damage caused by the deposition of immune complexes, and it can progress to arrhythmias, cardiomyopathies, and heart failure. It is diagnosed based on a combination of signs and symptoms, elevated blood inflammatory markers, echocardiographic and electrophysiological studies, myocardial enhancement on contrast-enhanced magnetic resonance imaging (MRI), and biopsy showing immune complex deposition by immunofluorescence. Treatment is based on immunosuppression to control SLE. Case Description: A 35-year-old female patient, previously healthy, was referred to the emergency department in 2012 complaining of dyspnea, diffuse chest pain, and palpitations. On physical examination, no abnormalities were noted. Subsequently, cardiac troponin levels were measured in the blood (3.7 ng/mL), an electrocardiogram was performed (indicating right atrial overload and ST-segment depression), an echocardiogram (revealing grade I left ventricular diastolic dysfunction), and a chest computed tomography scan (showing pericardial effusion and pleural effusion), which raised suspicion of myopericarditis, confirmed by contrast-enhanced MRI, with no defined etiology. Subsequently, an etiological investigation of the myopericarditis was conducted, in which serology for HIV and Hepatitis B and C, as well as blood culture and VDRL, were negative; however, there was absolute and relative lymphocytosis on the complete blood count, a positive FAN tites of 1:1280, and positive anti-SSA, anti-SM, and p-ANCA antibodies, while the levels of other autoantibodies were negative. A myocardial biopsy was performed, revealing deposition of anti-nuclear immunoglobulins on immunofluorescence. She was then diagnosed with SLE associated with acute myopericarditis and pleuritis resulting from the first flare-up of the disease. Treatment with glucocorticoids and cyclophosphamide pulse therapy was indicated, leading to complete resolution of the condition. Today, at age 47, she undergoes regular treatment with 5 mg of prednisone once daily, with no disease recurrence. Conclusions: Acute SLE myocarditis is difficult to clinically suspect and diagnose; however, unlike viral myocarditis, it responds effectively to treatment. Therefore, it is essential to consider this differential diagnosis in young women with myocarditis and to seek more efficient diagnostic methods.

14372

YAMAGUCHI SYNDROME IN A NON-ASIAN PATIENT PRESENTING WITH ATYPICAL CLINICAL MANIFESTATIONS: A CASE REPORT

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Introduction: Apical hypertrophic cardiomyopathy (AHCM), or Yamaguchi syndrome, is an uncommon morphological variant of hypertrophic cardiomyopathy characterized by predominant hypertrophy of the left ventricular (LV) apex. Although classically described in Asian populations, its occurrence in non-Asian individuals is increasingly recognized, often with atypical clinical presentation and potential misdiagnosis as acute coronary syndrome (ACS). Case Description: A 64-year-old Caucasian female with a history of systemic arterial hypertension presented with atypical chest pain and exertional dyspnea following emotional stress. Electrocardiography demonstrated diffuse anterior precordial T-wave inversion and criteria for LV hypertrophy. Serial high-sensitivity cardiac troponin assays showed mild elevation (38.5–54.1 ng/L), without dynamic ischemic pattern. Transthoracic echocardiography revealed preserved LV systolic function (ejection fraction 69%, Teichholz method), with marked apical hypertrophy and mild concentric hypertrophy of non-apical segments, raising suspicion for AHCM. Due to persistent symptoms despite optimization of antihypertensive therapy, invasive coronary angiography was performed, demonstrating non-obstructive coronary artery disease, including mild (30%) stenosis in the mid-left anterior descending artery associated with myocardial bridging, luminal irregularities in the circumflex artery, and ectasia of the right coronary artery. Given ongoing exertional dyspnea and suspected Yamaguchi phenotype, beta-adrenergic blockade (Bisoprolol 2.5 mg/day) was initiated, resulting in significant symptomatic improvement. Cardiac magnetic resonance imaging confirmed apical-predominant hypertrophic cardiomyopathy, with evidence of dynamic LV outflow tract obstruction at rest and late gadolinium enhancement consistent with non-ischemic myocardial fibrosis. Conclusions: AHCM is a distinct phenotypic variant requiring multimodality imaging for diagnosis, with cardiac magnetic resonance enabling precise assessment of apical hypertrophy and myocardial fibrosis. Late gadolinium enhancement and dynamic obstruction may be associated with increased arrhythmic risk. This case highlights the need to consider AHCM in non-Asian patients with atypical chest pain and elevated biomarkers. Multimodal imaging was essential for diagnosis, and beta-blocker therapy improved symptoms. Follow-up and family screening are recommended.

14580

CARDIAC PARAGANGLIOMA AS A CAUSE OF SECONDARY HYPERTENSION: DIAGNOSTIC CHALLENGES IN A YOUNG PATIENT.

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Introduction: Pheochromocytomas and paragangliomas are rare catecholamine-secreting tumors, accounting for approximately 0.1-0.6% of cases of secondary hypertension. Extra-adrenal tumors represent up to 15-20% of cases, whereas cardiac paragangliomas are exceptionally rare (<1%), posing significant diagnostic challenges due to their atypical location. Case Description: 20-year-old male with a family history of systemic arterial hypertension was presented with recurrent tachycardic palpitations and paroxysmal hypertension. Initial evaluation, including electrocardiogram, Holter monitoring and transthoracic echocardiography, showed no structural abnormalities; bisoprolol was initiated (5–10 mg/day). Biochemical assessment demonstrated markedly elevated urinary catecholamines (1424; reference 15-80) and plasma norepinephrine (2500 pg/mL; reference <460), confirming catecholamine hypersecretion. The patient underwent multidisciplinary evaluation; however, tumor localization remained inconclusive, with recurrent hypertensive crises requiring emergency care. Given persistent symptoms and exertional intolerance, further investigation was performed. Holter monitoring revealed rare supraventricular ectopy, a brief supraventricular tachycardia episode, and multiple sinus pauses >2.0 seconds (maximum 19.5 seconds), without ventricular arrhythmias. Transesophageal echocardiography identified a 5.4 × 5.4 × 3.7 cm sessile right atrial mass displacing the interatrial septum. Cardiac magnetic resonance imaging demonstrated a highly vascularized lesion adherent to the septum, and iodine-131 metaiodobenzylguanidine scintigraphy confirmed radiotracer uptake in the right atrial region. Preoperative management was performed with alpha-adrenergic blockade using doxazosin (6 mg/day) and beta-blockade with bisoprolol (15 mg/day), followed by surgical resection involving the right atrial wall and interatrial septum. The specimen measured 5.3 × 4.8 × 3.5 cm and weighed 48.6 g. Histopathological and immunohistochemical analyses confirmed cardiac paraganglioma as the cause of secondary hypertension. The postoperative course was uneventful. Conclusions: Cardiac paraganglioma is a rare cause of secondary hypertension, yet remains an important diagnostic consideration. Its atypical location poses diagnostic challenges, particularly when initial investigations are inconclusive, underscoring the importance of multimodal imaging and a multidisciplinary approach for accurate localization and definitive surgical management.

18154

PULMONARY ARTERY ANEURYSM PRESENTING WITH NONSPECIFIC RESPIRATORY SYMPTOMS: CASE REPORT

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Introduction: A 44-year-old male presented with bronchitis and respiratory symptoms, including recent expectoration and chronic bronchodilator use, associated with nonspecific symptoms such as excessive fatigue and intermittent dyspnea, without chest pain or syncope. Initial evaluation for primary pulmonary disease was unremarkable, prompting further cardiovascular investigation. Transthoracic echocardiography and CT angiography identified fusiform dilatation of the main pulmonary artery (40 mm) and right pulmonary artery (27 mm), while the left pulmonary artery remained normal (21 mm). Based on these findings, which were clinically significant given the risk of progression and potential for life-threatening events, the patient underwent pulmonary artery aneurysmorrhaphy. Case Description: Pulmonary artery aneurysm (PAA) is a rare and potentially life-threatening pathology of the pulmonary vasculature, most commonly associated with congenital heart disease or infections. PAA, it is frequently asymptomatic and incidentally diagnosed, as in the reported case. Therefore, the absence of pathognomonic symptoms makes diagnosis based solely on the patient's symptoms rare. However, symptoms of dyspnea, exertional fatigue, and the absence of chest pain or syncopal episodes, together with Transthoracic echocardiography and CT angiography enabled the diagnosis in this patient. Progressive dilatation of the pulmonary artery (≥70mm) may lead to catastrophic complications, including massive hemoptysis due to rupture, coronary artery compression resulting in acute coronary syndrome, bronchial or recurrent laryngeal nerve compression, and pulmonary artery dissection, which has, on average, a 50 to 100% chance of mortality (INOLAN, D. C et al. 2026). Nevertheless, the patient did not experience any of the possible complications due to early recognition and low dilation of the Pulmonary Artery. PAA is treated through a surgical procedure, which the patient underwent. Conclusions: Pulmonary artery aneurysm is a rare and diagnostically challenging condition due to its nonspecific presentation. This case emphasizes the importance of PAA, since its diagnostic difficulty stemming from the absence of pathognomonic symptoms, which could otherwise rule out differential diagnoses.

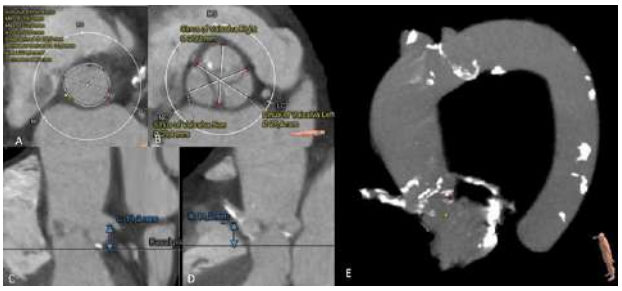
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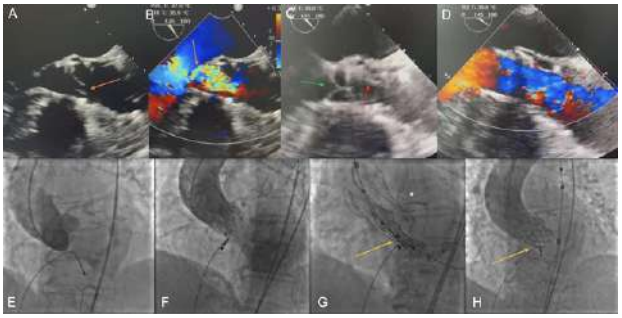
ACUTE LEAFLET INVERSION CAUSING CATASTROPHIC AORTIC REGURGITATION AFTER TAVI: SUCCESSFUL EMERGENCY TAV-IN-TAV BAILOUT IN A HIGH-RISK PATIENT

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Introduction: Transcatheter aortic valve implantation (TAVI) is the standard of care for patients with severe aortic stenosis at high surgical risk. Despite its safety profile, acute structural valve dysfunction is rare and may result in rapid hemodynamic collapse, requiring immediate bailout strategies. Case Description: An octogenarian female with severe aortic stenosis, chronic kidney disease, and restrictive lung disease was considered at prohibitive surgical risk and referred for transfemoral TAVI. Pre-procedural imaging demonstrated favorable native valve anatomy for a self-expanding prosthesis, with moderate and symmetric calcification and a symmetric aortic annulus. A self-expanding Navitor valve (Abbott) was deployed via right femoral access. Immediately after implantation, acute valve failure occurred due to leaflet inversion, leading to torrential aortic regurgitation and profound hemodynamic instability. Rapid angiographic assessment confirmed severe prosthetic dysfunction. Given the life-threatening scenario, an emergent percutaneous bailout was performed. A balloon-expandable Myval 21.5 mm valve was implanted within the failed prosthesis (TAV-in-TAV strategy). The intervention resulted in immediate abolition of regurgitation, restoration of valve competence, and rapid hemodynamic recovery. The patient had an uneventful clinical course thereafter. Conclusions: Acute leaflet inversion is a rare but potentially catastrophic complication of TAVI that may lead to abrupt hemodynamic collapse. This case highlights that prompt recognition and immediate percutaneous intervention are crucial. TAV-in-TAV implantation represents a rapid, effective, and potentially life-saving bailout strategy, allowing restoration of valve function while avoiding emergent surgery in critically ill, high-risk patients.





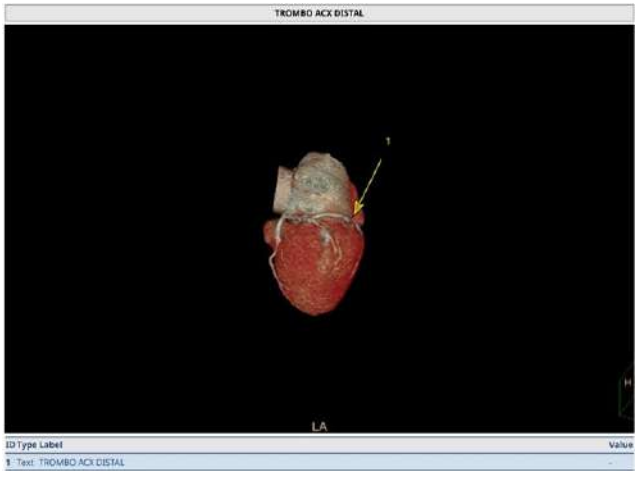
20384

ACUTE MYOCARDIAL INFARCTION TRIGGERED BY DEFECATION STRAINING IN A PATIENT WITH PROSTHETIC VALVE THROMBOSIS POST-TAVR: A CASE REPORT.

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Introduction: The transcatheter aortic valve replacement (TAVR) revolutionized the management of severe aortic stenosis by offering a less invasive alternative to surgical replacement in a large number of patients. Among potential complications, prosthetic valve thrombosis (PVT), though relatively uncommon, represents a significant challenge requiring careful monitoring and management strategies. This case report highlights a particularly intricate scenario involving PVT, further complicated by ST-elevation myocardial infarction (STEMI) in the context of a Valsalva-like maneuver. Case Description: A 75 year-old male with a history of alcoholism was admitted to the hospital with symptoms of community-acquired pneumonia. Three months prior, he had undergone a TAVR procedure in another institution. During his evaluation, an echocardiogram revealed a significant transvalvular gradient. Due to this, a computed tomography angiography (CTA) revealed intense thrombosis of the prosthetic valve. Anticoagulation was immediately initiated with enoxaparin. Approximately 48h after starting anticoagulation, he experienced severe chest pain and diaphoresis following prolonged straining during defecation. An electrocardiogram (ECG) showed findings consistent with STEMI. He was transferred to the intensive care unit and treatment was initiated with aspirin, clopidogrel, tirofiban, nitroglycerin and enoxaparin. His symptoms decreased and his condition stabilized within 36 hours. Coronary CTA demonstrated occlusion of the circumflex artery (CX) by a thrombus and a significant reduction in the thrombotic burden on the aortic valve. A new echocardiogram confirmed a reduction in the transvalvular gradient. After 10 days, coronary angiography showed no thrombus in the aortic valve and no significant coronary disease. Conclusions: The occurrence of a STEMI in a post-TAVR patient with prosthetic valve thrombosis presents an unique and complex case challenge. Low prosthesis implantation may have favored thrombus formation via turbulent flow in the left ventricular outflow tract. The excessive straining, which increased myocardial overload and systemic vascular resistance, likely contributed to the rupture of thrombus that subsequently embolized to the CX artery. This case highlights the importance of individualized risk stratification and management in post-TAVR patients with thrombotic complications, offering valuable insights into the potential management in selected cases of complex valve thrombosis.



16653

ASSOCIATION OF PARAVALVULAR LEAK AND MITRAL REGURGITATION POST TRANSCATHETER AORTIC VALVE IMPLANTATION: A CASE REPORT

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Introduction: Transcatheter aortic valve implantation (TAVI) is a minimally invasive treatment for severe aortic stenosis. Moderate-to-severe paravalvular leak (PVL) occurs in approximately 3.4% of cases, while mitral regurgitation (MR) is present in 25–30% of patients undergoing TAVI. Both are associated with worse prognosis; however, their combined occurrence, particularly when mechanically related, represents a rare and highly challenging clinical scenario. Case Description: An 81-year-old woman with obesity, hypertension, and hyperlipidemia presented with a 2-month history of progressive dyspnea (NYHA functional class III). Transthoracic echocardiography (TTE) demonstrated concentric left ventricular hypertrophy with preserved systolic function (LVEF 62%), pulmonary hypertension (estimated pulmonary artery systolic pressure 50 mmHg), and severe aortic stenosis (aortic valve area 0.8 cm^2; mean gradient 43 mmHg). The patient underwent TAVI, which was technically challenging due to aortic tortuosity. Despite successful deployment, lack of annular calcification led to prosthesis instability with 14 mm ventricular migration and significant paravalvular leak. Three weeks later, the patient developed progressive heart failure symptoms, requiring recurrent hospital admissions. Follow-up TTE demonstrated ventricular displacement of the prosthesis associated with severe PVL and newly developed severe MR, attributed to mechanical interaction between the migrated prosthesis and the anterior mitral leaflet. Given the patient's high surgical risk, a simultaneous fully percutaneous strategy was pursued, consisting of a TAVI-in-TAVI procedure with complete PVL sealing combined with transcatheter edge-to-edge mitral valve repair. The procedure was successfully performed, and the patient showed symptomatic improvement to NYHA II. Final TTE demonstrated a well-positioned aortic bioprosthesis without residual PVL, a mean transvalvular gradient of 24 mmHg, and only mild residual mitral regurgitation. Estimated pulmonary artery systolic pressure decreased to 29 mmHg. Conclusions: This case highlights a rare complication of TAVI involving severe PVL associated with secondary severe MR due to prosthesis migration. Simultaneous treatment with a fully percutaneous TAVI-in-TAVI approach combined with transcatheter edge-to-edge mitral repair is exceptionally uncommon and technically demanding. In this high-risk patient, the strategy proved feasible and safe, resulting in substantial clinical and hemodynamic improvement.

20466

CARCINOID HEART DISEASE WITH SEVERE TRICUSPID REGURGITATION: PERCUTANEOUS MANAGEMENT WITH CAVAL VALVE IMPLANTATION (CAVI) USING THE TRICVALVE SYSTEM

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Introduction: Tricuspid regurgitation (TR) is a prevalent valvular disease associated with significant morbidity and mortality. Traditionally underrecognized and often considered secondary to left-sided heart disease, its management has frequently been delayed until advanced stages, when surgical intervention carries higher risk, with in-hospital mortality rates around 9%, contributing to its undertreatment. In this context, percutaneous strategies have gained increasing attention, including edge-to-edge valve repair, annuloplasty, transcatheter valve replacement, and caval valve implantation. Among these approaches, bicaval valve implantation (Caval Valve Implantation – CAVI), represented by systems such as the TricValve, has emerged as a promising alternative for patients with severe TR and high surgical risk, leading to reduction of systemic venous reflux and clinical improvement. Thus, transcatheter therapies are redefining the management of TR, particularly in this high-risk population. Case Description: A 58-year-old female with hypertension, type 2 diabetes mellitus, dyslipidemia, hypothyroidism, and depression, on optimized medical therapy, presented with facial flushing and chronic diarrhea and was diagnosed with metastatic hepatic neuroendocrine tumor in the setting of carcinoid syndrome. She developed progressive cardiovascular symptoms, including exertional dyspnea (NYHA II), fatigue, palpitations, and lower limb edema. Cardiac evaluation revealed carcinoid heart disease with significant right-sided valvular involvement. Transthoracic echocardiography showed right chamber dilation and severe tricuspid regurgitation, along with mild-to-moderate mitral regurgitation and indirect signs of pulmonary hypertension, confirmed by cardiac magnetic resonance imaging. Given the severity of TR and high surgical risk, a percutaneous approach with caval valve implantation (TricValve system) was performed. Post-procedural echocardiography demonstrated well-positioned prostheses, with restoration of forward flow and resolution of systolic reflux in the hepatic veins, despite persistence of TR at the native valve level, as expected. Conclusions: This case highlights the role of transcatheter therapies in the management of severe TR in high-risk patients, particularly in carcinoid heart disease. Caval valve implantation proved effective in controlling congestive symptoms and improving clinical status, representing a valuable therapeutic option when conventional approaches are not feasible.



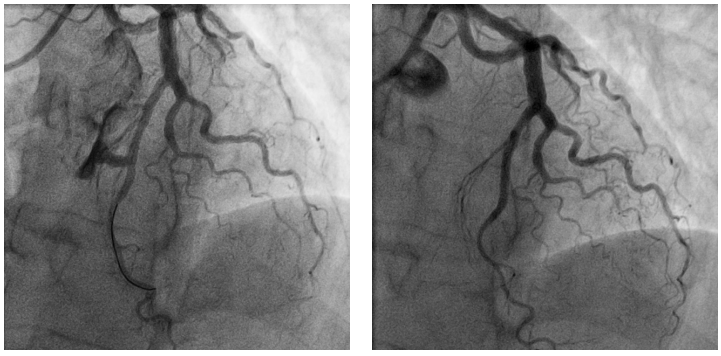
18529

LIFE-SAVING TREATMENT OF CORONARY PERFORATION USING A HANDMADE POLYURETHANE-COVERED STENT DURING ELECTIVE PCI

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Introduction: Coronary artery perforation is a rare but catastrophic complication of percutaneous coronary intervention, particularly in severe forms associated with cardiac tamponade, emergency surgery, and substantial early mortality. Rapid sealing of the rupture while preserving distal coronary flow is essential. Although dedicated covered stents are the standard bailout strategy, they may be unavailable in time-sensitive scenarios. Case Description: A 64-year-old woman with hypertension, diabetes mellitus, and familial hypercholesterolemia underwent elective percutaneous coronary intervention of the left anterior descending artery for CCS class III stable angina. After implantation of a 2.25 × 30 mm drug-eluting stent, post-dilatation with a 2.5 × 20 mm non-compliant balloon resulted in an abrupt Ellis III coronary perforation with active contrast extravasation. Immediate prolonged low-pressure balloon inflation was performed to achieve temporary hemostatic control. As a dedicated covered stent was not readily available, a 2.25 × 15 mm drug-eluting stent was manually wrapped with sterile polyurethane material and deployed across the perforation site using a sandwich-type technique. This strategy achieved immediate angiographic sealing of the leak with preservation of TIMI 3 distal flow. Continuous intraprocedural echocardiographic monitoring demonstrated only minimal, non-progressive pericardial effusion, without hemodynamic compromise. No pericardiocentesis or emergency surgery was required. The patient remained stable throughout the procedure and had an uneventful in-hospital recovery. Follow-up echocardiography confirmed preserved biventricular systolic function and complete resolution of the pericardial effusion. Conclusions: This case highlights that implantation of a handmade polyurethane-covered stent may represent a feasible and life-saving bailout strategy for Ellis III coronary perforation when conventional covered stents are not immediately accessible. In carefully selected emergency situations, this rapidly deployable approach may provide prompt hemorrhage control, preserve coronary patency, and avoid escalation to surgical rescue.



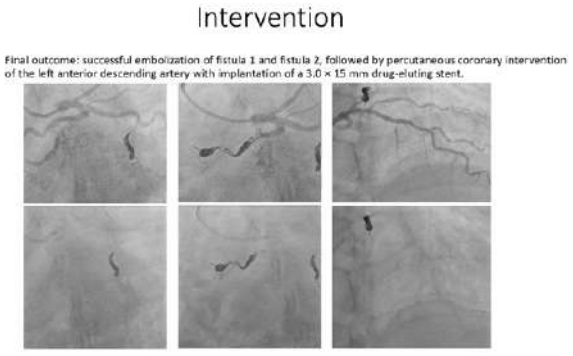
15663

PERCUTANEOUS COIL EMBOLIZATION OF CORONARY FISTULAS IN A PATIENT WITH CONGENITAL ABSENCE OF THE LEFT PULMONARY ARTERY

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Introduction: Coronary fistulas are rare anomalies that may be asymptomatic or lead to myocardial ischemia, heart failure, and volume overload. Congenital absence of the pulmonary artery is an uncommon condition, often associated with extensive collateral circulation, increasing surgical complexity. In such cases, percutaneous embolization emerges as a less invasive alternative. Case Description: A patient with hypertension, dyslipidemia, and class I obesity presented with progressive exertional dyspnea (NYHA functional class III). The patient was on antiplatelet therapy, statin, beta-blocker, and diuretics. Physical examination was unremarkable. Coronary CT angiography showed moderate stenosis in the left anterior descending artery (LAD) and a calcium score of 63. Thoracoabdominal CT revealed congenital absence of the left pulmonary artery, with extensive mediastinal and left hilar collateral circulation, as well as left lung hypoplasia and mediastinal shift. Three-dimensional reconstruction identified two fistulas originating from the circumflex artery, draining into the mediastinum and left pulmonary hilum. Left ventricular enlargement and diffuse hypokinesia were also observed. Due to high surgical risk, a percutaneous approach was chosen. Embolization of the fistulas was performed via radial access using a microcatheter and detachable coils, achieving complete occlusion. Subsequently, LAD angioplasty with implantation of a drug-eluting stent (3.0 × 15 mm) was performed, with a satisfactory angiographic result. Conclusions: This case highlights the complexity of managing coronary fistulas associated with congenital absence of the pulmonary artery. Percutaneous embolization proved to be a safe and effective alternative in favorable anatomy, avoiding the high risks of surgery. Multimodal imaging planning and multidisciplinary decision-making are essential, as is follow-up to detect potential recanalization.



18634

A CASE REPORT OF A RARE CONDITION MIMICKING CORONARY ARTERY DISEASE SYMPTOMS

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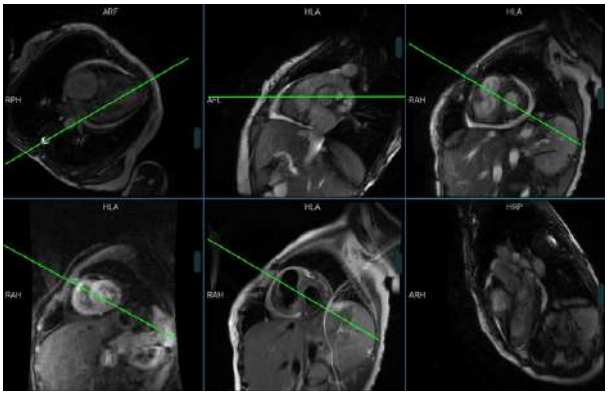
Introduction: Takayasu arteritis (TA) is a chronic and idiopathic large vessel vasculitis. It predominantly affects females, who account for approximately 80% to 90% of cases. Despite its high mortality and morbidity, this rare disease may present with nonspecific symptoms, which can make diagnostic approach and management challenging. Case Description: Our patient is a 40-year-old woman with a 15-years history of Takayasu arteritis and who had experienced a recent disease flare after temporarily discontinuing her medications during pregnancy 4 years earlier. She sought medical care describing a history of five days of constricting chest pain, radiating to her back, worsened by physical exertion and associated with shortness of breath. Physical examination showed absence of ulnar and radial arterial pulses bilaterally. Following chest pain investigation, electrocardiography showed no signs of acute ischemia. A diagnostic coronary angiography ruled out coronary obstruction, and a transthoracic echocardiography identified segmental wall motion abnormality of the left ventricle, with dilated cardiomyopathy and LVEF of 29%. Some of the patient's previous exams included a CT angiography of the carotid and vertebral arteries, demonstrating regular and concentric parietal thickening of the aortic arch and supra-aortic vessels, along with minimal stenosis of the proximal brachiocephalic trunk, common carotid arteries and subclavian arteries, being those findings consistent with TA. After careful evaluation, the patient's current chest pain was considered related to TA and dual antiplatelet therapy was introduced, as well as standard therapy targeting heart failure with reduced ejection fraction (HFrEF). Immunosuppressive therapy was optimized so as to achieve clinical remission of the systemic inflammation. In order to address TA with poorly controlled clinical course and significant cardiovascular implications, the patient was referred for outpatient follow-up with the rheumatology team. Conclusions: This case demonstrates the difficulties of managing TA due to the scarcity of information about the condition and delayed diagnosis. Since the disease's early manifestations are often vague, such as fever and weight loss, most patients do not seek treatment before clinical deterioration. Therefore, it is important to raise awareness on TA, since it is associated with a poor prognosis if untreated.

19223

HYPEREOSINOPHILIC SYNDROME AND LÖFFLER ENDOMYOCARDITIS: A CASE REPORT

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Introduction: Hypereosinophilic Syndrome (HES) is a rare hematologic disease characterized by persistent eosinophil overproduction. One of its most severe complications is Löffler endomyocarditis, in which granular toxicity damages cardiac tissues, progressing from an acute necrotic phase to thrombosis and obliterative fibrosis. Given its high risk of restrictive heart failure and thromboembolic events, prompt multidisciplinary care is vital. Case Description: A 49-year-old female patient, previously healthy, was transferred from a local facility to a tertiary referral center to expand diagnostic capabilities. She was admitted with acute right-sided heart failure, presenting with hepatomegaly 5cm below the costal margin, jugular venous distention, and lower limb edema. Initial laboratory workup revealed bicytopenia with anemia and a platelet count of 72000/mm³, alongside severe hypereosinophilia of 9450/mm³. An echocardiogram showed bilateral intramural thrombi and right ventricular wall motion abnormalities. Cardiac MRI confirmed the diagnosis by demonstrating significant obliteration of the right ventricle and left ventricular apex by thrombi, as well as T2-weighted hypersignal in the endomyocardial topography, consistent with severe fibrotic changes. After failure of empirical antiparasitic therapy (albendazole and ivermectin), focus shifted to primary hematologic causes. A myelogram confirmed this suspicion by documenting global marrow hyperplasia with 57% eosinophils. Corticosteroid therapy with prednisone was initiated, resulting in a rapid favorable response (within 48 hours, eosinophils dropped to 890/mm³ and and platelets normalized to 178000/mm³). During hospitalization, the patient suffered an transient paresis of the left upper limb. Brain MRI confirmed a minor ischemic stroke in the right precentral gyrus, ratifying the high cardioembolic risk despite early anticoagulation (rivaroxaban). Four months later, in outpatient follow-up, she remains asymptomatic (NYHA I), with complete eosinophilia remission (0.01%) and a 97% reduction in NT-proBNP levels, while continuing a gradual prednisone tapering. Conclusions: This case highlights Löffler endocarditis aggressiveness as a manifestation of HES and the importance of integrating laboratory and imaging findings in its management. Early immunosuppression reversed hematologic toxicity and prevented further cardiac deterioration. However, the ischemic complication emphasizes that rigorous thromboembolic surveillance is mandatory in this population.

20805

A CASE OF RIGHT VENTRICULAR OUTFLOW TRACT OBSTRUCTION CAUSED BY ISOLATED SINUS OF VALSALVA ANEURYSM

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Introduction: Sinus of Valsalva aneurysm is a rare condition characterized by abnormal dilation of an aortic root sinus, either congenital or acquired, with an estimated prevalence of 0.09% in the general population and accounting for 0.1%–3.5% of congenital heart diseases, most commonly involving the right coronary sinus (65%–85%). Clinical presentation varies according to size and complications, ranging from asymptomatic cases to acute conditions due to rupture or compression of adjacent structures, often posing a diagnostic challenge and requiring multimodality imaging Case Description: A 73-year-old man with a medical history of hypertension presented to the emergency department with sudden-onset exertional dyspnea. Initial evaluation showed ST-segment depression in anterior leads and rising troponin, leading to ICU admission with suspected non-ST-elevation acute coronary syndrome. He was stable on nasal oxygen (HR 106 bpm, BP 129/92 mmHg, SpO□ 92%) with a 3/6 systolic murmur. During ICU stay, he developed progressive hypoxemia (SpO□ ~90%) requiring a non-rebreather mask at 15 L/min without respiratory distress. Arterial blood gas showed severe hypoxemia (PaO□ 67 mmHg; PaO□/FiO□ 67) with respiratory alkalosis (pH 7.44; PaCO□ 31 mmHg). Given the disproportionate hypoxemia and signs of right heart strain, further investigation was performed. Echocardiography demonstrated preserved left ventricular ejection fraction (57%), moderate right ventricular dilation and dysfunction, and a large sinus of Valsalva aneurysm (4.6 × 5.4 cm) from the right coronary sinus causing compression of the right ventricular outflow tract and pulmonary trunk, with significant obstruction and an estimated peak gradient of 57 mmHg. CT angiography confirmed impending rupture and extrinsic compression without pulmonary embolism, consistent with cor pulmonale. Surgical repair with ascending aorta replacement using a Dacron graft and right coronary reimplantation was performed .After surgery, the patient evolved with progressive right ventricular dysfunction, worsening hypoxemia, and hemodynamic deterioration, culminating in refractory shock and death. Conclusions: This case highlights an uncommon clinical presentation of unruptured sinus of Valsalva aneurysm mimicking acute coronary syndrome and causing severe hypoxemia due to right ventricular outflow tract obstruction, emphasizing the importance of early recognition and multimodality imaging in atypical cases.





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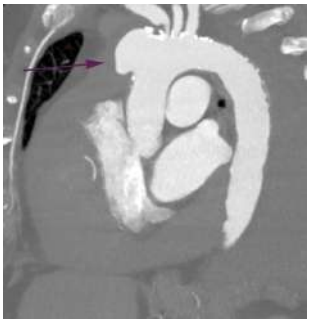
ATYPICAL PRESENTATION OF A PENETRATING AORTIC ULCER OF THE ASCENDING AORTA: A CASE REPORT

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Introduction: Penetrating aortic ulcer (PAU) is an uncommon cause of acute aortic syndrome (AAS), accounting for 2–7% of AAS cases. Only 7% of penetrating ulcers involve the ascending aorta. Its pathogenesis is related to atherosclerotic plaque formation that progresses to intimal disruption, penetrating through the aortic wall. This case report describes a patient with an ascending PAU with atypical presentation and fatal outcome. Case Description: A 75-year-old female patient was admitted with suspected abdominal sepsis after developing new-onset atrial fibrillation with rapid ventricular response. On the fifth hospital day, she presented with palpitations and dyspnea, with recurrent episodes of atrial fibrillation with rapid ventricular response. Transthoracic echocardiography (TTE) revealed a moderate pericardial effusion (20 mm), presumed to be reactive to the septic condition. On the fourteenth hospital day, the patient experienced acute deterioration with dyspnea and severe, tearing precordial pain radiating to the back. Given the clinical suspicion of AAS, an urgent computed tomography angiography (CTA) was requested. Following CTA, the patient developed hemodynamic instability. Bedside TTE demonstrated progression of the pericardial effusion (51–55 mm) with signs of cardiac tamponade. The cardiac surgery team was activated; however, before transfer she developed cardiac arrest. During resuscitation maneuvers, pericardiocentesis was performed, without clinical response, death was declared after 30 minutes of resuscitative efforts. The CTA report, released post-mortem, revealed a penetrating aortic ulcer measuring 2.5 × 2.0 cm at the transition between the ascending aorta and the aortic arch. The study confirmed direct continuity between the ulcer and the pericardial sac, suggesting a contained aortic rupture that progressed to massive hemopericardium. Conclusions: Although rare, penetrating aortic ulcer represents a highly lethal medical emergency and may present atypically, particularly in elderly patients. This case highlights how nonspecific manifestations and overlap with infectious conditions may delay diagnosis, leading to fatal outcomes. It underscores the importance of maintaining a high index of suspicion for acute aortic syndrome in the setting of unexplained clinical instability, enabling early diagnosis and timely intervention.





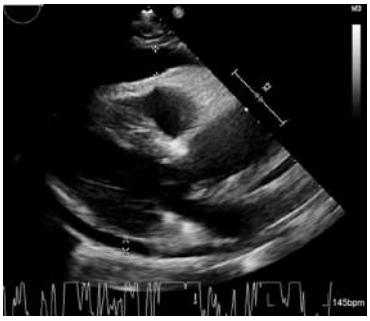
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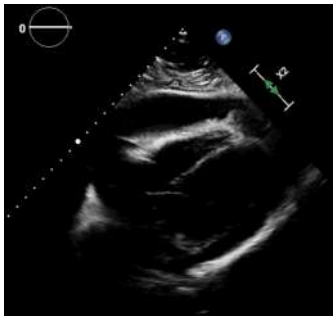
BACTERIAL MYOPERICARDITIS DUE TO STAPHYLOCOCCUS AUREUS MIMICKING ST-ELEVATION MYOCARDIAL INFARCTION (STEMI): A CASE REPORT

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Introduction: Bacterial pericarditis accounts for less than 1% of acute pericarditis cases, carrying high mortality rates and risk of cardiac tamponade. Staphylococcus aureus is among the leading causative agents, typically through hematogenous dissemination. Myopericarditis presenting with ST-segment elevation may mimic ST-Elevation Myocardial Infarction (STEMI), often leading to immediate reperfusion therapy. This overlap complicates diagnosis, delays recognition of the infectious etiology, and should be considered in cases of atypical clinical courses. **Case Description:** A 66-year-old male patient with chronic kidney disease, chronic alcoholism, and recent peptic ulcer disease presented to the emergency department with continuous burning chest pain at rest. During evaluation, he developed atrial fibrillation, reverted with amiodarone, and ST-segment elevations in inferior and lateral leads. Presumed STEMI prompted left heart catheterization, which revealed 70% stenosis in the dominant right coronary artery, treated with angioplasty and stenting, and 95% stenosis in a small-caliber left circumflex artery, left unintervened. During in-hospital reassessment, chest pain exhibited a distinct pattern, characterized as pleuritic in nature, associated with a troponin plateau without the typical rise-and-fall pattern of myocardial necrosis. Transthoracic echocardiography demonstrated circumferential pericardial effusion with signs of diastolic filling restriction. The patient progressed to cardiac tamponade and underwent pericardiocentesis. Pericardial fluid culture isolated methicillin-sensitive Staphylococcus aureus (MSSA). Review of prior records identified positive MSSA blood cultures from a hospitalization one month earlier, associated with a labial skin lesion, regarded as the probable hematogenous source. Transesophageal echocardiography excluded endocarditis. Oxacillin was initiated for three weeks, with favorable clinical outcome. **Conclusions:** This case illustrates MSSA myopericarditis with cardiac tamponade mimicking STEMI, initially leading to management as ST-elevation myocardial infarction. Pleuritic chest pain, troponin plateau, and progressive pericardial effusion were pivotal findings that prompted diagnostic reassessment. Early identification of the infectious etiology enabled targeted antibiotic therapy and a favorable outcome, underscoring the value of continuous clinical reassessment in atypical presentations.





17518

RESCUE LEFT CAROTID-SUBCLAVIAN BYPASS AND DISTAL EMBOLECTOMY FOR UPPER LIMB ISCHEMIA AFTER ZONE 2 TEVAR FOR AN UNSTABLE PENETRATING AORTIC ULCER: A CASE REPORT

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Introduction: Penetrating aortic ulcer (PAU) is part of the acute aortic syndrome spectrum and may progress to aneurysmal degeneration, contained rupture, or other signs of instability, often requiring urgent treatment. Lesions at the aortic isthmus or distal arch are particularly challenging because thoracic endovascular aortic repair (TEVAR) may require zone 2 deployment with intentional coverage of the left subclavian artery (LSA) to achieve an adequate proximal seal, which can lead to ischemic complications. **Case Description:** An 85-year-old man with hypertension, type 2 diabetes mellitus, coronary artery disease, and paroxysmal atrial fibrillation presented with a 2-week history of tearing chest pain radiating to the back, worsening over the previous 48 hours, with dyspnea, cough, and hemoptysis. CTA showed a PAU at the isthmus, immediately distal to the LSA, with enlargement on serial imaging from 25.9 mm to 6.5 x 3.7 cm, mural thickening, and adjacent soft-tissue infiltration, consistent with instability. He underwent TEVAR and intentional LSA coverage. Completion angiography showed successful exclusion without endoleak and preserved flow through the brachiocephalic trunk and left common carotid artery. On postoperative day 2, he developed acute left upper limb ischemia and underwent rescue left carotid-subclavian bypass. Because distal flow remained absent on intraoperative Doppler, the procedure was extended to brachial, radial and ulnar embolectomy, with retrieval of fresh thrombus from the brachial artery. Follow-up imaging confirmed exclusion of the lesion, proximal occlusion of the LSA, and patency of the bypass. Despite the successful treatment, the subsequent course was complicated by enterorrhagia due to newly diagnosed colon cancer, central nervous system bleeding, septic shock, and multiorgan dysfunction, culminating in death. **Conclusions:** This case highlights that acute upper limb ischemia may occur despite technically successful zone 2 TEVAR and that persistent ischemia after rescue carotid-subclavian bypass should prompt immediate reassessment for associated distal thromboembolism. Adjunctive distal embolectomy may be necessary when proximal revascularization alone is insufficient to restore limb perfusion.

16844

SEPTAL RUPTURE AFTER TAVI: INCIDENTAL DIAGNOSIS AND DECISION FOR CONSERVATIVE TREATMENT IN AN OCTOGENARIAN

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Introduction: Transcatheter aortic valve implantation (TAVI) is a minimally invasive alternative to surgical replacement for patients at high surgical risk. Ventricular septal defect (VSD) is a rare complication after TAVI (~1.5% incidence), which may be associated with pressure from the bioprosthesis on the septum, device oversizing, extensive calcification of the valve annulus, or mechanical trauma. Management of these cases is not well established, ranging from a conservative approach to percutaneous or surgical closure, depending on the hemodynamic impact. Case Description: An 89-year-old male patient, independent for daily activities, with systemic arterial hypertension and symptomatic aortic valve disease. Transthoracic echocardiography (TTE) demonstrated an aortic valve area of 0.44 cm² (indexed 0.30 cm²/m²), a mean systolic gradient of 76 mmHg, a peak velocity of 5.6 m/s, and a DVI of 0.15, with moderate aortic regurgitation (PHT 445 ms) and preserved left ventricular systolic function (LVEF 57%). After a heart team discussion, due to symptoms, critical aortic stenosis, advanced age, and intermediate-to-high surgical risk (EuroSCORE II 7.27%), TAVI was selected. Percutaneous implantation of a size 26 aortic bioprosthesis (Sapien 3 ULTRA RESILIA) was performed via transfemoral access. Aortography confirmed good positioning of the bioprosthesis, absence of paravalvular leak, patent coronary arteries, and no complications. Transesophageal echocardiography (TEE) at the end of the procedure revealed an image suggestive of a ventricular septal defect (VSD) (Annex 1), possibly linked to septal rupture caused by prosthesis expansion in the setting of calcification. Given the hemodynamic stability, the patient was transferred to the Intensive Care Unit for monitoring. Post-procedural TTE showed a discontinuity in the interventricular septum (3.6 mm) adjacent to the endoprosthesis and the tricuspid valve, with flow into the right ventricle (RV), suggesting a perimembranous VSD. In the absence of RV overload, pulmonary hypertension, or hemodynamic impacts, conservative management was maintained with outpatient echocardiographic follow-up. Conclusions: With the expanding indications and increasing performance of TAVI in current clinical practice, rare complications such as ventricular septal defect may be more frequently encountered, often incidentally. In this setting, the assessment of symptoms and hemodynamic impact is essential to guide the decision between intervention and conservative management.



20427

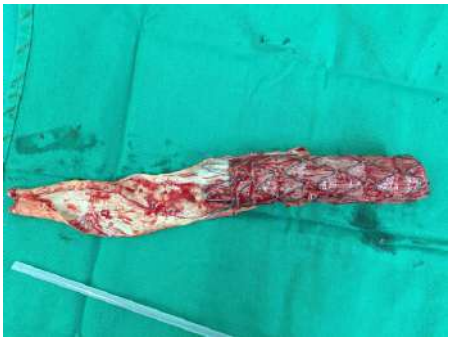
STAGED TREATMENT OF COMPLEX AORTIC DISSECTION

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Introduction: Aortic dissection is an acute aortic emergency requiring early diagnosis to improve prognosis. This report describes a complex Stanford type A/DeBakey type I aortic dissection. Case Description: A 45-year-old male patient, weighing 73 kg, with hypertension, type 2 diabetes mellitus, gouty arthritis, and a history of smoking and alcohol use, presented 10 years ago with severe tearing precordial pain radiating to the back, associated with lipothymia. Diagnostic workup revealed Stanford type A/DeBakey type I aortic dissection with aneurysmal degeneration of the false lumen. He underwent surgical correction with aortic root reconstruction using a Dacron graft, with preservation of the native aortic valve through the David procedure. Six months after hospital discharge, he was readmitted with dyspnea on mild exertion, classified as New York Heart Association functional class II. Further evaluation showed severe aortic regurgitation with significant diastolic flow reinforcement, as well as persistent dissection involving the aortic arch and supra-aortic vessels, extending throughout the entire aorta to the iliac arteries. A new surgical approach was required, with mechanical aortic valve implantation and rerouting of branches to the brachiocephalic trunk and common carotid artery. Postoperatively, the dissection persisted, with dilation of the false lumen in the aortic arch and aorta, extending through the descending aorta to the iliac arteries. An attempt was then made to implant an endoprosthesis in zone 0 of the ascending aorta to correct the dissection. During the procedure, fracture of the prosthesis delivery system occurred, requiring removal of the introducer system together with a large portion of the dissection flap from the aortic arch and descending aorta via laparotomy, associated with embolectomy of the iliac and femoral arteries. The patient evolved without complaints, and definitive endovascular treatment was postponed. Follow-up imaging later showed only a residual dissection flap in the descending aorta, located 30 to 40 cm from the upper dental arch, with slow flow in the false lumen. After 9 years of follow-up, the patient remains clinically stable and asymptomatic. Conclusions: Aortic dissection is a complex condition that should be managed in specialized centers by a multidisciplinary team. This case required multiple surgical interventions by different teams to achieve a satisfactory outcome and improve life expectancy.





20880

STAPHYLOCOCCUS AUREUS INFECTIVE ENDOCARDITIS ASSOCIATED WITH PREVIOUS VISCERAL LEISHMANIASIS: A CASE REPORT WITH MITRAL VALVE INVOLVEMENT

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Introduction: Infective Endocarditis remains a condition with high morbidity and mortality, particularly when associated with structural cardiac complications. The coexistence of systemic infections and neglected tropical diseases may hinder diagnosis and delay appropriate treatment. Case Description: A previously healthy young adult male from a rural area was admitted with a three-week history of persistent fever associated with intense chills, night sweats, progressive fatigue, anorexia, 8-kg weight loss, and erythematous papules on the lower extremities consistent with Janeway lesions. Initially, he was treated at an emergency care unit with symptomatic medications and antiemetics, without clinical improvement. He was subsequently referred to a tertiary care center, where laboratory tests revealed leukocytosis, thrombocytopenia, and elevated inflammatory markers. Electrocardiography showed nonspecific abnormalities, and empirical broad-spectrum antibiotic therapy was initiated. Transthoracic echocardiography demonstrated mitral valve vegetation, while blood cultures were positive for Staphylococcus aureus. The diagnosis of infective endocarditis was established according to the modified Duke criteria, with two major and two minor criteria. Further investigation revealed a previous history of Visceral Leishmaniasis, considering the patient's epidemiological and occupational background. The patient progressed with severe valvular involvement requiring surgical mitral valve replacement. He remained hospitalized in a coronary intensive care unit receiving vancomycin, oxacillin, and gentamicin, with satisfactory clinical recovery after six weeks of treatment. Conclusions: This case highlights the importance of early investigation of infective endocarditis in patients presenting with prolonged fever and nonspecific systemic manifestations. In addition, it emphasizes the epidemiological relevance of visceral leishmaniasis as a possible predisposing factor for severe bacterial infections in vulnerable rural populations.

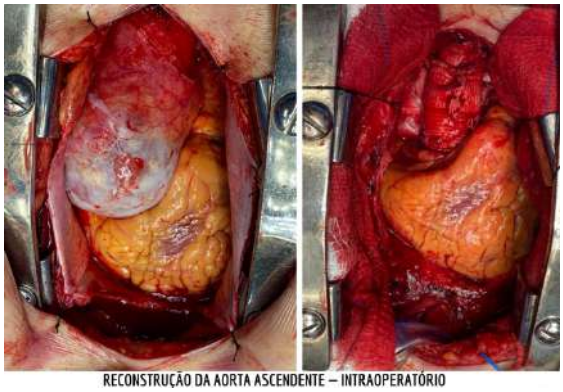
20560

THE SOVEREIGN CLINIC: UNEXPECTED DIAGNOSIS OF GIANT ASCENDING AORTIC ANEURYSM IN AN ASYMPTOMATIC COMPANION — FROM CLINICAL SUSPICION TO SURGICAL TREATMENT

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Introduction: Giant ascending aortic aneurysms are associated with a high risk of potentially fatal complications, particularly type A aortic dissection. Although incidental findings may occur in asymptomatic individuals, diagnosis outside the usual clinical setting is uncommon. Case Description: A 60-year-old female patient with no previously known cardiovascular disease presented as a companion during an outpatient consultation, without specific complaints. She reported recent episodes of elevated blood pressure, with values reaching approximately 180/90 mmHg. Physical examination revealed visible pulsations in the sternal notch and left supraclavicular region, in addition to a blowing early diastolic decrescendo murmur at the aortic and accessory aortic areas, associated with an Austin Flint murmur at the mitral area. Based on these semiological findings, an urgent transthoracic echocardiogram was requested, revealing a giant ascending aortic aneurysm measuring 74 mm, associated with moderate aortic regurgitation and no signs of dissection. Due to the high risk of acute complications, the patient was urgently referred for surgical treatment and underwent ascending aortic aneurysm repair associated with aortic valve replacement using a biological prosthesis. During the postoperative period, the patient developed an acute neurological deficit compatible with cerebrovascular event, with partial motor impairment. She is currently under outpatient follow-up, showing functional improvement after rehabilitation. Conclusions: This case highlights the importance of clinical perception, demonstrating how initially nonspecific findings in an asymptomatic companion led to the diagnosis of a potentially fatal condition. Early recognition allowed surgical intervention before the occurrence of catastrophic complications, such as dissection, rupture, or sudden death.



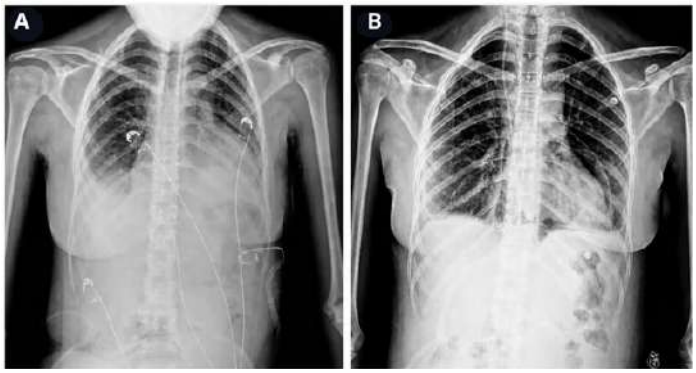
RECONSTRUÇÃO DA AORTA ASCENDENTE – INTRAOPERATÓRIO

21005

TUBERCULOUS PLEUROPERICARDITIS WITH IMPENDING CARDIAC TAMPONADE: A CASE REPORT

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Introduction: Tuberculosis (TB) remains a major global public health concern. According to the World Health Organization (WHO), extrapulmonary forms account for approximately 15–20% of TB cases, with pericardial involvement being a rare manifestation, corresponding to around 1–2% of these forms. This presentation may mimic autoimmune diseases, particularly in polyserositis. Although uncommon in developed countries, TB is the most frequent etiology of pericarditis in developing nations and is associated with a high risk of large pericardial effusion and progression to cardiac tamponade. Case Description: A 29-year-old female patient with a history of pulmonary TB confirmed by positive TRM-TB on bronchoalveolar lavage and early abandonment of RHZE treatment was admitted. She had prior emergency visits for respiratory complaints and had previously undergone therapeutic thoracentesis. Admitted with progressive dyspnea, cough, and fatigue, chest CT revealed tree-in-bud pattern, bilateral pleural effusion, and moderate pericardial effusion. She deteriorated hemodynamically and was transferred to the Intensive Care Unit. Echocardiography demonstrated a very large pericardial effusion (41mm) with swinging heart, right chamber collapse, significant respiratory flow variation, and septal bounce, indicating high risk of cardiac tamponade. She underwent pleurectomy with right pleuropericardial window, with subsequent clinical improvement. Although chest X-ray is not the primary imaging modality for diagnosing pericardial effusion, serial radiographs demonstrated significant reduction of the cardiac silhouette and pleural effusion, evidencing therapeutic success. Pericardial fluid was hemorrhagic/exudative; sputum smear microscopy was negative and PCR for Mycobacterium tuberculosis returned indeterminate, findings that do not exclude the diagnosis given the history of incomplete treatment. Conclusions: Pericardial tuberculosis, though rare worldwide, should be considered a differential diagnosis in pericardial effusion. Echocardiography is essential for early identification of hemodynamic compromise. Negative initial tests do not exclude the diagnosis; investigation of cavitary fluids and molecular methods is crucial. In cases of hemodynamic deterioration, surgical intervention may be decisive for clinical stabilization and improved prognosis.

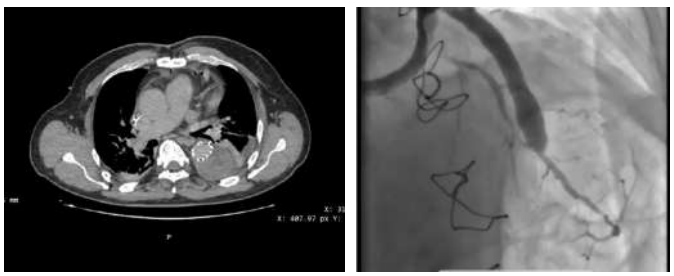
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TYPE B AORTIC DISSECTION AND MULTIVESSEL CORONARY ARTERY DISEASE: A HYBRID APPROACH COMPLICATED BY SPINAL CORD INJURY

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(1) UFRN - NATAL - RN - BRASIL; (2) PRONTO SOCORRO CARDIOLOGICO DE PERNAMBUCO - PROCAPE - RECIFE - PE - BRASIL; (3) HOSPITAL DOS SERVIDORES - RECIFE - PE - BRASIL;

Introduction: Acute Stanford type B aortic dissection (TBAD) is a cardiovascular emergency characterized by involvement of the descending aorta distal to the left subclavian artery. Although medical therapy remains the main approach in uncomplicated cases, persistent pain, signs of malperfusion, or progression of the dissection may require endovascular or surgical intervention. The concomitant presence of multivessel coronary artery disease (CAD) increases therapeutic complexity and the risk of adverse outcomes, particularly neurological ischemic complications. Case Description: A 63-year-old male with a history of systemic arterial hypertension, previous myocardial infarction, and unilateral nephrectomy was admitted with TBAD and multivessel CAD, including 70% stenosis of the proximal left anterior descending artery. On admission, blood pressure was 190/90 mmHg, and the patient reported episodes of retrosternal burning pain over the previous two months, unrelated to exertion. Computed tomography angiography demonstrated TBAD involving the descending thoracic aorta, extending to the left iliac system and involving the celiac trunk, associated with aortic dilation and mural thrombus. Coronary angiography confirmed multivessel CAD, with severe lesions in the left anterior descending artery, first and second diagonal branches, and circumflex artery. The patient underwent off-pump coronary artery bypass grafting using a saphenous vein graft to the left anterior descending artery, combined with endovascular repair of the aortic dissection with stent graft implantation. Postoperatively, the patient developed spinal cord infarction due to anterior spinal artery compromise, possibly involving the artery of Adamkiewicz, resulting in lower limb motor deficit and neurogenic bladder. Subsequently, he underwent angioplasty for graft anastomotic stenosis and evolved with an episode of ventricular tachycardia. The patient achieved clinical stabilization and was discharged for multidisciplinary outpatient follow-up and rehabilitation. Conclusions: This case highlights the complexity of managing TBAD associated with multivessel CAD, emphasizing the importance of a multidisciplinary and individualized approach. Despite the technical success of the hybrid strategy employed, severe neurological complications such as spinal cord infarction remain rare but potentially disabling events following endovascular aortic repair, requiring early recognition, adequate clinical support, and specialized rehabilitation.



19468

REVERSIBLE HIGH-GRADE ATRIOVENTRICULAR BLOCK IN AN ASYMPTOMATIC ENDURANCE ATHLETE: WHEN PHYSIOLOGY MIMICS PATHOLOGY

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Introduction: Atrioventricular conduction disturbances are frequently observed in endurance athletes and are commonly attributed to increased vagal tone. While usually benign, the occurrence of prolonged pauses and higher-grade AV block—especially during wakefulness—may raise concern for underlying conduction system disease and create uncertainty regarding training safety. Case Description: A young female endurance athlete, actively engaged in long-distance running and marathon training, underwent cardiovascular evaluation as part of routine assessment to improve performance. She denied syncope, presyncope, or exercise limitation. Initial evaluation revealed first-degree AV block and sinus pauses up to 2.4 seconds, predominantly during sleep, consistent with heightened vagal tone. Over time, with progressive increase in training load, follow-up Holter monitoring demonstrated longer pauses. In 2025, pauses of up to 3.7 seconds were recorded during wakefulness, including daily activities, without associated symptoms. Concomitantly, second-degree AV block was documented, raising concern for possible pathological conduction disturbance. She was referred for further evaluation. Cardiac magnetic resonance imaging showed no evidence of structural heart disease, fibrosis, or infiltrative process, and echocardiography demonstrated normal cardiac structure and function. Given these findings, a period of detraining was recommended. Subsequent reassessment showed reduction of pauses and resolution of higher-grade AV block. The patient later resumed training progressively, without recurrence of significant conduction abnormalities on follow-up monitoring. Conclusions: This case highlights that marked conduction disturbances in endurance athletes, including pauses during wakefulness and apparent progression to higher-grade AV block, may still represent a reversible, physiologically mediated phenomenon. Recognition of this pattern is essential to avoid unnecessary interventions. Detraining can play a key role in distinguishing adaptive changes from true conduction system disease and may guide safe return to high-level physical activity.