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Congresso Português de Cardiologia 2023

14 a 16 de Abril de 2023

Sexta-feira, 14 Abril de 2023 | 09:00-10:00

Sala Aquarius | Comunicações Orais (Sessão 1) - Insuficiência cardíaca: a clínica primeiro

CO 1. SCREENING FOR SLEEP BREATHING DISORDER IN PATIENTS WITH HEART FAILURE - 1 YEAR MULTIDISCIPLINARY TEAM EXPERIENCE

Mariana Marçal, Vânia Caldeira, Sara Gonçalves, Catarina Rijo, Margarida Castanho, Paula Duarte

Centro Hospitalar de Setúbal, EPE/Hospital de São Bernardo.

Introduction: Sleep breathing disorders (SBD) are a spectrum of diseases, including obstructive sleep apnea (SA), central SA and sleep-related hypoventilation. SBD are highly prevalent (48-81%) and associated with adverse outcomes in patients with heart failure (HF), including symptom progression, hospitalization and mortality.
Objectives: To improve awareness and increase diagnosis of SBD in HF patients (pts), estimate prevalence and test the correlation between overnight pulse oximetry (OPO) and home sleep apnea testing (HSAT).
Methods: Screening of SBD was implemented in pts with recently diagnosed HF and followed by a multidisciplinary HF team. The screening consisted of a survey of symptoms, arterial blood gas sampling (ABGS) and OPO. Pts who had 2 positive answers, oxygen dessaturation index (ODI) > 5/h or < 5/h with symptoms/comorbidities, SpO2 time < 90% greater than 20% of total recording or changes in ABGS (HCO_3 > 27, pCO2 > 45 or pO2 < 60) were submitted to HSAT and pulmonology evaluation. Descriptive retrospective analysis of data regarding pts identified between January and November 2022 was carried out. Statistical analysis was performed with IBM SPSS Statistics 27. Pearson's correlation coefficient was used to assess the correlation between ODI in OPO and apnea-hypopnea index (AHI) in HSAT.
Results: During this period, 37 pts met the referral criteria (81.1% male, mean age 65.7 ± 12.3 years). Most pts had ischaemic HF (n = 12; 34.3%), NYHA = 2 (n = 20; 54.1%) or ≥ 3 (n = 10; 27%), 47.2% with reduced ejection fraction (EF) (n = 17) and 30.6% with mildly reduced EF (n = 11); main comorbidities were dyslipidemia (n = 32; 86.5%), hypertension (n = 30; 81.1%), smoking (n = 26; 70.2%) and obesity (n = 22; 59.4%). All pts who underwent a HSAT after positive SBD screening were diagnosed with SA (n = 33; 89.2%) and started positive airway pressure therapy, the majority of them with severe disease (n = 15; 40.5%; mean AHI 30.9 ± 15.2 events/h) and obstructive events (n = 30; 81%). 4 pts are waiting for the HSAT. The ODI values showed a moderate positive correlation with the AHI (r = 0.699; p = 0.001).
Conclusions: The high prevalence of SBD in pts with HF, coupled with evidence of improved HF outcomes after SBD treatment, provides a rationale for SBD screening. OPO seems to have a high sensitivity for screening SA in patients with HF and a high pre-test probability of SBD. However, confirmation of suspected diagnosis through HSAT, essential in grading and characterization of SBD, remains necessary.

CO 2. INFLUENCE OF DIHYDROPYRIDINES CLASS OF CALCIUM CHANNEL BLOCKERS IN IRON DEFICIENCY IN PATIENTS WITH HEART FAILURE WITH REDUCED EJECTION FRACTION

Rui Antunes Coelho, Ana Rita Piteira, Jéni Quintal, Sara Gonçalves, Tatiana Duarte, Pedro Carreira, Margarida Madeira, Hugo Viegas, Ana Sousa, Crisálida Ferreira, Andreia Soares, Dina Ferreira, Ana Fátima Esteves, António Pinheiro, Joana Silva Ferreira, Pedro Amador, Ermelinda Pedroso, Rui Caria

Centro Hospitalar de Setúbal, EPE/Hospital de São Bernardo.

Introduction: Iron deficiency (ID) is a recognized factor associated with worse prognosis of heart failure (HF) but the mechanism by which the patients develop ID is still unclear. Some studies suggest a relationship between ID and therapy used in the clinical control of HF. Hypertension is one of the most frequent etiologies and comorbidities of HF, whereby many patients with HF are medicated with Calcium Channel Blockers from the class of dihydropyridines (D-BCC). A single study evaluated the impact of medication on patients with HF and established a statistically significant relationship between D-BCC and ID.
Objectives: The aim of this study was to verify if therapy with D-BCC is indeed associated with ID in patients with HF with reduced ejection fraction (EFrHF).
Methods: We performed a retrospective observational cohort study of all patients with EFrHF followed at our HF Unit, between January 2019 and December 2020. Patients with severe anemia or conditions that may cause anaemia/ID were excluded. Of a total of 100 patients that were included, 30 patients were medicated with D-BCC for at least 3 months. We compared ID (ferritin < 100 µg/L or ferritin 100-300 µg/L and transferrin saturation < 20%) of at least 6-months follow-up as well as other patient characteristics between the groups.
Results: Taking D-BCC (n = 30) had a statistically significant association with ID (73.3% in D-BCC group *vs.* 45.2% in control group; p = 0.006). Most of these patients (n = 17; 57%) were taking amlodipine, 11 patients (37%) were taking lercanidipine and 1 patient (3.3%) was on nifedipine. 17 of these patients (45%) were on the lowest dose of these drugs. Neither the active principle nor the dose had a statistically significant relationship with the development of ID. The group on D-BCC had a slightly higher EF (37% *vs.* 35%; p = 0.02) and higher levels of corrected calcium to albumin (9.7 mg/dL *vs.* 9.3 mg/dL, p = 0.02).

Patient characteristics	All (n = 100)	Dihydropyridines (n = 30)	Control group (n = 70)	p
Age in years, median (IQR)	69 (60-76)	70 (61-76)	69 (59-76)	0,741
Male gender, n (%)	69 (69,0)	20 (66,7)	49 (70,0)	0,792
Hypertension, n (%)	82 (82,0)	28 (93,3)	54 (77,1)	0,053
Diabetes mellitus, n (%)	48 (48,0)	15 (50,0)	33 (47,1)	0,793
Dyslipidemia, n (%)	62 (62,0)	18 (60,0)	44 (62,9)	0,875
Smoking, n (%)	44 (44,0)	11 (36,7)	33 (47,1)	0,333
Body mass index in Kg/m², median (IQR)	27,8 (24,4-31,9)	28,4 (24,5-32,0)	27,7 (24,2-31,9)	0,903
Creatinine clearance in ml/min, median (IQR)	65,0 (59,9-76,0)	49,5 (34,8-72,0)	70,5 (44,0-93,2)	**0,040**
Etiology of HF, n (%)				
Ischemic	41 (41,0)	11 (39,3)	30 (45,5)	0,581
Dilated	21 (21,0)	7 (25,0)	14 (2,2)	0,687
Hipertensive	5 (5,0%)	5 (17,9)	0 (0,0)	**<0,001**
Valvular	3 (3,0%)	1 (3,6)	2 (3,0)	0,659
NYHA, n (%)				0,181
I	14 (14,0)	7 (23,3)	7 (10,0)	
II	53 (53,0)	13 (43,3)	40 (57,1)	
III	33 (33,0)	10 (33,3)	23 (32,9)	
IV	0 (0,0)	0 (0,0)	0 (0,0)	
Sacubitril-Valsartan, n (%)	64 (64,0)	16 (53,3)	48 (68,6)	0,093
ACEI, n (%)	26 (26,0)	12 (40,0)	14 (90,0)	**0,042**
Beta-blockers, n (%)	90 (90,0)	27 (90,0)	63 (90,0)	0,639
Spironolactone, n (%)	71 (71,0)	20 (66,7)	51 (72,9)	0,391
Furosemide, n (%)	70 (70,0)	19 (63,3)	51 (72,9)	0,231
GLP2i, n (%)	32 (32,0)	9 (30,0)	23 (32,9)	0,717
LVEF (%), median (IQR)	35 (28-41)	37 (33-43)	35 (25-40)	**0,018**
Iron deficiency, n (%)	50 (50,0)	22 (73,3)	28 845,2)	**0,006**
Hemoglobin (g/dl), median (IQR)	13,3 (11,8-14,4)	13,6 (12,7 – 14,6)	13,0 (11,6-14,4)	0,123
Ferritin µg/L, median (IQR)	163 (75-278)	142 (81-210)	191 (69-358)	0,135
Transferrin saturation in %, median (IQR)	25,1 (17,9-33,1)	23,3 (17,0-32,6)	25,6 (18,0-33,2)	0,143
Iron (µg/dL), median (IQR)	82 (59-97)	75 (60-95)	83 (59-101)	0,496
NT-proBNP (pg/ml), median (IQR)	1531 (393-3579)	1261 (311-3521)	1656 (441-3617)	0,550
Folate (ng/mL), median (IQR)	6,35 (4,83-8,13)	5,30 (4,70-9,60)	6,59 (5,26-8,33)	0,570
B12 vitamine (pg/mL), median (IQR)	391 (323-546)	330 (181-473)	445 (355-582)	0,052
Corrected calcium (mg/dl), median (IQR)	9,3 (9,1-9,8)	9,5 (9,3-9,9)	9,2 (8,6-9,4)	0,017
TSH (mIU/L), median (IQR)	1,87 (1,29-2,36)	1,74 (1,39-2,25)	1,90 (1,10-2,40)	0,650
CRP (mg/dl), median (IQR)	1,1 (0,3-2,1)	0,61 (0,2-2,1)	1,2 (0,3-2,2)	0,365
Hospitalizations by HF, n (%)	22 (22,0)	6 (20,0)	16 (22,9)	0,760
2-years mortality, n (%)	18 (18,0)	4 (13,3)	14 (21,0)	0,448

Table 1 - Characteristics of patients with HFrEF from which common causes of iron deficiency anemia were excluded.

Conclusions: In a population of 100 patients with EFrHF, the intake of D-BCC is used, as expected, mainly to control hypertension and is significantly associated with a higher incidence of ID in the follow-up at 6 months - 1 year, but not to the development of anemia, NYHA class, hospitalizations for HF or 2-years mortality. If this association is confirmed in more robust studies, the therapeutic and prognostic implication of these drugs could lead to a review of clinical practice, with greater vigilance and attention for this possible drug effect that can be controlled, allowing an intervention early prognosis in these patients.

CO 3. CLINICAL PHENOTYPES AND PROGNOSIS OF PATIENTS WITH HEART FAILURE WITH MILDLY REDUCED EJECTION FRACTION

Vítor Hugo Pereira[1], Juliana Rodrigues[2], Rui Flores[1], Cátia Oliveira[1]

[1]Hospital de Braga, EPE. [2]Universidade do Minho.

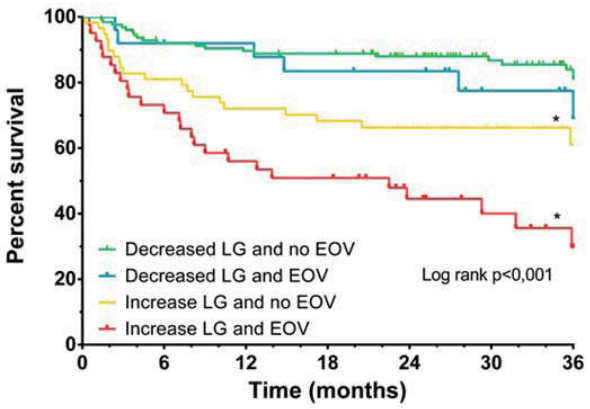
Introduction: Heart failure (HF) is a complex clinical syndrome resulting from systolic and/or diastolic dysfunction, leading to considerable mortality and morbidity. The recent definition of an intermediate clinical phenotype based on an ejection fraction (EF) between 41% and 49%, named HF with mildly reduced EF (HFmrEF), has fueled investigations into the clinical profile and prognosis of this patient group.
Objectives: The aim of this study was to characterize the clinical phenotype and explore the long term prognosis of patients with HFmrEF at 5-years of follow-up.
Methods: This retrospective study included 279 outpatients with HFmrEF classified according to baseline LVEF (41-49%) between January and December 2016. Clinical, analytical and imagiological data were carefully collected and analyzed. In terms of prognosis, primary (overall mortality) and secondary endpoints (cardiovascular mortality, HF hospitalizations and major adverse cardiac events) were evaluated during a period of 5 years of follow-up. Patients were further classified as HFmrEF-Decreased if LVEF had decreased to ≤ 40%, HFmrEF-Improved if LVEF had increased to ≥ 50%, or HFmrEF-Stable if they stayed in the same HF category.
Results: Most of the clinical characteristics of HFmrEF patients were intermediate between HFrEF (HF with reduced EF) and HFpEF (HF with preserved EF) when compared with previous studies. However, HFmrEF shared with HFrEF several aspects, including male gender (73.8%), ischemic etiology (51.3%), and the lower prevalence of atrial fibrillation and non-cardiac comorbidities. During a period of 5 years of follow-up, the overall cumulative survival was 68.5%. Regarding the LVEF trajectory, in a multivariate analysis including gender and age, patients in the group HFmrEF-Improved had lower mortality at 5 years when compared to HFmrEF-Decreased [p = 0.004, HR (95%CI): 0.34(0.16-0.71)].
Conclusions: These findings strongly support that HFmrEF constitutes a distinct HF category with distinguished prognosis. LVEF trajectory provide meaningful information and may help clinicians to decide which patients should have more aggressive monitoring and medical therapy.

CO 4. THE PROGNOSTIC IMPACT OF LOOP GAIN IN HEART FALILURE

Rita Amador[1], Sérgio Maltês[1], Bruno Rocha[1], Duarte Nina[2], Carlos M. Aguiar[1], Maria J. Andrade[1], Luís Moreno[1], Anaí Durazzo[1], Miguel Mendes[1], Gonçalo Cunha[1], Piergiuseppe Agostoni[3]

[1]Centro Hospitalar Universitário de Lisboa Ocidental, EPE/Hospital de Santa Cruz. [2]Instituto Superior Técnico. [3]Centro Cardiológico Monzino.

Introduction: Exercise oscillatory ventilation (EOV) is a strong prognostic marker in patients with heart failure (HF) and left ventricular (LV) dysfunction. However, this parameter has had multiple definitions and a high interobserver variability. This phenomenon can be explained through a single quantitative measurement of ventilatory instability, the loop gain.
Objectives: We aimed to compare loop gain measurement with exercise oscillatory ventilation (EOV) regarding demographic characteristics and prognostic value.
Methods: We performed a single-centre retrospective study that included patients with LV ejection fraction (LVEF) < 50% who had been consecutively referred for cardiopulmonary exercise testing (CPET) from 2016-2020. Loop gain was measured through computational evaluation of the minute ventilation graph. The primary endpoint was a composite of cardiovascular (CV) death (sudden death, progressive heart failure-related death and electric storm), urgent heart transplantation/left ventricular assist device (LVAD) implantation or HF hospitalization.



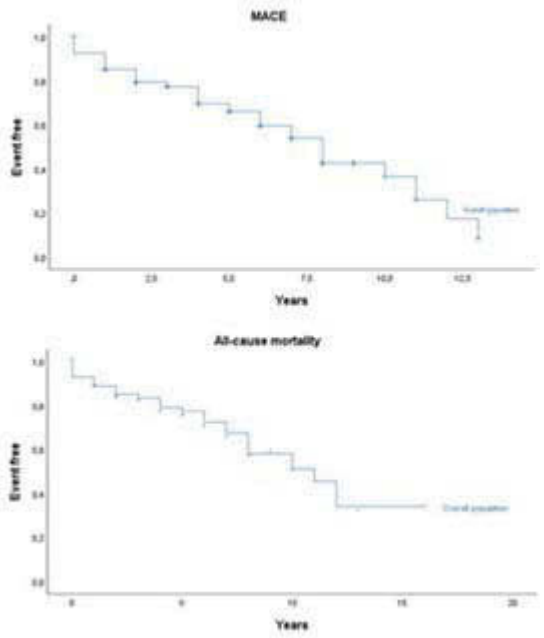
Results: Of the 250 patients included (mean age 58years, 75% male, 67% with ischemic HF), the 66 that presented EOV also had increased value of loop gain when compared to patients without EOV. Those with increased loop gain had more severe HF, higher NT-proBNP and VE/VCO2 slope as well as lower pVO2 and LVEF. On multivariate cox regression analysis, loop gain showed significant correlation with time to composite endpoint (HR for 1 point increase in loop gain 6.866; 95%CI 1.724-27.341; p = 0.006), even when adjusted for pVO2, VE/VCO2 slope, log transformation of NTproBNP and LVEF. Presence of EOV was not prognostically significant in this analysis. The prognosis of patients with lower loop gain seems to be better while patients with higher loop gain seem to fare worse, regardless of the presence of EOV.
Conclusions: Loop gain is an objective parameter that quantifies ventillatory instability and showed to have a strong prognostic value in a cohort of patients with HF and LVdysfunction, outperforming the classification of EOV.

CO 5. LONG-TERM OUTCOMES AFTER RESYNCHRONIZATION THERAPY: A DECADE OF EXPERIENCE FROM A SINGLE-CENTER

Mariana S. Brandão, João Gonçalves Almeida, Paulo Fonseca, Elisabeth Santos, Filipa Rosas, Marco Oliveira, Helena Gonçalves, João Primo, Ricardo Fontes-Carvalho

Centro Hospitalar de Vila Nova de Gaia/Espinho, EPE.

Introduction: Cardiac resynchronization therapy (CRT) improves outcomes of heart failure (HF) patients (pts). We aim to report long-term outcomes after CRT implantation in a Portuguese center.
Methods: Single-center retrospective study of consecutive pts submitted to CRT implantation (2007-2018). Major adverse cardiac events (MACE) included HF hospitalization or all-cause mortality (ACM).



Results: 295 pts were included: mean age 67 ± 11 yrs; 70.5% male; 72.5% non-ischemic HF; 76.7% NYHA III-IV. Comorbidities were prevalent: 65.9% hypertension, 33.6% diabetes, 32.6% atrial fibrillation, 26.8% moderate to severe valvular disease, 22.1% chronic kidney disease. Use of guideline-directed therapy: renin-angiotensin system inhibitors 86.4%; β-blockers 83.6%; mineralocorticoid receptor antagonists 56.4%. Baseline QRS morphology was mainly left bundle branch block (91.5%), mean QRS duration 171 ± 22 ms. Mean baseline LVEF was 27 ± 7%. Successful implantation at 1st attempt was accomplished in 94.6%; an epicardial lead was placed in 9 (3.1%) pts. Concomitant atrioventricular junction ablation was performed in 10 (6.6%) pts. CRT-D was implanted in 54.6%, of whom 23.6% had a secondary prevention indication. 19% of pts underwent an upgrade from a previous device, mostly from a conventional pacemaker. At 1-year follow-up (FU), 80.3% of patients presented with biventricular pacing ≥ 95%. QRS duration decreased significantly (169 ± 21 *vs.* 154 ± 23 ms, p <.001). Sustained ventricular arrhythmias were observed in 18 (6.9%) pts; appropriate therapies were delivered in 16 (6.2%) pts. Echocardiographic response (left ventricle end-systolic volume reduction > 15% at 1-year) was reached by 72.0% of pts. Superresponse (LVEF ≥ 50% at 1-year) was achieved by 59 (21.4%) pts. Clinical response (New York Heart Association class improvement without MACE in the 1st year of FU) rate was 62.0%; 51 (19.2%) pts had a HF hospitalization. During a mean FU of 3.8 ± 3.1 years, lead complications were rare (8.5%), and were more common with CRT-D (12.4% *vs.* 3.7%, p =.014). Device infection occurred in 8 (2.7%) pts; 6 underwent explantation. MACE occurred in 36.2% of pts; 73 (24.7%) pts died from any cause [Figure]. 78 (57.8%) pts survived > 5 years since implantation (mean FU 8 ± 2 yrs).
Conclusions: CRT resulted in clinical and echocardiographic improvement, with few complications. The reported response rate is in line with previous landmark studies. Optimized implementation of CRT may stabilize the trajectory of HF pts.

Sexta-feira, 14 Abril de 2023 | 09:00-10:00

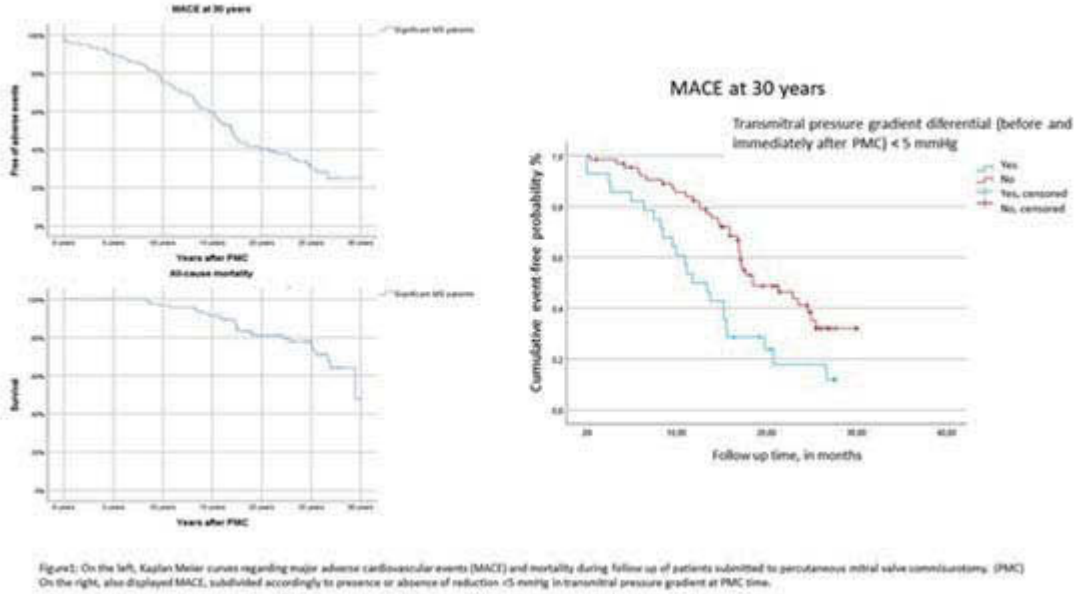
Sala Vega | Comunicações Orais - Sessão 02 - Intervenção não coronária

CO 6. 20 YEAR-FOLLOW UP OF MITRAL STENOSIS PATIENTS AFTER PERCUTANEOUS VALVE COMMISSUROTOMY: INVASIVE TRANSMITRAL PRESSURE GRADIENT DIFERENTIAL AS A PREDICTOR OF EVENTS

Ana Amador, Catarina Costa, João Calvão, André Cabrita, Catarina Marques, Ana Pinho, Cátia Oliveira, Luís Santos, Helena Moreira, Miguel Rocha, Pedro Palma, Mariana Paiva, João Carlos Silva, Filipe Macedo

Centro Hospitalar Universitário de S. João, EPE.

Introduction: Percutaneous valve commissurotomy (PMC) is a viable alternative to mitral valve (MV) surgery in the treatment of patients (pts) with clinically significant mitral stenosis (MS). About 40% of pts treated with PMC will require at least one reintervention (either PMC or MV surgery) along time. The aim of our study was to evaluate the long-term results of PMC in pts with rheumatic MS and to seek for an immediate intra operative predictor of events.
Methods: We retrospectively analysed all consecutive patients between 1991 and 2008 with clinically significant rheumatic MS undergoing PMC. Clinical and echocardiographic data were collected at baseline and during early and long-term follow-up. MACE was a composite of adverse events defined as all-cause mortality, MV re-intervention or cardiovascular hospitalization.
Results: A total of 124 pts were enrolled: 108 (87%) female, mean age at the time of PMC of 46 ± 11 years. At baseline, 34% pts were in NYHA class ≥ III and 81% had a Wilkins score ≤ 8; all patients had preserved biventricular systolic function and 83% presented pulmonary hypertension. In 20 cases, there was concomitant moderate disease of other valve (3/4 tricuspid regurgitation). Most of the procedures were successful (91%) and without complications (94%), with a median reduction in pulmonary artery systolic pressure PASP of 8 mmHg (IQR 10) and a mean reduction in mitral valve gradient of 8 ± 7 mmHg. During the mean follow-up of 20 ± 6 years, 51 (42%) of patients had MV re-intervention (86% surgery and 14% re-PMC), 37 (30%) were hospitalized and 30 (24%) died. Concerning time-to-event analysis, approximately 80% of patients kept MACE-free after 10 years; after 30 years, more than 20% continued MACE-uneventful, approximately 50% were alive and about 45% were free from re-intervention. Using Cox regression, we found that a reduction < 5 mmHg in transmitral pressure gradient at PMC time (before and immediately after PMC) was associated with a 2.1-fold greater rate of MACE compared to pts with a reduction ≥ 5 mmHg (HR_{crude} = 2.2; 95%CI 1.319-3.813 p = 0.003). After adjusting for the presence of mitral regurgitation after PMC (HR_{crude} = 1.7; 95%CI 1.020-2.950, p = 0.042) and for moderate disease of other valves (HR_{crude} 1.9; 95%CI 1.070-3.267, p = 0.028) the observed effect remained significant and was even greater ($HR_{adjusted}$ = 2.7; 95%CI 1.395-5.298, p = 0.003). Of note, differential in PSAP or in left atrium pressure intra-operative did not show an association with occurrence of events (p = 0.285 and p = 0.769).
Conclusions: PMC was safe and effective in clinically significant rheumatic MS. Most of the patients were free from adverse events after 10 years and half were alive after 30 years; still, about 40% required re-intervention. A reduction < 5 mmHg in transmitral gradient at PMC time was associated with events during follow up; more studies are needed to validate this practical independent predictor.



CO 6 Figure

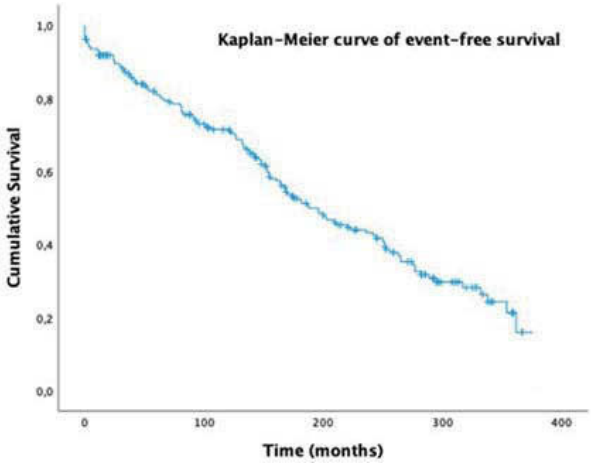
CO 7. LONG-TERM FOLLOW-UP OF PERCUTANEOUS BALLOON MITRAL VALVULOPLASTY FOR RHEUMATIC MITRAL STENOSIS

Sofia Jacinto, André Paulo Ferreira, Luís Almeida Morais, Luís Bernardes, Duarte Cacela, Inês Rodrigues, Ana Galrinho, Luísa Moura Branco, Ana Teresa Timóteo, Pedro Rio, Cristina Soares, Cristina Fondinho, Rui Cruz Ferreira

Centro Hospitalar Universitário de Lisboa Central, EPE/Hospital de Santa Marta.

Introduction: Percutaneous balloon mitral valvuloplasty (PBMV) remains the mainstay of treatment for patients with severe rheumatic mitral stenosis (MS) and a favorable anatomy.
Objectives: The present study aimed to assess very long-term outcomes after PBMV.
Methods: A retrospective analysis of PBMV performed at a single tertiary center between August 1991 and September 2022 was conducted. Successful PBMV was defined as a post-procedural functional mitral valve area (MVA) ≥ 1.5 cm^2, mitral regurgitation less than moderate, and absence of in-hospital major cardiac or cerebrovascular events. The primary endpoint was composed of overall mortality and need for mitral reintervention (percutaneous and/or surgical).

Results: A total of 238 PBMV for severe rheumatic MS were conducted in our center during the specified timeframe (88.7% [n = 211] female gender; mean age 48 ± 16 years; 48.6% [n = 108] had atrial fibrillation [AFib]; 78.8% [n = 149] had a Wilkins score ≤ 8). Acute success was achieved in 88% (n = 198) procedures. Acute complications were present in 10.2% (n = 23), mainly severe mitral regurgitation (n = 10) and acute cerebrovascular events (n = 5). During a mean follow-up of 15.3 ± 9.4 years, the incidence of the primary endpoint was 55% (n = 131) (overall mortality 32.9% [n = 77] and mitral valve reintervention 22.1% [n = 54]). On bivariate analysis, higher age (p = 0.042), presence of AFib (p = 0.002), unsuccess of the procedure (p < 0.001), acute complications (p = 0.001) and larger left atrial (LA) diameter (p = 0.05) were statistically significant for the occurrence of the primary endpoint. On multivariate analysis, larger LA diameter (hazard ratio [HR]: 1.03; 95%CI: 1.00-1.06; p = 0.022), unsuccessful procedure (HR: 3.30; 95%CI: 1.56-7.01; p = 0.002) and presence of complications (HR: 0.37; 95%CI: 0.17-0.84; p = 0.017) were the only independent predictors of the primary endpoint.



Conclusions: In one of the largest national registries of patients submitted to PBMV for severe rheumatic MS, more than half met the primary endpoint for overall mortality or need for reintervention, up to 30 years after the procedure. This supports the dismal prognosis of this pathology. Prediction of late favorable results is multifactorial and appears to be determined by smaller LA diameter, absence of complications and acute success of the procedure.

CO 8. POST-PROCEDURAL MITRAL REGURGITATION AS AN INDEPENDENT PREDICTOR OF MORBIDITY AND MORTALITY OUTCOMES

Ana Rita Teixeira, Sofia Jacinto, João Ferreira Reis, Luísa Moura Branco, Pedro Rio, Ana Galrinho, António Fiarresga, Duarte Cacela, Rui Cruz Ferreira

Centro Hospitalar Universitário de Lisboa Central, EPE/Hospital de Santa Marta.

Introduction: The Mitraclip® system is the most established percutaneous mitral valve intervention indicated for patients (pts) with severe mitral regurgitation non-eligible for surgery. Our aim was to identify clinical,

echocardiographic, and cardiopulmonary exercise testing (CEPT) predictors of morbidity and mortality outcomes.
Methods: Retrospective single center analysis of all patients who underwent Mitraclip implant for secondary MR. Clinical, echocardiographic and CEPT variables were assessed at baseline, 1, 3 and 6 months after the procedure. Univariate analysis was performed followed by a multivariate Cox analysis to determine predictors for the primary (overall mortality) and secondary endpoints (overall mortality/heart failure hospitalization). p < than 0.05 were considered statistically significant.
Results: We included 51 pts (64.7% male, mean age 70 ± 14 years, mean follow-up time 14 ± 13 months, mean left ventricular ejection fraction 35 ± 9%). NYHA class ≥ 3 was present in 31 pts. MR grade IV was present in 72.5% and ischemic etiology in 47.1%. Successful implantation was achieved in 98%, with 33 (64.7%) pts presenting mild MR post-procedure. Overall mortality (M) was 31.4%, mostly due to cardiovascular causes, and 14 had at least one heart failure hospitalization (HFH). COAPT inclusion criteria was met in 22 pts. Both post-procedural MR (p = 0.008) and mitral gradient (p = 0.039) were predictors of M. Although not statistically significant, non-ischemic etiology (HR 0.24, 95%CI: 0.069-1.008, p = 0.051) had a borderline p-value for predicting M. In the multivariate analysis moderate to severe post-procedural MR was as independent predictor of M (p = 0.041). COAPT criteria (p = 0.048), moderate to severe post-procedural MR (p = 0.015) and TAPSE/PASP ratio ≤ 0.36 (p = 0.043) were predictors of M/HF, being post-procedural moderate-severe MR an independent one (p = 0.020).
Conclusions: In our population, moderate to severe post-procedural mitral regurgitation was an independent predictor of overall mortality and mortality/HF hospitalization. Patients with COAPT inclusion criteria had also better outcomes.

CO 9. TRANSCATHETER MITRAL VALVE REPAIR AND ITS IMPACT ON REVERSE RIGHT VENTRICULAR REMODELLING

Diogo de Almeida Fernandes, Joana Guimarães, Gonçalo Costa, Eric Monteiro, Ana Rita Gomes, João Rosa, Gustavo Campos, Ana Vera Marinho, Luís Paiva, Manuel Oliveira-Santos, Elisabete Jorge, Ana Botelho, Natália António, Marco Costa, Lino Gonçalves

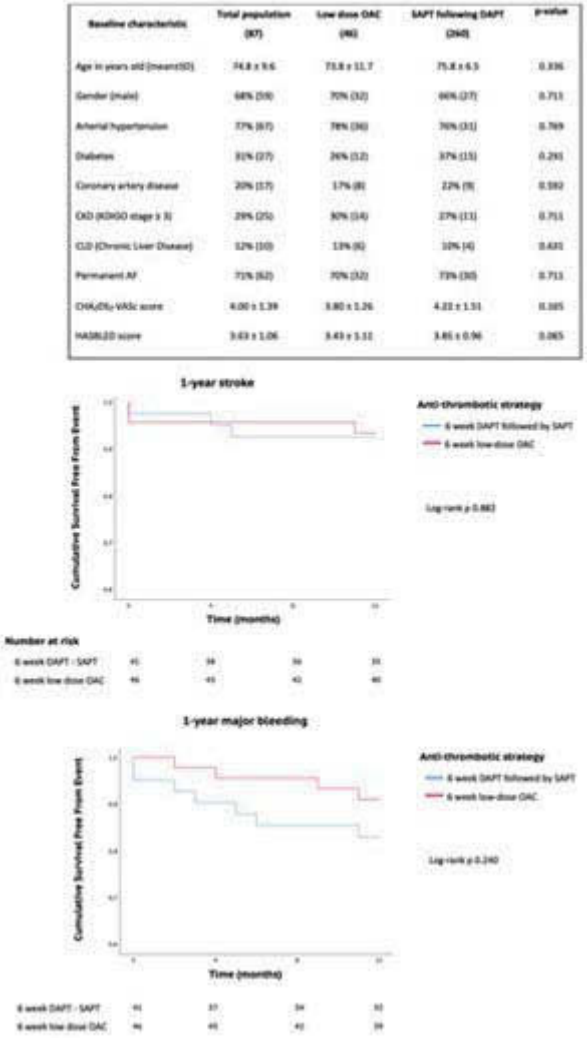
Centro Hospitalar e Universitário de Coimbra, EPE/Hospitais da Universidade de Coimbra.

Introduction: Transcatheter edge-to-edge repair (TEER) has been proven to reduce cardiovascular events in a particular subset of patients with severe mitral insufficiency (MR) and left ventricle dysfunction. Nevertheless, its short and long-term impact on the right ventricle (RV) remained to be determined. Our goal was to assess the effect of TEER on the RV and right chamber pressures.
Methods: Patients were consecutively enrolled from Nov 2018 to Jul 2022. Clinical, laboratory echocardiographic and procedural data were collected. Follow-up information of admissions for heart failure, New York Heart Association (NYHA) functional class and survival was collected. The data was analysed prior to and at 3 and 12 months after the procedure. RV dysfunction was defined as Tricuspid Annular Plane Systolic Excursion (TAPSE) < 17 mm or S' < 9 cm/s. Changes between baseline and follow-up parameters were assessed using the paired t-test.
Results: A total of 46 patients were included. Average age was 77.28 ± 7.92 years and 30 were male (65.2%). Twelve patients were on NYHA class III (26.1%) and most had functional mitral insufficiency (25; 54.3%) and mild to moderate tricuspid insufficiency (36; 78.3%). All patients had severe mitral insufficiency (estimated regurgitant orifice area 41.28 ± 16.77mm; regurgitant volume 62 ± 28.96 mL). Seventeen patients had diabetes (37.0%), 10 had coronary artery disease (21.7%), 23 had atrial fibrillation (50.0%) and 6 had chronic kidney disease (13.0%). At 3 months, mean right ventricular/right atrial gradient (RV/RA_{grad}) was significantly lower (37.26 ± 9.66 mmHg *vs.* 30.81 ± 17.36 mmHg; p 0.017) as well as MR (2.98 ± 0.15 *vs.* 1.67 ± 0.63; p < 0.001). There were no differences regarding severity of tricuspid regurgitation (TR) and RV and left ventricle (LV) function. At 1 year follow-up there was a marked improvement of RV/RA_{grad} (37.49 ± 10.87 mmHg *vs.* 28.12 ± 10.13 mmHg; p 0.009), TAPSE (18.83 ± 4.22 mm *vs.* 20.88 ± 3.08 mm; p 0.035), S' (10.81 ± 4.00 cm/s *vs.* 13.5 ± 1.97 cm/s, p 0.015) and MR severity (2.98 ± 0.15 *vs.* 1.83 ± 0.71; p < 0.001). Number of heart failure readmissions was also lower at 1 year follow-up post TEER (0.35 ± 0.80 *vs.* 0.81 ± 0.87; p 0.032). Over a mean follow-up time of 1.72 ± 1.16 years, only 8.7% of patients died and 17.4% were readmitted due to heart failure.
Conclusions: TEER has a positive impact on right ventricle function and pressures. This effect was more prominent at 1 year follow-up and suggests reverse remodelling continues even after 3 months. Overall, patients with TEER had low rates of death and heart failure readmissions.

CO 10. LOW-DOSE ORAL ANTICOAGULATION *VERSUS* DUAL ANTIPLATELET THERAPY FOLLOWED BY SINGLE ANTIPLATELET THERAPY IN PATIENTS SUBMITTED TO LEFT ATRIAL APPENDAGE OCCLUSION

André Grazina, Bárbara Lacerda Teixeira, António Fiarresga, Ruben Ramos, Isabel Cardoso, José Miguel Viegas, Lídia de Sousa, Ana Galrinho, Duarte Cacela, Rui Cruz Ferreira

Centro Hospitalar Universitário de Lisboa Central, EPE/Hospital de Santa Marta.



Introduction: Left atrial appendage occlusion (LAAO) is a therapeutic option for atrial fibrillation (AF) patients who have ischemic events despite therapeutic oral anticoagulation and/or relative or absolute contraindications to oral anticoagulation. Among the several proposed post-procedural anti-thrombotic regimens, low-dose oral anticoagulation (OAC)

and dual antiplatelet therapy (DAPT) followed by single antiplatelet therapy (SAPT) are common. However, the best strategy remains unclear.
Objectives: This analysis aims to compare the ischemic and bleeding events among AF patients treated with LAAO treated with an initial 6-week course of low-dose OAC *versus* 6-week course of DAPT followed by SAPT.
Methods: Retrospective analysis of AF patients submitted to LAAO in a single tertiary center. The decisions of whether to continue the OAC after the 6-week period and some possible crossover between strategies were made by the assistant cardiologist. One year stroke and major bleeding events were evaluated using a Kaplan-Meier survival curves analysis.
Results: A total of 87 patients (68% male, mean age 74.8 ± 9.6 years old, 71% with permanent AF) submitted to LAAO were included in this analysis. 46 patients underwent a 6-week course of low-dose OAC and 41 a 6-week course of DAPT followed by SAPT. Baseline characteristics are described in the figure 1 and were similar between the two groups, including the conventional stroke and bleeding prediction scores (CHA_2DS_2-VASc 3.80 ± 1.26 *vs.* 4.22 ± 1.51, p 0.165; HAS-BLED 3.43 ± 1.11 *vs.* 3.85 ± 0.96, p 0.065). Regarding outcomes, the stroke and major bleeding rates at 1 year were not different between the two strategies (p 0.882 and p 0.240, respectively). However, regarding the major bleeding, the Kaplan-Meier survival curves tend to separate between the groups, in favor of an initial low-dose OAC strategy.
Conclusions: Among patients with AF submitted to LAAO, those treated with an initial 6-week period of low-dose oral anticoagulation do not have higher ischemic risk and seem to have lower bleeding risk than those treated with a 6-week period of dual antiplatelet therapy followed by single antiplatelet therapy. Larger prospective randomized clinical trials are needed to corroborate this data.

Sexta-feira, 14 Abril de 2023 | 10:00-11:00

Sala Aquarius | Comunicações Orais - Sessão 03 - Fibrilhação auricular - Inovações no tratamento ablativo

CO 11. ATRIAL FIBRILATION CATHETER ABLATION: ELECTROPORATION AGAINST HIGH-POWER SHORT DURATION RADIOFREQUENCY

Rita Reis Santos, Daniel Matos, Daniel Gomes, Mariana S. Paiva, Gabriela Bem, Gustavo Rodrigues, João Carmo, Francisco Costa, Pedro G. Santos, Pedro Carmo, Francisco Morgado, Diogo Cavaco, Miguel Mendes, Pedro Adragão

Centro Hospitalar Universitário de Lisboa Ocidental, EPE/Hospital de Santa Cruz.

Introduction: Pulmonary vein isolation (PVI) is one of the cornerstones of rhythm-control therapy for symptomatic atrial fibrillation (AF) patients. The new ablation technologies of pulse field ablation (PFA) and high-power short-duration radiofrequency ablation (HPSD) with the new QDOT® catheter have been recently introduced in the EP lab.
Objectives: To evaluate and compare the efficacy, and safety of single-shot PFA and HPSDRA for PVI in AF symptomatic patients.
Methods: Single centre, retrospective study of consecutive patients undergoing PVI with PFA or HPSD between May-December 2022. Data on demographic, procedural and clinical/electrocardiographic recurrence (assessed after a 3-months blanking period) were analysed. Comparative analysis between both techniques was performed.
Results: One hundred and ten consecutive patients were included (63 ± 11 years, 75% men), with a mean CHA_2DS_2-VASc score of 2 ± 1 points, median LVEF of 61% [IQR 57-62%] and a median left atrial volume index (by CT scan) of 56 mL/m² [IQR 51-67 mL/m²]. 55% patients presented paroxysmal-AF and 19 patients (17%) performed a redo ablation. 47% (n = 52) patients performed HPSD and 53% (n = 58) PFA (all with CARTO®3D system v.7 and high-density mapping). In the HPSD: median RF ablation time was 792 sec [IQR 614-919sec], while in PFA was 90 sec [IQR 30-138 sec]. Median time of catheter inside the LA for PFA was 18 min [IQR 2-33 min]. Comparing HPSD and PFA (Figure): median procedure time was similar (91 min [IQR 71-107 min] *vs.* 89 min [IQR 66-111 min], p = 0.261), while median fluoroscopy time was lower with HPSD (5.4 min [IQR 3.1-6.8 min] vs. 13.2 min [IQR 10.3-15.6 min], p < 0.001); posterior wall isolation (PWI) was performed in 5 (10%) HPSD *vs.* 21 (37%) PFA patients (p < 0.001). All PFA patients undergoing PWI had first pass isolation, while only 40% of HPSD had first pass isolation. When performed PVI only, PFA presents a lower median procedure time than HPSD (76 min [IQR 62-93 min] vs. 97 min [IQR 69-135 min], p = 0.048). There was only one major complication, a cardiac tamponade with PFA, treated with pericardiocentesis. At 3 months of follow-up, 17% (n = 10) patients had clinical or electrocardiographic AF recurrence: 7 PFA patients and 3 HPSD patients (p = 0.127).

			*p-value*
	n=52	n=58	
Age, y	61 ± 11	61 ± 12	p=0.856
Male, %	89%	62%	**p=0.006**
LV ejection fraction, %	71 (59-85)	71 (59-85)	p=0.598
Left atrial volume index , ml/m2	53 (39-64)	50 (40-70)	p=0.630
Paroxysmal AF, %	62%	47%	p=0.056
AF redo ablation, %	13%	21%	p=0.449
Posterior Wall ablation, %	10%	37%	**p<0.001**
Procedure time (median), min	91 (71-107)	89 (66-111)	p=0.261
Fluoroscopy time (median), min	5.4 (3.1-6.8)	13.2 (10.3-15.6)	**p<0.001**

Figure 1 – Comparative analyses of high-power short duration radiofrequency ablation (HPSDRF) and pulse field ablation (PFA).

Conclusions: PFA and HPSD were both feasible and safe. When undergoing PVI-only, procedure time was lower with PFA. In patients undergoing PWI, PFA achieved higher first pass isolation. Although still in its early real-world evaluation, both techniques seem to be efficient, providing low AF recurrence during follow-up.

CO 12. CROSSING THE LINE IN PERIMITRAL FLUTTER ABLATION: A NEW SOLUTION FOR AN OLD PROBLEM

Joana Brito[1], Afonso Nunes Ferreira[1], Gustavo Lima da Silva[1], Catarina Almeida Barreiros[2], Diogo Albuquerque[2], Fernando Santos Silva[2], Ilda Viana[2], Manuel Rocha Abecassis[2], Ricardo Bernardo[2], Sofia Fernandes[2], Sara Neto[2], Luís Carpinteiro[1], Nuno Cortez-Dias[1], Fausto Pinto[1], João de Sousa[1]

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Introduction: Left-sided atrial flutter (AFl) often implies perimitral circuits, which can be interrupted with linear lesions connecting electro-anatomical obstacles. Inferior mitral line (IML), from the mitral annulus to the left inferior pulmonary vein (PV) is a common strategy to interrupt perimitral circuits, although difficulties in achieving bidirectional blockage are frequent.
Objectives: To compare the safety and effectiveness of the IML with a modified anterior line (MAL).
Methods: Cohort of patients (pts) submitted to perimitral AFl ablation guided though high-density mapping from 2015 to 2022. Pts presented either a perimitral single loop circuit or a perimitral loop with an additional loop evolving the left pulmonary veins (PV). Up to 2018, the classic IML was applied with complementary epicardial applications at operator description. Since then, a MAL was done, from the anterior mitral annulus to the left superior PV, positioned at the transition between the left atrial appendage and the anterior wall. Acute success rate was defined as conversion to sinus rhythm after completion of the ablation line.

Results: The study population included 23 pts - 11 submitted to IML and 12 to MAL - with a mean age of 65 ± 13 and 65% male, structural cardiomyopathy in 31%, without differences between groups. Regarding AFl circuits, 8 were single-loop, 11 were dual-loop and 1 was a triple-loop. In 11/12 the outer loop involved the left PV, the other was scar-dependent with the critical isthmus localized in the left PV antrum. AFl with more than 1 loop were more commonly approached with a MAL (MAL, 73% *vs.* IML, 27%, p = 0.005). In the pts submitted to IML, additional applications in the coronary sinus were performed in 8 (73%) and lead to conversion in 4 of them. In these pts, the success rate was 55%, persisting conduction through the ablation line in the remaining. In the pts submitted to MAL, acute success was achieved 100%, with first-pass block being achieved in 92% (in 1 patient additional applications were done in a gap to achieve bidirectional block). Success rate was significantly higher with a MAL ablation strategy (OR: 21.2; 95%CI 1.01-445; p = 0.0496), radiofrequency application time was lower (20 ± 11 *vs.* 65 ± 35 min; p = 0.032) and procedure duration was reduced (171 ± 40 *vs.* 230 ± 73 min; p < 0.001). No significant complications occurred in both groups.
Conclusions: A MAL is a novel and attractive alternative approach to the classic IML, increasing the effectiveness for perimitral AFl ablation.

CO 13. VERY HIGH-POWER SHORT-DURATION *VERSUS* CONVENTIONAL RADIOFREQUENCY ABLATION GUIDED BY ABLATION INDEX FOR PULMONARY VEIN ISOLATION: DATA FROM A PORTUGUESE HEALTHCARE CENTRE

Rafael Silva Teixeira[1], Marta Catarina Almeida[1], Fábio Sousa Nunes[1], André Lobo[1], Marta Leite[1], Ana Inês Neves[1], Tiago Silva Martins[2], Diogo Santos[1], Mariana Brandão[1], Paulo Fonseca[1], João Gonçalves Almeida[1], Marco Oliveira[1], Ana Mosalina Manuel[1], Helena Gonçalves[1], João Primo[1], Ricardo Fontes-Carvalho[1]

[1]*Centro Hospitalar de Vila Nova de Gaia/Espinho, EPE.* [2]*CINTESIS.*

Introduction: Very high-power short-duration (vHPSD) is a new modality of radiofrequency (RF) pulmonary vein (PVs) isolation which minimizes conductive heating while increasing resistive heating, delivering a targeted heating to the atrial wall and decreasing the probability of collateral tissue damage. vHPSD is expected to improve AF outcomes at the cost of narrower safety margin towards the oesophagus, shorter procedure times and less PVs reconnections based on insufficient non-transmural ablation lesions.
Objectives: The aim of this study was to compare short-term duration outcomes of a vHPSD modality (90 Watt, 4 s) with a novel temperature-controlled RF catheter ablation system, with 'CLOSE' protocol which uses a power-controlled RF catheter ablation system guided by the ablation index (AI), an arbitrary unit composed of power, contact force and ablation time.
Methods: We retrospectively analyzed short-term outcomes data from consecutive patients (pts) who were scheduled for first-do-symptomatic PVI since December 2021 and had a complete documentation of the technical procedure and follow-up (FUP) by month 3 after ablation in a ratio of 1 vHPSD to 1 CLOSE patient. Assessed outcomes included freedom from symptomatic AF recurrence at 3 months and procedure endpoints (first passage isolation (FPI) rate, total procedure time and total radiofrequency (RF) time and related procedure complications).
Results: We included 68 pts (mean age was 61 ± 10 years, 66% pts were male, mean body mass index 30 ± 4 kg/m^2, 69% had paroxysmal AF). At the beginning of the ablation, 85% of pts undergoing CLOSE and 64% of pts undergoing vHPSD (p = 0.10) were in sinus rhythm and electrical cardioversion was performed in 29% and 35% (p = 0.80) in each group at some moment during the procedure, respectively. Ablation beyond PVI was performed in 18% of pts in each group. FPI rate was 75% in both groups (p = 0.56). Total procedure time was significantly lower (p < 0.001) in pts submitted to vHPSD (110 ± 19 min) when compared to CLOSE (133 ± 26 minutes), as was total RF time (5 min, interquartile range (IQR) 4-6 min, in vHPSD, *versus* 23 min, IQR 22-19 min, in CLOSE). Fluoroscopic total time was similar between groups (p = 0.508). Overall freedom from AF was found in 94% (vHPSD) *vs.* 85% (CLOSE), (p = 0.64). Only one minor vascular complication was documented in the post-procedure 24 hours in a patient submitted to vHPSD.
Conclusions: Our results from this small studied population suggest that vHPSD may shorten ablation procedure times without significantly increasing the rate of relevant intraprocedural complications or AF relapse in the first 3 months.

CO 14. SINGLE *VERSUS* DOUBLE TRANSEPTAL PUNCTURE IN CATHETER ABLATION OF ATRIAL FIBRILLATION: CHARACTERIZATION AND LONG-TERM OUTCOMES IN A SINGLE TERTIARY CENTER

Bárbara Lacerda Teixeira, Pedro Silva Cunha, Ana Rita Teixeira, Ana Sofia Jacinto, Guilherme Portugal, Bruno Valente, Madalena Coutinho Cruz, Ana Lousinha, Ana Sofia Delgado, Manuel Brás, Margarida Paulo, Cátia Guerra, Rui Cruz Ferreira, Mário Oliveira

Centro Hospitalar Universitário de Lisboa Central, EPE/Hospital de Santa Marta.

Introduction: An ablation catheter in conjunction with a circular mapping catheter (CMC) requiring a double transeptal puncture (TSP) for left atrial access is conventionally used for atrial fibrillation (AF) ablation in the

PARAMETER	Overall sample (n= 341)	Single Puncture (n= 165)	Double Puncture (n = 176)	p-value
Procedure duration in minutes – Mean ± SD	126 ± 34,2	129 ± 33,2	122 ± 34,9	0,055
Fluoroscopy time in minutes – Mean ± SD	16 ± 8,4	**13 ± 6,3**	19 ± 9,1	**< 0,001**
Complication rate – n (%)	23 (7,7)	8 (5,6)	15 (9,7)	0,181

Table 2: Procedure characteristics, regarding time and complications, and group comparison.

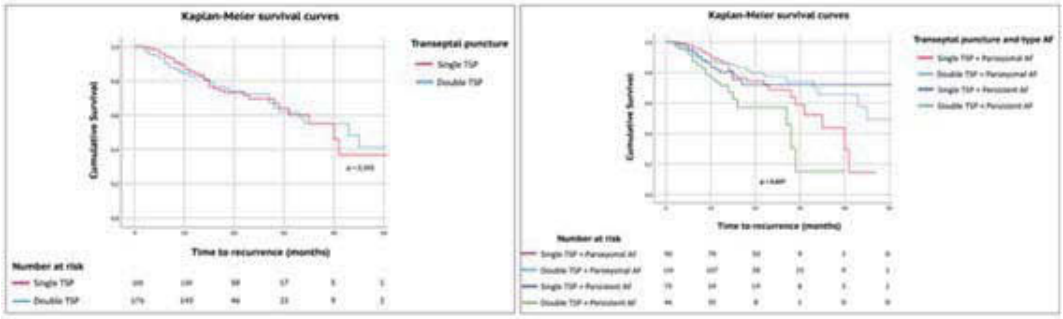


Figure 1 and 2. Kaplan Meier survival curves of AF recurrence during follow-up, in patients with AF undergoing catheter ablation.

CO 14 Figure

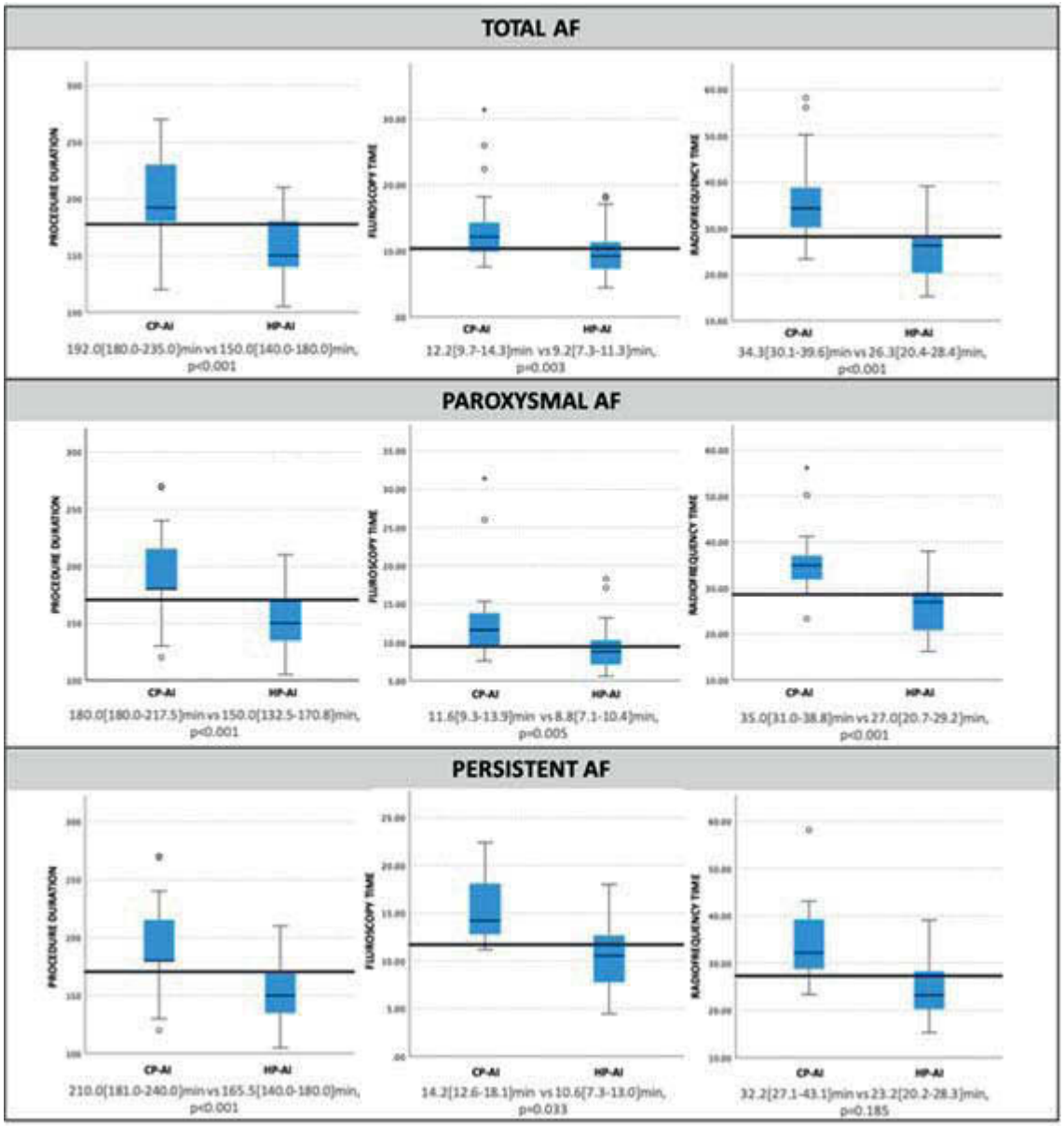
majority of centers. In the recent years, different operators have combined a single transseptal puncture technique with 3D high-density mapping catheters for pulmonary veins isolation (PVI) in AF patients.

Objectives: The aim of this analysis is to compare two different strategies, single *versus* double TSP, regarding duration of the procedure, radiation dose, complications and long-term outcomes.

Methods: retrospective analysis of an AF large cohort of consecutive patients that underwent PVI with radiofrequency energy (RF) using a 3D mapping system, either with single or double TSP, from 2016 to 2020.

Results: we included 341 patients (female 35.8%, paroxysmal AF 64.2%) who underwent catheter ablation with RF. At the time of the ablation, age was 59.1 ± 11.8 years old, and the mean CHA2DS2-VASc score was 1.6 ± 1.3. All patients were taking oral anticoagulation. Single TSP was performed in 165 (48.4%) patients and double TSP in 176 (51.6%) patients. In 56 (16.4%) cases (50 [30.3%] in the single TSP and 6 [3.4%] in the double TSP), the procedure was a repeat ablation after AF recurrence. Operator experience (defined as ≥ 5 years of AF ablation procedures) was equally distributed between the two groups. The average procedure time single (129 ± 33.2 minutes *vs.* 122 ± 34.9 minutes, for single and double TSP, respectively) did not reach statistical difference between the two groups (p = 0.55), but there was a significant difference regarding fluoroscopy time (13 ± 6.3 *vs.* 19 ± 9.1, for single and double TSP, respectively; p < 0.001). Acute complications were less frequent in the single TSP approach (5.6% *vs.* 9.7%, for single and double TSP, respectively), but did not reach statistical significance (p = 0.181). At 4-year follow-up, sinus rhythm maintenance rate was equal in both groups (72.7%). The Kaplan-Meier survival curves revealed no difference in AF recurrence between the two groups during the follow-up time of 4 years (log rank p = 0.975). However, further analysis of subgroups according to type of AF revealed a significant difference among the subgroup with persistent AF submitted to double TSP (log rank p = 0.007).

Conclusions: A simplified single-TSP technique using high-density multi-electrode 3D mapping is a safe and highly successful approach for AF ablation. This approach yields a substantial reduction in fluoroscopy time, with the potential to avoid acute complications when compared to a conventional double-TSP strategy. Long-term outcomes are similar between groups, although our analysis suggests that patients with persistent AF submitted to double-TSP present a statistically significant lower survival free from recurrence.



CO 15 Figure

CO 15. ATRIAL FIBRILLATION HIGH POWER RADIOFREQUENCY ABLATION: EFFICIENCY AND SAFETY

Mariana Martinho, João Grade Santos, Sofia Almeida, Rita Miranda, Bárbara Ferreira, Diogo Santos Cunha, Oliveira Baltazar, João Mirinha Luz, Nazar Ilchyshyn, Alexandra Briosa, Daniel Sebaiti, Luís Brandão, Hélder Pereira

Hospital Garcia de Orta, EPE.

Introduction: High power-ablation index (HP-AI) guided radiofrequency (RF) ablation of atrial fibrillation (AF) is increasingly being used as an alternative to conventional power (CP) ablation due to its better procedural performance and similar safety profile. Some evidence suggests that the lower RF time used in HP-AI may also have a protective effect in contact related complications. Despite this evidence, this strategy is still not widely used.
Objectives: Compare procedural efficiency and safety between HP-AI *vs.* CP-AI-guided ablation in AF patients (pts).
Methods: Retrospective single-center study of consecutive pts submitted to AI-guided ablation, between 05/2018 and 10/2022. RF power and AI were 25W/500 and 45W/500 for the anterior wall and 20W/380 and 35W/380 for the posterior wall in CP-AI and HP-AI, respectively. Procedure related complications incidence were checked at 1 month.
Results: Of a total of 83 pts included in the study, mean age was 62 ± 10y and 57.8% were males. HP-AI was performed in 61.4% (n = 51). 39.2% had persistent AF (vs 25% in CP-AP, p = 0.235). HP-AI was associated with significantly lower median procedure duration (150.0 [140.0-180.0] min *vs.* 192.0 [180.0-235.0] min, p < 0.001), fluoroscopy time (9.2 [7.3-11.3] min *vs.* 12.2 [9.7-14.3] min, p = 0.003) and RF time (26. 3[20.4-28.4] min *vs.* 34.3 [30.1-39.6] min, p < 0.001). These times were significantly reduced for both paroxysmal and persistent AF (Figure). Electrical isolation of all the pulmonary veins was achieved in all patients. There were no early complications related to the procedure in either CP-AI or HP-AI groups.
Conclusions: HP-AI guided AF ablation significantly reduced procedure duration without impairing safety. It was also associated with lower RF application time, which may potentially lead to a reduction in procedure related complications. Data regarding long-term effectiveness will eventually support HP-AI as the best option for RF AF ablation.

Sexta-feira, 14 Abril de 2023 | 10:00-11:00

Sala Vega | Comunicações Orais - Sessão 04 - Choque cardiogénico

CO 16. PREDICTORS OF IN-HOSPITAL MORTALITY IN MYOCARDIAL INFARCTION PRESENTING WITH CARDIOGENIC SHOCK

Nazar Ilchyshyn[1], Ana Catarina Gomes[1], Ana Isabel Marques[1], Alexandra Briosa[1], João Grade Santos[1], Bárbara Ferreira[1], Mariana Martinho[1], Diogo Cunha[1], Oliveira Baltazar[1], João Luz[1], Ana Rita Pereira[1], Gonçalo Morgado[1], Rita Calé[1], Cristina Martins[1], Hélder Pereira[1], On Behalf of The Portuguese Registry of Acute Coronary Syndrome Investigators[2]

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Introduction: Myocardial infarction (MI) presenting with cardiogenic shock (CS) carries a high potential for hazard outcome. Despite therapeutic advances, CS mortality rate remains high.
Objectives: Our aim was to characterize the population presenting with MI and CS and assess in-hospital, 1- and 6- month mortality rates, mortality trends and predictors of in-hospital mortality.
Methods: Retrospective analysis of all patients admitted with MI and CS between 2010 and 2022 included in the ProACS. Medical records were analyzed for demographic, procedural data and mortality outcomes. Mortality trends over the past 12 years were assessed using chi-square test for linear trend. Logistical forward stepwise regression was performed to assess in-hospital mortality predictors.
Results: 660 patients presented with MI and CS. The mean age was 69.2 ± 13.2 years-old, 68% male, 17% obese, 23.7% smokers, 69.8% hypertensive, 39% diabetic and 55.6% had dyslipidemia. 16.4% had previous history of MI and 19.3% had chronic coronary syndrome. 11.9% had history of chronic kidney disease (CKD) and 10.8% of heart failure. Time from symptom onset to first medical contact was > 120 min in 52.1%. 82.9% had STEMI, 49.5% being anterior MI and 46.5% inferior MI. 90.3% of reperfusion group was submitted to PCI. 60.9% had multivessel disease. Culprit lesion was left main coronary artery (LMCA) in 9.2%, left anterior descending artery (LAD) in 33.4%, circumflex artery in 10.3%, right coronary artery (RCA) in 35.1% and other in 11.9%. 23.7% needed invasive mechanical ventilation (IMV), 7.6% needed circulatory assist device and 11.1% needed temporary pacemaker. In-hospital, 1- and 6-month mortality was 36.4%, 37.3% and 38.9%, respectively, with a statistically significant trend for decrease in mortality in all 3 groups (p = 0.038, p = 0.043 and p = 0.042). In-hospital mortality was associated with ≥ 75 years-old (OR 2.36, p = 0.001), obesity (OR 1.67, p = 0.025), time from symptom onset to first medical contact > 120 min (OR 1.53, p = 0.04), hypertension (OR 1.17, p = 0.001), diabetes (OR 1.43, p = 0.001), dyslipidemia (OR 1.23, p = 0.001), CKD (OR 1.55, p = 0.001), STEMI (OR 2.40, p = 0.001), Creatinine > 2.0 mg/dL (OR 1.88, p = 0.001), Hemoglobin < 8 g/dL (OR 1.53, p = 0.001), LMCA-disease (OR 3.25, p = 0.001), pre-hospital fibrinolysis (OR 9.86, p = 0.001), need for intra-aortic balloon (OR 2.10, p = 0.013), IMV (OR 1.54, p = 0.02), while PCI was protective (OR 0.41, p = 0.001). Logistic regression model revealed ≥ 75 years-old, time from symptom onset to first medical contact > 120 min, LMCA as culprit lesion and use of IMV as predictors of in-hospital mortality.
Conclusions: Predictors of in-hospital mortality were old age, delay in seeking medical assistance, LMCA as culprit lesion and the need for IMV. There was a decrease in CS mortality over the years, probably due to improvement of therapeutic management (including PCI-procedures).

CO 17. THE PORTUGUESE APPROACH TO CARDIOGENIC SHOCK IN ACUTE CORONARY SYNDROME

Margarida G. Figueiredo, Sofia B. Paula, Mariana Santos, Hélder Santos, Mariana Coelho, Samuel Almeida, Lurdes Almeida

Centro Hospitalar Barreiro/Montijo, EPE/Hospital Nossa Senhora do Rosário.

Introduction: Acute myocardial infarction (ACS) with myocardial dysfunction is the most frequent cause of cardiogenic shock (CS), which results in end-organ damage tissue, with high mortality rates. Early use of mechanical circulatory support (MCS) allows a reduction in need for inotropes and may prevent the downward spiral of shock.
Objectives: To compare patients with CS due to ACS that received with those that didn't receive MCS, regarding intrahospital complications, intrahospital mortality, and one-year follow-up in terms of mortality, readmissions (R) for cardiovascular (CV) causes and R for other causes.
Methods: Multicenter retrospective study, based on the Portuguese Registry of ACS, from 1/10/2010-24/10/2022. Patients were divided into two groups: A - without MCS - and B - patients that needed MCS. Kaplan-Meier test was performed to establish the survival rates, CV readmissions and readmissions for other causes, at one year.
Results: A total of 1168 patients were analyzed, 1074 in group A (92.0%) and 94 in group B (8.0%). Mean age was 72.5 ± 12.6 years and 62.5% of the patients were male in group A, while in group B mean age was 68.0 ± 11.4 and 64.9% were men. Group A had more patients with previous acute myocardial infarction (MI) (21.2% *vs.* 11.1% p = 0.024). On admission, group B presented more ST-elevation myocardial infarction (STEMI) (81.9% *vs.* 21.2%, p = 0.020), anterior MI (63.6% *vs.* 49.9%, p = 0.022) and Killip-Kimball classification of IV (48.9% *vs.* 37.2%, p = 0.025). Group B underwent more prehospital thrombolysis (66.7% *vs.* 6.5%, p < 0.001), had a higher Door-to-

Balloon time (134.5 (62.0-234.0) min *vs.* 95.0 (39.5-185.0) min, p = 0.020), and left main artery was the culprit artery in more cases in this group (15.6% *vs.* 6.0%, p = 0.003). Group B had more mechanical complications (13.8% *vs.* 5.8%, p = 0.002) and cardiac arrest (29.8% *vs.* 17.5%, p = 0.003). There were no differences between the two groups in terms of intrahospital mortality (group A 48% *vs.* group B 46.8%, p = 0.826) or in mortality rates, R for CV causes and R for other causes at one-year follow-up, with a Kaplan-Meier test of p = 0.235 (Figure 1A), p = 0.601 (Figure 1B) and p = 0.257 (Figure 1C), respectively.

Figure 1. Mortality rates (A), readmission for cardiovascular causes rates (B) and readmission for other causes rates (C), in patients without mechanical circulatory support (group A) and in patients with mechanical circulatory support (group B).

Conclusions: Even though patients in need of MCS had a more severe clinical presentation, intrahospital mortality, survival rates, CV hospitalizations and R for other causes at one year did not show significant differences from patients without MCS.

CO 18. PREDICTION OF IN-HOSPITAL MORTALITY IN PATIENTS ADMITTED FOR CARDIOGENIC SHOCK TREATED WITH VA-ECMO - VALIDATION OF SAVE SCORE AND THE INCREMENTAL VALUE OF SERUM LACTATE

João Presume, Daniel Gomes, Francisco Albuquerque, Pedro Lopes, Ana Rita Bello, Catarina Brízido, Christopher Strong, Jorge Ferreira, Miguel Mendes, José Pedro Neves, Helena Brandão, António Tralhão

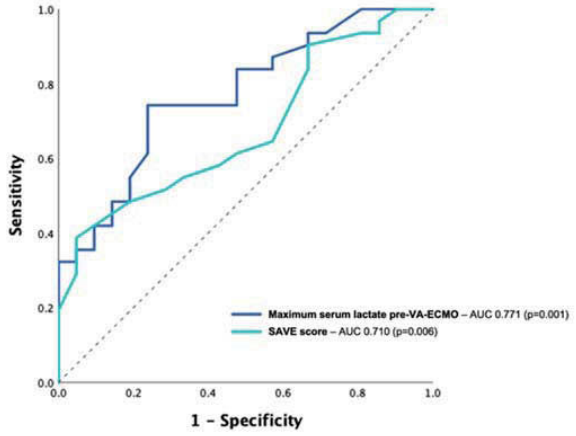
Centro Hospitalar Universitário de Lisboa Ocidental, EPE/Hospital de Santa Cruz.

Introduction: Veno-Arterial extracorporeal membrane oxygenation (VA-ECMO) is a treatment option to provide circulatory and pulmonary support to patients with cardiogenic shock. However, a risk profile assessment is essential for an adequate selection of patients for this type of therapy. The aim of this study was to 1) validate the SAVE score in a Portuguese cohort of patients treated with VA-ECMO due to cardiogenic shock; 2) evaluate the prognostic impact of the maximum serum lactate level pre-VA-ECMO implantation; 3) assess the ability of lactate to improve risk stratification by the SAVE score.

Methods: We conducted a single-center retrospective analysis of patients treated with VA-ECMO due to cardiogenic shock from 2017 until 2022. Variable assessments were considered before VA-ECMO implantation. The primary outcome analyzed was in-hospital mortality.

Results: A total of 61 patients were included (52 ± 12 years, 74% male, 40% with acute myocardial infarction, 54% with an ejection fraction < 20%, and 74% in SCAI stage D pre-implantation). Overall, 38 (62%) died during hospitalization. The mean SAVE score was -1.7 ± 7.2 points, and the median maximum serum lactate before ECMO implantation was 5.8 [2.7; 11.8] mmol/L. SAVE score showed a statistically significant association (1 ± 5 *vs.* -4 ± 7; OR 0.872 [0.789; 0.964] per each point increase; p = 0.008) and good discriminative power (AUC 0.710; p = 0.006) to predict in-hospital mortality. When grouping patients according to this score, 25 (41%) were classified as SAVE risk class I or II, and 36 (59%) as SAVE class III, IV, or V. Maximum serum lactate before VA-ECMO implantation also showed a significant association (4.5 ± 3.1 *vs.* 9.6 ± 6.6; OR 1.264 [1.066;1.498] per each 1mmol/l increase; p = 0.007) and good discriminative power (AUC 0.771; p = 0.001) to predict the primary outcome. The best lactate cut-off to identify high mortality risk was 5 mmol/l with a sensitivity of 74% and a specificity of 76%. Additionally, taking into account this threshold, lactate significantly enhanced the SAVE score group stratification, with a net reclassification improvement of 36.7% (p = 0.021).

Figure 1 – Receiver operating characteristic (ROC) curves of SAVE score and maximum serum lactate before VA-ECMO implantation to predict in-hospital mortality.



Conclusions: In this cohort of patients, the SAVE score was significantly associated with in-hospital mortality. Maximum serum lactate before VA-ECMO implantation was a strong predictor of in-hospital mortality and significantly improved SAVE score risk stratification.

CO 19. CIRCULATORY POWER - A NEWLY DEVELOPED NON-INVASIVE DYNAMIC PARAMETER TO PREDICT IN-HOSPITAL MORTALITY IN CARDIOGENIC SHOCK

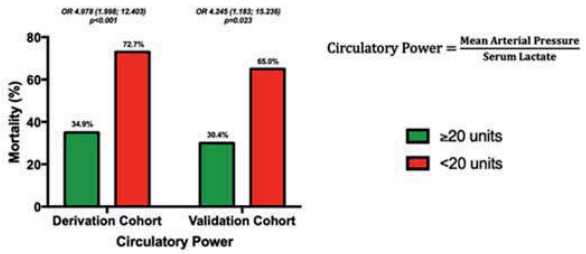
João Presume, Ana Rita Bello, Daniel Gomes, Catarina Brízido, Christopher Strong, António Tralhão, Jorge Ferreira

Centro Hospitalar Universitário de Lisboa Ocidental, EPE/Hospital de Santa Cruz.

Introduction: Prognosis estimation is essential for tailored treatment in patients admitted due to cardiogenic shock (CS). Cardiac Power Output is the strongest independent hemodynamic correlate to predict in-hospital mortality in patients with CS but needs invasive pulmonary artery catheterization. We sought to develop an alternative non-invasive dynamic variable (Circulatory Power [CP]) including the reciprocal of serum lactate measurement as a surrogate of cardiac output, and evaluate its performance in predicting in-hospital mortality in patients admitted for CS.

Methods: Patients admitted to a cardiac ICU due to CS of any cause from 2017 to 2022 were retrospectively identified. Those without serum lactate at admission were excluded. CP was defined as the ratio between mean arterial pressure and serum lactate, collected at admission. To derive and validate this marker, patients were randomized in a 2:1 fashion into two cohorts, respectively.
Results: We analyzed a total of 144 patients (67 ± 16 years, 68% male, 53% with acute myocardial infarction). At admission, 79% of patients were in SCAI stage C, the median LVEF was 27% [20; 35], the median CP was 21 [12;34] and the median serum lactate was 3.3 [2.0;5.9] mmol/L. Both CP (35 ± 27 *vs.* 20 ± 20; OR 0.966 [0.946; 0.986]; p = 0.001) and serum lactate (3.3 ± 2.3 *vs.* 5.4 ± 3.9; OR 1.275 [1.113; 1.459]; p < 0.001) showed a statistically significant association with in-hospital mortality. Furthermore, both markers showed good discriminative power to predict in-hospital mortality, with CP being significantly superior (AUC 0.738 *vs.* AUC 0.695; p = 0.005). Patients were then randomized to derivation (n = 96) and validation cohorts (n = 48). In the derivation cohort, CP was associated with increased in-hospital mortality (p = 0.019) and good discriminative power (AUC 0.742; p < 0.001), maintaining superiority over isolated serum lactate (p = 0.030). The best threshold to identify high mortality risk was 20 with a sensitivity of 70.2% and specificity of 70.0%. In the validation cohort, this cut-off was significantly associated with higher mortality (30.4% *vs.* 65.0% mortality - OR 4.245 [1.183; 15.236]; p = 0.023) (Figure).

Figure 1 – In-hospital mortality and odds ratio for the best circulatory power threshold applied to the derivation and validation cohort



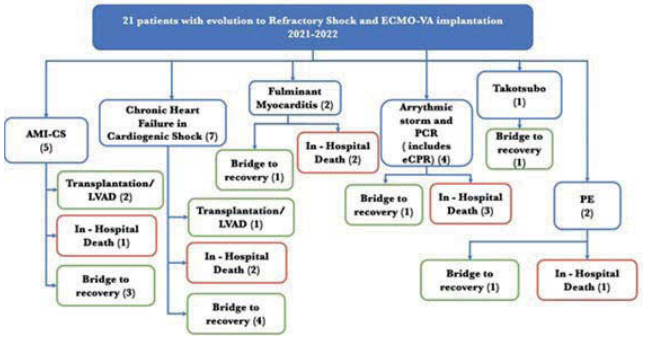
Conclusions: Circulatory power is a newly developed non-invasive parameter that showed a strong association with in-hospital mortality in patients admitted due to cardiogenic shock, superior to isolated serum lactate. There was a 3.4% lower mortality for each unit increase in CP. The best cut-off for the identification of mortality risk was 20 units, which was associated with a 4x increase in the odds of in-hospital mortality in the validation cohort.

CO 20. VENO-ARTERIAL EXTRACORPOREAL MEMBRANE OXYGENATION FOR CARDIOGENIC SHOCK: ONE-YEAR OUTCOMES FROM A CARDIAC INTENSIVE CARE UNIT LED SHOCK TEAM PROGRAM

Ana Rita Bello, João Presume, Daniel Gomes, Francisco Albuquerque, Pedro Lopes, Catarina Brízido, Christopher Strong, Jorge Ferreira, Helena Brandão, José Pedro Neves, António Tralhão

Centro Hospitalar Universitário de Lisboa Ocidental, EPE/Hospital de Santa Cruz.

Introduction: Mechanical circulatory support (MCS) with peripheral veno-arterial extracorporeal membrane oxygenation (VA-ECMO) is increasingly used for severe cardiogenic shock (CS).
Objectives: To describe the initial experience with peripheral VA-ECMO within a cardiac intensivist team led program.
Methods: Retrospective analysis of a short-term MCS prospective registry, from 1 September 2021 to 1 December 2022. Clinical and device related variables were reviewed and reported. We assessed both patient outcomes as well as ECMO-related complications.
Results: A total of 21 patients were included in this analysis (50 ± 13 years-old, 80% male), ranging from SCAI-C (n = 8) to E (n = 5) and with a median predicted mortality by SAVE score of -4 points [IQ -6 - 0] (corresponding to 30% in-hospital survival). All cannulations were done percutaneously, mostly by trained cardiac intensivists and while at the CICU (n = 12). A femoro-femoral configuration was used for all patients. One patient was cannulated at the referring hospital and retrieved to our unit for further care. Three patients were cannulated during intra-hospital cardiac arrest and one patient was cannulated while breathing spontaneously (awake-ECMO). Mean venous and arterial cannula sizes were 22 ± 1.9 Fr and 17 ± 1.6 Fr, respectively. A 7 French (Fr) arterial limb reperfusion cannula was used in 85% of cases. The most frequent etiology was acute decompensation of chronic heart failure (n = 7), followed by acute myocardial infarction related CS (n = 5), fulminant myocarditis (n = 2) and massive pulmonary thromboembolism (n = 2). A left ventricle venting device was used in 70% of patients [intra-aortic balloon pump (n = 10); percutaneous microaxial pump (n = 2)] and upgrade to a veno-arterio-venous configuration was necessary in one patient due to differential hypoxemia. Mean ECMO-run duration was 8.4 ± 4.8 days while mean CICU length of stay was 22 ± 17.9 In-hospital mortality was 42%. In survivors, decannulation was surgical in all but one patient. The most frequent strategy was bridge to recovery (n = 14). One patient was bridged directly to heart transplant, one to a temporary centrifugal left ventricular assist device (LVAD) and one to a durable magnetically levitated LVAD. Complications were common and included bleeding from cannula insertion sites (n = 19), renal replacement therapy requirement (n = 10), Harlequin syndrome (n = 2), cardiac tamponade (n = 2), intestinal ischemia (n = 3) and limb ischemia (n = 2).



Conclusions: VA-ECMO performed by cardiac intensivists is a feasible MCS strategy for severe cardiogenic shock patients in whom mortality, while high, was similar to large international published series. Further experience will allow for improvement in patient selection and minimization of device related complications.

Sexta-feira, 14 Abril de 2023 | 11:00-12:00

Sala Aquarius | Comunicações Orais - Sessão 05 - Doença cardiovascular na mulher

CO 21. SEX DIFFERENCES AND OUTCOMES AFTER TRANSCATHETER AORTIC VALVE IMPLANTATION IN SEVERE AORTIC STENOSIS - AN ANALYSIS OF 488 CASES

Diogo Santos Ferreira[1], Silvia Diaz[2], Cláudio Guerreiro[1], Gualter Silva[1], Mariana Silva[1], Mariana Brandão[1], Fábio Nunes[1], Rafael Teixeira[1], Eulália Pereira[1], Gustavo Pires-Morais[1], Bruno Melica[1], Lino Santos[1], Alberto Rodrigues[1], Pedro Braga[1], Ricardo Fontes-Carvalho[1]

[1]Centro Hospitalar de Vila Nova de Gaia/Espinho, EPE. [2]Faculdade de Medicina da Universidade do Porto.

Introduction: Conflicting results have been reported regarding survival after transcatheter aortic valve implantation (TAVI) for severe aortic stenosis (SAS) treatment in women, when compared to men.

Objectives: Compare mortality after TAVI for SAS, according to sex.
Methods: A single-centre retrospective database of all TAVI performed between 2011 and 2019 was analyzed, and clinical, echocardiographic and blood-analysis data were compared according to sex. Primary endpoint was defined as time to all-cause death of last follow-up over the five years after intervention. Secondary endpoint was defined as a reduction of at least one New York Heart Association (NYHA) class after TAVI. Kaplan-Meier curves, log-rank test, Cox proportional hazard model adjusted for EuroSCORE II, as well as Pearson's Chi-squared test, Wilcoxon rank sum test and Fisher's exact test were used, as appropriate. $p < 0.05$ was considered statistically significant.
Results: From a total of 488 TAVI, 252 (51.6%) women were treated. They were older (84 *vs.* 80 years-old, $p < 0.001$), had a lower body surface area, and had a higher estimated surgical risk, using EuroSCORE II (4.5 *vs.* 3.8, $p = 0.011$) and STS-mortality (4.46 *vs.* 3.44, $p < 0.001$). There was also a lower prevalence of diabetes *mellitus*, coronary artery disease and peripheral artery disease, lower estimated creatinine clearance, as well as a lower frequency of previous pacemaker implantation. Women had a lower functional aortic valve area, higher transvalvular gradients and ejection fraction. TAVI design was no different according to sex, but smaller valves were implanted in women. In the whole cohort, there was a 40% mortality over 5 years after treatment. No statistically significant differences were found regarding survival after TAVI in both univariate and multivariate analysis, after adjusting for EuroSCORE II. The latter had a statistically significant association with the primary endpoint [hazard ratio 1.03 (1.01-1.05), $p = 0.004$). Despite similar NYHA class before intervention, there was a lower frequency of NYHA class improvement in women after TAVI (61% *vs.* 72%, $p = 0.034$).
Conclusions: Despite exhibiting a higher estimated surgical risk, mortality after TAVI was not found to be different in women. However, heart failure symptomatic improvement was less frequent in this subset.

CO 22. STRESS IN WOMEN: DOES IT PREDICT THE TYPE ACUTE CORONARY SYNDROME?

Margarida G. Figueiredo, Sofia B. Paula, Mariana Santos, Hélder Santos, Mariana Coelho, Samuel Almeida, Lurdes Almeida

Centro Hospitalar Barreiro/Montijo, EPE/Hospital Nossa Senhora do Rosário.

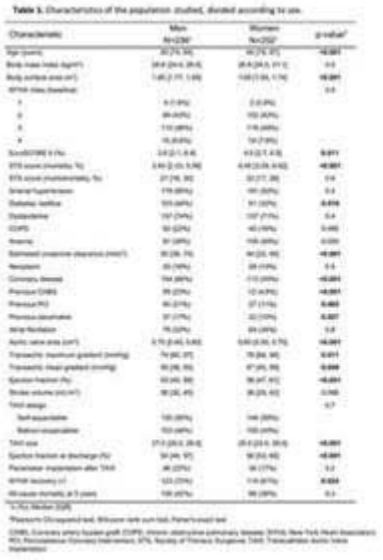
Introduction: In the last decades, there has been a significant increase in acute coronary syndrome (ACS) hospitalizations in young women, especially in those admitted for ST-elevation myocardial infarction (STEMI). Recent studies indicate that non-traditional risk factors, such as psychosocial stress may contribute substantially to the increasing risk noticed in this population, since depression and perceived stress (PS) are much more common in younger women. The 10-item Perceived Stress Scale (PSS-10) is a validated instrument to estimate stress levels in clinical practice.
Objectives: To assess the impact of if PS in women ant if it was a predictor of non-ST-elevation myocardial infarction (NSTEMI).
Methods: Single-center prospective study involving women hospitalized for ACS from 20/03/2019 to 31/03/2020. PSS-10 was completed during the hospitalization period. Patients were divided into two groups, according to the type of ACS: group A - STEMI; group B - NSTEMI. Follow-up of these patients was carried out until December 11, 2022, regarding death, readmissions (R) for cardiac causes and (R) for other causes. Logistic regression was performed to assess if PS was a predictor of NSTEMI.
Results: PSS-10 score was higher in women than in men (22.90 ± 6.90 *vs.* 17.40 ± 6.40, respectively). A total of 106 women with ACS were included, of whom 34 in group A and 57 in group B. Mean age was 58.41 ± 10.03 years in group A and 61.79 ± 14.98 years. There were no differences between the two groups regarding cardiovascular risk factors. Group A presented more with chest pain (86.9% *vs.* 62.9%, $p = 0.002$); there were no other statistically significant variables at presentation or regarding intrahospital complications between the two groups. In group A, PSS-10 score was 16.88 ± 6.584, and in group B 20.03 ± 5.18 ($p = 0.004$). There were no differences in terms of death (5.90% in group A *vs.* 17.50% in group B, $p = 0.199$) or R for other causes (17.60% in group A *vs.* 29.80% in group B, $p = 0.196$). However, group B had more R for cardiac causes (36.10% *vs.* 8.80% in group A, $p = 0.013$). Logistic regression revealed that PS was a predictor of NSTEMI (odds ratio (OR) 1.001, $p = 0.006$, confidence interval (CI) 1.003-1.018).
Conclusions: This is the first prospective study carried out in the Portuguese population regarding this thematic, and showed that women had higher levels of PS, women with NSTEMI had more PS and that PS is a predictor of NSTEMI in women.

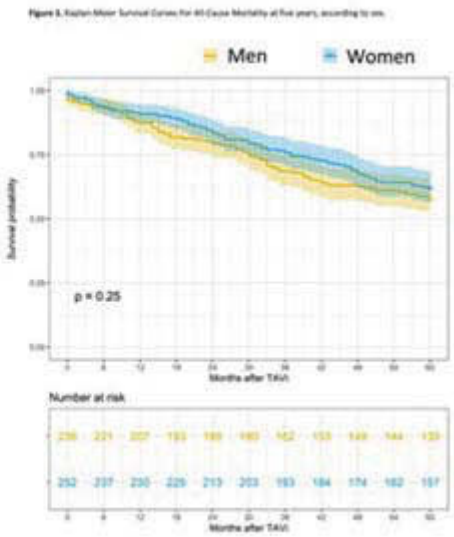
CO 23. EFFECTIVENESS OF A CARDIAC REHABILITATION PROGRAM IN WOMEN WITH HEART FAILURE

Andreia Campinas, Cristine Schmidt, Maria Isilda Oliveira, Sandra Magalhães, Catarina Gomes, José Preza-Fernandes, Severo Torres, Mário Santos

Centro Hospitalar Universitário do Porto, EPE/Hospital Geral de Santo António.

Introduction: Cardiac rehabilitation (CR) improves exercise capacity and quality of life (QoL) and reduces hospital readmission rates in heart failure





CO 21 Figure

(HF) patients. However, like other cardiovascular treatments, CR remains underutilized in women for several reasons, namely a misperception of its reduced effectiveness.
Objectives: We aimed to compare the adherence and effectiveness of a CR program of women and men with HF.
Methods: We conducted a prospective single-centre study of consecutive 93 patients with HF referred to the CR program at our hospital between September 2019 and July 2021. We defined adherence as the percentage of sessions patients attended. The effectiveness outcomes were differences in peak oxygen uptake (VO2peak) and QoL measurement differences before (baseline) and after the CR program (3-month). VO2 peak was assessed by a maximal effort cardiopulmonary exercise testing on a treadmill. QoL was assessed using Minnesota Living with Heart Failure Questionnaire® (MLHFQ).
Results: Of the 93 studied patients, 30 (32.3%) were female. Their baseline features differed regarding smoking and chronic kidney disease (CKD) which were more prevalent in men (71.4% *vs.* 27.6%, p < 0.001 and 20.6% *vs.* 3.3%, p = 0.032, respectively). The HF with reduced ejection fraction (EF) phenotype [Left ventricular ejection fraction (LVEF) < 40%] was more prevalent in men (92.1% *vs.* 73.3%, p = 0.024). Regarding adherence, 84% of the 93 studied patients completed the CR program and no differences were found between groups (female *vs.* male: 76.7% *vs.* 87.3%; p = 0.232). The significant increase in VO2peak observed in the overall cohort (+1.3 ± 2.3 L/min/Kg; p < 0.001) did not differed between gender (female: *vs.* men: 1.5 ± 2.1 *vs.* 1.2 ± 2.4 L/min/Kg; p = 0.938). We also observed a significant reduction in the total, physical and emotional dimension MLHFQ scores in both genders (all p < 0.05). However, the overall improvement in QoL was significantly higher in women as indicated by a larger reduction of MLHFQ total score (p = 0.042) and physical dimension score (p = 0.009).
Conclusions: Women with HF had similar adherence to the CR program and had the same increase in VO2peak - a robust and validated HF prognostic marker in this setting. Women benefited more than men regarding QoL improvements, particularly in the physical dimension score. Together, these data emphasize the need to increase the referral of women with HF to CR programs.

CO 24. CARDIOTOXICITY ASSESSMENT ACCORDING TO CURRENT CARDIO-ONCOLOGY GUIDELINES IN A POPULATION OF FEMALE BREAST CANCER PATIENTS

Cátia Oliveira, Ana Pinho, Luís Santos, Pedro Palma, Sara Maia, Guilherme Ferreira, André Cabrita, Catarina Marques, Ana Filipa Amador, João Calvão, Tânia Proença, Miguel Carvalho, Carla Sousa, Mariana Paiva, Filipe Macedo

Centro Hospitalar de Entre Douro e Vouga, EPE/Hospital de S. Sebastião.

Introduction: Assessment of cardiovascular complications in oncologic patients exposed to cardiotoxic therapies has been affected by a lack of uniformity in definitions and management. Our aim was to characterize and evaluate the risk of cancer therapy-related cardiac dysfunction (CTRCD) in a population of breast cancer patients (pts) exposed to chemotherapy (QT), considering the new published guidelines.
Methods: A retrospective cohort of female breast cancer pts referred to Cardio-Oncology outpatient clinic between January 2017 to November 2021 was analyzed. Baseline cardiotoxicity risk was defined according to HFA/ICOS assessment tool and CTRCD was defined according to 2022 ESC Cardio-Oncology guidelines criteria. Pts were evaluated with echocardiogram, high sensitivity troponin I (hs-cTn) and BNP before treatment initiation and at 3, 6 and 12-months. As cardioprotective drugs we considered beta-blockers and renin-angiotensin-aldosterone system inhibitors.
Results: 382 pts were included: the mean age was 52.1 ± 11.8 years old. Most pts were treated with anthracyclines (AC) (45%), followed by AC plus anti-HER2 therapy (AHT) (27%), AHT (17%) and other QT (11%). At baseline, the mean LV ejection fraction was 62.3 ± 0.2% and mean global longitudinal strain was -19.6 ± 0.4%. The median baseline hs-cTn was 1.9 (IQR 1.9-2.6) ng/L and median BNP was 20.9(IQR 11.1-38.8) pg/L. Most of the pts had a low baseline cardiotoxicity risk; 40% of the pts were medicated with cardioprotective drugs prior to CTRCD, mostly due to comorbidities. CTRCD was observed in 43% of the pts: 40% mild; 3% moderate and 0.8% severe. Most were asymptomatic. Around 20% of the pts were classified as having CTRCD according to the isolated biomarkers elevation criteria. 61% of pts with CTRCD had full recovery at the end of follow-up. As for the long-term follow-up (14.8 ± 5.4 months), cumulative all-cause mortality was 2.1% and cumulative cardiovascular death was 0.3%. The risk of developing CTRCD was 35% per pts-year.
Conclusions: According to the new guideline's CTRCD criteria, our population had a significantly high susceptibility for CTRCD, even though most of the pts had a baseline low risk and 40% of the patients were medicated with cardioprotective drugs. However, a large part of CTRCD was classified as so based on the criteria of isolated biomarkers elevation. Further studies are needed to clarify if that criteria is clinically relevant and if it should be considered as CTRCD.

CO 25. RELATIONSHIP BETWEEN ECHOCARDIOGRAPHIC OUTCOMES AND CARDIOPROTECTIVE DRUGS IN A POPULATION OF FEMALE BREAST CANCER PATIENTS EXPOSED TO ANTHRACYCLINES

Cátia Oliveira, Pedro Palma, Luís Santos, Ana Pinho, Sara Costa, Sara Maia, André Cabrita, Catarina Marques, Ana Filipa Amador, Catarina Costa, João Calvão, Ricardo Pinto, Mariana Paiva, Carla Sousa, Filipe Macedo

Centro Hospitalar Universitário de S. João, EPE.

Introduction: Anthracyclines (AC) have been widely studied as a cause of cancer therapy-related cardiac dysfunction (CTRCD) in patients with breast cancer. Nonetheless, the role of cardioprotective drugs (CPD) as primary prevention is not well understood. We aimed to evaluate the impact of CPD in preventing CTRCD and on echocardiographic outcomes in female breast cancer patients.
Methods: A retrospective cohort of breast cancer female patients treated with AC referred to Cardio-Oncology outpatient clinic from January 2017 to November 2021 was selected. All patients were evaluated with echocardiogram, high sensitivity troponin I(hs-cTnI) and BNP before treatment initiation, at 3 and 6 months and at 12-months after completing oncologic treatment. CTRCD was defined as LV ejection fraction < 50% and/or global longitudinal strain (GLS) variation > 15% during follow-up. As CPD we considered renin-angiotensin-aldosterone system inhibitors and beta-blockers.
Results: A total of 274 patients were included with mean age of 49.9 ± 10.3 year-old. Most patients had a low cardiotoxicity risk. At baseline, median hs-cTnI was 1.9 (IQR 1.9-2.3) ng/L, median BNP 17 (IQR 10.0-32.9) pg/L, mean LVEF 62.9 ± 3.5% and mean GLS -19.77 ± 8.4%. During follow-up (15.5 ± 5.3 months), 30.5% of patients developed CTRCD. The overall prevalence of CTRCD was similar in patients on AC and on AC plus anti-HER2 therapy (AHT) (27.2% *vs.* 35.9%, p = 0.131), but CTRCD was more severe in the AC plus AHT group (moderate/severe CTRCD 1.8% *vs.* 7.8%, p = 0.038). CPD was initiated or titrated in 35.8% of patients and 2.6% needed to suspend AHT; overall 59.3% of CTRCD patients recovered. When comparing patients already medicated with CPD prior to CTRCD development to those naïve of CPD, the first group presented a significantly lower incidence of CTRCD [20% *vs.* 36.6%, p = 0.005, OR = 0.43 (95%CI 0.24-0.78)]. Analyzing the whole sample, LVEF at 12 months was similar regardless of CTRCD development (59.9% *vs.* 61%, p = 0.84). However, GLS at 12 months was significantly lower in the CTRCD group (-16.7% *vs.* -19.2%, p < 0.001). The risk of developing CTRCD was 24% per patients-year.
Conclusions: Patients exposed to AC had higher risk of developing CTRCD, which was more severe when concurrently on AHT therapy. Pre-treatment with CPD was significantly associated with a lower prevalence of CTRCD and with better echocardiographic outcomes regarding LVEF, but not GLS, in patients who developed CTRCD. These results highlight the importance of cardiac evaluation in AC patients and strengthen the value of primary prevention but also the need to investigate new therapies that might improve outcomes regarding GLS.

Sexta-feira, 14 Abril de 2023 | 11:00-12:00

Sala Vega | Comunicações Orais - Sessão 06 - Intervenção coronária

CO 26. ANTI-THROMBOTIC AND GLUCOSE LOWERING THERAPY IN DIABETIC PATIENTS UNDERGOING PCI: BASELINE INCLUSION DATA OF THE ARTHEMIS MULTICENTRE REGISTRY

Sérgio Bravo Baptista[1], Gustavo Pires-Morais[2], Luís Almeida Morais[3], João Costa[4], Hugo Vinhas[5], Gustavo Campos[6], Pedro Carrilho Ferreira[7], Nélson Vale[8], Filipe Seixo[9], Miguel Santos[1], Cristina Martins[10], Diogo Rodrigues Brás[11], André Alexandre[12], Luís Raposo[8]

[1]Hospital Prof. Dr. Fernando da Fonseca, EPE/Hospital Amadora Sintra. [2]Centro Hospitalar de Vila Nova de Gaia/Espinho, EPE. [3]Centro Hospitalar Universitário de Lisboa Central, EPE/Hospital de Santa Marta. [4]Hospital de Braga, EPE. [5]Centro Hospitalar e Universitário do Algarve, EPE/Hospital de Faro. [6]Centro Hospitalar e Universitário de Coimbra, EPE/Hospitais da Universidade de Coimbra. [7]Centro Hospitalar Universitário de Lisboa Norte, EPE/Hospital de Santa Maria. [8]Centro Hospitalar Universitário de Lisboa Ocidental, EPE/Hospital de Santa Cruz. [9]Centro Hospitalar de Setúbal, EPE/Hospital de São Bernardo. [10]Hospital Garcia de Orta, EPE. [11]Hospital do Espírito Santo, EPE, Évora. [12]Centro Hospitalar Universitário do Porto, EPE/Hospital Geral de Santo António.

Introduction and objectives: Diabetes (DM) is a major determinant of ischemic events after percutaneous coronary intervention (PCI). In a nationwide prospective registry, treatment regimens, compliance and 2-year clinical outcomes were studied in unselected patients with DM undergoing PCI. The current analysis describes the population's baseline characteristics and the prescription patterns of anti-thrombotic and glucose-lowering drugs.
Methods: Between January and November 2021, 1,000 consecutive pts with type-2 diabetes undergoing PCI with stent implantation were enrolled in 12 hospitals. In addition to clinical and procedural-related characteristics, data on diabetes status, CAD complexity (SYNTAX Score), as well as thrombotic and bleeding risks (DAPT and PRECISE DAPT Scores, respectively), were registered. Planned duration of dual anti-platelet therapy was also recorded. Data was collected in a dedicated web-based e-CRF and randomly audited for quality.
Results: Mean age was 68 ± 13 yo, and 70% of participants were men. Classical risk factors where highly prevalent and one third had clinically overt CAD (28% AMI and 31% prior revascularization). Mean LVEF was 49 ± 12% and 8% of pts had a prior admission due to heart failure. Indication for PCI was an ACS in 55.4% of cases and 63% had 2-3 vessel CAD (mean SYNTAX score 15.6 ± 10.7; mean stent length and diameter 26.3 ± 14.8 and 3.0 ± 1.2 mm, respectively). Most patients (> 98%) were discharged on DAPT, but only 42% received potent P2Y12 inhibitors. Recommendation for short DATP regimens (≤ 6 months,) was 35% overall and differed according to bleeding risk (30% *vs.* 43% in low *vs.* high-bleeding risk defined by the PRECISE-DAPT Score [mean 21.7 ± 13.1]; p < 0.001) and need for concomitant anti-coagulation (27% *vs.* 83%; p < 0.001). CAD complexity did not influence DAPT duration as it was similar across SYNTAX Score terciles (p = 0.43). Prolonged DAPT (> 12 months) was recommended in < 1%. Self-reported duration of DM was > 6-years in 56%, mean HbA1c was 7.5 ± 1.7% and 12% had known microangiopathic involvement at inclusion. Notably, only 28% and 3% of patients were taking SGLT2 inhibitors and GLP-1 analogues on admission.
Conclusions: In this population both ischemic and bleeding risks were relatively high, and prolonged DAPT was rarely prescribed, irrespective of CAD extent. Average metabolic control was off-target and guideline-directed treatment for diabetes was underused at admission, although it improved at discharge.

CO 27. COMPARATIVE PERFORMANCE OF CONTEMPORARY STENTS IN 3D-PRINTED LEFT MAIN BIFURCATION SIMULATION MODELS

Catarina Simões de Oliveira, Tiago Rodrigues, Joana Brito, Pedro Alves Silva, Beatriz Valente Silva, Beatriz Garcia, Ana Margarida Martins, Ana Abrantes, Miguel Raposo, Catarina Gregório, Daniel Cazeiro, Daniela Ricardo, Helena Santiago, Fausto J. Pinto, João Silva Marques

Santa Maria University Hospital CHULN, CAML, CCUL, Lisbon School of Medicine, Universidade de Lisboa.

Introduction: Interventions in left anterior descending artery (LAD) ostial lesions remain defiant. A left main (LM)-to-LAD cross-over stenting provides favorable outcomes but challenges current devices. There is need for comparative independent data on the performance of currently available stents. In clinical practice, wide anatomical variation impairs such studies. However, 3D-printing allows accurate anatomical reproduction that can be used in simulation testing.
Objectives: To assess stent performance in 3D-printed diseased LM bifurcation model (medina 0.1.0) using a realistic simulation environment.
Methods: A standard realistic LM anatomy with an eccentric ostial LAD lesion was replicated using 3D-printing. Tests were performed on a realistic pulsatile flow simulator in the cath lab. Five 3.5 × 18-21 mm stents (Xience, Onyx, Synergy, Megatron and Ultimaster) were implanted in 3D-printed models using a standardized protocol (Figure a) that included proximal optimization technique (POT). Angiographic and OCT runs were acquired at each procedural step and images were blindly reviewed and analyzed offline. We report descriptive and comparative data of stent platform performance with a focus on stent placement accuracy, longitudinal deformation, overexpansion ability and radial strength.
Results: In total, 5 test procedures were performed and a total of 15 OCT runs and 20 angiographic images were reviewed. Stent placement accuracy, defined as balloon marks to stent distance in angio was highest with Xience (0.27 mm) and lowest with Synergy (1.01 mm). Proximal overexpansion ability after sequential 5 mm and 6 mm POT was also highest with Xience (stent area 26.99 mm^2) and lowest with Synergy (stent area 15.58 mm^2). Regarding longitudinal deformation, OCT analysis revealed shortening of Onyx (-0.1 mm), Megatron (-0.4 mm) and Ultimaster (-0.7 mm) stents and elongation

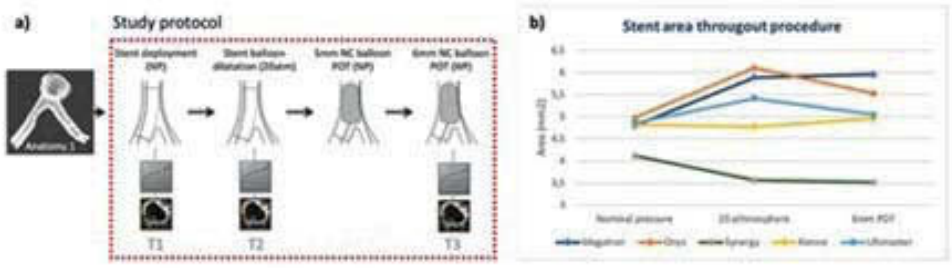


Figure 1: a) Study protocol; b) stent area throughout procedure

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of Synergy (1.4 mm) and Xience (+3.8 mm) after POT. In angio, there was elongation of Xience (+3.5 mm) and shortening of all other stents (-0.9 to -3.5mm). Radial strength was highest with Onyx (MLA 4.99 mm^2) and lowest with Synergy (4.12 mm^2). Considering eccentricity, Ultimaster achieved the lowest (0.92) and Onyx the highest (0.84). High pressure balloon inflation increased MLA in all stents except Synergy and Xience (Figure b). POT negatively impacted stent performance at the LAD ostial lesion in two of the stents that showed recoil. There was no significant correlation of proximal stent expansion and stent strut thickness (r 0.296; p = 0.629).
Conclusions: In this study of percutaneous coronary intervention in 3D-printed realistic models of left main bifurcation coronary artery disease we have shown that stent performance is not uniform among available stents. Knowledge of strengths and weaknesses of each individual stent allows a tailored approach to bifurcation stenting in order to anticipate and optimize results.

CO 28. LONG-TERM OUTCOMES OF "FULL-METAL JACKET" PERCUTANEOUS CORONARY INTERVENTIONS: A SEVENTEEN-YEAR SINGLE-CENTRE EXPERIENCE

José Miguel Viegas, Isabel Cardoso, Pedro Garcia Brás, Tiago Mendonça, Inês Rodrigues, Tiago Pereira-Da-Silva, Ruben Ramos, António Fiarresga, Duarte Cacela, Rui Cruz Ferreira

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Introduction: Limited long-term data exist on patients who have undergone "Full Metal Jacket" (FMJ) stenting procedures, defined as overlapping stent length ≥ 60 mm, for tandem or very long coronary lesions.
Objectives: The aim of this study was to evaluate the long-term outcomes and predictors of adverse events following successful FMJ percutaneous coronary interventions (PCI).
Methods: Retrospective single-centre study that included consecutive FMJ PCI taking place between January 2002 and December 2018. Major adverse cardiac events (MACE) were the primary endpoint and included all-cause death, myocardial infarction (MI), and target vessel revascularization (TVR). The secondary endpoint was target lesion failure (TLF), a composite of cardiac death, target vessel-related MI (TV-MI), target lesion revascularization (TLR) or occlusion. Demographic, clinical, angiographic, and procedural variables were evaluated using stepwise Cox regression analysis to determine independent predictors of outcome.
Results: Overall, 592 patients (P) underwent FMJ PCI, increasing in frequency over time (< 3% before 2012, 3-5% from 2013 to 2016, and > 5% after 2017). P with unsuccessful procedure or lost to follow-up were excluded from the analysis. A total of 353 eligible P, mean age 65.4 ± 11.4 years, 78% male. The mean stent length was 74.3 ± 14.2 mm (range 60 to 132 mm), and the average number of stents was 2.95 ± 0.80 (range 2 to 6). During the mean follow-up period of 5.0 years, the incidence of MACE and TLF was 46% and 32%, respectively. All cause mortality rate was 26% (11% cardiac deaths), MI was 16%, TV-MI was 11% and stent thrombosis was 4%. TVR occurred in 19% and TLR in 17% of P. Multivariate Cox analysis identified 8 independent predictors for MACE and 7 independent predictors for TLF (Figure). Insulin-dependent diabetes *mellitus*, current smoker, cardiogenic shock, ostial lesion, bifurcation and severe calcification were associated with increased incidence of both events. Age and absence of complete revascularization were independent predictors of MACE. Using a brand exclusive strategy was protective for TLF.
Conclusions: FMJ procedures provides acceptable long-term results. Several clinical and angiographic factors were associated with adverse events and may help identifying high-risk patients. Complete revascularization and avoiding combination of different stent brands may improve outcomes.

CO 29. PERFORMANCE AND SAFETY OUTCOMES OF A STRUCTURED CHRONIC TOTAL OCCLUSION (CTO) PCI PROGRAM

Nazar Ilchyshyn[1], Luís Leite[2], Elisabete Jorge[2], Joana Silva[2], Ana Vera Marinho[2], Rui Baptista[3], Marco Costa[2], Lino Gançalves[2]

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Introduction: Coronary chronic total occlusions (CTOs) are routinely found in patients undergoing coronary angiography. In recent years, the success rate of CTO intervention has increased, driven by advances in material and interventional techniques, without compromising patient safety. We aimed to describe the characteristics, procedural aspects and clinical outcomes of a structured CTO program.
Methods: We conducted a prospective, cohort study including all consecutive patients enrolled in our CTO program since December 2013. Angiographic and clinical data were collected. We defined a co-primary safety outcome as procedure-related complications and a co-primary efficacy outcome as procedural success. A follow-up with a median duration of 508 days was conducted. Secondary, exploratory endpoints during the follow up included

Multivariate Cox analysis	Hazard ratio (95% confidence interval)	p value
Predictors of MACE		
Age	1.019 (1.001-1.037)	0.040
Insulin-dependent diabetes mellitus	1.831 (1.051-3.189)	0.033
Current smoker	2.155 (1.488-3.121)	<0.001
Cardiogenic shock	4.724 (1.869-8.016)	0.011
Ostial lesion	1.846 (1.026-3.322)	0.041
Bifurcation	2.219 (1.312-3.751)	0.003
Severe calcification	2.100 (1.434-3.075)	<0.001
Complete revascularization	0.576 (0.386-0.860)	0.007
Predictors of TLF		
Insulin-dependent diabetes mellitus	1.923 (1.008-3.671)	0.047
Current smoker	3.132 (1.927-5.088)	<0.001
Cardiogenic shock	4.986 (2.489-8.408)	<0.001
Ostial lesion	2.284 (1.096-4.759)	0.027
Bifurcation	2.647 (1.401-5.000)	0.003
Severe calcification	2.337 (1.402-3.895)	0.001
Same brand stents	0.353 (0.150-0.831)	0.017

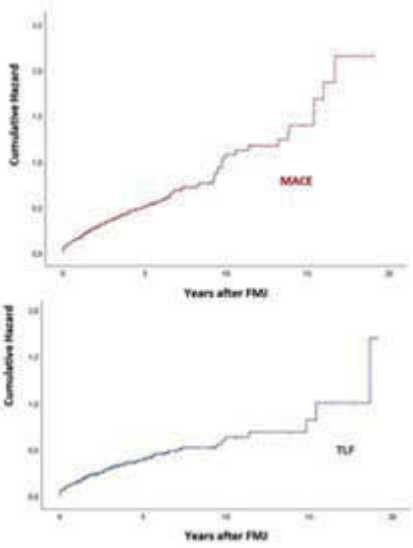

Figure 1. Independent predictors of MACE and TLF following FMJ procedure

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death, myocardial infarction (MI), target lesion revascularization (TVR), CCS grade, NYHA class and impact on left ventricular ejection fraction (LVEF).
Results: A total of 195 patients with 202 CTO lesions were included. Most patients were hypertensive (79.3%), had dyslipidemia (82.4%) and a body mass index (BMI) > 25.kg/m^2 (87.1%); 35.6% were diabetic, 32.6% were smokers and a third had a prior history of MI. The indication for a CTO PCI was angina in 78.0%, viable heart failure in 9.2% and ventricular arrhythmias in 1.2%. Multivessel coronary disease was present in 54.5%. Regarding the technical procedure, 89.7% of PCI CTOs were performed via the anterograde approach with wire-escalation technique. The mean J-CTO score was 2.0 ± 0.8. J-CTO and not EuroCTO (CASTLE) score predict successful CTO PCI. The overall success rate for CTO PCIs was 92.8% (85.6% with one attempt). The primary safety co-endpoint occurred in 9 patients (4.0%). During follow up, 7 patients (4.6%) died (2 of cardiovascular causes). Admissions for MI occurred in 3 patients (1.5%). TVR occurred in 5 patients (2.6%). CCS grade decreased following a successful CTO treatment in 90.3% of patients (2.1 ± 0.9 *vs.* 0.6 ± 0.6, p = 0.01). LVEF significantly increased (48.73 ± 10% *vs.* 52.55 ± 8.26%, p = 0.01) after a successful CTO intervention.
Conclusions: During implementation of a dedicated CTO PCI program a high success rate with low rate of complications were achieved. A successful CTO PCI was associated with important symptomatic relief and a significant increase in LVEF. J-CTO score remains the best predictors of successful CTO and the use of other more complex scores did not seem to be advantageous.

Methods: We systematically searched PubMed, Embase and Cochrane databases, in June 2022, for randomised controlled trials (RCTs) comparing early *versus* delayed early CAG. A random-effects meta-analysis was performed.
Results: A total of eight RCTs were included, providing a total of 2.167 patients: 1.068 in an early strategy and 1.099 in a delayed strategy. In terms of outcomes assessed, our meta-analysis revealed a similar rate of all-cause mortality (pooled odds ratio [OR] 1.10 [0.93, 1.31], p = 0.27, I^2 = 0%), neurological status (pooled OR 0.94 [0.74, 1.21], p = 0.65, I^2 = 0%), need of renal replacement therapy (pooled OR 1.11 [0.74, 1.66], p = 0.63, I^2 = 0%) and major bleeding events (pooled OR 1.14 [0.80, 1.61], p = 0.47, I^2 = 0%).
Conclusions: According to our meta-analysis, in patients who experienced OHCA without ST elevation, early CAG is not associated with reduced mortality or an improved neurological status.

Sexta-feira, 14 Abril de 2023 | 12:00-13:00

Sala Vega | Comunicações Orais - Sessão 07 - Cardiopatias congénitas e cardiologia pediátrica

CO 30. CORONARY ANGIOGRAPHY AFTER OUT-OF-HOSPITAL CARDIAC ARREST WITHOUT ST-SEGMENT ELEVATION: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMISED TRIALS

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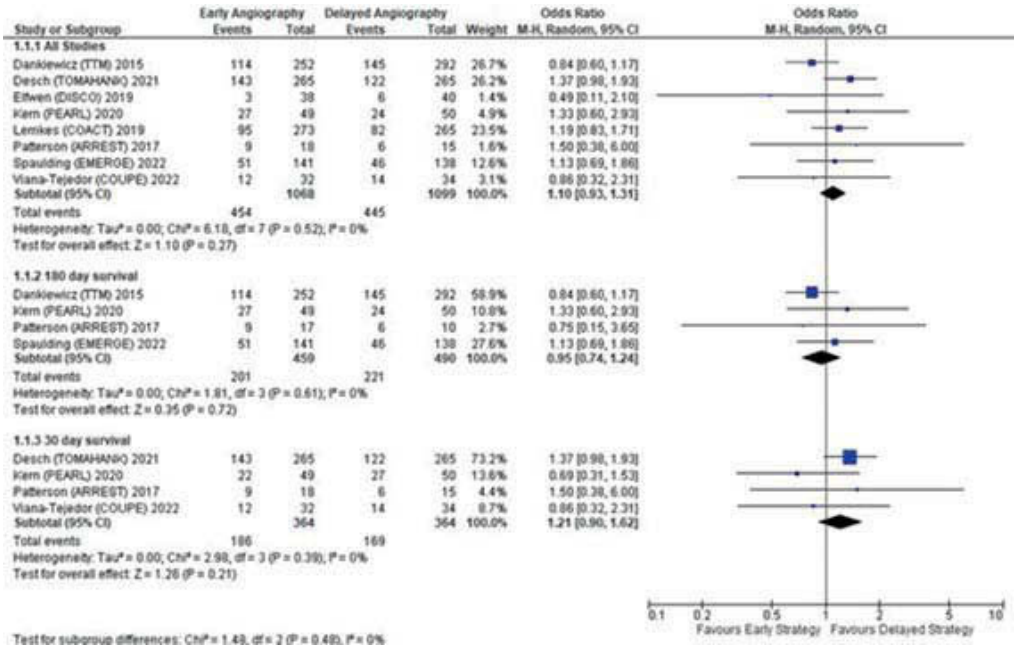
Centro Hospitalar e Universitário de Coimbra, EPE/Hospitais da Universidade de Coimbra.

Introduction: Out-of-hospital cardiac arrest (OHCA) has a poor prognosis. The timing and role of early coronary angiography (CAG) in OHCA patients without ST-segment elevation remains unclear.
Objectives: To compare an early CAG *versus* delayed CAG strategy in OHCA patients without ST elevation.



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CO 31. CHARACTERIZATION AND COMPARISON OF RHYTHM DISTURBANCES AFTER ATRIAL OR ARTERIAL SWITCH SURGERIES FOR DEXTRO-TRANSPOSITION OF THE GREAT ARTERIES - A LONG-TERM FOLLOW-UP STUDY

Catarina Amaral Marques, Ricardo Alves Pinto, Tânia Proença, Miguel Martins de Carvalho, André Cabrita, João Calvão, Catarina Martins da Costa, Ana Filipa Amador, Cátia Oliveira, Luís Daniel Santos, Ana Isabel Pinho, Miguel Rocha, Pedro Mangas Palma, Helena Santos Moreira, Cristina Cruz

Centro Hospitalar Universitário de S. João, EPE.

Introduction and objectives: Dextro-transposition of the great arteries (D-TGA) is a congenital heart disease (CHD) palliated with atrial switch (ATR-

S) and, more recently, with arterial switch (ART-S). As late complications from ATR-S are expected, novel challenges from ART-S surgery arises. Our aim was to evaluate these patients' (pts) arrhythmic disturbances after a long-term follow-up.
Methods: We retrospectively analyzed D-TGA pts born between 1974 and 2001 and followed in Adult CHD Outpatient Clinic at a tertiary care hospital. Clinical records were used to collect pts data.
Results: A total of 79 pts were enrolled with a mean follow-up time after surgery of 27 ± 6 years. Pts median age was 27 years-old and 46% were female. 54% were submitted to ATR-S, while 46% underwent ART-S; median age at intervention was 13 months and 10 days, respectively. Focusing arrhythmic events (Table), almost all ART-S pts remained in sinus rhythm *versus* 64% of ATR-S (p = 0.002). The latter presented significantly higher frequencies of arrythmias (41% *vs*. 3%, p < 0.001), mainly atrial flutter or fibrillation (26% *vs*. 0%), as well as bradyarrhythmias (12% *vs*. 0%). Chronotropic incompetence was also more frequent after ATR-S (46% *vs*. 9%, p = 0.011). Inversely, intraventricular (IV) conduction disturbances were more frequent after ART-S (54% *vs*. 15%, p < 0.001), the majority due to incomplete right bundle branch block. Cardiac Implantable Electronic Devices (CIED) were implanted in 6 pts (5 pacemakers and 1 implantable cardioverter defibrillator) and 1 patient was submitted to catheter ablation of cavotricuspid isthmus, all of them from ATR-S group. The overall median time to first arrhythmia was 23 ± 9 years.

			ART-S (n=43)	ATR-S (n=36)	*p-value*
Sinus rhythm		% (n)	97% (34)	64% (27)	**0.002***
AV conduction disturbance	First degree AVB	% (n)	3% (1)	12% (4)	0.197
IV conduction disturbance	Total	% (n)	54% (19)	15% (6)	**< 0.001***
	Incomplete RBBB	% (n)	37% (13)	0% (0)	
	RBBB	% (n)	11% (4)	3% (1)	
	LBBB	% (n)	3% (1)	3% (1)	
	Bifascicular block	% (n)	3% (1)	0% (0)	
	LPFB	% (n)	0% (0)	5% (2)	
	LAFB	% (n)	0% (0)	3% (1)	
	NICD	% (n)	0% (0)	3% (1)	
Chronotropic incompetence		% (n)	9% (3)	46% (6)	**0.011***
Arrythmias	Total	% (n)	3% (1)	41% (17)	**< 0.001***
	Atrial flutter / fibrillation	% (n)	0% (0)	26% (11)	
	Bradyarrhythmia	% (n)	0% (0)	12% (5)	
	VT/VF	% (n)	3% (1)	3% (1)	
CIED	Total	% (n)	0% (0)	15% (6)	**0.028***
	Pacemaker	% (n)	0% (0)	13% (5)	
	ICD	% (n)	0% (0)	2% (1)	
Catheter ablation		% (n)	0% (0)	2% (1)	1.000

Table 1 – Rhythm, conduction disturbances and implanted CIED in D-TGA patients submitted to atrial or arterial switch.
ART-S, arterial switch surgery; ATR-S, atrial switch surgery; AV, atrioventricular; AVB, atrioventricular block; CIED, cardiac implantable electronic devices; D-TGA, Dextro-transposition of the great arteries; ICD, implantable cardioverter defibrillator; IV, intraventricular; LAFB, left anterior fascicular block; LBBB, left bundle branch block; LPFB, left posterior fascicular block; NICD, nonspecific intraventricular conduction delay; RBBB, right bundle branch block; VT/VF, ventricular tachycardia / ventricular fibrillation; *p<0.05

Conclusions: ATR-S presented significantly fewer pts in sinus rhythm and higher rates of chronotropic incompetence, as well as need for CIED. Additionally, ATR-S pts had higher rates of arrhythmia development, namely supraventricular (SV) ones. These findings highlight the advantages of ART-S over ATR-S in reducing SV arrhythmias occurrence. Curiously, IV conduction disturbances, mainly incomplete right bundle brunch block, were more frequent after ART-S. This fact emphasizes the importance of long-term follow-up of all pts, regardless of the initial surgical approach, as ART-S pts were not arrhythmic-free. Our work raises awareness for arrhythmic disturbances in this subgroup of CHD pts, irrespective of surgical strategy adopted.

CO 32. LONG-TERM FOLLOW-UP STUDY OF ADVERSE EVENTS AFTER ATRIAL OR ARTERIAL SWITCH SURGERIES FOR DEXTRO-TRANSPOSITION OF THE GREAT ARTERIES

Catarina Amaral Marques, Ricardo Alves Pinto, Tânia Proença, Miguel Martins de Carvalho, André Cabrita, Ana Filipa Amador, Catarina Martins da Costa, João Calvão, Luís Daniel Santos, Ana Isabel Pinho, Cátia Oliveira, Pedro Mangas Palma, Helena Santos Moreira, Miguel Rocha, Cristina Cruz

Centro Hospitalar Universitário de S. João, EPE.

Introduction and objectives: Dextro-transposition of the great arteries (D-TGA) is a congenital heart disease (CHD) initially palliated with atrial switch (ATR-S) and more recently repaired with an arterial switch (ART-S). Our aim was to evaluate patients' (pts) adverse events after a long-term follow-up (FU).
Methods: Retrospective analysis of D-TGA pts born between 1974 and 2001 and followed in Adult CHD Outpatient Clinic at a tertiary care hospital. Data was collected by reviewing medical records. Time-to-event analysis was performed. Adverse events were defined as a composite of death, stroke, coronary revascularization, arrhythmia and ventricular, baffle or significant valvular dysfunction.
Results: 79 pts were enrolled with a mean follow-up time after surgery of 27 ± 6 years. Pts median age was 27 years-old and 46% were female. ATR-S was performed in 54%, while 46% underwent ART-S. Concerning post-switch complications, systemic ventricle systolic dysfunction (SVSD) occurred only in ATR-S pts (41% *vs*. 0%, p < 0.001); subpulmonic ventricle dysfunction (SPVD) was a rare event in both groups; the most frequent complication after ART-S was significant systemic ventriculoarterial (VA) valve regurgitation, though no significant differences between groups were found (7% ATR-S *vs*. 14% ART-S; p = 0.459); only 1 ART-S presented neoaortic root dilation and 2 ATR-S developed baffle dysfunction. Regarding long-term outcomes, 1 ATR-S and 3 ART-S pts were submitted to surgical coronary revascularization (p = 0.325); 1 patient in each group had a stroke (p = 0.725); no ART-S pts died during FU and only 1 ATR-S died due to baffle dysfunction (p = 1). Regarding time-to-event analysis, 80% and 40% of ATR-S pts were free from adverse-events after 20 and 30 years, respectively; the mean time to first adverse-event was 23 ± 8 years and no significant differences were found between groups (log-rank = 0.596, Figure).

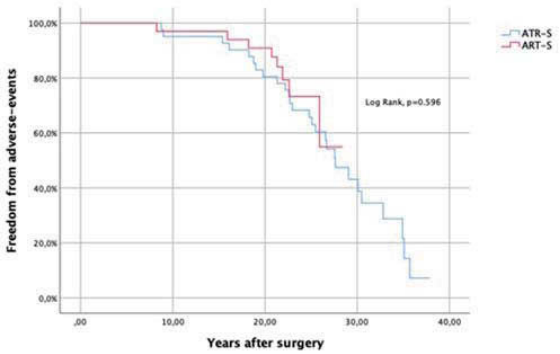


Figure 1 - Time-to-adverse-event analysis after atrial and arterial switch for D-TGA.
ART-S, arterial switch surgery; ATR-S, atrial switch surgery; D-TGA, Dextro-transposition of the great arteries

Conclusions: In our study, SVSD and baffle dysfunction were found in ATR-S pts, highlighting the advantage of performing ART-S over ATR-S. In ART-S pts, the most common complication was systemic VA valve regurgitation, even though no significant differences were found to ATR-S. Aortic root dilatation was a rare complication and coronary revascularization was equally performed in both groups. After a long-term free of adverse-events, ATR-S patients experienced significantly more SVSD, while ART-S complications were predominantly anastomosis related.

CO 33. PATHOPHYSIOLOGY OF REFLEX SYNCOPE RESPONSE: ROLE OF THE AUTONOMIC NERVOUS SYSTEM AND BAROREFLEX FUNCTION

Sérgio Matoso Laranjo[1], Guilherme Lourenço[1], Teresa Mateus[1], Helena Fonseca[1], Isabel Rocha[2], Conceição Trigo[1], Mário Oliveira[1], Fátima F. Pinto[1]

[1]Centro Hospitalar Universitário de Lisboa Central, EPE/Hospital de Santa Marta. [2]Faculdade de Medicina da Universidade de Lisboa.

Introduction and objectives: Syncope is a common medical problem during the lifetime, with a recurrence rate of 35%. Excluding cardiac disease, most syncopes are of reflex origin, and despite their frequent occurrence, their mechanisms are not yet well defined. Furthermore, while studies in the adult population with vasovagal syncope are abounding, few studies (with conflicting results) have investigated the vasovagal syncope mechanisms in paediatric patients.
Methods: 238 patients were enrolled (range 12-18 years-old, mean age 13.4 ± 4.1 years, 64.3% females), having experienced, on average, 3.7 ± 2.9 syncope episodes before the HUT. The population was divided according to the HUT response: tilt-positive patients (fainters) and tilt-negative patients (non-fainters). Heart rate (HR), blood pressure (BP), and cardiac haemodynamics were continuously monitored using a Task Force Monitor. In addition, HR variability (HRV), BP variability, baroreflex sensitivity (BEI), cross-spectral wavelet coherence, and phase were evaluated.
Results: The test was positive in 99 (41.8%) patients, representing the fainters' group. 38 patients (38%) were defined as cardioinhibitory (type 2), 35 patients (35.4%) mixed type (Type 1) syncope and 26 (26.6%) as vasodepressor (Type 3). Fainters showed significantly higher HR, lower stroke volume and total peripheral resistance values during HUT. Four phases of cardiovascular responses leading to syncope could be described. Additionally, a significant rise in sympathetic activity characterised Fainters' HRV response to HUT. In brief, the core dynamic changes to LF included sudden and initial rise of sympathetic tone immediately after tilting up (Phase 1), followed by a significant decrease of sympathetic activity (Phase 2), the second overshoot of activity (Phase 3), and, then, a steady fall-off 1-2 minutes before syncope (Phase 4). Despite similar BEI in the supine position, the fainters' group showed less systolic BP ramps and a higher lag of the baroreflex response. After HUT, the fainters' group showed a progressive but significant BEI decrease.
Conclusions: These results strengthen the hypothesis that impaired baroreflex function and an imbalance between the two branches of the autonomic nervous system may represent a pathophysiological marker of altered response to orthostatic stress and play a role in the pathophysiology of reflex syncope. The findings can stratify reflex syncope patients to define an integrated and personalised therapeutic approach.

CO 34. SURPASSING THE COMPLEX SUBSTRATE OF ACCESSORY PATHWAYS ABLATION IN EBSTEIN ANOMALY

Sérgio Matoso Laranjo, Guilherme Lourenço, Guilherme Portugal, Pedro Cunha, Lídia de Sousa, Conceição Trigo, Fátima Pinto, Rui Cruz Ferreira, Mário Martins Oliveira

Centro Hospitalar Universitário de Lisboa Central, EPE/Hospital de Santa Marta.

Introduction and objectives: Data regarding long-term follow-up of radiofrequency catheter ablation (RFCA) of accessory pathways (APs) in patients (P) with Ebstein's anomaly are limited. This type of procedure is considered challenging due to multiple and broad APs. The present study aimed to describe the electrophysiological features of APs in P with Ebstein's anomaly, and report our RFCA experience with an open-window electroanatomic 3D mapping using high-density mapping catheters in these patients.
Methods: A retrospective study of 15 consecutive Ebstein anomaly P with APs who underwent an electrophysiologic study and RFCA from 2013 to 2022.
Results: There were a total of 21 manifested non-decremental APs. APs were mainly located on the posterior, posteroseptal, and posterolateral tricuspid annulus. The index procedure was unsuccessful in six P, requiring a redo procedure. This redo procedure was performed with a high-density catheter (Pentaray, Biosense or HD-Grid, Abbott), using the open-window annotation algorithm (Abbott's NavX Precision or BiosenseWebster Carto3), guided by CT integration and intracardiac echo. Broad APs were documented in all these six patients (width range 2-15cm) and successfully ablated. In one P, the AP encompassed 3/4 of the TA, resulting in a complete AV block after the procedure, having fitted a pacemaker. All P remained free from tachycardias during 15 ± 8 months of follow-up, with the majority (n = 12) having sinus rhythm with morphology of right bundle branch block, while three patients showed a narrow QRS.
Conclusions: RFCA in P with Ebstein anomaly is challenging, but safe, and has a high long-term success rate. APs are predominantly right-sided, manifest and localized to the lower half of the anatomic tricuspid annulus. Some APs have broad widths. In this population, the new high-resolution mapping catheters, using the open-window annotation, produce an improved anatomical resolution of the APs, increasing the odds of success.

CO 35. EXTERNAL VALIDATION OF SURVIVAL PREDICTING SCORE IN REPAIRED TETRALOGY OF FALLOT: AN OPPORTUNITY TO IMPROVE

Ana Rita Teixeira, Francisco Barbas de Albuquerque, André Paulo Ferreira, Tânia Mano, Tiago Rito, Marta António, Rui Cruz Ferreira, Sérgio Laranjo, Mário Oliveira, Lídia de Sousa

Centro Hospitalar Universitário de Lisboa Central, EPE/Hospital de Santa Marta.

Introduction: In recent years, integrating better diagnosis and treatment allowed most adults with repaired tetralogy of Fallot (rTOF) to expect a longer life expectancy. However, a minority is at higher risk for premature cardiovascular death. Recently, 2 scores identified the subgroup of rTOF patients (pts) who are at high annual risk of death and ventricular arrhytmias (VA). We aimed to implement both in our population.
Methods: Retrospective single center review on rTOF pts who undergone cardiovascular magnetic resonance with gadolinium, blood sampling for B-type natriuretic peptide (BNP), echocardiography and cardiopulmonary exercise testing. The risk scores were calculated with weighted independent predictors, namely presence of late gadolinium enhancement in left ventricle (LV) and right ventricle (RV), akinetic RV outflow length, LV and RV ejection fraction (EF), RV systolic pressure, peak oxygen uptake (pVO2), BNP, atrial arrythmias and age.
Results: From a total of 240 rTOF pts, 61 (56% male, mean age 34 ± 9 years) had all the necessary data. RV dysfunction was present in 52.5%, RV systolic pressure was high in 12 and LVEF ≤ 35% in 18% pts. BNP level was elevated in 27 and pVO2 ≤ 17mL/kg/m^2 in 14.8% pts. The mean mortality risk score was 15.1 ± 11.2, being that 68.9% had a lower and 31.1% an intermediate risk. Regarding VA score, the mean was 14.7 ± 10.8, where the majority (80.3%) were in lower risk. 29.5% had a sustain atrial arrhythmia (mainly atrial fibrillation) and 14.8% a VA. There were 3 cardiac related deaths (4.9%). Analysis of time to event data showed that mortality and VA scores were not predictors of overall mortality (M) or VA events, respectively. However, considering 1-year M, LVEF ≤ 35% ($p = 0.002$), RVEF ≤ 35% ($p = 0.002$), pVO2 ≤ 17 mL/kg/m^2 ($p < 0.001$), and both scores: M ($p = 0.013$) and VA ($p < 0.001$) were predictors of that endpoint. In multivariate analysis, VA risk score ($p = 0.035$) and low pVO2 ($p = 0.006$) were independent 1-year M predictors.
Conclusions: In our population, ventricular arrhythmia score and low pVO2 were independent predictors of 1-year mortality. However, there is probably a selection bias. Since the scores were recently proposed, patients were not recruited prospectively, many ended up not having all the needed or recent data, thus were not included. There is the need to validate and improve available scores to truly assess the risk of mortality and arrhythmias, as well as defined protocols and longer follow-up for this purpose.

Sexta-feira, 14 Abril de 2023 | 13:00-14:00

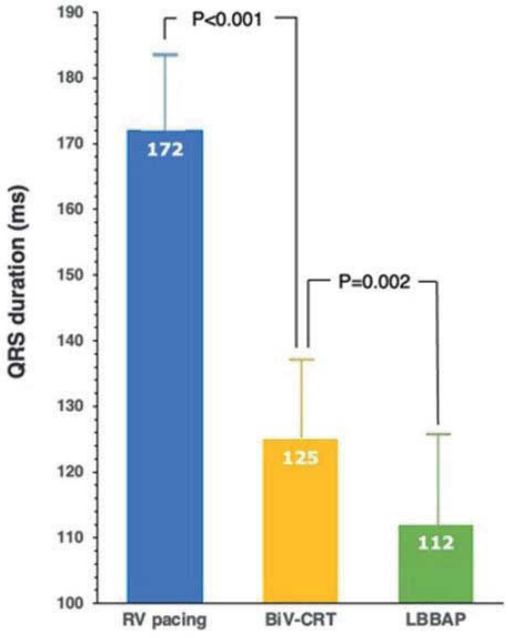
Sala Aquarius | Comunicações Orais - Sessão 08 - Dispositivos em arritmologia

CO 36. LEFT BUNDLE BRANCH AREA PACING FOR ELECTRICAL SYNCHRONIZATION: DESCRIPTION OF A SINGLE-CENTER EXPERIENCE AND COMPARISON TO CONVENTIONAL BIVENTRICULAR PACING

Daniel A. Gomes, Francisco Moscoso Costa, Rita Reis Santos, Mariana Sousa Paiva, Gustavo Rodrigues, Daniel Matos, João Carmo, Gabriela Bem, Isabel Santos, Pedro Galvão Santos, Mafalda de Sousa, Pedro Carmo, Diogo Cavaco, Francisco Belo Morgado, Pedro Adragão

Centro Hospitalar Universitário de Lisboa Ocidental, EPE/Hospital de Santa Cruz.

Introduction: Long-term right ventricular (RV) pacing has been shown to induce desynchrony and left ventricular (LV) dysfunction. Accordingly, some patients may need upgrade for resynchronization therapy (CRT). Left bundle branch area pacing (LBBAP) is increasingly recognized as an attractive alternative for conventional pacing, by preserving LV synchrony. We aimed to describe procedural characteristics of patients with LBBAP, and to compare final QRS duration with those undergoing biventricular CRT (BiV-CRT) for RV apical pacing induced cardiomyopathy.
Methods: Single-center cohort including consecutive patients undergoing LBBAP since November 2021. Pacing lead was implanted deep on the interventricular septum, aiming to a right bundle branch pacing pattern and LV activation time (LVAT) < 90 ms. Feasibility, procedure, and fluoroscopy times, electrical synchrony assessed by QRS duration immediately after implantation, and periprocedural complications were assessed. Procedure characteristics were compared to a group of consecutive patients undergoing BiV-CRT upgrade.



Results: A total of 54 patients underwent LBBAP (aged 76 ± 13 years, 63% male, 10 (19%) with LV ejection fraction [LVEF] < 50%). The most common indication was high-degree atrioventricular block (n = 27, 50%), and in 7 cases (13%) LBBAP was implanted due to failed BiV-CRT. Overall, LBBAP resulted in a median LVAT was 86 ms (IQR 80-95) and in a final QRS immediately after implantation of 112 ms (IQR 105-125). QRS duration was similar across LVEF categories and pacing indication (110 ms [IQR 102-132] in LBBAP due to failed BiV-CRT). No cases of lead dislocation or perforation at discharge. When compared to a group of patients undergoing BiV-CRT upgrade (n = 46), LBBAP QRS complex was significantly narrower than pacing QRS before (172 ms [IQR 154-184]; p < 0.001) and after the upgrade (125 ms [IQR 114-138]; p = 0.002). Furthermore, procedure (64 min [IQR 53-82] *vs.* 112 min [IQR 94-140], p < 0.001) and fluoroscopy times (4.1 min [IQR 3.4-6.5] *vs.* 19.3 min [IQR 11.6-33.6], p < 0.001) were lower in the LBBAP group.
Conclusions: In this series of patients undergoing LBBAP, greater electrical synchronization was achieved when compared to BiV-CRT. LBBAP seems a safe and feasible alternative pacing strategy to preserve synchrony. Further studies are needed to understand its role as first-line therapy in patients with indication for ventricular pacing to prevent desynchrony-related cardiomyopathy.

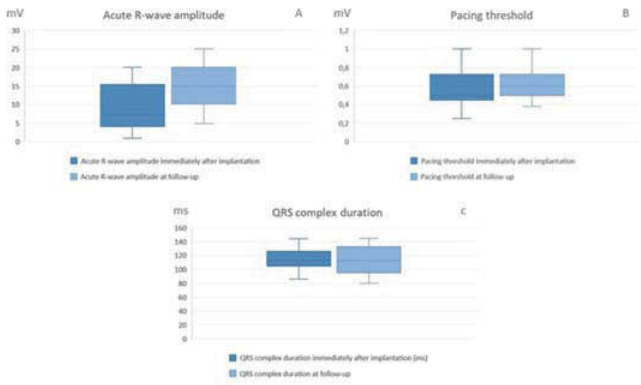
CO 37. LEFT BUNDLE BRANCH AREA PACING- FOLLOW UP DATA ON PACING PERFORMANCE

Joana Certo Pereira, Daniel A. Gomes, Francisco Moscoso Costa, Rita Reis Santos, Gustavo Rodrigues, Daniel Matos, João Carmo, Gabriela Bem, Sandra Feliciano, Isabel Santos, Pedro Galvão Santos, Pedro Carmo, Diogo Cavaco, Francisco Belo Morgado, Pedro Adragão

Centro Hospitalar Universitário de Lisboa Ocidental, EPE/Hospital de Santa Cruz.

Introduction: Left bundle branch area pacing (LBBAP) is an increasingly recognized modality for physiologic ventricular pacing preserving left ventricular synchrony. While data on procedural characteristics are increasingly reported, those regarding mid-long-term lead stability are not yet fully understood. We aimed to describe the procedural characteristics and stability of parameters during follow-up of a group of consecutive patients submitted to LBBAP.
Methods: Retrospective study of consecutive patients submitted LBBAP since November 2021 at a single center. Procedural characteristics, lead parameters and final QRS complex duration were collected immediately after implantation and during follow-up. LBBA pacing aimed to achieve right bundle branch block pattern in V1during pacing and left ventricular activation time (LVAT) < 90 ms.
Results: Overall, 53 consecutive patients were included (mean age was 76 ± 13 years and 62% male sex). Procedural duration was 65 min (IQR 52-83) and fluoroscopy time was 4 min (IQR 3-6). Median LVAT was 86 ms (IQR 80-93) and QRS immediately after implantation was 112ms (IQR 105-126). Acute R-wave amplitude and pacing threshold were 7.3 mV (IQR 4.1-15.3) and 0.6mV (IQR 0.50-0.73), respectively. One case of in-hospital ischemic stroke associated with withholding anticoagulation in a patient with atrial fibrillation. No other major complications, including electrode dislocation were reported at discharge. After a median follow-up of 4 (IQR 2-8) months, pacing threshold remained stable at 0.6 mV (IQR 0.5-0.72) and R-wave amplitude increased to a median of 14.9 mV (IQR 10.2-20.0) and QRS complex duration remained narrow at follow-up (113 ms [IQR 95-132]).

Figure 1. Lead parameters and final QRS complex duration were collected immediately after implantation and during follow-up.



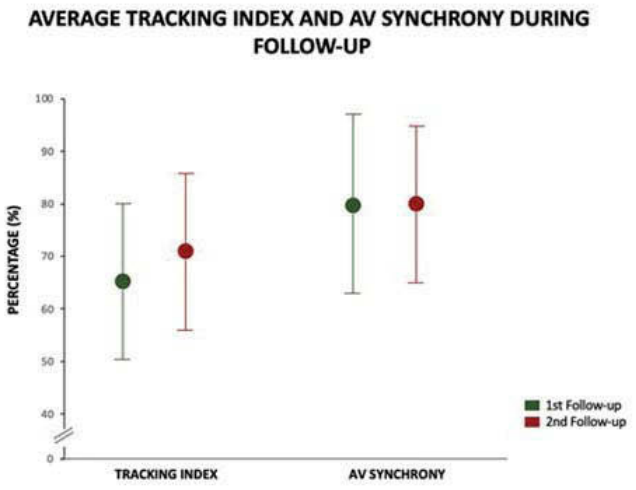
Conclusions: In this cohort, LBBAP was feasible and with exceptional pacing parameters that remained stable during follow up. Most relevant, QRS duration, a surrogate for ventricular synchrony, remained short, further supporting the role of this technique for the near future.

CO 38. ATRIOVENWTRICULAR-SYNCHRONOUS LEADLESS PACEMAKERS: A SINGLE CENTER EXPERIENCE

Rita Reis Santos, Daniel Gomes, Diogo Cavaco, João Carmo, Mariana S. Paiva, Pedro M. Lopes, Daniel N. Matos, Gustavo R. Rodrigues, Maria Salomé Carvalho, Francisco M. Costa, Pedro Galvão Santos, Pedro Carmo, Francisco B. Morgado, Pedro Adragão

Centro Hospitalar Universitário de Lisboa Ocidental, EPE/Hospital de Santa Cruz.

Introduction: Leadless pacemakers allow atrioventricular (AV) synchronous pacing using a new software to detect atrial contraction with a 3-axis accelerometer. Notwithstanding, evidence supporting its use is still scarce and only limited real-world data have been reported.
Objectives: To evaluate the feasibility and to describe pacing outcomes of AV-synchronous leadless pacemakers.
Methods: Consecutive patients with AV block referred to leadless pacemaker Micra™ at single center between June 2020 and November 2022 were retrospectively included. Patients were evaluated at two distinct times during follow-up and parameters from sensed atrial tracking were calculated: tracking index (atrial mechanical sense followed by ventricular pace [AM-VP] divided by total VP) and total AV synchrony (sum of AM-ventricular sense [AM-VS], AM-VP, and AV conduction mode switch).
Results: A total of 43 patients (mean age 78 ± 11 years; 72% male) were included. Pacing indication was complete AV block in 29 patients (67%) and high-grade AV block in the remaining 14 (33%). Mean implantation and fluoroscopy times were 48 ± 22 minutes and 4.5 ± 3.9 minutes, respectively. One major peri-procedural complication was reported: a cardiac tamponade, treated with pericardiocentesis. The first outpatient visit occurred at a mean follow-up of 3.2 ± 4.1 months after the implantation procedure. Overall, at the first screening, 47% of patients required at least 50% pacing; mean tracking index was 65 ± 16% and mean total AV synchrony was 80 ± 18%. Specific pacemaker parameters were adjusted according to physician's discretion, namely A3 and A4 thresholds and A3 window. Thirty-seven patients performed 2 follow-up visits, 8 ± 5 months after the first visit. In comparative analysis between both follow up times, mean total AV synchrony remained stable (80 ± 17% *vs.* 80 ± 15%, p = 0.970) and there was a numerical improvement of tracking index by 6 ± 13% (65 ± 15% *vs.* 71 ± 16%, p = 0.059). During the follow-up, 7 patients (16%) died, none related to the procedure nor the device.



Conclusions: Implantation of AV-synchronous leadless pacemakers is feasible and safe. In our cohort, there was anumerical increased of atrial tracking and a stability of AV synchrony during follow-up.

CO 39. LEAD EXTRACTION OF VERY OLD LEADS USING THE PISA TECHNIQUE - EXPERIENCE OF A PORTUGUESE TERTIARY CARE CENTER

André Paulo Ferreira, Bruno Tereno Valente, Pedro Silva Cunha, Guilherme Portugal, Paulo Osório, Ana Lousinha, Sérgio Laranjo, Rui Cruz Ferreira, Mário Oliveira

Centro Hospitalar Universitário de Lisboa Central, EPE/Hospital de Santa Marta.

Introduction: The "Pisa Technique" (PT) is an increasingly used method of lead extraction (LE) and is associated with the lowest rate of complications reported in the ELECTRa Registry. Lead dwell time has been recognized as the highest risk factor for extraction failure and procedure-related complications.
Objectives: To investigate the safety and efficacy of LE, using the PISA technique, of very old cardiac implantable electronic devices (CIED) leads.
Methods: Patients submitted to LE of very old leads (with an implant duration of more than 10 years) between February 2013 and October 2022 (Old group), were compared with a contemporary cohort of patients subjected to LE of leads with a shorter implant duration (New group). The PT was used in all patients. Demographic, clinical, and patient-related variables, complications, mortality, and reimplantation data were assessed.
Results: A total of 150 very old leads were removed from 86 patients in the Old group, and a total of 305 leads were removed from 171 patients in the New group during the study period. Regarding the former baseline characteristics, patient mean age was 69.5 ± 16.9 years, 82.6% were male. Nine patients (10.5%) had cardiac resynchronization devices, 11 (12.8%) implantable cardioverter-defibrillator devices, and 66 (76.4%) pacemaker systems (mostly DDD). Of the total LE in the Old group, 88.4% were due to CIED infection (44.1% with valvular or lead endocarditis) *vs.* 75.9% (p = 0.464) *vs.* the New group. The mean "age" of the extracted leads was 163.7 ± 53.4 *vs.* 46.6 ± 34.9 months, and they were less of active fixation in the Old group 35.2% *vs.* 58.9%, p < 0.01. A previous attempt of LE had been done in 5.8% *vs.* 11.1% (p = 0.172) of the patients, there were more previous generator replacements in the Old group 67.4% *vs.* 23.7% (p < 0.01). The radiographic success rate of the attempted lead extractions was similar between both groups 90.7% *vs.* 96.5% (p = 0.063). The clinical success rate was slightly lower in the Old group 95.3% *vs.* 99.4% (p = 0.031). The procedure major complications rate in the Old group was 2.3% (there were 2 cases of cardiac tamponade that required sternotomy with no laceration of the SVC observed) *vs.* 1.2% (p = 0.294) in the New group. Minor complications occurred in 11.6% *vs.* 8.8% (p = 0.466) of the LE (mostly comprised of infected pocket hematomas). No deaths occurred during the procedures, and there was no extraction-related mortality in both groups.

	Old leads	<10 years leads	p-value
Mean "age" of the leads (months)	163.7±53.4	46.6±34.9	
CIED infection	88.4%	75.9%	p=0.464
Leads of active fixation	35.2%	58.9%	**p<0.01**
Radiographic success	90.7%	99.4%	p=0.063
Clinical success	95.3%	99.4%	**p=0.031**
Major complications	2.3%	1.2%	p=0.294
Minor complications	11.6%	8.8%	p=0.466

Table 1 – Comparison of the extraction of leads with implant duration of more and less than 10 years

Conclusions: Our center's experience with the PISA technique confirms the method's safety and feasibility for the percutaneous extraction of very old CIED leads.

CO 40. MYOCARDIAL SCAR CHARACTERISTICS BY 3D-LGE CANNOT FULLY EXPLAIN DIFFERENT ARRHYTHMIC EVENT RATES IN PRIMARY AND SECONDARY PREVENTION OF SUDDEN CARDIAC DEATH

Ana Rita Bello[1], Rita Amador[1], Pedro Freitas[2], Sara Guerreiro[2], João Abecasis[2], Daniel Matos[2], Gustavo Rodrigues[2], João Carmo[2], Pedro Galvão Santos[2], Francisco Moscoso Costa[2], Salomé Carvalho[2], Pedro Carmo[2], Diogo Cavaco[2], Francisco Morgado[2], António Ferreira[2], Pedro Adragão[2]

[1]Centro Hospitalar Universitário de Lisboa Ocidental, EPE/Hospital Egas Moniz. [2]Centro Hospitalar Universitário de Lisboa Ocidental, EPE/Hospital de Santa Cruz.

Introduction: There is a noticeable difference in the incidence of ventricular arrythmias among patients receiving defibrillator devices (ICD or CRT-D) for primary *vs.* secondary prevention of sudden cardiac death (SCD). The underlying reasons for this difference remain to be fully explained.
Objectives: To assess for differences in myocardial scar characteristics between patients who had defibrillator devices implanted in primary *vs.* secondary prevention scenarios, and their correlation with arrhythmic events.
Methods: In this single center retrospective study, patients who underwent late gadolinium enhancement (LGE) cardiac MRI for clinical purposes before the implantation of an ICD or CRT-D were included. Patients with channelopathies (n = 2) or inappropriate imaging quality (n = 7) were excluded. We used ADAS software to perform myocardial scar characterization in 3D-LGE datasets in all but 16 patients, in which 2D datasets were used. The primary endpoint was a composite of appropriate ICD therapy (appropriate shock or ATP), sustained ventricular tachycardia or SCD.
Results: A total of 116 patients (mean age 66 ± 14 years, 81% male) were included, 40 (35%) with devices implanted in secondary prevention. During a median follow-up of 28 months (IQR 16-24), 23 events were identified (18 appropriate ICD therapy, 9 shocks and 9 ATP; 2 SCD; 3 sustained VT), 7 of which (30.4%) in the primary prevention group, and 16 (69.6%) in the secondary prevention group. The event rate was significantly higher in the secondary prevention setting (15.0 events per 100 persons-year [95%CI 7.7-22.4] *vs.* 4.1 events per 100 persons-year [95%CI 1.1-7.1]; p < 0.001). Despite a higher LVEF in the secondary prevention group (41 ± 14% *vs.* 30 ± 13%; p-value < 0.001), no statistically significant differences were found regarding scar tissue characteristics, namely scar and borderzone (BZ) mass, total channel mass, largest channel mass, number of channels and scar heterogeneity (BZ mass/scar mass ratio) (Figure).
Conclusions: Despite the higher event rate in patients receiving defibrillator devices in secondary *vs.* prevention, no differences in myocardial scar characteristics were found between both groups. These findings suggest that arrhythmic risk is unlikely to be explained solely by the anatomical substrate and support a greater role for the interplay between substrate and transient triggers.

Sexta-feira, 14 Abril de 2023 | 13:00-14:00

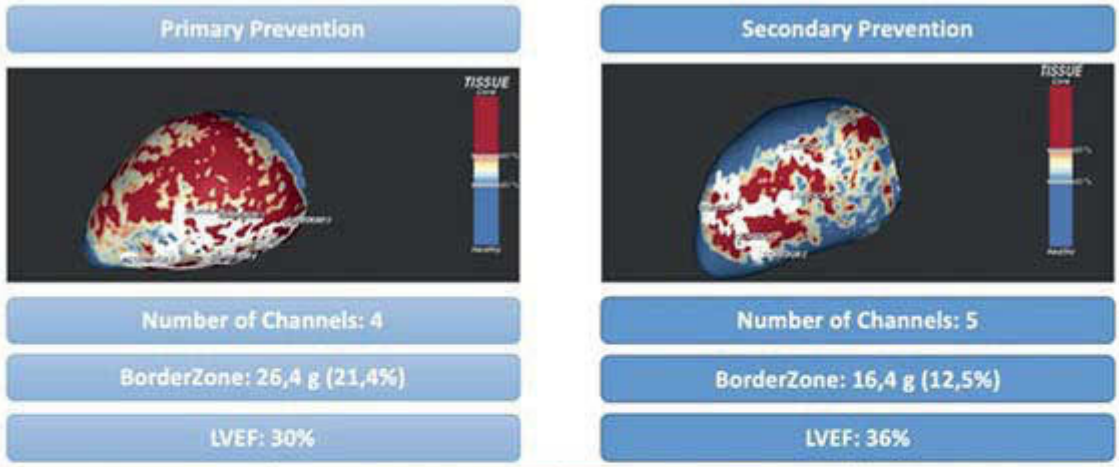
Sala Vega | Comunicações Orais - Sessão 09 - Técnicos e Enfermeiros

CO 41. THE INFLUENCE OF A NURSE-LED CARDIAC REHABILITATION PROGRAM ON QUALITY OF LIFE AND FUNCTIONAL CAPACITY OF PATIENTS WITH HEART FAILURE

Cecília Almeida, Andreia Soares, Sara Gonçalves

Centro Hospitalar de Setúbal, EPE/Hospital de São Bernardo.

Introduction: Heart Failure (HF) is a growing health problem worldwide, characterized by typical signs and symptoms that negatively and often significantly interfere with the functional capacity and quality of life of patients. Multidisciplinary team programs and Cardiac Rehabilitation (CR) are important tools and Class I and IIa for the management of patients with HF. In this context and based on current guidelines that recommend exercise programs, systematic education and lifestyle change, a nurse-led home-based rehabilitation program aimed for HF patients was developed.



	Primary Prevention	Secondary Prevention	p-value
Scar + BZ mass (g)	26.2 (IQR 13.3 – 35.0)	23.7 (IQR 11.4 – 33.4)	p = 0.322
Scar + BZ (%)	18.0 (IQR 11.0 – 27.0)	17.0 (9.0– 26.0)	p = 0.545
BZ mass	17.7 (IQR 11.1 – 24.2)	14.8 (IQR 8.8 – 22.0)	p = 0.350
BZ (%)	13.0 (IQR 8.0 – 18.0)	11.0 (IQR 6.0 – 17.0)	p = 0.677
Scar mass	6.6 (IQR 3.4 – 11.0)	6.9 (IQR 2.0 – 10.3)	p = 0.693
Scar (%)	4.0 (IQR 2.0 – 9.0)	5.0 (IQR 1.0 – 8.0)	p = 0.695
Scar heterogeneity	2.4 (IQR 1.7 – 3.9)	2.7 (IQR 1.5 – 4.4)	p = 0.797
Total channels mass	3.0 (IQR 0.7 – 4.9)	1.8 (IQR 0 .0– 5.0)	p = 0,215
Biggest channel mass	1.4 (IQR 0.5 – 2.5)	0.8 (IQR 0.0 – 3.0)	p = 0.163
Number of channels	3.0 (IQR 1.0 – 5.0)	3.0 (IQR 0.0 – 5.0)	p = 0.520

CO 40 Figure

Objectives: This study was conducted to determine the influence of a nurse-led home-based CR program on quality of life and functional capacity in patients with HF.
Methods: A Prospective study was carried out on patients admitted with HF, considered eligible and with no contraindication by HF specialist. After patients informed consent, sociodemographic data were collected and exercise and education sessions were carried out during hospitalization. Upon discharge, they were advised a home exercise program with the aim of a maximum intensity of 3-4 (modified Borg scale) and a maximum increase of 30 beats in heart rate at rest. Over the course of 12 weeks, regular contacts were made to monitor the program. At the beginning and at the end of the program, functional capacity was evaluated with 6 Minute Walk Test (6MWT) and 1 Minute Sit-to-Stand Test (1MSST) and quality of life assessed (Kansas City questionnaire).
Results: Non-probabilistic sample of 17 patients, with mean age of 55.0 ± 9.7 years and who were mostly male (84.2%) was evaluated. Mean ejection fraction was 28.7 ± 8.9% and the predominant etiology was tachycardia-induced heart disease (29.4%). There were 10.4 ± 1.2 follow ups per participant, and it was found that, in average, each one performed 4.5 ± 1.1 exercise sessions per week, with no reports of adverse events. In functional capacity, increments were verified in the 6MWT (364.5 ± 63.5 meters *versus* 480 ± 82.9 meters; p = 0.002) and 1MSST (17.8 ± 3.9 stands *versus* 23.8 ± 3.8 stands; p = 0.002). In the quality of life index, a significant increase was also verified (81.6 ± 18.7 *versus* 112.1 ± 11.9; p = 0.003).
Conclusions: The results showed an improvement in the functional capacity and quality of life of the participants, which suggests that nurse-led home-based CR program is safe and could represent a pivotal role in addition to the standard care, in valuing the self-management of the disease, in the follow-up of the patient/family during the post-discharge period and as an alternative tool to promote and encourage physical exercise.

CO 42. CAPACIDADE DE AUTOCUIDADO DOS DOENTES COM DIAGNÓSTICO DE INSUFICIÊNCIA CARDÍACA INTERNADOS NUM SERVIÇO DE CARDIOLOGIA

Patrícia Silva, Cátia Ferreira, Magda Soares, Joana Antunes, Licínia Aguiar, Raul Pinto, Magda Soares

Centro Hospitalar do Tâmega e Sousa, EPE/Hospital Padre Américo, Vale do Sousa.

Introdução: A Insuficiência Cardíaca (IC) é considerada um grave problema de saúde pública em todo o mundo. Os custos, a prevalência e a complexidade do tratamento da IC estão a aumentar, juntamente com o envelhecimento da população. Identificar e apoiar o acesso do doente a intervenções que sejam clinicamente custo-efetivas, será necessário para otimizar o uso de recursos. A capacitação do doente para o autocuidado (AC) é uma estratégia fundamental de forma a reduzir os internamentos e melhorar a qualidade de vida. O Enfermeiro Especialista em Enfermagem de Reabilitação (EEER) tem que, no seu corpo de competências específicas, contribuir para a capacitação dos doentes em estratégias de AC.
Objetivos: Avaliar a capacidade de AC dos doentes com diagnóstico de IC há pelo menos 6 meses, internados num Serviço de Cardiologia por IC crónica agudizada, não integrados em programas multidisciplinares de tratamento da IC.
Métodos: Estudo descritivo transversal de índole quantitativa, utilizando a Escala Europeia de Autocuidado (EEAIC).
Resultados: A amostra é constituída por 54 doentes (n = 54), 70% do sexo masculino (n = 38), com média de idade de 70 anos ± 11 anos, com baixa escolaridade, tendo 72% apenas escolaridade primária. A etiologia mais prevalente foi a isquémica, em 43% dos casos (n = 23) e a fração de ejeção do ventrículo esquerdo foi em média de 36 ± 12,5%. Cerca de 41% dos doentes apresentaram dependência de terceiros para as atividades de autocuidado. Verificámos uma capacidade de AC média de 33,2 ± 17,6, sendo que 12 representa a melhor capacidade de AC e 60 a pior. Na dimensão de *compliance* obtivemos uma média de 5,2 (2 representa melhor capacidade de AC e 10 pior). Na dimensão de «procura de ajuda» uma média de 14,4 (5 para melhor AC e 25 para pior AC) e na dimensão de «atividades de adaptação» uma média de 6,8 (2 para melhor AC e 10 pior AC).
Conclusões: Com base nos resultados e nas competências específicas da área de intervenção do EEER considera-se importante o desenvolvimento de um projeto que contribua para a melhoria do AC da pessoa com IC, nomeadamente, nos domínios de *compliance*, atividades de adaptação e procura de ajuda, assim como para a melhoria da acessibilidade aos cuidados de saúde. Acredita-se que com isto se possa perspetivar uma redução significativa da taxa de reinternamentos e melhorar a qualidade de vida dos doentes e suas famílias.

CO 43. HEALTH LITERACY IN HEART FAILURE - THE PORTUGUESE REALITY IN 2022

Ana Rita Sousa, Crisálida Ferreira, Sara Gonçalves, Andreia Soares, Dina Ferreira, Cecília Almeida, Tatiana Duarte, Margarida Madeira, Hugo Viegas, Pedro Carreira, M.ª Violante Nunes, Cláudia Estevão, Ermelinda Pedroso, Rui Caria, Quitéria Rato

Centro Hospitalar de Setúbal, EPE/Hospital de São Bernardo.

Introduction: Heart failure (HF) is a growing health problem worldwide and despite the increase in public awareness observed in recent years, HF symptoms are often not early recognised leading to a late diagnosis, higher rates of hospitalization and mortality. Health literacy (HL) focuses on people's ability to access, understand and use health information to contribute to its promotion and maintenance. Low HL is associated with a lower demand for health services for prevention, lower self-management and treatment, leading to a late search for medical advice and increased rates of adverse events.
Objectives: To evaluate the level of HL regarding HF in a Portuguese population.
Methods: A prospective study based on the information collected through the application of a questionnaire was performed by a multidisciplinary heart failure team.
Results: We prospectively evaluated 328 individuals recruited at a local cardiovascular screening event in May 2022. 52.4% in the 65-80 years age group, and 28% in the age group of 41-65 years; 64.6% were male. About 88.1% of individuals recognized that they have heard about HF, 64.3% considered that it threatens people's lives and 44.9% believed that it causes symptoms which may limit quality of life. Nevertheless, only 13.1% correctly identified symptoms of HF and 86.9% of the individuals confused HF symptoms with acute myocardial infarction and/or stroke symptoms. Risk factors are recognised by more than 50% of the participants but 12.6% were not able to identify any risk factor. Although 62.6% considered that in the face of HF symptoms primary care help and evaluation should be sought, 44.2% admitted that they would directly go to the emergency department. About 82.9% recognized health professionals as a reliable source of information, with 47.1% using the internet and other media and 14.7% confess they consult friends and family for health advice. Higher levels of education, sex and a younger age were not related to a better level of HL.
Conclusions: Despite the recent efforts regarding increasing public HF awareness, symptoms keep being under-recognized by the Portuguese population and often confused with other cardiovascular diseases. It keeps necessary to improve population HF knowledge in order to promote prevention, early diagnosis and timely medical treatment which may contribute to improve prognosis.

CO 44. CARDIAC REMODELLING AND REVERSE REMODELLING IN PREGNANCY: WHAT IS THE IMPACT OF CARDIOVASCULAR RISK FACTORS?

Ana Filipa Ferreira[1], Juliana Morais[1], Maria João Azevedo[2], Francisca Saraiva[1], Ana Paula Machado[3], Ana Filipa Amador[3], Carla Sousa[3], Benedita Sampaio-Maia[2], Adelino Leite-Moreira[3], Carla Ramalho[3], Inês Falcão-Pires[1]

[1]Faculdade de Medicina da Universidade do Porto. [2]I3S-Instituto de Investigação e Inovação em Saúde, UP. [3]Centro Hospitalar Universitário de S. João, EPE.

Introduction: Pregnancy-induced cardiac remodelling (CR) is characterized by non-pathological left ventricle (LV) hypertrophy and left-atrium

enlargement. After delivery, the woman's heart undergoes reverse remodelling (RR) and myocardial function and structure normalization. Currently, the impact of cardiovascular risk (CVR) factors in CR and RR remains to clarify.
Objectives: To characterize CR and RR during pregnancy and postpartum, respectively, as well as to investigate the impact of CVR factors in these processes.
Methods: Pregnant women healthy and with CVR factors (obese, hypertensive and/or with gestational diabetes) were recruited in two tertiary centres between 2019 and 2021. Women were evaluated by transthoracic echocardiography during [1st trimester,1T: 10-15 weeks; 3rd trimester,3T: 30-35 weeks] pregnancy and in 1st and 6th months after delivery. Kruskal-Wallis/Wilcoxon test and Friedman tests were used for between and within groups comparisons, respectively.
Results: We included 125 pregnant women with a median age of 34 [21;44] years, 46% having CVR factors. As shown in Table, pregnant women tended to develop eccentric hypertrophy from 1T to 3T, characterized by a significant increase in LV mass index (LVMi, $p < 0.001$) and relative wall thickness (RWT, $p = 0.034$), accompanied by atrial and ventricular enlargement (1T to 3T, $p < 0.001$ and $p < 0.001$, respectively). A significant rise in filling pressures was also documented during gestation (E/e', $p < 0.001$). During postpartum, LVMi and indexed left atrial and ventricular volumes normalized as soon as 1 month after delivery ($p = 0.012$, $p < 0.001$ and $p < 0.001$, respectively). Ventricular filling pressures also normalized 1 month after delivery ($p < 0.001$). LV systolic function remained preserved (ejection fraction, $p = 0.174$). These structural adaptations during RR were accompanied by a significant reduction of C-Reactive Protein (CRP, $p < 0.001$), IL33/ST2 ($p < 0.001$) and procollagen type I c-terminal propeptide (PICP, $p < 0.001$) from 3T to 6 months after delivery. Compared to the healthy pregnant women, the group with CVR factors showed higher RWT in all follow-up moments, but similar values of indexed cardiac volumes. This group also displayed higher values of LVMi when compared with healthy women 6 months after delivery ($p = 0.036$). Pregnant women with CVR factors revealed deterioration of diastolic function (E/e',1st month, $p = 0.002$; 6th month, $p = 0.010$). Higher values of CRP ($p = 0.016$), IL33/ST2 ($p = 0.021$) and PICP ($p = 0.005$) were reported in pregnant women with CVR factors when compared with the healthy group at 3T.
Conclusions: All cardiac parameters studied seemed to recover as soon as 1 month after delivery and were associated with a reduction of inflammatory and extracellular matrix turnover biomarkers. Pregnant women with CVR factors showed higher RWT and diastolic deterioration when compared with healthy women.

Table 1: Echocardiographic assessment in total cohort sample.

	1st Trimester	3rd Trimester	1 month after delivery	6 month after delivery	p-value
Left Ventricular Mass Index [g/m²]	61 [32;81]	72 [43;101]	64 [44;105]	59 [42;93]	<0.001
Relative Wall Thickness	0.32 [0.22;0.48]	0.35 [0.24;0.49]	0.32 [0.22;0.44]	0.31 [0.22;0.46]	<0.001
Left Atrial Volume Index [mL/m²]	24 [18;34]	28[20;45]	23 [13;35]	22 [13;32]	<0.001
Left Ventricular Diastolic Volume Index [mL/m²]	47 [34;65]	54 [35; 75]	48 [37;66]	47 [31;62]	<0.001
Left Ventricular Systolic Volume Index [mL/m²]	18 [13;26]	21 [13;34]	19 [14;24]	19 [11;29]	<0.001
Heart Rate (bpm)	72 [55;97]	81 [59;102]	59 [45;84]	64 [44;79]	<0.001
Ejection Fraction (%)	62 [51;70]	60 [51;72]	62 [50;68]	61 [51;73]	0.174
Global Longitudinal Strain (%)	-22.7 [-30.7;-18.8]	-22.3 [-28.0;-16.5]	-21.7 [-29.2;-17.9]	-21.1 [-27.4;-16.7]	0.525
Global Circumferential Strain (%)	-30.4 [-38.1;-24.7]	-31.9 [-37.1;-21.6]	-29.4 [-34.2;-25.4]	-29.8 [-37.1;-25.9]	0.769
E/e'	5.8 [3.9;8.7]	6.4 [0.6;8.6]	5.6 [3.6;10.4]	5.6 [3.5;8.2]	<0.001

Values expressed by median [min; max].

CO 44 Figure

CO 45. DIAGNOSTICAR PRECOCEMENTE A DOENÇA VASCULAR PULMONAR - PARA ALÉM DA AVALIAÇÃO EM REPOUSO

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Introdução: A doença vascular pulmonar (DVP) é muitas vezes diagnosticada tardiamente quando se apresenta com hipertensão pulmonar (HP). Os exames complementares de diagnóstico mais frequentemente utilizados avaliam o sistema cardiovascular em repouso, embora os primeiros sintomas se manifestem durante o esforço. A prova de esforço cardiorrespiratória (PECR) é um instrumento de excelência para avaliar os mecanismos fisiopatológicos que levam à intolerância ao exercício e permite identificar doentes com probabilidade elevada de DVP numa fase precoce. Recentemente o cateterismo cardíaco direito com esforço (CCDE) surgiu como nova ferramenta que permite avaliar a hemodinâmica durante o exercício e detetar DVP precoce (HP de esforço), através do declive da curva (*slope*) entre a pressão média na artéria pulmonar (PAPm)/débito cardíaco (DC) > 3 mmHg/L/min.
Objetivos: Avaliar a resposta ao esforço em doentes (dts) com risco elevado de DVP através de PECR e CCDE.
Métodos: Estudo prospetivo que incluiu dts avaliados em consulta de hipertensão pulmonar sintomáticos (dispneia de esforço) com doença tromoembólica confirmada, mas com hemodinâmica normal em repouso e que aceitaram investigação adicional com PECR e CCDE. A PECR foi realizada em passadeira rolante (protocolo de Bruce Modificado ou Bruce, de acordo com capacidade física) e o CCDE foi realizado em decúbito dorsal com recurso a uma pedaleira (protocolo incremental de 10 Watt a cada 3 minutos até aos 50 watt).
Resultados: Entre abril e novembro de 2022 foram incluídos 10 doentes (dts), 90% do sexo feminino, idade média 63 ± 11 anos, 50% doença tromboembólica crónica, 50% HP tromboembólica crónica curada, 70% dts apresentaram alterações sugestivas de DVP na PECR ($_{DVP}$PECR) definida como: eficiência ventilatória (*VSlope*) > 31 e pressão parcial de CO2 no final da expiração (PETCO2) < 37 mmHg. 60% dos dts cumpriram critérios de hipertensão pulmonar com esforço com *slope* PAPm/DC > 3 mmHg/L/min. O quadro em anexo apresenta os parâmetros avaliados durante a realização da PECR e do CCDE. Os dts com HP de esforço apresentaram *Vslope* mais elevado (37,6 ± 6,1 *vs.* 31,6 ± 4,1, p = 0,132) e PETCO2 inferior (33,8 ± 4,3 *vs.* 36,2 ± 4,3, p = 0,412). Verificou-se correlação entre o *VSlope* e DC pico (t = -0,494, p = 0,048) e resistência vascular pulmonar total (RVP_T) pico e $_{DVP}$PECR (t = 0,562, p = 0,039).

PECR - Parâmetros	Repouso	Esforço - pico
RT		Adequada em 90% dts
RC		Adequada em 100% dts
ΔFC 1' rec		30,6±9,9 bpm
VO2		18,4±4,5 mL/Kg/minuto
%VO2		86,1±20,0%
VE/VCO2 - *slope*		35,2±6,0
PETCO2	30,3±2,8 mmHg	34,8±4,2 mmHg
ΔPETCO2		4,5±4,1
QR		1,1±0,1
SpO2	98,6±1,6%	98,2±1,4%
ΔSpO2		-0,4±0,8
RR		Esgotada em 50% dts
Pulso de O2		Crescendo em 80% dts
CCDE - Parâmetros		
PAPm	18,0±4,9 mmHg	31,4±11,2 mmHg
AD	4,5±3,4 mmHg	
CPE	9,0±3,3 mmHg	12,8±4,4 mmHg
DC	5,3±1,8 L/min	9,0±2,3 L/min
IC	2,8±0,8 L/min/m^2	4,84±0,9 L/min/m^2
RVP	1,8±0,6 U wood	2,1±1,1 U wood
RVP_T	3,7±1,5 U wood	3,8±2,0 U wood
Δ SpO2 cat esf		-0,0±2,7
slope PAPm/DC		4,7±5,5

AD – aurícula direita; CPE – capilar pulmonar encravado; DC – débito cardíaco; IC – índice cardíaco; QR – quociente respiratório; PAPm – pressão na artéria pulmonar média; PETCO2 – pressão parcial de CO2 no final da expiração; RC – resposta cardíaca; RR – reserva respiratória; RT – resposta tensional; RVP – resistência vascular pulmonar; RVP_T – resistência vascular pulmonar total; ΔFC 1' rec – variação da frequência cardíaca ao primeiro minuto da recuperação; ΔPETCO2 – variação da pressão parcial de CO2 no final da expiração; ΔSpO2 – variação da saturação O2; Δ SpO2 cat esf – variação da saturação O2 durante o cateterismo de esforço; VE/VCO2 – *slope* – eficiência ventilatória; VO2 – consumo de O2;

Conclusões: Embora os dados obtidos não possam ter valor preditivo, podemos concluir que a PECR e o CCDE podem ser ferramentas úteis na avaliação de doentes com dispneia de esforço e risco elevado para hipertensão pulmonar, por permitirem detetar doença vascular pulmonar precocemente. São necessários mais estudos e com *follow-up* alargado, para validação destes resultados.

Sexta-feira, 14 Abril de 2023 | 14:00-15:00

Sala Vega | Comunicações Orais - Sessão 10 - Hipertensão pulmonar tromboembólica crónica

CO 46. BALLOON PULMONARY ANGIOPLASTY FOR CHRONIC THROMBOEMBOLIC PULMONARY HYPERTENSION: 5 YEARS OF EXPERIENCE IN A PORTUGUESE PULMONARY HYPERTENSION REFERRAL CENTER

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Introduction: Balloon pulmonary angioplasty (BPA) is an establish alternative therapy in chronic thromboembolic pulmonary hypertension (CTEPH) patients (pts) with residual pulmonary hypertension (PH) after pulmonary endarterectomy (PEA) or inoperable disease. The aim of this study was to evaluate the effectiveness and safety of BPA in the first 5 years of experience in a Portuguese PH referral center.
Methods: Prospective single-centre study that included all BPA sessions performed in CTEPH pts from 12/2017 to 12/2022. Clinical assessment including WHO functional class, plasma biomarkers, Doppler echocardiogram, 6 minutes walking test (6MWT) and right heart catheterization was performed at baseline, 6-months and > 3 years after the last session. Life-threatening complications related with the procedure were defined as death in the first 30 days, need of invasive ventilation or circulatory support. Major complications were vascular complications requiring surgical or percutaneous intervention or contrast nephropathy requiring dialysis. Lung injury and hemoptysis was also assessed.
Results: A total of 103 sessions were performed in 21 CTEPH pts (mean age 64.6 ± 14.8 years, 66.7% female): 15 inoperable and 6 with residual PH after PEA. 14 pts completed the program (median of 5.5 sessions per pt; mean of 24.8 ± 8.1 vessels treated per pt). At baseline, 85.7% were treated with pulmonary vasodilator therapy (including 5 pts under intravenous prostacyclin analogs) and 35.7% (5 pts) were under long-term oxygen therapy. At 6-months follow-up (Table), there were significant improvements in WHO functional class, 6MWT, right ventricular function and hemodynamic: 25.7% decrease in mean pulmonary artery pressure (p = 0.016) and 42.1% decrease in pulmonary vascular resistance (p = 0.012). Prostacyclin analogs and long-term oxygen therapy were withdrawn in 4 pts. Vascular lesions occurred in 8 sessions (7.8%): but only 3 pulmonary artery perforation required percutaneous treatment (prolonged balloon inflation). Hemoptysis occurred in 6 sessions (5.8%) and lung injury occurred in 6 sessions (5.8%, all grade 2). There was 4.9% contrast nephropathy, with no need of dialysis. There were no life-threatening complications. After a mean follow-up of 42.5 ± 17 months, survival was 92.9% (one pt died of malignancy 28 months after beginning BPA).

Table 1. Clinical, echocardiographic and hemodynamic parameters

Variable	Baseline (Beginning of BPA program)	6 months follow-up (N=14)	Long-term follow-up (N=6)	Baseline vs 6 months FUP p-value	6 Months vs Long-term FUP p-value
Clinical characteristics					
WHO FC I/II/III/IV	0/9/5/0	11/3/0/0	5/1/0/0	**<0.001**	0.189
6MWT, m	419 ± 48	460 ± 53	400 ± 126	**0.021**	0.273
NT-proBNP, pg/mL	229 (132-699)	179 (109-438)	236 (107-490)	0.136	**0.022**
Echocardiographic characteristics					
RA volume, ml	76.1 ± 47.4	48.9 ±1 8.4	53.3 ± 23.6	0.071	0.183
RV FAC, %	32.7± 11.9	41.8 ± 7.7	41.2 ± 4.3	**0.012**	0.942
TAPSE, mm	18.9 ± 5.2	21.2 ± 4.7	20.9 ± 4.2	0.112	0.554
RV S´, cm/s	11.1 ± 3.4	12.4 ± 2.8	12.8 ± 3.5	0.081	0.326
LV diastolic EI	1.1 ± 0.2	1.0 ± 0.1	1.0 ± 0.0	0.086	0.244
LV systolic EI	1.3 ± 0.4	1.1 ± 0.2	1.0 ± 0.1	**0.029**	0.305
Hemodynamic characteristics					
Systolic PAP, mmHg	59.8 ± 20,5	46.7 ± 16.5	51.3 ± 22.5	**0.038**	0.664
Diastolic PAP, mmHg	26.0 ± 7.4	18.6 ± 6.5	18.8 ± 9.8	**0.012**	0.761
mPAP, mmHg	38.5 ± 12.7	28.6 ± 8.6	32.2 ± 11.2	**0.016**	0.404
Mean RAP, mmHg	6.1 ± 3.8	7.3 ± 3.3	7.0 ± 3.9	0.420	0.914
PVR, WU	5.7 ± 3.1	3.3 ± 1.4	4.0 ± 1.6	**0.012**	0.179
Cardiac Index, L/min/m^2	2.8 ± 0.6	3.1 ± 0.9	2.6 ± 0.5	0.410	0.349
SvO_2, %	66.1 ± 8.7	72.2 ± 5.6	68.8 ± 4.8	**0.016**	0.528

6MWT: 6-min walk test; BPA: Balloon pulmonary angioplasty; EI; eccentricity index; FAC: fractional area change; LV: left ventricle; mPAP: mean pulmonary artery pressure; PVR: pulmonary vascular resistance; RAP: right atrial pressure; RV: right ventricle; SvO_2: mixed venous oxygen saturation; FUP: follow-up; WHO: World Health Organization

Conclusions: This study confirmed the safety and effectiveness of BPA in residual PH after surgery or inoperable CTEPH. These data encourage the development of the technique at a national level.

CO 47. MORE OPTIONS FOR CHRONIC THROMBOEMBOLIC PULMONARY HYPERTENSION TREATMENT - BALLOON PULMONARY ANGIOPLASTY IS AFFIRMING IT'S ROLE.

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Introduction: Chronic thromboembolic pulmonary hypertension (CTEPH) has bad prognosis without treatment. Pulmonary endarterectomy (PEA) is

a surgical procedure with curative potential for these patients (pts) and is the first line therapy when feasible. However, in this last decade, balloon pulmonary angioplasty (BPA) had increasing evidence of its efficacy and safety and it's gaining importance as a treatment strategy particularly in inoperable pts or in pts with residual or recurrent disease after surgery, reflected in the recently published guidelines.
Objectives: Compare different treatment strategies for pts with diagnose of CTEPH.
Methods: Longitudinal retrospective study, that included all CTEPH pts followed in a referral center for pulmonary hypertension (PH). Baseline clinical data including plasma biomarkers, transthoracic echocardiogram, 6 minutes walking test (6MWT) and right heart catheterization were collected. We created 3 groups depending on treatment strategy (PEA *vs*. BPA *vs*. pulmonary vasodilators) and clinical follow up and outcomes (death) were accessed.
Results: We included 66 pts with CTEPH (68% female, mean age 59.97 ± 15.28 years). 77.3% were in WHO functional class ≥ III. All the pts were presented to multidisciplinary team for consideration for PEA but only 33 (50%) were submitted to surgery either because they were technically inoperable (42.4%), had high risk for surgery (1.5%) or pts refused surgery (6.1%). From the other 33 pts that didn't have surgery, 13 pts completed BPA program and 20 pts were treated conservatively with pulmonary vasodilators. Differences between the groups are represented in the Table. Pre-treatment with pulmonary vasodilator therapies was done in 12.1% of pts assigned for PEA and 78.5% of pts assigned for BPA ($p < 0.001$). 6 months after treatment, residual pulmonary hypertension (defined as pulmonary vascular resistance of 4 WoodUnits) was present in 25.8% of PEA group, 25% of BPA group and 91% of medical therapy. Additionally, 5 pts performed BPA after PEA for treatment of residual pulmonary hypertension. Kaplan Meier survival curves showed that pts submitted to interventions (PEA or BPA) had better survival compared to medical therapy (Log-rank test $p < 0.001$), but the best survival curve is for pts submitted to BPA (Figure).
Conclusions: There are three different treatment strategies available for CTEPH. Interventional (either BPA or PEA) had better survival in our patient population compared to medical therapy alone, presenting BPA the best survival curve in our population. Randomized studies are needed to compare prognostic benefit of both interventional strategies.

CO 48. A TALE OF A DEADLY DUO - ESTIMATING PROGNOSIS IN CTD ASSOCIATED PH

Pedro Alves da Silva, Joana Brito, Beatriz Silva, Ana Margarida Martins, Catarina Simões Oliveira, Ana Beatriz Garcia, Ana Abrantes, Miguel Raposo, Catarina Gregório, João Fonseca, Tatiana Guimarães, Nuno Lousada, Rui Plácido, Fausto J. Pinto

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Introduction: Pulmonary arterial hypertension (PAH) is a severe complication of connective tissue disease (CTD), conveying a poor prognosis in this population. PAH specific therapies improved the outcome for PAH patients in the modern treatment era, but few data are available regarding risk stratification and prognosis in this specific pts. Pulmonary vascular compliance is diminished due to decreased proximal pulmonary arterial elasticity and increased distal pulmonary arterial vasculopathy. A recent paper proposed that pulmonary artery compliance (PAC) could be a marker of prognosis in Chinese patients with LES and PH, but its application in other CTD is yet to be confirmed.
Objectives: We aimed to identify factors that could influence mortality in this subset of pts and to determine if PAC could act as a valid predictor in pts with CTD other than LES.
Methods: Observational single centre retrospective study including pts followed in a reference hospital for PH related to CTD. Clinical, lab, echo and RHC data were collected at beginning and during FUP. Uni and multivariate analysis were performed with Cox regression and survival analysis was done using Kaplan Meyer curves.
Results: 48 patients with CTD and associated PH were gathered, mean age was 65.25 ± 14.4 years and female per male ratio 10:1 (9% male). Systemic sclerosis was the most prevalent CTD (52.1%), followed by LES and Sjögren sydrome. During a mean FUP of 5 years, 39.6% pts died (n = 39) and 43.8% were hospitalized (n = 21) due to CV cause. There were no statistical differences between different CTD aetiologies in respect to mortality and admissions. On univariate Cox analysis, NTproBNP ($p < 0.001$), alkaline phosphatase ($p = 0.001$); uric acid ($p = 0.014$), TAPSE/sPAP ratio ($p = 0.015$) and COMPERA at beginning FUP ($p < 0.001$) correlated with CV

		PEA (n=33)	BPA (n=14)	Medical therapy (n=20)	p-value*
	Mean age	56.79±13.88	64.07±15.78	63.15±16.52	0.019
	Female (%)	66.6	64	75	0.756
Baseline evaluation	NT-proBNP	531 (138-1891)	1885 (513-4145)	1725 (224-3752)	0.075
	6MWT	323.79±145.82	345.71±82.03	306.08±159.04	0.301
	PASP	86.34±28.68	93.64±24.01	84.15±28.65	0.704
	TAPSE	18.25±5.28	17.50±5.13	18.06±5.02	0.791
	CI	2.34±0.76	2.23±0.76	2.09±0.72	0.802
	mPAP	46.67±10.33	48.93±10.27	41.45±10.60	0.617
	RAP	8.55±5.19	9.57±5.35	9.32±7.18	0.576
	PVR	10.06±4.57	11.80±5.14	10.46±5.81	0.576
6 months reevaluation	NTproBNP	197 (91-324)	114 (64-146)	943 (242-2742)	**0.002**
	6MWT	434.29±98.19	433.00±91.42	338.57±125.49	0.831
	PASP	42.56±22.76	48.25±14.56	72.83±38.26	0.382
	TAPSE	16.72±3.14	23.64±4.08	19.67±6.21	0.427
	CI	2.58±0.57	3.20±1.03	2.72±0.74	**0.074**
	mPAP	25.91±9.53	28.75±7.92	41.00±8.96	0.406
	RAP	5.81±3.37	6.67±3.28	7.27±4.32	0.879
	PVR	3.85±2.42	3.67±1.41	7.26±3.45	0.248

***Table 1* Clinical characteristics of the patients submitted to pulmonary endarterectomy vs balloon pulmonary angioplasty vs medical therapy at baseline, and 6 months after treatment.**
Continuous variables are expressed as mean ± standard deviation with exception of NT-proBNP expressed as median, Q1 and Q3.
*Reported p-value concerns significance between PEA vs BPA.
Abbreviations: PEA – pulmonary endarterectomy; BAP – balloon pulmonary angioplasty; 6MWT – 6-minute walking test; PASP – pulmonary artery systolic pressure; TAPSE – tricuspid annular plane systolic excursion; CI – cardiac index; mPAP – mean pulmonary arterial pressure; RAP – right atrial pressure; PVR – pulmonary vascular resistance.

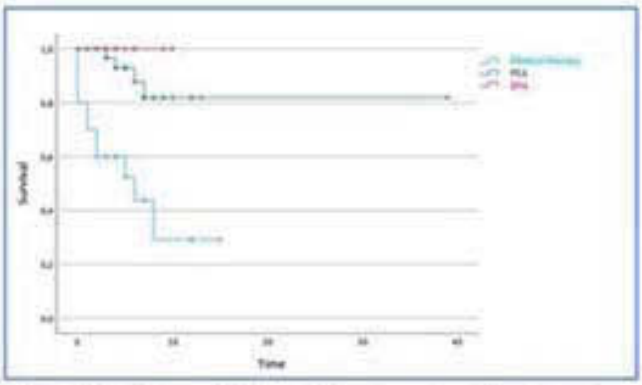
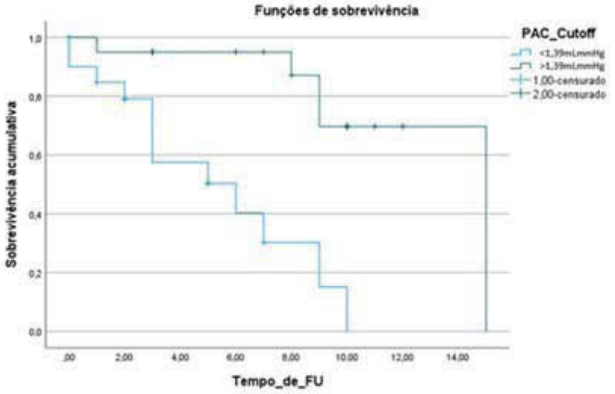


Figure 1 Kaplan Meier analysis showed that patients submitted to interventions (pulmonary endarterectomy or balloon pulmonary angioplasty) had better survival compared to medical therapy (Log-rank test p<0.001).

CO 47 Figure

events (composite endpoint of admissions and mortality). TAPSE/sPAP ratio < 0.55 has been described as a non-invasive marker of severity in PAH. After ROC curve analysis, TAPSE/sPAP ratio < 0.379 had the best specificity and sensitivity in our population. Pulmonary vasculature is a highly compliant system but pts with PAH have a lower PAC. PAC can be estimated by a simplified calculus, dividing stroke volume per pulse pressure. A cut-off of lower than 1.39mL/mmHg had been proposed as conveying worse prognosis and we thus divided our population using this value. In our cohort 40 pts had all the parameters at RHC that enabled calculation of PAC: 20 above and 20 below 1.39 mL/mmHg. Kaplan-Meyer analysis showed a significant difference between two groups (p = 0.001, 95%CI 6.82-11.1).



Conclusions: In this specific population NTproBNP, alkaline phosphatase, uric acid and COMPERA at beginning were predictors of CV events. In line with proposed pathophysiology, PAC showed to be a marker of severity and a previously proposed cut-off of 1.39 mL/mmHg revealed a positive association with prognosis not only in LES but in other CTD.

CO 49. ABDOMINOPELVIC CT FOR CANCER SCREENING IN PATIENTS WITH UNPROVOKED PULMONARY EMBOLISM - A CLOSED DISCUSSION?

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Introduction: Pulmonary embolism (PE) may be the earliest sign of cancer. Early diagnosis of malignancy leads to improved overall survival. ESC guidelines suggest a focused clinical assessment before proceeding to abdominopelvic computed tomography (CT) in patients with an unprovoked PE. However, there is insufficient evidence to draw conclusions on the effectiveness of screening for occult malignancy in these patients (pts). Our study aimed to establish whether routine abdominopelvic CT allowed earlier malignancy diagnosis and improved outcomes.
Methods: Retrospectively single-center study of pts admitted with PE diagnosis established by CT pulmonary angiogram and without a previous diagnosis of cancer, from 2019 to 2020. Clinical records were examined to establish whether routine abdominopelvic CT increased the detection rate of underlying malignancy.
Results: A total of 253 pts with PE diagnosis and no previous history of malignancy were included (42% male; mean age 68 years). Eighty-nine (35%) pts underwent abdominopelvic CT in order to exclude malignancy (of those, 87% performed the exam during the current hospitalization). Extended screening for malignancy was associated with a significantly longer hospital stay (13 ± 14 *vs.* 7 ± 8 days, p < 0.001). Anaemia or thrombocytopenia did not influence the decision for screening (p = 0.625). Thirteen out of 89 had evidence of malignancy on abdominopelvic CT (diagnostic profitability of 14%). The most diagnosed primary tumours were colorectal (39%), lung (15%) and ovarian (15%). About half of patients (54%) were diagnosed on stage IV (metastatic), 3 pts (23%) on stage III, and 1 patient for stages I and II. In the subgroup of pts in which malignancy screening was not performed, 7 pts (4%) were diagnosed with cancer during the follow-up (mean time difference between PE and diagnosis of 16 ± 7 months). Of those, 2 pts were diagnosed in stage IV and 3 pts in stage III. There was no difference in all-cause mortality between the group of patients who were submitted to routine abdominopelvic CT after unprovoked PE and those who were not (p = 0.145).
Conclusions: We found that the prevalence of occult cancer was high among pts with a first unprovoked PE. Even though routine abdominopelvic CT helps in the diagnosis of underlying malignancy it does so at advanced stages and does not provide a significant reduction in overall mortality.

CO 50. CTEPH: RELEVANCE OF THE NEW 2022 ESC/ERS DEFINITION OF PULMONARY HYPERTENSION AND IMPACT ON DIAGNOSIS ACCURACY BY RIGHT HEART CATHETERIZATION

Bárbara Lacerda Teixeira, André Grazina, Luís Almeida Morais, João Reis, Ana Galrinho, Francisco Albuquerque, Inês Ferreira, Miguel Antunes, Ricardo Carvalheiro, Duarte Cacela, Rúben Ramos, António Fiarresga, Rui Cruz Ferreira

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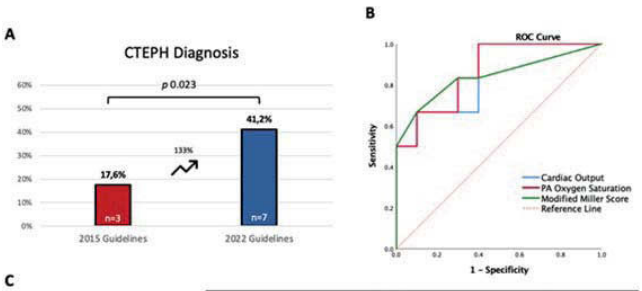
Introduction: The hemodynamic definition of pulmonary hypertension (PH) has been updated, lowering of the mean pulmonary arterial pressure (mPAP) threshold from 25 to 20 mmHg. Plus, pulmonary vascular resistance > 2 Wood units and pulmonary arterial wedge pressure < 15 mmHg are essential for the definition of pre-capillary PH according to the new 2022 ESC/ERS Guidelines. However, the impact of these revised criteria on the number of patients (P) reclassified as PH has not been extensively studied, namely in chronic thrombo-embolic pulmonary hypertension (CTEPH) population.
Objectives: To analyze the proportion of P reclassified as CTEPH according to the new 2022 ESC/ERS hemodynamic criteria in the subset of acute PE P treated with Catheter Directed Therapies (CDT) after 3 months of effective anticoagulation and to compare their clinical and hemodynamic profile.
Methods: A prospective registry of consecutive intermediate-high- and high-risk PE P submitted to CDT in a single tertiary center was used. Clinical, biomarkers, echocardiographic, CT, pulmonary angiogram and right heart catheterization (RHC) data were systematically collected at admission and 3 months after CDT. P were divided in groups according to the old and new hemodynamics criteria for PH. The predictive accuracy of RHC parameters were assessed w/a ROC curve analysis.



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RHC PARAMETERS	AUC	p	Cut-off according to Youden's index	Sensivity (%)	Specificity (%)
2015 GUIDELINES					
Modified Miller Score	0,726	0,231			
Pulmonary artery oxygen saturation in %	0,615	0,545			
Cardiac Output in L/min	0,718	0,253			
2022 GUIDELINES					
Modified Miller Score	**0,842**	**0,026**	2	83,3	70,0
Pulmonary artery oxygen saturation in %	**0,867**	**0,017**	69	83,3	70,0
Cardiac Output in L/min	**0,850**	**0,023**	5,2	71,4	90,0

Figure 1.

Results: 17 P (60% women, mean age 59 ± 16 years) had baseline and 3 months follow-up assessment and were included. Among these, 4 (23.5%) were reclassified to have pre-capillary PH, meaning that, at 3 months of follow-up, RHC showed that 7 P had PH according to the new guidelines instead of only

3 (41.2% *vs.* 17.6%, p = 0.023). Patients that developed CTEPH were more likely to be older (p = 0.014), female (p = 0.05), to have an acute-on-chronic PE presentation (p = 0.027) and to have a longer duration of symptoms (p = 0.018). No difference between groups in the type of CDT used. Regarding PH predictors in RHC, higher residual perfusion defects (assessed by modified Miller index), lower cardiac output (CO) and lower PA oxygen saturation showed diagnostic prediction for CTEPH according to the new guidelines but not according to previous ones. In ROC curve analysis, AUC for modified Miller was 0.814 with Sn of 71% and Sp 70% for a cut-off of 2, for CO was 0.871 with Sn of 71% and Sp 90% for a cut-off of 5.2 L/min and for PA oxygen saturation was 0.867 with Sn of 83% and Sp 70% for a cut-off of 69%.
Conclusions: The new 2022 ESC/ERS criteria for PH have led to a significant increase in patients classified as CTEPH after intermediate-high- and high-risk PE submitted to CDT. With the new cut-offs, among hemodynamic parameters at 3 months of PE patients submitted to CDT, residual perfusion defects, lower CO and lower PA oxygen saturation have shown to correlate with the presence of CTEPH. With the prevalence increase of CTEPH diagnosis, better care should be attended in the acute and chronic phases of this disease.

Sábado, 15 Abril de 2023 | 08:30-09:30

Sala Vega | Comunicações Orais - Sessão 11 - Síndromes coronárias agudas

CO 51. PRETREATMENT WITH PARENTERAL ANTICOAGULATION IN PATIENTS WITH ST-SEGMENT ELEVATION MYOCARDIAL INFARCTION: A SYSTEMATIC REVIEW AND META-ANALYSIS

Francisco Albuquerque, Daniel Gomes, Jorge Ferreira, Pedro Lopes, Afonso Félix de Oliveira, Pedro de Araújo Gonçalves, Rui Campante Teles, Manuel de Sousa Almeida

Centro Hospitalar Universitário de Lisboa Ocidental, EPE/Hospital de Santa Cruz.

Introduction and objectives: According to ESC guidelines, parenteral anticoagulation is recommended for all patients presenting with ST-segment elevation myocardial infarction (STEMI) during primary percutaneous coronary intervention (PPCI). However, no specific recommendations are made regarding the timing of administration. In fact, whether upstream anticoagulation improves clinical outcomes in STEMI patients is not well established. We conducted a systematic review and meta-analysis of current evidence on parenteral anticoagulation timing for patients presenting with STEMI.
Methods: We performed a systematic search of electronic databases (PubMed, CENTRAL and Scopus) until December 2022. Studies were considered eligible if they a) compared upstream anticoagulation with administration at the catheterization lab; and b) enrolled patients with STEMI undergoing PPCI. Studies comparing different anticoagulants were excluded from the analysis. Random-effects meta-analyses were performed. Efficacy outcomes included TIMI flow-grade pre- and post-PPCI, in-hospital cardiogenic shock (CS) and 30-day all-cause mortality. Safety outcome was defined as major in-hospital bleeding events.
Results: Overall, 9 studies were included (all non-randomized), with a total of 69.571 patients (30.693 in the pretreatment arm). In all but one, anticoagulation strategy was exclusively based on unfractionated heparin. Pretreatment was associated with a significant reduction in the incidence of 30-day all-cause mortality (OR 0.61; 95%CI 0.47-0.80; p < 0.001) and in-hospital CS (OR 0.69; 95%CI 0.59-0.81; p < 0.001). Upstream anticoagulation was also associated with a significant increase of spontaneous reperfusion of the culprit artery before PPCI (pre-PPCI TIMI > 0: OR 1.47; 95%CI 1.35-1.60; p < 0.001) and TIMI flow ≥ 2 after coronary intervention (OR 1.28; 95%CI 1.05-1.56; p = 0.016). Regarding safety outcomes, pretreatment was not associated with an increase of in-hospital major bleeding (OR 1.01; 95%CI 0.70-1.44; p = 0.970). Multiple sensitivity analyses, including propensity-matched populations, showed consistent results.
Conclusions: Upstream anticoagulation was associated with a significantly lower risk of 30-day all-cause mortality, the incidence of in-hospital cardiogenic shock and improved reperfusion of the culprit artery. These benefits were not accompanied by an increased risk of major bleeding, suggesting an overall clinical benefit of early anticoagulation in patients presenting with STEMI. These results require confirmation in a randomized clinical trial.

CO 52. SYSTEMATIC REVIEW AND META-ANALYSIS ON THE EFFICACY AND SAFETY OF P2Y12 INHIBITOR PRETREATMENT FOR PRIMARY PCI IN STEMI

João Presume, Daniel Gomes, Jorge Ferreira, Francisco Albuquerque, Manuel S. Almeida, Miguel Sousa Uva, Carlos Aguiar, Miguel Mendes

Centro Hospitalar Universitário de Lisboa Ocidental, EPE/Hospital de Santa Cruz.

Introduction: One of the cornerstones of antithrombotic therapy in patients with ST-segment elevation myocardial infarction (STEMI) is dual antiplatelet therapy (DAPT) with both aspirin and P2Y12 inhibitors, which is associated with better outcomes. Yet, the optimal timing for its initiation is still uncertain. The aim of this study was to perform a systematic review and meta-analysis of evidence on pretreatment with P2Y12 inhibitors in combination with aspirin in patients with STEMI undergoing primary percutaneous coronary intervention (PCI).
Methods: We performed a systematic search of electronic databases Pubmed, CENTRAL, and Scopus until April 2022. Studies were eligible if they were comparing P2Y12 inhibitor upstream administration *vs.* downstream use in patients with STEMI submitted to PCI. Studies with patients receiving fibrinolysis or medical therapy only were excluded. Outcomes were assessed at the shortest follow-up available.
Results: Out of 2,491 articles, 3 RCT and 15 non-RCT studies were included, with a total of 79,300 patients (66.1% pretreated, 66.0% treated with Clopidogrel). Pretreatment was associated with reduction in definite stent thrombosis (OR 0.59 [0.37-0.94] - Figure 1.1), all-cause death (OR 0.77 [0.60-

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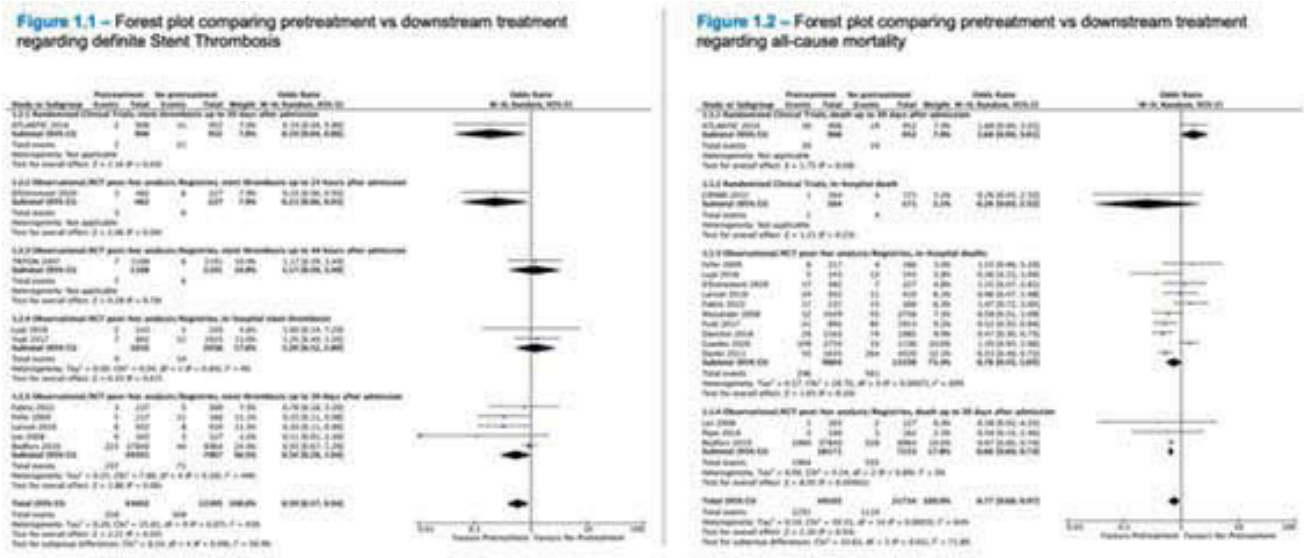

CO 52 Figure

0.97] – Figure 1.2), and cardiogenic shock (OR 0.60 [0.48-0.75]). It was also associated with a lower incidence of TIMI flow < 3 pre-PCI (OR 0.78 [0.67-0.92]). However, incidence of recurrent MI was not significantly reduced (OR 0.93 [0.57-1.52]). Regarding safety, pretreatment was not associated with a higher risk of major bleeding events (OR 0.83 [0.75-0.92]).
Conclusions: P2Y12 pretreatment was associated with better pre-PCI coronary perfusion, lower incidence of definite stent thrombosis, cardiogenic shock, and, possibly, all-cause mortality with no sign of potential harm encountered.

CO 53. THE INFLUENCE OF WEATHER IN THE FORECASTING OF STEMI OCCURRENCE

Vítor Hugo Pereira[1], João Serafim[1], Carlos Braga[1], Patrício Costa[2]

[1]Hospital de Braga, EPE. [2]Universidade do Minho.

Forecasting applied to health data is expanding, but its application to ST-elevation myocardial infarction (STEMI) incidence data has not been explored. Although several works study seasonal and circadian patterns and the influence of the weather in the occurrence of acute myocardial infarction (AMI), none have been conducted in Portugal, to our knowledge. This study aimed to develop predictive models of STEMI incidence in our region. Additionally, our purpose was to find temporal patterns of STEMI onset and assess the relationship between weather variables and STEMI occurrence. Clinical data from 2011 to 2021 on STEMI incidence was collected from our hospital. Meteorological data were obtained for the same region and period. The frequencies of STEMI onset by month, day of the week and time of the day were registered. A time series analysis was performed. ARIMA and Neural Network Autoregression (NNAR) forecasting models were applied to the STEMI time series. Moreover, cross-correlation functions between MI and meteorological time series were explored. A total of 3391 cases were enrolled. There were significant differences in the monthly and circadian distribution of STEMI incidence ($p < 0.001$), being winter months and morning hours the most frequent. No weekly variation was found. NNAR model was more accurate in predicting STEMI incidence than ARIMA model (MAPE: 11.24 *vs.* 17.26). For a certain period, our region temperature and solar radiation were inversely related to the number of STEMI cases, but higher air humidity was associated with more events. There is a seasonal and circadian pattern for STEMI onset. Colder, wetter, and less sunny periods are associated with higher STEMI incidence. Neural network models seem more suitable than ARIMA for STEMI incidence forecasting.

CO 54. COMPLETE REVASCULARIZATION *VS.* CULPRIT-ONLY PCI IN STEMI PATIENTS WITH MULTIVESSEL DISEASE: A LONG-TERM FOLLOW-UP ANALYSIS (8 YEARS) OF REINFARCTION AND ALL-CAUSE MORTALITY

André Alexandre, David Sá-Couto, André Luz, João Faria, Andreia Campinas, Anaisa Pereira, Mariana Santos, Raquel Santos, Bruno Brochado, João Silveira, Severo Torres

Centro Hospitalar Universitário do Porto, EPE/Hospital Geral de Santo António.

Introduction: For STEMI patients with multivessel coronary artery disease, the optimal treatment of the non-culprit artery has been controversial. Most randomised studies show that complete revascularization is associated with a reduction in the incidence of reinfarction when compared to a culprit-only percutaneous coronary intervention (PCI) strategy. However, overall effects on long-term all-cause mortality are still unclear.
Objectives: To determine whether complete percutaneous revascularization has a positive impact on long-term reinfarction and all-cause mortality in STEMI patients with multivessel disease when compared to culprit-only PCI.
Methods: This is a retrospective study of STEMI patients admitted to primary PCI between Jan 2008 to Dec 2013 and followed for 8 year-interval. Patients with multivessel coronary artery disease were classified according to the revascularization strategy in two groups: complete percutaneous revascularization *vs.* culprit-only PCI. The primary endpoint was all-cause mortality. The secondary endpoints were reinfarction and target vessel failure (TVF).
Results: From a total of 584 STEMI patients, 302 had multivessel disease and were included in the analysis: 49.7% (n = 150) had 2-vessel disease; 50.3% (n = 152) had 3-vessel disease. Mean follow-up time was 6.95 (± 2.29) years. 74% were male; median age was 63 years. Patients with multivessel disease were classified according to the revascularization strategy: 104 (34%) patients underwent complete percutaneous revascularization *vs.* 198 (66%) patients who underwent culprit-only PCI. There were no significant differences between groups regarding baseline clinical characteristics, except for age (patients in the complete revascularization group were younger: 60 *vs.* 66 years; $p < 0.001$) and smoking (more common in the complete revascularization group: 60% *vs.* 42%; $p = 0.003$). Regarding angiographic characteristics, there were no differences between groups, except for no-reflow (more common in the culprit-only PCI group: 7% *vs.* 1%; $p = 0.020$) and drug-eluted stents (more common in the complete revascularization group (69% *vs.* 47%; $p = 0.001$). Multivariate analysis with Cox regression revealed that culprit-only PCI was independently associated with a higher risk of reinfarction (adjusted HR 2.46;

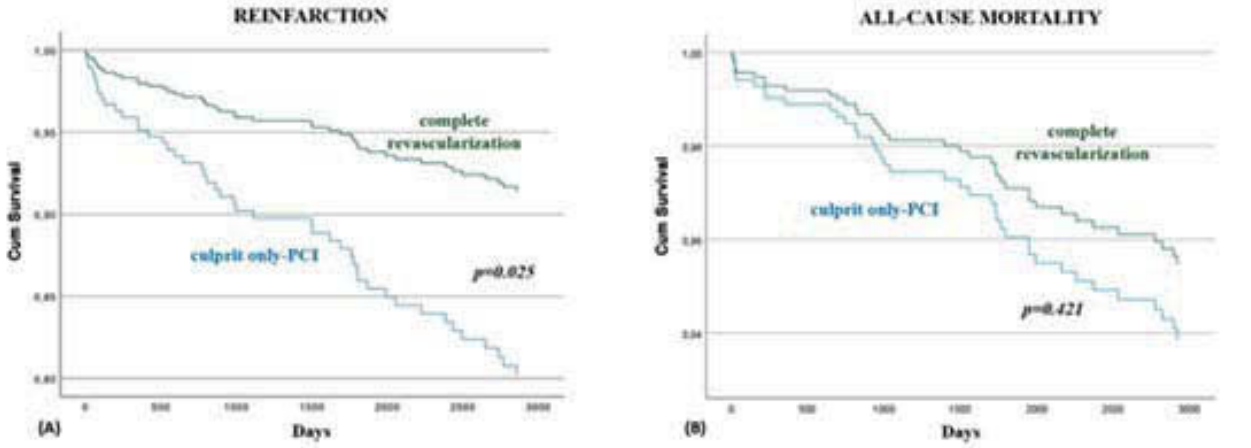

Figure 1: Adjusted model event-free survival curve for the incidence of reinfarction **(A)** and all-cause mortality **(B)** according to the revascularization strategy.

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95%CI 1.12-5.38; p = 0.025) and TVF (adjusted HR 2.37; 95%CI 1.02-5.48; p = 0.044) when compared to complete percutaneous revascularization, but with no significant differences in the primary endpoint of all-cause mortality (adjusted HR 1.37; 95%CI 0.64-2.93; p = 0.421).
Conclusions: Our study corroborates the benefits of complete revascularisation for STEMI patients with multivessel disease with regard to the incidence of reinfarction, while demonstrating the lack of effect on all-cause mortality at long-term follow-up.

CO 55. SEQUENTIAL KASH SCORE EVALUATION RESULTS IN NEAR PERFECT MORTALITY RISK PREDICTION IN ACUTE MYOCARDIAL INFARCTION

Rafaela G. Lopes, Débora Sá, Isabel Cruz, Bruno Bragança, Inês Gomes Campos, Mauro Moreira, Glória Abreu, António Drumond, Aurora Andrade, Joel Ponte Monteiro

Centro Hospitalar do Tâmega e Sousa, EPE/Hospital Padre Américo, Vale do Sousa.

Introduction: KAsH is the first continuous multiplicative score able to predict in-hospital mortality in patients with myocardial infarction (MI). It has been validated in the context of first medical contact to predict mortality during hospitalization.
Objectives: To test the predictive value of systematic KAsH evaluation during the first 48h of hospitalization.
Methods: Multicentric study of consecutive patients admitted with myocardial infarction in two tertiary centers. Patients' medical history, clinical management and outcome data were collected. KAsH was calculated at hospital admission, 24 hours and 48 hours of hospitalization using the following formula: KAsH = Killip-Kimbal × Age × Heart-Rate/Systolic Blood Pressure. KAsH was categorized into 4 sub-groups using the recommended cut-offs: < 40 (KAsH 1); 40-90 (KAsH 2); 90-190 (KAsH 3); > 190 (KAsH 4). A cumulative continuous and categorized score at 48 hours was analyzed. The score's capacity to predict in-hospital mortality was analyzed using ROC curves, their respective area under the curve (AUC) and 95% confidence intervals.
Results: 196 patients were included, with mean age of 66.8 ± 12.6 years, 74% were male, 43% had ST-elevation myocardial infarction (STEMI) and in-hospital mortality of 6%. Daily KAsH evaluation led to significant improvements in mortality risk prediction: admission - AUC 0.905 (0.853-0.958); 24h - AUC 0.950 (0.917-0.984); 48h - AUC 0.946 (0.908-0.984). Categorization did not significantly impact the score's risk prediction: Admission - AUC 0.892 (0.827-0.958); 24h - AUC 0.923 (0.857-0.990); 48h - AUC 0.912 (0.848-0.976). Subgroup analysis at 48 hours excellent predictive capacity in both the STEMI (AUC = 0.891, 95%CI 0.820-0.961) and NSTEMI groups (AUC = 0.991, 95%CI 0.974-1.00). There were no differences between centers.
Conclusions: This work shows that systematically recalculating KAsH score since admission results in near perfect hospital mortality prediction, regardless of categorization or center, showing a significant improvement of risk prediction comparing to KAsH at admission alone. This work supports the use of this score in routine clinical practice.

Sábado, 15 Abril de 2023 | 09:30-10:30

Sala Vega | Comunicações Orais - Sessão 12 - Fibrilhação auricular: novas perspetivas sobre os mecanismos

CO 56. ASSOCIATION BETWEEN EPICARDIAL ADIPOSE TISSUE VOLUME AND RECURRENCE OF ATRIAL FIBRILLATION AFTER CATHETER ABLATION

Bárbara Lacerda Teixeira, Pedro Silva Cunha, Ana Sofia Jacinto, Guilherme Portugal, Bruno Valente, Ana Lousinha, Madalena Coutinho Cruz, Ana Sofia Delgado, Manuel Brás, Margarida Paulo, Cátia Guerra, Ruben Ramos, Ilária Fontes, Rui Cruz Ferreira, Mário Oliveira

Centro Hospitalar Universitário de Lisboa Central, EPE/Hospital de Santa Marta.

Introduction: In patients (pts) undergoing catheter ablation of atrial fibrillation (AF), up to one third have arrhythmia recurrence after a first ablation. Epicardial adipose tissue (EAT) secretes proinflammatory adipokines, and has been considered to be closely related to AF, with a potential role in the recurrence of AF after catheter ablation.
Objectives: To evaluate the association between the volume of EAT measured by cardiac angio-CT and arrhythmia recurrence in pts submitted to catheter ablation of AF.

Methods: Single-center retrospective study of consecutive AF pts submitted to ablation between 2011 and 2020, with, at least, one-year follow-up. Epidemiological, clinical, laboratory, echocardiography and angio-CT related data were retrieved. A standardized protocol for quantification of EAT, thoracic adipose volume (TAV) and left atrium volume (LAV) was performed. After comparison of groups using Chi-square and Mann-Whitney analysis, an appropriate Cut-Off of EAT for our population was determined using ROC Curve, and Kaplan Meier survival curves were used to estimate the risk of events (recurrence of AF).
Results: 344 pts (63.1% men) were included, with a mean age of 57.4 ± 10.9 years and a median follow-up time of 22 months. During follow-up, 31.7% (n = 109) had recurrence of AF. Baseline characteristics were similar between groups, except for persistent AF, which was higher in pts with recurrence (25% *vs.* 46%, p = 0.011). AF recurrence was associated with higher EAT (p = 0.040) and higher LAV (p < 0.001), but not with TAV (p = 0.115) nor body mass index (BMI) (p = 0.123). In pts with AF recurrence, values of EAT above a cut-off of 151 cm^3 predicted the endpoint of time to recurrence (HR 2.05, IC [1.180-3.566], p = 0.01), with pts presenting a median of 11 months survival free from recurrence, compared to a median of 15 months in those with EAT values bellow the aforementioned cut-off (log-rank p = 0.008).

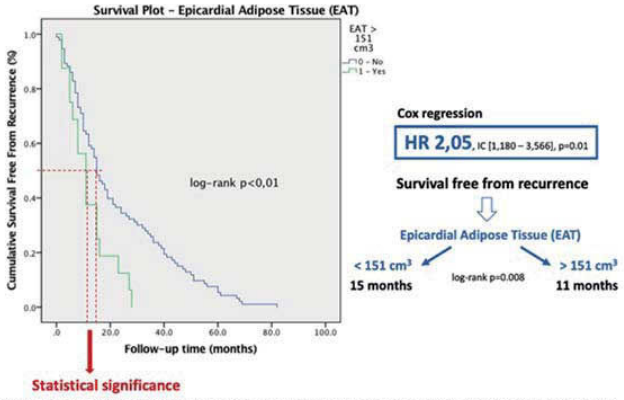


Figure 1: Kaplan–Meier survival estimates of time to recurrence of AF in patients with AF undergoing catheter ablation, stratified by preprocedural angio-CT measured EAT volume of ≤151 cm3 versus >151 cm3 (log-rank, p = 0.008).

Conclusions: EAT may serve as a predictor of AF recurrence after ablation, with pts showing an EAT volume > 151 cm^3 presenting a statistically significant lower survival free from recurrence.

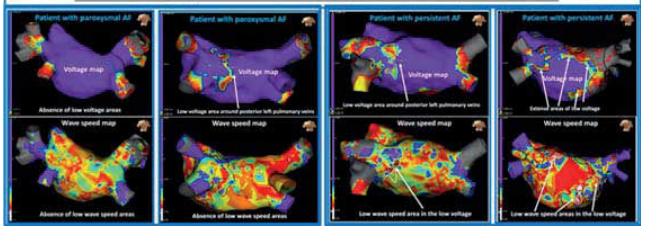
CO 57. LOW VOLTAGE AND LOW WAVE SPEED ARE RARELY PRESENT OUTSIDE THE LEFT ATRIUM-PULMONARY VEINS JUNCTION IN PAROXYSMAL ATRIAL FIBRILLATION BUT FREQUENTLY PRESENT IN PERSISTENT FORMS

Leonor Parreira, Lia Marques, Rita Marinheiro, José Farinha, Dinis Mesquita, Cláudia Encarnação, Pedro Amador, Luís Duarte, Maria João Lopes, Pedro Contreiras, Duarte Chambel, Rui Caria

Centro Hospitalar de Setúbal, EPE/Hospital de São Bernardo.

Introduction and objectives: Multielectrode high-density catheters have enabled acquisition of comprehensive and dense maps of electrogram's amplitude and timing. However, automated activation and voltage mapping are flawed by catheter orientation in relation to the wavefront activation. Omnipolar mapping technology (OT) uses both unipolar and bipolar signals to obtain OT signals and increases the accuracy of automatic point acquisition allowing for a high- density map in a quick and efficient way. The aim of this study was to automatically assess with OT, the left atrium (LA) voltage and wave speed propagation map in sinus rhythm (SR) according to the type of atrial fibrillation (AF).
Methods: We studied 12 consecutive patients referred for ablation of AF, either paroxysmal (PAF) (n = 6) or persistent (Pers-AF) (n = 6) using catheters with OT. Patients with Pers-AF were cardioverted, and a voltage and propagation wave speed map in SR was obtained before ablation in all patients. The cut-off value for low voltage areas (LVAs) was less than 0.1 mV and for low wave speed (LWS) was less than 0.4 mm/ms. Results were compared according to the type of AF.
Results: The results are depicted in the Table. The median duration of AF in Pers-AF was 15 (5-24) months and those patients had a higher CHADSVASC score, but the two groups did not differ regarding other demographic and anatomical evaluated parameters. Patients with Pers-AF displayed presence of LVAs in 100% of cases in comparison with 17% for PAF patients (p = 0.015) and the total LVA in cm^2 was also significantly higher, (p = 0.002). Also, the number of LWS areas and the total area of LWS were higher in Pers-AF than PAF (p = 0.041 and p = 0.015), and were more frequently located outside the PV-LA junction in Pers-AF than in PAF, p = 0.015.

	PAF n=6	Pers-AF n=6	P value
Age in years, median (Q_1-Q_3)	55 (46-63)	64 (61-68)	0.065
Male gender, n (%)	4 (67)	4 (67)	1.000
Idiopathic, n (%)	6 (100)	4 (67)	0.455
BMI in Kg/m^2, median (Q_1-Q_3)	29 (27-32)	32 (26-32)	0.699
Indexed LA vol in ml/m^2, median (Q_1-Q_3)	35 (32-40)	45 (40-55)	0.093
LVEF in %, median (Q_1-Q_3)	48 (39-55)	55 (52-56)	0.093
CHADSVASC, median (Q_1-Q_3)	1 (0-2)	3 (2-4)	0.041
N points in the map, median (Q_1-Q_3)	2700 (2575-2736)	3078 (2858-3241)	0.065
Presence of LVAs, n (%)	1 (17)	6 (100)	0.015
N of LVAs, median (Q_1-Q_3)	0 (0-1)	3 (1-4)	0.009
Total area of LVA in cm^2, median (Q_1-Q_3)	0 (0-0.4)	7.7 (2.7-15.7)	0.002
LVAs in the PV-LA junction, n (%)	1 (17)	4 (67)	0.242
LVAs in the LA body, n (%)	0 (0)	4 (67)	0.061
Presence of LWS areas, n (%)	2 (33)	6 (100)	0.061
N of areas of LWS, median (Q_1-Q_3)	0 (0-2)	3 (1-3)	0.041
Total area of LWS in cm^2, median (Q_1-Q_3)	0 (0-0.7)	2.1 (0.7-4.1)	0.015
LWS in the PV-LA junction, n (%)	2 (33)	4 (67)	0.567
LWS in the LA body, n (%)	0 (0)	5 (83)	0.015



Conclusions: Patients with PAF never presented LVAs or LWS outside the PV-LA junction. On the contrary, patients with Pers-AF have frequently anatomical and electrophysiological abnormalities in the LA body. These findings may suggest the need for a wider ablation strategy in Pers-AF.

CO 58. CHARACTERIZATION OF ROTOR PHENOMENA WITH HIGH-DENSITY BODY SURFACE ELECTRODE MAPPING IN PERSISTENT ATRIAL FIBRILLATION AND IMPACT OF PULMONARY VEIN ISOLATION

Mário Martins Oliveira[1], Pedro Silva Cunha[1], Sérgio Laranjo[1], Guilherme Portugal[1], Bruno Valente[1], Ana Lousinha[1], Barbara Teixeira[1], Manuel Braz[1], Josep Boque[2], Ana Sofia Delgado[1], Rui Cruz Ferreira[1]

[1]Centro Hospitalar Universitário de Lisboa Central, EPE/Hospital de Santa Marta. [2]Medtronic Espanha.

Introduction: Rapid rotational activations have been proposed to be implicated in atrial fibrillation (AF) maintenance. CardioInsight (ECGi) high-density body surface electrode mapping of atria has been used to identify atrial rotor activities to guide persistent AF ablation (PersAF). Stability and reproducibility of rotor identification across the atria during AF have not been well-validated. Also, the impact of pulmonary veins isolation (PVI) on the dynamics of rotors remains unknown. We aim to evaluate the spatial pattern of rotors distribution in PersAF patients (P) undergoing PVI.
Methods: Fourteen P (mean age 57.7 years; 78.5% men), who underwent catheter radiofrequency ablation with ECGi mapping, to identify high-yield rotors, projected onto cardiac computed tomography scan per protocol. Unipolar electrogram files of 10-sec duration were recorded before vascular catheterization (step 1) and repeated after 3D voltage electroanatomic mapping (CARTO system) (step 2), and PVI (step 3). Rotor activities were recognized automatically (phase map analysis) and checked manually. A wave rotating > 2.0 times around a spatially stable core was considered for the present analysis. A biatrial schema (Bordeaux atrial classification) with 7 regions was used: left PV and left atrial appendage (region 1); right PV and posterior interatrial grove

(region 2); posterior left atrium (LA) (region 3); upper half of the right atrium (RA) and RA appendage (region 4); lower half of the RA (region 5); anterior LA and roof (zone 6); anterior interatrial grove (region 7).
Results: A total of 152 rotors were seen in 11P (78.5%). Rotors were most commonly observed in region 2 (mean number of rotors [MNR]: 3.7), followed by zones 1 and 4 (MNR: 2.2; 2.1; respectively) and zones 3, 6 and 7 (MNR: 1.0; 0.8 and 1.6; respectively) (p 50%) in the number of rotors and number of rotations was observed in all but zones 5 and 6.
Conclusions: ECGi high-density phase mapping of atria identified high-yield stable and reproducible rotors in most PersAF P. Right PV and posterior interatrial grove showed a higher number of rotors, with more rotational activity. Antral PVI may obtain a reduction in rotor activity. Future validation of ECGi technology contribution for understanding mechanistic-based ablation of PersAF is needed.

CO 59. UNDERSTANDING THE COMPLEX STRUCTURE OF THE LEFT ATRIUM FROM CARDIAC CT - A MACHINE LEARNING-BASED RADIOMICS MODEL TO PREDICT POST-ABLATION RECURRENCE OF ATRIAL FIBRILLATION

João Bicho Augusto[1], Pedro Cunha[2], Sérgio M. Laranjo[2], Guilherme Portugal[2], Bruno Valente[2], Ana Lousinha[2], Bárbara Teixeira[2], André V. Monteiro[2], Margarida Paulo[2], Cátia Guerra[2], Mário M. Oliveira[2]

[1]Institute of Cardiovascular Science, University College London. [2]Centro Hospitalar Universitário de Lisboa Central, EPE/Hospital de Santa Marta.

Introduction: Complex properties of the left atrial (LA) wall and cavity could help understand the pathophysiology of atrial fibrillation (AF) and the risk of recurrence after ablation. Beyond conventional cardiac CT measures, radiomics allow extraction of high-dimensional data and deep quantitative phenotyping of the LA.
Objectives: We aimed to assess radiomics models based on LA wall images from cardiac CT to predict the risk of AF recurrence after ablation.
Methods: Cardiac CT images from 37 patients obtained immediately prior to AF ablation were prospectively collected and reviewed. The LA wall was segmented using a machine-learning LA wall segmentation tool with minimal input from the user. The LA cavity was segmented using a semi-automated tool. A total of 140 radiomics features were extracted (without wavelet decomposition) using the PyRadiomics library, which included first-order and textural features from the LA wall, and shape and size features from the LA cavity. Features with a high variance inflation factor were excluded from the analysis. A model of radiomics signatures was built using least absolute shrinkage and selection operator (LASSO) regression to explore the prognostic value for AF recurrence within 12 months. Flow chart is summarized in Figure.
Results: Size zone non-uniformity (SZN), an LA wall texture feature, was the only independent predictor of AF recurrence at 12 months follow-up. SZN measures the variability of size zone volumes in the image, with a lower value indicating more homogeneity in size zone volumes. SZN was significantly higher (suggesting more LA wall heterogeneity) in patients with AF recurrence (median 24,567 [IQR 19,729-30,286] *vs.* 18,481 [IQR 13,485-21,623], p = 0.03). C-statistics showed good ability in predicting AF recurrence, with AUC 0.712 (95% confidence interval 0.539-0.886). The survival analysis revealed a log-rank Mantel-Cox test with a chi-square of 103 (p < 0.001).
Conclusions: The complex structure of the LA wall through radiomics conveys information beyond conventional CT imaging. We present a novel non-invasive tool to measure heterogeneous atrial tissue. Heterogenous LA walls are more prone to AF recurrence post-ablation, likely reflecting a higher susceptibility to re-entry mechanisms, high conduction anisotropy, or a combination of these.

CO 60. LEFT-SIDED ATYPICAL FLUTTER: A LOOK INTO THE MECHANISMS IN PATIENTS NOT SUBMITTED TO PRIOR LINEAR ABLATION

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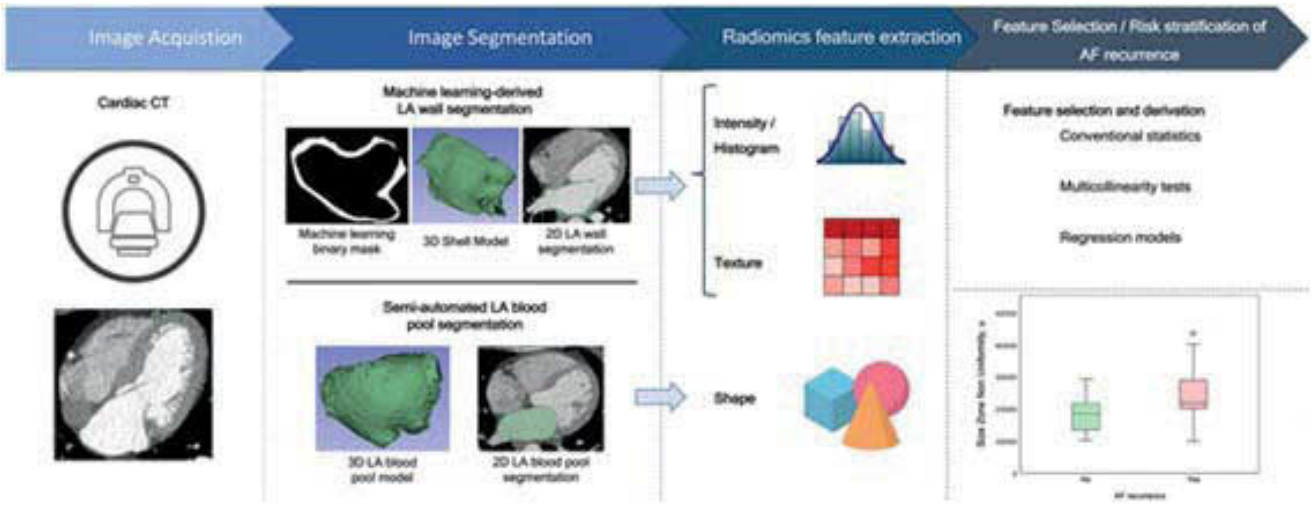
Introduction: The decrease in the use of linear ablation for atrial fibrillation treatment has reduced the frequency of iatrogenic feft-sided atypical flutters (AFl). However, AFl are becoming increasingly frequent, associated with population age and risk factors for atrial scar. Revising the mechanisms of non-iatrogenic AFl may lead to a better procedure workflow.
Objectives: To describe the mechanisms of non-iatrogenic AFl.
Methods: Retrospective single-center study of AFl patients (pts) submitted high-density mapping from 2018 to 2022. Patients submitted to any prior left atrial linear ablation were excluded. Map collection was performed just visualizing the voltage map and a comprehensive workflow was applied for activation map interpretation, starting by facing the mitral annulus and following the sequence of colors to systematically identify all potential circuits, their common-isthmuses, and eventual slow-conduction sites. Entrainment maneuvers were performed to confirm the circuit interpretation if sinus rhythm was not restored with the completion of the planned ablation set.
Results: A total of 59 pts were included (male: 56% male; 67 ± 13 years), 28 previously submitted to atrial fibrillation ablation, restricted to pulmonary vein (PV) isolation. About 88% presented a macro-reentrant mechanism,



CO 59 Figure

either restricted to the left atrium (N = 50) or biatrial (N = 2) and involving 2 or 3 loops in 61% - Figure 1. Perimitral loop was the most frequent reentrant circuit, representing 60% of macro-reentrant arrhythmias (N = 30) and exhibiting an evident out-of-proportion predominance of counterclockwise rotations (73% *versus* 27%). Among perimitral flutters with at least one additional loop, a balanced distribution was recognized of rotations around the left and right PVs (10 *versus* 10). Image 2 represents the linear ablation lines produced in each pt. As a result of the existence of additional loops producing common-isthmuses locations in various atrial regions, the classical inferior mitral isthmus line (from the mitral annulus to the left inferior PV) would only terminate as much as 53% of the perimitral AFl. The mechanism-tailored ablation strategy, particularly targeting the AFl common-isthmuses, resulted in restoration of sinus rhythm in 96.6% of pts (N = 57).

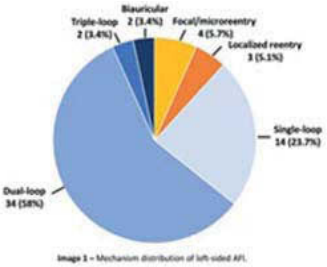


Image 1 – Mechanism distribution of left-sided AFl.

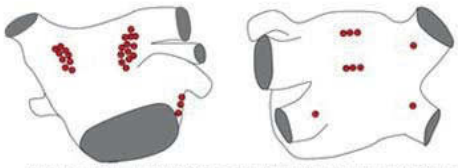


Image 2 – Schematic representation of critical isthmus in macro-reentrant AFl with more than one loop. Each dot represents one patient.

Conclusions: In pts not previously submitted to linear ablations, AFl are predominantly caused by macro-reentrant circuits involving a perimitral rotation but not necessarily possible to treat with a conventional mitral isthmus line. With current high-density mapping tools, a comprehensive analysis of the substrate and activation maps and a mechanism-tailored ablation strategy results in an unprecedently high acute success rate.

Sábado, 15 Abril de 2023 | 10:30-11:30

Sala Aquarius | Comunicações Orais - Sessão 13 - Taquicardia ventricular e morte súbita cardíaca

CO 61. USING THE 3D ARCHITECTURE OF SCAR TO PREDICT LIFE-THREATENING VENTRICULAR ARRHYTHMIAS - STILL A LONG WAY TO GO

Rita R. Amador, Ana Rita Bello, Pedro Freitas, Sara Guerreiro, João Abecasis, Ana Coutinho Santos, Carla Saraiva, Pedro Galvão Santos, Francisco Moscoso Costa, Maria Salomé Carvalho, Pedro Carmo, Diogo Cavaco, Francisco Morgado, António Miguel Ferreira, Pedro Adragão

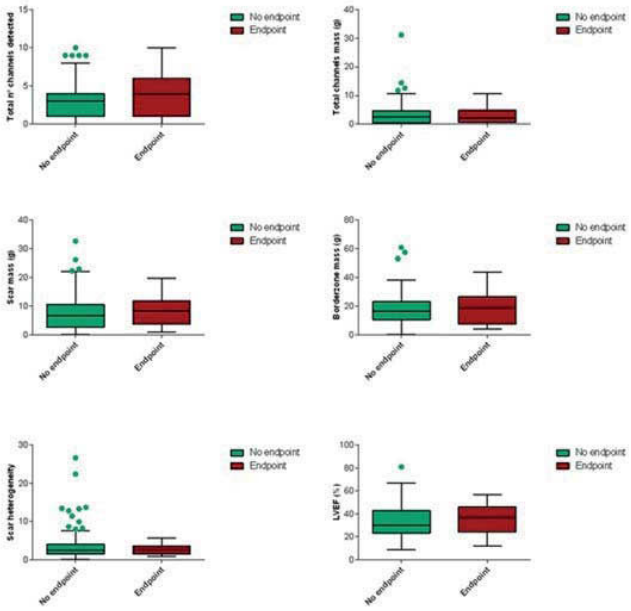
Centro Hospitalar Universitário de Lisboa Ocidental, EPE/Hospital de Santa Cruz.

Introduction: Late gadolinium enhancement (LGE) has been proposed as an independent predictor of ventricular arrhythmias.

Objectives: The purpose of this study was to assess if myocardial scar characterization could enhance the risk stratification for life-threatening arrhythmias and sudden cardiac death (SCD).

Methods: We included patients with an indication for ICD or CRT-D implantation who underwent cardiac magnetic resonance for clinical proposes since February/2018 and in whom a 3D-LGE dataset was obtained. Patients with channelopathies (n = 2) or inappropriate imaging quality (imaging artifacts; n = 7) were excluded. Scar characterization using ADAS software was performed in 3D-LGE datasets in all but 5 patients, where 2D datasets were used. The primary endpoint was the composite of appropriate ICD therapy (classified as ATP or shock) or SCD.

Results: A total of 116 patients were analysed (mean age 66 ± 14 years; 81% male; mean LVEF 34 ± 14%; 74 patients with ischemic and 42 with non-ischemic cardiomyopathy; 40 patients received a device in the setting of secondary prevention). During a median follow-up of 2.3 years (IQR 1.3-3.3 years) there were 23 events (18 appropriate ICD therapies [9 shocks and 9 ATP], 3 episodes of VT under the threshold for ICD therapy and 2 SCD). No statistically significant differences were found between patients with or without events in terms of scar mass, border zone (BZ) mass, BZ channels (BZC), BZC mass, number of channels detected, and scar heterogeneity (BZ mass/scar mass ratio) - all p values > 0.2 (Figure). Restricting the analysis to only primary prevention cases yielded similar results. Overall, 26 patients did not show any channel. Four of these experienced an arrhythmic event, yielding a negative predictive value of 83% (95%CI 64-93%) for the absence of channels.



Conclusions: In this cohort with still relatively limited follow-up duration, no single parameter reflecting scar tissue characterization was able to predict appropriate device therapies or sudden cardiac death.

CO 62. EXTRACORPOREAL MEMBRANE OXYGENATION'S ROLE IN REFRACTORY ELECTRICAL STORM WITH NO STRAIGHTFORWARD TREATMENT - HOW MUCH TIME WORTHS?

Catarina Martins da Costa, Isabel Durães Campos, Ana Rita Ferreira, Ana Lebreiro, Gonçalo Pestana, Luís Adão, Luís Filipe Macedo, José Pinheiro Torres, José Artur Paiva, Roberto Roncon-Albuquerque Jr

Centro Hospitalar Universitário de S. João, EPE.

Introduction: Refractory electrical storm is a very severe condition that may be rescued by percutaneous venoarterial extracorporeal membrane oxygenation

Table 1. Patient's characteristics

#	SEX	AGE	CVRF	ES ETIOLOGY	FINAL TREATMENT
1	M	58	Yes	ACS	Palliative
2	M	74	Yes	AdHF	EPS
3	M	54	Yes	AdHF	HxT
4	F	32	Yes	Lymphocytic myocarditis	HxT
5	F	60	Yes	ACS	EPS
6	M	67	Yes	AdHF	Palliative
7	F	51	Yes	ACS	AA
8	M	62	Yes	subACS	Palliative
9	F	43	No	Eosinophilic myocarditis	AA + CCT
10	M	22	No	Idiopatic	EPS
11	M	57	Yes	AdHF	HxT
12	M	58	No	ACS	HxT
13	M	44	Yes	Ischemic scarr	SympAb
14	M	1	No	Myocarditis	AA + CCT
15	F	57	Yes	Iatrogenic?	AA
16	F	48	Yes	Idiopathic*	AA

*Hereditary arrhythmia?; AA - antiarrytmic drugs; AdHF – advanced heart failure; CCT – corticotherapy; CVRF- cardiovascular risk factors (at least one of hypertension, smoking habits, dyslipidemia, diabetes melitus; obesity); EPS – electrophysiology study and ablation; HxT – heart transplant; F- female; M – male; N – normal; SympAb - Sympathetic blockage; VA – vasospastic angina; VT/FV – ventricular tachycardia/ ventricular fibrillation; X -unknow

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(VA-ECMO). ECMO data in this context are limited. The authors aimed to study the utility of emergency VA-ECMO in rES with no specific treatment.
Methods: Retrospective study of rES cases supported with VA-ECMO at a tertiary centre from April 1st 2016 to June 1st 2022. Patients with acute coronary syndrome (< 48h) or with evident treatment were not included. Follow-up data was retrieved from electronic records.
Results: Sixteen patients were included (49 ± 18 years-old), most men and with cardiovascular risk factors. Ten patients were admitted with ongoing rES. Cardio-respiratory arrest pre-VA-ECMO cannulation occurred in 11 patients. VA-ECMO was started 4 (8) days post-admission and was maintained for 14 ± 9 days. Definitive treatment included antiarrhythmic drugs (4, 25%, 2 of them with concomitant myocarditis treatment); emergency heart transplant (4, 25%); electrophysiological study and catheter ablation (3, 19%); and sympathetic blockage (1, 6%). In 3 refractory cases, palliative care was provided. Thirteen patients that underwent VA-ECMO due rES were discharged with no concomitant neurological deficits (overall survival: 81%). Half of patients presented minor vascular complications, and one had a major fatal complication. During follow-up, 19 ± 16 months, no rES recurrence was reported. See table 1 for detailed data.
Conclusions: In this single-centre study, emergency VA-ECMO offered valuable hemodynamic support in rES, allowing patient stabilization until definitive treatment in a high proportion of cases. A multi-disciplinary approach was crucial for the survival of these patients and included an intensive care medicine department with a high-volume ECMO centre, a cardiology department with an electrophysiology laboratory and a thoracic surgery department with a heart transplant program.

CO 63. NOVEL EPICARDIAL ACCESS TECHNIQUE FACILITATED BY CARBON DIOXIDE INSUFFLATION OF THE PERICARDIUM FOR ABLATION OF ARRHYTHMIAS

Bruno Tereno Valente[1], Pedro Cunha[1], Guilherme Portugal[1], Ana Lousinha[1], Paulo Osório[1], André Viveiros Monteiro[2], Mário Oliveira[1]

[1]Centro Hospitalar Universitário de Lisboa Central, EPE/Hospital de Santa Marta. [2]Hospital do Divino Espírito Santo, Ponta Delgada.

Introduction: Epicardial access for mapping and ablation of the epicardial substrate may be required in catheter ablation of arrythmias. High complication rates are associated with the standard epicardial access approach. Recently, a novel method of intentional coronary vein (CV) exit with pericardial CO_2 insufflation to facilitate epicardial access has been described. This study describes our initial experience with this technique.
Methods: Patients undergoing consecutive epicardial ablation between September 2021 and June 2022 at our hospital were included in this study. Via femoral venous access, a branch of the coronary sinus was sub-selected and intentional CV exit was performed with a high tip load coronary angioplasty wire. A microcatheter was then advanced over the wire into the pericardial space, followed by pericardial CO_2 insufflation, facilitating subxiphoid pericardial puncture. In one patient access was performed from right atrial appendage because congenital anomalous return of the coronary sinus to left atrium.
Results: Nine patients underwent epicardial access attempt for arrythmia mapping and ablation. All patients had successful intentional CV exit and CO_2 facilitated epicardial access except one patient because of adhesions from previous heart surgery. The type of ablations performed were 6 ventricular tachycardia, one epicardial accessory pathway ablation and one left epicardial flutter ablation. All the patients had previous endocardial unsuccessful ablations.
Conclusions: This is the first case series of epicardial access facilitated by CO_2 insufflation in Portugal. This technique enabled successful epicardial access in all patients except one patient due to strong epicardial adhesions, there was no adverse outcomes from epicardial access. The extreme safety of this approach allowed to perform epicardial ablations not only of ventricular arrhythmias but also of atrial arrythmias successfully, an additional potential to explore in the field of epicardial ablations.

CO 64. CAUSES OF SUDDEN DEATH IN A YOUNG (40 YEARS OLD) SOUTH EUROPEAN POPULATION: A POSTMORTEM STUDY

Mafalda Carrington[1], Rosa Henriques de Gouveia[2], Rogério Teixeira[3], Francisco Corte Real[2], Lino Gonçalves[3], Rui Providência[4]

[1]Hospital do Espírito Santo, EPE, Évora. [2]Instituto Nacional de Medicina Legal. [3]Centro Hospitalar e Universitário de Coimbra, EPE/Hospitais da Universidade de Coimbra. [4]St Bartholomew's Hospital/Reino Unido.

Objectives: To describe the annual incidence and the leading causes of sudden non-cardiac and cardiac death (SCD) in children and young adult Portuguese population.
Methods: We retrospectively reviewed autopsy of sudden unexpected deaths reports from the Portuguese National Institute of Legal Medicine and Forensic Sciences' database, between 2012 and 2016, for the central region of Portugal, Azores and Madeira (ages 1-40: 26% of the total population). Young adults with sudden unexpected death were included. Violent deaths were excluded.

Table – Anatomopathological diagnosis in sudden cardiac death victims

Main anatomopathological diagnosis	N = 112, n (%)	Mean age ± SD (years-old)	Gender predominance
Atherosclerotic coronary artery disease Type VI complicated lesion (AHA classification) *	**37 (33,0)** 16 (14,3)	34 ± 4 (p<0,047)	Male (83,8%; p=0,032)
LVH** Evolution towards dilation Associated with fibrosis With extensive area of myocardial scar Associated myxomatous mitral valve disease	**17 (15,2)** 8 (7,1) 4 (3,6) 2 (1,8) 1 (0,9)	33 ± 8	NS
Hypertrophic CM*** 	**3 (2,7)**	19 ± 9,5 (p=0,001)	NS
Acute pulmonary embolism With documented deep venous thrombosis	**14 (12,5)** 9 (8,0)	33 ± 6	Women (78,6%; p<0,001)
Dilated LV Probable etiology: Post-partum Ethanolic Ischemic Post-myocarditis	**10 (8,9)** 2 (1,8) 2 (1,8) 1 (0,9) 1 (0,9)	31 ± 8	NS
Valvular Heart disease Myxomatous mitral valve disease Severe aortic stenosis Degenerative mitral valve disease	**7 (6,2)** 4 (3,6) 2 (1,8) 1 (0,9)	36 ± 4	NS
Acute myocarditis	**5 (4,5)**	20 ± 11 (p=0,002)	NS
Acute pulmonary edema/acute heart failure	**5 (4,5)**	34 ± 5	NS
Ascending aorta dissection and pericardial tamponade	**5 (4,5)**	30 ± 8	NS
Congenital Heart Disease Corrected	**5 (4,5)** 3 (2,7)	33 ± 4	NS
Left ventricular fibrosis Mild and multifocal fibrosis Fibrosis with myocardial scar	**2 (1,8)** 1 (0,9) 1 (0,9)	38 ± 4	NS
Arrhythmogenic Right Ventricle CM	**1 (0,9)**	30	NS
Acute left main coronary artery dissection	**1 (0,9)**	24	NS

Legend: *Corresponds to clinical type 1 myocardial infarction, ** Not meeting criteria for Hypertrophic CM, ***Two cases with anatomopathological and genetic data, one case with a previously known diagnosis and whose heart was not sent for anatomopathological analysis.
AHA = American Heart Association; CM = Cardiomyopathy, NS = non-significant

Results: During a 5-year period, 159 SD were identified, corresponding to an annual incidence of 2.4 (95%confidence interval, 1.5-3.6) per 100,000 people-years. Victims had a mean age of 32 ± 7 years-old, and 72.3% were male. There were 70.4% cardiac, 16.4% respiratory, 7.5% neurologic and 3.1% digestive causes of SD. The most frequent cardiac histopathological diagnosis was atherosclerotic coronary artery disease (CAD) (33.0%), with acute myocardial infarction identified as a final cause of SCD in 18.9% of the cases. There were 15.2% victims with left ventricular hypertrophy, with a diagnosis of hypertrophic cardiomyopathy only possible in 2.7%. 12.5% of deaths were due to acute pulmonary embolism. Acute myocarditis (4.5%) had the highest prevalence in children and teenagers. The prevalence of cardiac pathological findings of uncertain significance was 30.4%.
Conclusions: The annual incidence of SD was low. Atherosclerotic CAD was diagnosed in 33.0% victims, suggesting the need to intensify primary prevention measures in the young. The high prevalence of pathological findings of uncertain significance emphasizes the importance of molecular autopsy and screening of first-degree relatives.

CO 65. IDIOPATHIC ISOLATED LEFT BUNDLE BRANCH BLOCK - A BENIGN FINDING OR SOMETHING MORE?

Catarina Amaral Marques, André Cabrita, Miguel Martins de Carvalho, João Calvão, Catarina Martins da Costa, Ana Filipa Amador, Ana Isabel Pinho, Cátia Oliveira, Luís Daniel Santos, Miguel Rocha, Helena Santos Moreira, Pedro Mangas Palma, Elisabete Martins, Filipe Macedo

Centro Hospitalar Universitário de S. João, EPE.

Introduction and objectives: Idiopathic isolated left bundle branch block (LBBB) is a rare diagnosis, implying exclusion of structural heart disease and/or ischemia, mainly in patients (pts) with cardiovascular risk factors (CVRF). Natural history and prognosis of this entity remain poorly studied. Our aim was to characterize a population of pts with idiopathic LBBB and preserved left ventricular ejection fraction (LVEF > 50%).
Methods: Retrospective study of LBBB adult pts screened from a large tertiary care hospital electrocardiographic database from 2011 to 2017. Only idiopathic LBBB pts with LVEF > 50% and follow-up (FU) echocardiographic and clinical data were included in the analysis.

Results: 39% of all 641 LBBB pts were identified as idiopathic cases. Final cohort study (LVEF > 50%) had 152 pts. 61% were female, median age at pts' first-ever LBBB report was 61 years and 87% presented at least 1 CVRF. Median FU time was 8 years. During FU, 35 pts developed left ventricular dysfunction (2/3 mild dysfunction; 1/3 moderate or severe dysfunction). Causes for dysfunction (Figure) were identified in 13 pts, while the remaining 23 were possible LBBB-induced. All latter pts were submitted to additional testing (non-invasive ischemia testing in 78%; coronariography in 70%; cardiac magnetic resonance in 35%) to exclude other causes of LBBB. Overall median time-to-dysfunction was 8 years after first-ever LBBB report. Regarding clinical presentation of all idiopathic LBBB pts with LVEF > 50%, 60% were asymptomatic, while 17%, 14% and 7% presented with chest pain, heart failure symptoms and syncope/pre-syncope, respectively. 25 pts needed cardiac implantable electronic devices (CEID), namely 15 pacemakers, 1 implantable cardioverter defibrillator and 7 cardiac resynchronization therapy devices. Focusing pts outcomes, 18% presented at least 1 cardiovascular (CV) event needing hospitalization: 9% due to advanced conduction disturbances/complete heart block, 4% ischemic cerebrovascular event, 1% acute myocardial infarction, and 4% heart failure hospitalization. Only one patient died during FU due to CV cause. Baseline characteristics (age, sex, CVRF) were comparable between patients with and without LVEF drop, as well as between patients with known causes for LVEF drop *versus* possible LBBB-induced. No differences in time-to-dysfunction were found between the latter (Log-rank = 0.713).

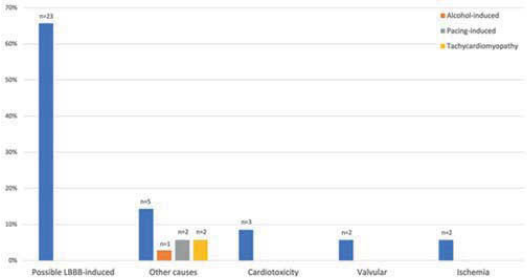

Figure 1 – Causes of left ventricular dysfunction during follow-up of idiopathic isolated left bundle branch block (LBBB) patients with initially preserved ventricular function.

Conclusions: Our data show that about one-quarter of pts with idiopathic LBBB and preserved LVEF later develop ventricular dysfunction and an important proportion are possible LBBB-induced. Additionally, 18% presented at least one CV event needing hospitalization, and 16% needed a CEID. Our study sheds some light on a largely unknown topic, bringing to discussion whether isolated idiopathic LBBB is, as it has been increasingly suggested, a not-so benign finding that may require follow-up.

Sábado, 15 Abril de 2023 | 10:30-11:30

Sala Vega | Comunicações Orais - Sessão 14 - Transplante cardíaco

CO 66. SPECKLE-TRACKING ECHOCARDIOGRAPHY FOR PREDICTION OF ADVERSE HEMODYNAMIC PARAMETERS IN HEART TRANSPLANT PATIENTS

Francisco Barbas de Albuquerque, Ana Raquel Carvalho Santos, António Valentim Gonçalves, Rita Ilhão Moreira, Tiago Pereira da Silva, Valdemar Gomes, Lídia de Sousa, Rui Cruz Ferreira

Centro Hospitalar Universitário de Lisboa Central, EPE/Hospital de Santa Marta.

Introduction: Invasive right heart (RH) catheterization for hemodynamic assessment is widely used in heart transplant (HT) patients. Speckle-

Table 1.	Predictors of unfavorable hemodynamic by speckle-traking echocardiography														
Parameter	GLS			GWI			GCW			GWW			GWE		
	AUC	p value	CI 95%	AUC	p value	CI 95%	AUC	p value	CI 95%	AUC	p value	CI 95%	AUC	p value	CI 95%
PCWP > 15	.54	.60	.38 - .70	.51	.92	.35 - .67	.48	.82	.47 - .76	.77	.001	.64 - .91	.61	.15	.47 - .76
CVP > 8	.60	.21	.44 - .75	.44	.42	.44 - .71	.43	.35	.27 - .58	.75	.001	.11 - .39	.57	.34	.44 - .71
CI < 2.5	.67	.07	.48 - .87	.68	.06	.52 - .83	.71	.027	.56 - .61	.73	.016	.57 - .89	.41	.36	.21 - .71
PAPi < 2	.60	.16	.46 - .74	.62	.11	.47 - .77	.61	.17	.46 - .75	.62	.12	.47 - .77	.52	.77	.37 - .67
CPO < 0.6	.51	.97	.20 - .83	.60	.63	.20 - .99	.70	.34	.39 - .90	.53	.89	.0 - 1	.56	.79	.0 - .90
mPAP > 20	.44	.91	.38 - .61	.57	.27	.45 - .69	.54	.49	.42 - .67	.64	.02	.23 - .48	.56	.31	.44 - .67

CO 66 Figure

tracking echocardiography through global longitudinal strain (GLS) and myocardial work (MW) have emerged for myocardial functional assessment in many cardiac conditions. In HT patients, it is unclear whether GLS and MW can predict unfavorable hemodynamic parameters.

Objectives: To assess whether GLS and MW can predict unfavorable hemodynamic parameters in HT patients.

Methods: Retrospective analysis of consecutive patients submitted to RH catheterization between February 2016 and November 2022. Transthoracic echocardiography (TTE) performed at the same day was used to calculate GLS and MW values, namely global work index (GWI), global constructive work (GCW), global wasted work (GWW) and global work efficiency (GWE). Area under curve (AUC) of Receiving Operator Curves (SPSS®) was performed to assess GLS and MW values for adverse hemodynamic parameters prediction. Statistical differences with a p-value < 0.05 were considered significant.

Results: From a total of 189 RH catheterization, 114 entered the primary analysis. Mean age was 49 years, 78% were male, mean left ventricular ejection fraction was 59 ± 10%. Mean GLS (%) value was -13 ± 3, mean GWI (mmHg%) was 1161 ± 396, mean GCW (mmHg%) was 1531 ± 449, mean GWW (mmHg%) was 160 ± 112 and mean GWE (%) was 89 ± 8.5. AUC results of GLS, GWI, GCW, GWW and GWE values for RH hemodynamic parameters prediction are depicted in Table 1. GWW was significantly increased in patients with central venous pressure (CVP) > 8 mmHg (p = 0.001), cardiac index (CI) < 2.5 L/min/m^2, and mean pulmonary artery pressure (mPAP) > 20 mmHg (p = 0.021). Both GWW and GCW were increased when pulmonary capillary wedge pressure (PCWP) was > 15 mmHg (p = 0.001 and p = 0.027, respectively). GLS, GWE and GWI were not significantly associated with any adverse hemodynamic parameter. GWW > 124 mmHg% had sensitivity (S) of 80% and specificity (Sp) of 61% to predict CI < 2.5 L/min/m^2, a S of 81% and a Sp of 60% for PCWP > 15 mmHg and a S of 75% and Sp of 55% for CVP > 8 mmHg. GCW > 1,451 mmHg% had a S of 80% and Sp of 61% to predict CI < 2-5 L/min/m^2.

Conclusions: In our HT patient's population, GLS was slightly impaired (-13%) suggesting some subclinical myocardial dysfunction associated. Also, this study demonstrated that GWW could predict adverse hemodynamic parameters in HT patients. Hence, myocardial work might be a useful tool to routinely use in HT patients' clinical approach.

CO 67. GLOBAL LONGITUDINAL STRAIN AND MYOCARDIAL WORK AS A NOVEL TOOL FOR ACUTE CELLULAR REJECTION PREDICTION IN HEART TRANSPLANT PATIENTS

Francisco Barbas de Albuquerque, Ana Raquel Carvalho Santos, António Valentim Gonçalves, Rita Ilhão Moreira, Tiago Pereira da Silva, Valdemar Gomes, Lídia de Sousa, Rui Cruz Ferreira

Centro Hospitalar Universitário de Lisboa Central, EPE/Hospital de Santa Marta.

Introduction: In heart transplanted (HT) patients, endomyocardial biopsy (EMB) remains the gold-standard for acute cellular rejection (ACR) detection. Non-invasive measurements to detect ACR are scarce. Global longitudinal strain (GLS) and myocardial work (MW) have emerged as a novel tool for myocardial function assessment. Whether GLS and MW parameters can confidently predict ACR in HT patients is not stablished.

Objectives: To determine whether GLS and MW parameters by speckle tracking echocardiography can predict ACR in HT patients.

Methods: Retrospective analysis of consecutive patients submitted to EMB between February 2016 and November 2022, who performed transthoracic echocardiography (TTE) at the same day. Significant ACR was defined as ≥ 2R on EMB, according to the ISHLT 2004 grading. The left ventricular (LV) GLS of each corresponding EMB were calculated by speckle tracking technique. Non-invasive blood pressure was measured and registered during TTE performance. MW parameters, namely global work index (GWI), global constructive work (GCW), global wasted work (GWW) and global work efficiency (GWE) were automatically generated by the software.GLS, GWI, GCW, GWW and GWE values were assessed by area under curve (AUC) of Receiving Operator Curves (SPSS®) for the prediction of ACR. Statistical differences with a p-value < 0.05 were considered significant.

Results: From a total of 189 EMB during the study period, 113 entered the primary analysis. Significant ACR was observed in 5 (4.4%) patients. Mean age was 49 years, 78% were male, mean left ventricular ejection fraction was 59 ± 10% and mean systolic blood pressure was 129 ± 18 mmHg. Mean GLS (%) was -13 ± 3, mean GWI (mmHg%) was 461 ± 397, mean GCW (mmHg%) was 1532 ± 450, mean GWW (mmHg%) was 160 ± 112 and mean GWE (%) 89 ± 9. AUC results of GLS and MW parameters are depicted in Table. GLS (p = 0.003), GCW (p = 0.003) and GWI (p = 0.003) were significantly associated with ACR, while GWW and GWE were not. ACR did not occur for GLS values < -11.4% as its sensitivity (S) was 100% and specificity (Sp) was 75%. GCW > 1069 mmHg% had a S of 80% and a Sp of 90%, and GWI > 721 mmHg% had a S of 80% and Sp of 88%.

Table.1	Acute cellular rejection prediction		
	AUC	p value	95% CI
GLS (%)	.888	.003	.809 - .966
GWI (mmHg%)	.889	.003	.827 - .951
GCW (mmHg%)	.896	.003	.826 - .966
GWW (mmHg%)	.601	.447	.102 - .696
GWE (%)	.610	.406	.405 - .815

Conclusions: Non-invasive ACR detection remains a clinical challenge. This study demonstrates that LV function assessment by speckle tracking echocardiography techniques, namely GLS and MW might be very useful in HT patients' clinical approach. In our population, GLS ruled out ACR for values below -11.4%. Furthermore, GWI and GCW were significantly associated with ACR, which might suggest subclinical LV involvement in the rejection process. These techniques shall be done routinely in HT patients. More studies addressing this issue are needed to draw more robust conclusions.

CO 68. KEEPING TRACK OF CARDIAC ALLOGRAFT VASCULOPATHY IN THE 21ST CENTURY - A SINGLE-CENTER EXPERIENCE

Mariana Sousa Paiva, Sérgio Maltês, Christopher Strong, Daniel A. Gomes, Rita Reis Santos, Rita Bello, Bruno Rocha, Catarina Brízido, António Tralhão, Carlos Aguiar, Miguel Mendes

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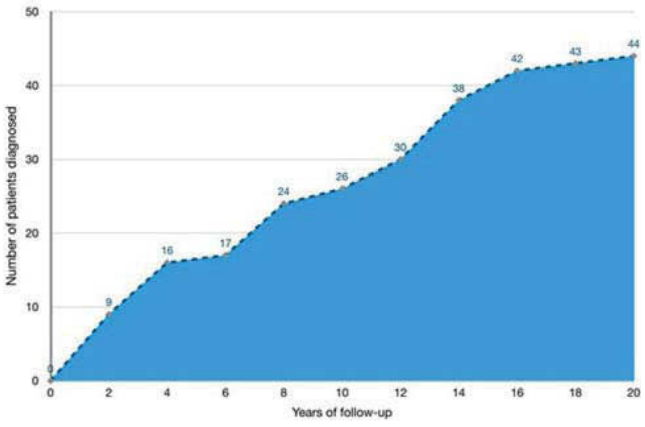
Introduction: Cardiac allograft vasculopathy (CAV) remains one of the major determinants of long-term morbidity and mortality associated with orthotopic heart transplantation (OHT). The aim of our study is to describe the incidence of CAV in a cohort of OHT recipients and to identify CAV predictors.
Methods: Single-center retrospective cohort including consecutive OHT patients who underwent CAV screening either by invasive coronary angiography (ICA) or coronary CT angiography (CCTA) from 2000-2021. CAV was classified according to International Society for Heart and Lung Transplantation (ISHLT) nomenclature. Cox regression analysis was performed to explore the association between clinical variables and CAV development.
Results: Overall, 88 patients (mean age 46 ± 14 years at the time of OHT, 72% men, 24 patients (27%) with previous ischemic cardiomyopathy) were included. The mean donor age was 32 ± 12 years and the mean cold ischemia time was 156 ± 46 min. The baseline immunosuppressive scheme included prednisolone in all patients, mofetil mycophenolate in 81 (92%), tacrolimus in 44 (50%), cyclosporin in 41 (47%) and mTOR inhibitors (mTORi) in 8 (9%). After OHT, 67 (76%) developed hypertension and 36 (41%) diabetes. Most (89%) were under statin therapy. During the first year, 19 (22%) patients experienced acute ≥ 2R cellular or humoral rejection. Furthermore, 12 patients (14%) developed donor-specific antibodies during follow-up. A total of 8 patients had documented CMV infection after OHT. During a median follow-up of 11 years (IQR 5-17), 44 (50%) patients developed ISHLT defined CAV (Figure): CAV1 in 31 (35%) patients, CAV2 in 5 (6%) and CAV3 in 8 (9%). All CAV patients were started on aspirin therapy; 14 initiated mTORi; 5 underwent coronary angioplasty; and 1 patient underwent re-transplantation. The only CAV predictor in our cohort was donor age (HR 1.05, 95%CI 1.01-1.083, p = 0.012). Over 20 years, there were 20 deaths (23%), of whom 5 (6%) were directly related with CAV.

Figure 1. Cumulative incidence of CAV over 20 years of follow-up



Conclusions: Over a median follow-up of 11 years, half of our OHT cohort developed at least mild CAV, culminating in one re-transplant and five CAV-related deaths. Donor age was a predictor of CAV. These findings highlight the importance of preventive measures and systematic CAV screening in OHT recipients.

CO 69. ANTIBODY-MEDIATED REJECTION - A MAJOR COMPLICATION AFTER HEART TRANSPLANTATION

Sandra Amorim[1], Pedro Rodrigues Pereira[1], Roberto Pinto[1], Paulo Araújo[1], José Pinheiro Torres[1], Marta Andrade[1], Sandra Tafulo[2], José Silva Cardoso[1], Filipe Macedo[1], Paulo Pinho[1]

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Introduction: Acute cellular rejection is the mechanism of most immune-related injury in cardiac transplant recipients. However, antibody-mediated rejection (AMR) is gaining increasing recognition as a major complication after heart transplantation (HT) associated with increased mortality and cardiac allograft vasculopathy (CAV). AMR results from activation of the humoral immune arm and the production of donor-specific antibodies (DSA) that bind to the cardiac allograft causing myocardial injury predominantly through complement activation. We sought to investigate the prevalence and predictors of AMR and its association with graft dysfunction, mortality, and CAV.
Methods: Prospective cohort study, from 2016 to 2021, with 71 adult heart transplant recipients (excluded pts with hospital mortality, not due to rejection) with endomyocardial biopsies searching for AMR according to ISHLT grading: histologic findings and immunofluorescence for C4d.
Results: AMR was present in 20 pts (28.2%). 7 had early AMR (< 1 y of HT) and 13 had late AMR (median 77 months post-HT). 18 pts had AMR1, 1 had AMR2 and in 1 pt diagnosis of AMR was made by severe allograft dysfunction combined with DSA and high titters of C1q-binding antibodies. DSA were detected in 66% and 7 pts (35%) had concurrent acute cellular rejection. Graft dysfunction occurred in 9 pts (45%, all late AMR). 5 pts received intravenous methylprednisolone, 3 received IVIg, 3 received plasmapheresis, 2 received rituximab, 7 received high dose of oral prednisolone and 5 pts received optimization of immunosuppressive therapy. Prognosis of pts with graft disfunction was poor (20% death/retransplant): cardiac death in 2 pts, infection in 1 pt and retransplant in 1 pt. Pts with AMR were more likely to have anti-HLA antibodies before HT (90.9% *vs.* 53.9%, p = 0.03), graft dysfunction (40.0% *vs.* 3.9%), acute cellular rejection episodes (≥ 2R ISHLT) (90.0% *vs.* 54%, p < 0.01), acute cellular rejection < 1 year post-HT (80.0% *vs.* 36.0%, p < 0.01) than those without AMR. No association was found between CAV, age, female gender, ECMO use and presence of AMR. Overall survival at 5 and 10 years was not different in pts with or without AMR. At 12 y there was a decrease in survival (57% *vs.* 79%) in pts with AMR.
Conclusions: Late AMR is frequently associated with graft dysfunction and an increased risk of mortality. Early diagnosis and treatment of AMR, particularly in those with pre-HT alossensibilization or with episodes of cellular rejection, may therefore be important to reduce the consequences of chronic inflammation leading to development of myocardial fibrosis and graft dysfunction.

CO 70. THE IMPACT ON THERAPEUTIC APPROACH AFTER CORONARY COMPUTED TOMOGRAPHY IN A HEART TRANSPLANT PATIENT POPULATION

Ana Amador, João Calvão, Catarina Martins da Costa, André Cabrita, Catarina Marques, Ana Pinho, Luís Santos, Cátia Oliveira, Mariana Vasconcelos, Sandra Amorim, Filipe Macedo

Centro Hospitalar Universitário de S. João, EPE.

Introduction: Although coronary angiography (CA) remains the gold standard for coronary allograft vasculopathy (CAV) screening, coronary computed tomography (CCT) has been used as non-invasive alternative. There is sparse data regarding how the CCT findings impact subsequent medical approach.
Methods: From January 2021 to April 2022, we prospectively included heart transplant (HT) recipients who performed CCT for CAV detection at a university hospital centre. Clinical, CCT and CA data were collected.
Results: We included 38 patients (pts), 23 (60.5%) men with mean age of 58 ± 14 years. The main cause of transplantation was familial dilated

cardiomyopathy (42.1%), followed by ischemic cardiopathy (31.6%). Median graft duration was 10 years (IQR 9) and 65.8% had previous rejection. At CCT time, 97.4% of pts had LEVF ≥ 60%, 89.5% pts had ≥ 1 cardiovascular risk factor (CVRF), 18.4% had peripheral arterial or cerebrovascular disease (PA/CVD), 94.7% pts took anti-thrombotics (86.8% anti-platelets and 7.9% anticoagulants) and all took anti-lipids (71.0% statins, 5.3% ezetimib, 26.7% both). Median calcium score was 17 (IQR 231) and 32 pts completed CCT: 7, 24 and 1 patients had ISHLT-CAV classification of 0, 1 and 2, respectively. Most patients (37.5%) had both calcified and hypodense plaques and median number of affected segments was 2 (IQR 3). The remained 6 pts had extensive coronary calcification and a CA was performed: 3, 1 and 2 had ISHLT-CAV classification of 1, 2 and 3, respectively. Four (10.5%) pts needed additional ischemia testing: the one with CAV3 and both the pts with CAV2; also one pt with CAV1 but suboptimal quality of CCT images. CCT also detected cardiac thrombus and pulmonary nodules in 2 and 4 pts, respectively. Findings in CCT lead to therapeutic changes in 10 (26.3%) pts - all had changes in anti-lipids. One pt also changed anti-thrombotics and anti-hypertensive (aspirin to warfine due to cardiac thrombus and titulation of amlodipine) and other pt with CAV1 with hypondense plaques and 21 years of graft switched immunosuppressant to everolimus. Therapeutic changes were associated with diabetes after HT (p = 0.043), but there were no significant associations with other CVRF, sex, age, previous PA/CVD, ischemic etiology, graft duration, plaque characteristics, calcium score, CAV classification nor previous rejection. However, our small sample size may not have the power to expose such associations. During the mean follow up of 12.2 ± 4.2 months, there were no deaths, PCI, ACS, ventricular arrythimias or stroke. 3 pts had de novo rejection (1 humoral, 1 cellular and 1 both) - the last one, evolved from CAV1 to CAV3 and was submitted to a new heart transplant.
Conclusions: Therapeutic changes (mainly anti-lipids) occurred in about 25% of pts after CCT, and were only associated with diabetes after HT. More studies are needed to access how CCT may guide therapy according to plaque burden.

Sábado, 15 Abril de 2023 | 11:30-12:30

Sala Vega | Comunicações Orais - Sessão 15 - Fibrilhação auricular e *flutter* atípico

CO 71. ATYPICAL FLUTTER: EFFECTIVENESS OF A SYSTEMATIC STRATEGY BASED ON COMPREHENSIVE HIGH-DENSITY MAP ANALYSIS

Joana Brito, Beatriz Valente Silva, Pedro Alves da Silva, Beatriz Garcia, Catarina Oliveira, Patrícia Teixeira, Afonso Nunes Ferreira, Gustavo Lima da Silva, Luís Carpinteiro, Nuno Cortez-Dias, Fausto J. Pinto, João de Sousa

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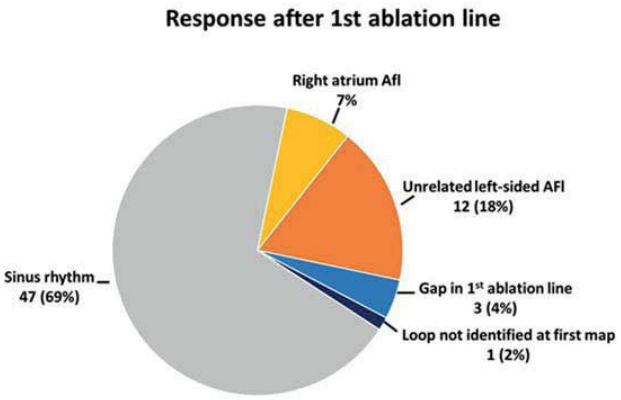
Introduction: High-density mapping tools expanded the mechanism characterization of atypical flutters (AFl), but a systematic analysis of substrate and activation maps is critical for proper interpretation and targeted ablation strategy.
Objectives: Between 2016 and 2017, we developed a comprehensive stepwise workflow for AFl map interpretation in 25 patients (pts). This study evaluates its effectiveness in a validation cohort.
Methods: Prospective single-center study of pts with left-sided AFl referred for ablation from 2018 to 2022. Pts with prior AFl ablation procedures were excluded. Complete high-density map collection was performed using Carto, Ensite or Rhythmia, while displaying only voltage data. The comprehensive workflow was applied for activation map interpretation, starting by facing the mitral annulus and following the sequence of colors to systematically identify all potential circuits, their common-isthmuses and slow-conduction sites. Additional algorithms (Coherent, Ripple, SparkleMap or LumiPoint) were used subsequently, at operator description, for interpretation validation purposes. A mechanism-tailored ablation strategy was applied targeting AFl common-isthmuses. If AFl persisted after completion of 1st ablation set, remap was performed and the mechanism was characterized. Acute success was defined as conversion to sinus rhythm with the completion of the final ablation set. Entrainment maneuvers were only used to confirm the circuit interpretation if AFl persisted after completion of the planned ablation set.
Results: A total of 68 pts were included in the AFl validation cohort (male 61.8%; 67 ± 13 years old). Substrate maps revealed low-voltage areas (< 0.3 mV) out of the PV in 88%. AFl mechanism was macro-reentrant in 90%, most often with dual-loop circuits (51%, N = 35) and including a perimitral rotation (53%, N = 36 pts). The 1st set of mechanism-tailored ablation restored sinus rhythm in 47 pts (69%). The residual AFl (N = 21) was found to be: (1) same AFl using an ablation line gap in 3 pts; (2) same AFl using a loop previously not recognized in 1 pt; (3) a completely different AFl using a distinctive circuit (N = 12); or (4) a right-sided peri-tricuspid flutter in 5 pts. Completion of the ablation set resulted in sinus rhythm restoration in 19 of these 21 pts, resulting in an overall acute success rate of 97% (66/68). In the remaining 2 pts, response to entrainment maneuvers was compatible with conduction persistence through the ablation line, being unsuccess explained by ablation failure.



Conclusions: This comprehensive stepwise workflow for AFl high-density map allows a mechanism-tailored ablation strategy resulting in a very high acute success rate. Our study enforces that if AFl persists after the 1st ablation set and a remap is pursued, additional targeted ablation results in a final procedural success.

CO 72. PROCEDURAL RELATED *VERSUS* IDIOPATHIC ATYPICAL ATRIAL FLUTTER

M. Inês Barradas[1], Paulo Fonseca[2], João Almeida[2], Marco Oliveira[2], Helena Gonçalves[2], João Primo[2], Anabela Tavares[1], Ricardo Fontes-Carvalho[2]

[1]Hospital do Divino Espírito Santo, Ponta Delgada. [2]Centro Hospitalar de Vila Nova de Gaia/Espinho, EPE.

Introduction: Atypical atrial flutter (AFLA) is a macro-reentrant atrial tachycardia not using the cavotricuspid isthmus (CTI). It is often associated with cardiac surgery or previous ablation, mainly pulmonary vein isolation (PVI) and AFLA not related to ablation or previous cardiac surgery is rare.
Methods: We performed a retrospective single-center review of all patients treated for AFLA ablation in our center from October 2008 to July 2022. Our study aimed to review and compare the incidence, clinical and electrophysiologic characteristics and acute and long-term results of AFLA

ablation, according to previous atrial procedure. Three groups were defined: group 1 (G1) - idiopathic AFLA not related to previous ablation or cardiac surgery (n = 18), group 2 (G2) - previous ablation (n = 32) and group 3 (G3) - previous cardiac surgery (n = 14). All patients underwent radiofrequency ablation with 3D mapping system.

Results: From 64 patients (61.0 ± 11.28 years, 60.9% male, follow-up (FUP) 58.5 ± 47.79 months) 32 (50.0%) had previous catheter ablation (35.9% PVI, 21.9% CTI, 3.1% accessory pathway), 14 (21.9%) previous cardiac surgery and 18 (28.1%) corresponded to AFLA not related to ablation or previous cardiac surgery. There were no significant differences in baseline demographic and clinical characteristics between the groups except for the higher prevalence of atrial fibrillation (AF) in G2 ($p < 0.01$) and valvular and congenital heart disease in G3 ($p < 0.01$). Echocardiographic data was similar between groups (left ventricular ejection fraction 55.1 ± 10.44%, moderate to severe left atrial (LA) dilatation in 25 (39.0%)). Low-voltage areas (LVA) were identified in 38 (59.4%) patients and were more prevalent in G1 (G1 77.8%, G2 46.9% and G3 71.4%, $p = 0.021$). There was no difference in the number of induced AFLA (1.3 ± 0.74 AFLA per patient, in 7 (10.9%) no arrhythmia was induced), anatomical location (LA 70.3% and right atrium 29.7%) or ablation strategy (table 1). Concomitant PVI or re-PVI was more prevalent in G2 (G1 11.1%, 0.0%; G2 0.0%, 46.9%; G3 7.1%, 0.0%; $p < 0.01$) and ablation of ectopic pulmonary triggers in G1 (G1 44.4%, G2 6.3%, G3 21.4%, $p < 0.01$). Acute ablation success was achieved in 87.5% and was similar in all patients. Atrial arrhythmia (AA) recurrence (AF, atrial tachycardia or flutter) occurred in 32.8% at 1 year, 35.9% at 2 years and 40.6% at FUP (14.1 ± 41.41 months after ablation) and was similar between groups, as well as visits to the emergency department due to AA, cardiovascular hospitalizations, ischemic stroke and death by all causes.

Conclusions: In our cohort of patients, patients with idiopathic AFLA had more frequently LVA suggestive of scaring or fibrosis, suggesting atrial cardiomyopathy. Although the additional ablation strategy differ between the groups, ablation success was achieved in the majority of patients and acute and long-term outcomes did not differ between the groups.

Table 1: Electrophysiologic characteristics of AFLA:

Procedural data	AFLA (n=64)	Group 1: Idiopathic AFLA (n=18)	Group 2: Previous ablation (n=32)	Group 3: Previous cardiac surgery (n=14)	p
General procedure parameters:					
Fluoroscopy time, mean ± SD (minutes)	15.3 ± 14.70	8.70 ± 4.95	18.21 ± 15.69	16.0 ± 13.39	ns
Procedure time, mean ± SD (minutes)	145.8 ± 44.15	142.0 ± 34.27	152.6 ± 49.66	135.0 ± 40.6	ns
Intraprocedural cardioversion, n (%)	14 (21.8)	2 (11.1)	8 (25.0)	4 (28.6)	ns
Complications, n (%)	7 (10.9)	0 (0.0)	5 (15.6)	2 (14.3)	ns
Hospitalization duration, mean ± SD (days)	1.0 ± 1.61	1.22 ± 0.65	1.8 ± 1.90	1.5 ± 1.73	ns
Number of AFLA induced:					
• 0, n (%)	7 (10.9)	2 (11.1)	4 (12.5)	1 (7.1)	ns
• 1, n (%)	37 (57.8)	12 (66.7)	15 (46.9)	10 (7.1)	
• 2, n (%)	16 (25.0)	3 (16.7)	10 (31.3)	3 (21.4)	
• ≥ 3, n (%)	4 (6.3)	1 (5.6)	3 (9.4)	0 (0.0)	
Substrate pattern:					
Low-voltage areas, n (%)	38 (59.4)	14 (77.8)	15 (46.9)	10 (71.4)	0.021
• Right atrium, n (%)	9 (14.1)	3 (16.7)	3 (9.4)	3 (21.4)	
• Left atrium , n (%)	29 (45.3)	11 (61.1)	12 (37.5)	6 (42.9)	
Large low-voltage areas, n (%)	19 (29.7)	9 (50.0)	8 (25.0)	6 (26.1)	ns
Anatomical location:					
Left atrium, n (%)	45 (70.3)	14 (77.8)	24 (75.0)	7 (50.0)	ns
• Peri-pulmonary, n (%)	23 (35.9)	6 (33.3)	14 (43.8)	3 (21.4)	
• Peri-mitral, n (%)	8 (12.5)	3 (18.8)	4 (12.5)	1 (7.1)	
• Roof-dependent, n (%)	1 (1.6)	4 (22.2)	1 (3.1)	0 (0.0)	
• Low voltage anterior, n (%)	9 (14.1)	1 (5.6)	2 (6.2)	3 (21.4)	
• Low voltage posterior, n (%)	4 (6.3)	14 (77.8)	3 (9.4)	1 (7.1)	
Right atrium, n (%)	19 (29.7)	4 (22.2)	8 (25.0)	7 (50.0)	
• Scar/ incisional, n (%)	12 (18.8)	2 (11.1)	5 (15.6)	5 (23.7)	
• Upper loop reentry, n (%)	2 (3.1)	1 (5.6)	0 (0.0)	1 (7.1)	
• Lower loop reentry, n (%)	2 (3.1)	0 (0.0)	2 (6.3)	0 (0.0)	
• Free-wall, n (%)	2 (3.1)	4 (22.2)	1 (3.1)	0 (0.0)	
• Superior vena cava, n (%)	1 (1.6)	0 (0.0)	0 (0.0)	1 (7.1)	
Additional ablation:					
Ectopic pulmonary triggers, n (%)	13 (20.3)	8 (44.4)	2 (6.3)	3 (21.4)	< 0.01
PVI, n (%)	3 (4.7)	2 (11.1)	0 (0.0)	1 (7.1)	< 0.01
Re-PVI, n (%)	15 (23.4)	0 (0.0)	15 (46.9)	0 (0.0)	< 0.01
CTI ablation, n (%)	17 (26.6)	2 (11.1)	8 (25.0)	7 (50.0)	0.045
Acute ablation outcomes:					
Immediate termination, n (%)	29 (45.3)	13 (72.2)	12 (37.5)	4 (6.3)	ns
Another AFLA terminated with additional ablation, n (%)	12 (18.8)	3 (16.7)	6 (18.8)	3 (21.4)	
Another AFLA not sustained, n (%)	2 (3.1)	0 (0.0)	2 (6.3)	1 (7.1)	
Another AFLA not terminated with additional ablation, n (%)	3 (4.7)	0 (0.0)	2 (6.3)	1 (7.1)	
Degenerated in AF, n (%)	1 (1.6)	1 (5.6)	0 (0.0)	0 (0.0)	
Not terminated, ECV, n (%)	5 (7.8)	0 (0.0)	3 (9.4)	2 (14.3)	
Not induced, n (%)	7 (10.9)	1 (5.6)	5 (15.6)	1 (7.1)	
Induced but not sustained, n (%)	5 (7.8)	0 (0.0)	3 (9.4)	2 (14.3)	
Acute success, n (%)	56 (87.5)	17 (94.4)	27 (84.4)	11 (78.6)	ns

AFLA: atypical atrial flutter; SD: standard deviation; PVI: pulmonary vein isolation; CTI: cavotricuspid isthmus; AF: atrial fibrillation; ECV: electrical cardioversion.

CO 72 Figure

CO 73. SEX DIFFERENCES IN TIME TO ATRIAL FIBRILLATION RECURRENCE AFTER CATHETER ABLATION

Ana Inês Aguiar Neves[1], Augusto Sá Carvalho[2], Sílvia O. Diaz[2], Mariana Ribeiro Silva[1], Gualter Santos Silva[1], João Almeida[1], Paulo Fonseca[1], Marco Oliveira[1], Helena Gonçalves[1], Francisca Saraiva[1], António S. Barros[1], Francisco Sampaio[1], João Primo[1], Ricardo Fontes-Carvalho[1]

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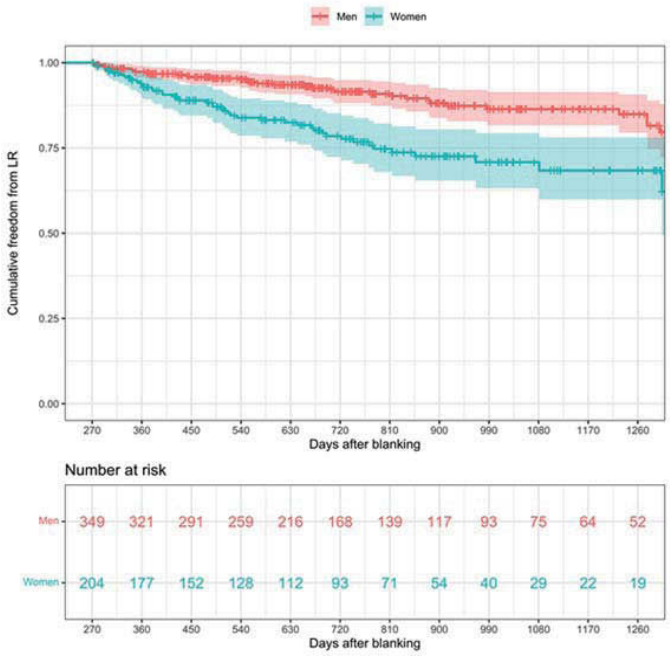
Introduction: The rate of recurrence of atrial fibrillation (AF) after catheter ablation tends to be higher in women than in men, and as such sex may be an independent risk factor for AF recurrence after pulmonary vein isolation. However, the impact of sex on time to AF recurrence after catheter ablation is still uncertain.

Methods: Single-centre retrospective study including all patients who underwent a first procedure of AF catheter ablation (radiofrequency or cryoablation) between 2017 and 2021. Late recurrence (LR) was defined as any AF recurrence after a 90-day blanking period post-catheter ablation. The effect of sex on the cumulative freedom from LR was estimated using the Kaplan-Meier method and compared using the log-rank test and Cox proportional hazards model, adjusted for clinically relevant characteristics (age, body mass index (BMI), persistent AF, hypertension, thyroid disfunction and dilated left atrium.

Results: A total of 656 patients were included in the analysis, 32% of whom were women. Median follow-up after catheter ablation was 27 months (minimum 6, maximum 68 months). Compared to men, women who underwent catheter ablation were older (median age 62 *vs.* 56 years), had higher BMI (median 27.9 *vs.* 27.1 kg/m^2), and had higher prevalence of hypertension (54% *vs.* 45%), thyroid disfunction (28% *vs.* 10%) and valvular disease (15% *vs.* 8.4%). After covariate adjustment, women had a higher



CO 73 Figure

risk of LR (hazard ratio [HR] 1.67, 95% confidence interval [CI] 1.18-2.36; p = 0.04). However, Kaplan-Meier curves showed that this effect was not constant over time and that HR diverged after 1-year follow-up. A reanalysis after a time split at 1-year follow-up showed that women had a higher risk of LR after 1-year from catheter ablation (HR 2.53; 95%CI 1.56-4.12; p < 0.001), but not within the first year after the procedure (HR 1.43; 95%CI 0.97-2.11; p = 0.072). Persistent AF was also an independent predictor of LR (HR 2.00; 95%CI 1.42-2.83; p < 0.001).

Conclusions: Recurrence of AF following catheter ablation is more frequent in women after one year. Sex did not impact AF recurrence within the first year after catheter ablation. Further studies are needed to unveil the association between the physiological and biological processes leading to the link between late AF recurrence and sex.

CO 74. ECG-PATCH ASSESSMENT OF ATRIAL FIBRILLATION DURING THE VERY-EARLY BLANKING PREDICTS LATE BLANKING PERIOD RECURRENCE: PRELIMINARY DATA FROM A PROSPECTIVE REGISTRY

Miguel Marques Antunes, Pedro Silva Cunha, Bárbara Lacerda Teixeira, Sara Alves, Guilherme Portugal, Bruno Valente, A. S. Delgado, M. Brás, Madalena Coutinho Cruz, M. Paulo, Ana Lousinha, C. Guerra, Rui Cruz Ferreira, Mário Martins Oliveira

Centro Hospitalar Universitário de Lisboa Central, EPE/Hospital de Santa Marta.

Introduction: Ablation of atrial fibrillation (AF) is a procedure that causes significant atrial tissue lesions, with transient, albeit significant tissue oedema and inflammation. These mechanisms may trigger early rhythm abnormalities that do not necessarily correlate with future arrhythmias, and, therefore, evaluation of AF recurrence is currently validated by routine ECG and ambulatory 24h Holter monitoring, only after a 3-month blanking period. However, recent data have shown that AF episodes occurring during the blanking period are common and may predict late AF recurrences. The E-Patch (Bio Tel Heart) is an innovative, thin single-use adhesive electrode with extended continuous ECG monitoring for up to 120h.
Objectives: To assess if continuous extended monitoring in the very-early blanking period can be associated with event recorder data performed in the late blanking period after AF ablation.
Methods: Single-centre, prospective, longitudinal study, including consecutive patients (P) 24h after AF ablation, monitored with the E-patch. The effectiveness of the device in continuously recording within 5 days after ablation was analyzed, as well as the occurrence of AF episodes during an external 7- day loop-recorder, obtained in the 2nd-month post-ablation.
Results: A total of 30P were included (57% male, 63 ± 8 years). AF ablation was performed with radiofrequency (RF) energy in 14P and with a balloon of cryoenergy in 16P. All P were in sinus rhythm at the beginning of the recording. The mean number of hours of recording was 113 ± 16, with no discomfort complaints in the use of the device or interpretation artefacts. During the E-patch monitoring, a total of 10P (33%) presented AF (AF burden 6.8% of the recording, IQR 3.0-20%). All 30P underwent an external loop recorder for 7 days 2 months post-ablation, with 40% showing AF periods (> 30 seconds duration). All 10P that had AF detection in the very-early E-patch recording had also recurrence in the 2 nd month of extended 7-day continuous recording. Very- early AF detection had a sensitivity of 83.3% and a specificity of 100% to detect late blanking period AF (ROC 0.916 ± 0.06; 95%CI 080-1.0).
Conclusions: The use of the E-patch very-early after AF ablation is effective for AF detection and is highly predictive of AF recurrence in the late blanking period. These findings require validation in larger studies to assess the potential of very-early assessment in the determination of a higher risk for AF recurrence.

CO 75. DIAGNOSTIC YELD AND CLINICAL IMPLICATIONS OF IMPLANTABLE LOOP RECORDER FOR ARRYTHMIA INVESTIGATION: A SINGLE CENTER EXPERIENCE

Pinheiro Candjondjo, Leonor Parreira, Dinis Mesquita, Ana Fátima Esteves, Joana Silva Ferreira, Jéni Quintal, Rui Antunes Coelho, Pedro Amador, Rita Marinheiro, José Farinha, Artur Lopes, Rui Caria

Centro Hospitalar de Setúbal, EPE/Hospital de São Bernardo.

Objectives: Implantable loop recorders (ILR) are indicated in a variety of clinical situations for continuous cardiac monitoring and have become an important diagnostic tool in detecting infrequent cardiac arrhythmias. We intended to analyze ILR indications, effectiveness and diagnostic yield in a single center experience.

Table 2 - Events detected by the ILR according to the indication for implantation.

Recorded events	Indications						P value
	Overall	Syncope	Palpitations	Suspected paroxysmal AF	Stroke	Brugada syndrome	
		n (%)	n (%)	n (%)	n (%)	n (%)	
	N=142	91 (64.1)	32 (22.5)	8 (5.6)	5 (3.5)	4 (4.2)	
Atrial fibrillatio n (%)	35(24.6)	17 (18.7)	12 (37.5)	5 (62.5)	1 (16.7)	0 (0)	0.013
Pauses n (%)	28(19.7)	23 (25.3)	3 (9.4)	0 (0)	2 (33.3)	0 (0)	0.098
PSVT n (%)	6 (4.2)	4 (4.4)	2 (6.3)	0 (0)	0 (0)	0 (0)	0.88
VT n (%)	4 (2.8)	2 (2.2)	1(3.1)	0 (0)	0 (0)	1 (20)	0.20
AV block n (%)	3 (2.1)	3 (3.3)	0 (0)	0 (0)	0 (0)	0 (0)	0.79
Atrial flutter n (%)	3 (2.1)	1(1.1)	1(3.1)	1 (12.5)	0 (0)	0 (0)	0.29

AF: atrial fibrillation; PSVT: Paroxysmal supraventricular tachycardia; VT: Ventricular tachycardia; AV block: Atrioventricular block.

Table 3 - Therapy established in response to ILR events according to the indication for implantation

Therapeutic interventions	Overall N=142	Indications					P value
		Syncope	Palpitations	Suspected paroxysmal AF	Stroke	Brugada syndrome	
		n (%)	n (%)	n (%)	n (%)	(%)	
		91 (64.1)	32 (22.5)	8 (5.6)	5 (3.5)	4 (4.2)	
Pacemaker implant n (%)	17 (12)	17 (18.7)	0 (0)	0 (0)	0 (0)	0 (0)	0.029
ICD implant n (%)	3 (2.1)	0 (0)	1 (3.1)	0 (0)	0 (0)	2 (40)	0.001
EP study/ablation n (%)	17 (12)	8 (8.8)	8 (25)	1(12.5)	0 (0)	0 (0)	0.11
Anticoagulation n (%)	21(15)	11 (12.1)	8 (25)	1 (12.5)	1 (16.7)		0.39
Start AAD/AAD therapy change n (%)	33(23)	6 (6.6)	6 (18.8)	1 (12.5)	0 (0)	0 (0)	0.24

AF: atrial fibrillation; ICD: implantable cardioverter defibrillator; EP: eletrophysiological study; AAD: Anti-arrhythmic drugs.

CO 75 Figure

Methods: In this retrospective observational single-center study we included patients who received the ILR from October 2013 to November 2022. All patients were provided with the remote monitoring system. The primary endpoint was events detected by the ILR, either automatically or triggered by the patient and the secondary endpoint was a change in the clinical management after the event detection.
Results: This study included 142 patients (mean age 63.02 ± 15 years, 46.5% men). The most frequent indications for ILR implantation were unexplained syncope, n = 91 (64.1%), non-documented palpitations, n = 32 (22.5%) and screening for suspected undiagnosed paroxysmal atrial fibrillation (AF), n = 8 (5.6%). During a mean follow-up of 23.0 ± 25.2 months (range 0-105 months), the primary endpoint was met in 69 (48.6%) patients with a time to diagnosis of 10.8 ± 10.5 months (range 0-42 months) and the secondary endpoint in 53 (37.3%) patients. Overall, atrial fibrillation was the most common event recorded, n = 35 (24.6%), followed by sinus pause, n = 28 (19.7%), while atrio-ventricular block and atrial flutter were recorded in n = 3 (2.1%) and n = 3 (2.1%), respectively. Among patients with unexplained syncope, the most common events were sinus pause, n = 23 (25.3%) and AF, n = 17 (18.7%). Regarding changes in clinical management following an event detection the most frequent intervention was starting or changing anti-arrhythmic drug treatment, n = 33 (23%), followed by starting anticoagulation drug treatment, n = 21 (15%), pacemaker implantation, n = 17 (12%) and electrophysiology study/ablation procedure, n = 17 (12%). During the follow-up, all-cause hospital admission rate was 20.4% (n = 29), with only one recorded cardiovascular admission, and all-cause mortality rate was 7% (n = 10), with no cardiovascular deaths recorded.
Conclusions: The ILR is a valuable tool for the diagnosis of undocumented suspected arrhythmic events, often leading to a change in the clinical management of the patient.

Sábado, 15 Abril de 2023 | 13:00-14:00

Sala Vega | Comunicações Orais - Sessão 16 - Ciência básica

CO 76. ZNF259 RS964184 GENETIC VARIANT IS ASSOCIATED WITH METABOLIC SYNDROME IN A PORTUGUESE POPULATION

Débora Sá[1], Maria Isabel Mendonça[1], Marina Santos[1], Margarida Temtem[1], Francisco Sousa[1], Sónia Freitas[1], Sofia Borges[1], Eva Henriques[1], Mariana Rodrigues[1], Graça Guerra[1], António Drumond[1], Ana Célia Sousa[1], Roberto Palma dos Reis[2]

[1]Hospital Dr. Nélio Mendonça. [2]Faculdade de Ciências Médicas de Lisboa/ NOVA Medical School.

Introduction: Zinc finger protein (ZPR1) has been associated with defects in transcription and cell cycle progression. Additionally, the promoter site of ZPR1 binds to peroxisome proliferator-activated receptor gamma (PPARG), which plays a crucial role in insulin sensitivity and obesity. It's not consensual in its association with Metabolic Syndrom (MetS).
Objectives: To estimate the influence of the ZNF259 rs964184 variant in MetS appearance.
Methods: A case-control study was performed with 3134 subjects (mean age 52.8 ± 8.1 years, 76.4% male) recruited from the Research Unit database, a regional quality clinical registry of hospital admissions. 1756 were patients

with MetS and 1378 controls without MetS. MetS was diagnosed according to the International Diabetes Federation (IDF) criteria. The ZNF259 rs964184 C>G was genotyped with the TaqMan PCR assay (Applied Biosystems 7300 Real-Time). The bivariate analysis evaluated the genotypic and allelic distribution in the two groups, with and without MetS. Multivariate Logistic Regression assessed the variables independently associated with MetS.
Results: There were significant differences in genotype and allele distributions for the ZNF259 C>G variant between patients with MetS and without MetS. Wild-type genotype CC was increased in the non-MetS group, whereas the risk GG was higher in patients with MetS (p = 0.008). Similarly, C allele frequencies were significantly higher in the non-MetS group, while the G allele was highly present MetS population (p = 0.002). After multivariate logistic regression, GC genotype (OR = 1.23; 95%CI: 1.05-1.45; p = 0.011) and GG genotype (OR = 1.59; 95%CI: 1.01-2.50; p = 0.047) remained as independent risk factors for Metabolic Syndrome.

Genotype and allele frequencies distribution of ZNF259 C>G variant

SNP	Genotype/allele	MetS	Without MetS	P-value
rs964184C>G	CC	1149 (65.4)	967 (70.2)	0.008
	CG	548 (31.2)	381 (27.6)	
	GG	59 (3.4)	30 (2.2)	
	C allele	2846 (81.0)	2315 (84.0)	0.002
	G allele	666 (19.0)	441 (16.0)	

Variables independently associated with Metabolic syndrome (Logistic regression)

Variables	B	S.E.	Wald	df	OR (95% CI)	P-value
Male sex	0.178	0.088	4.139	1	1.195 (1.007-1.420)	0.042
Age	0.059	0.005	152.357	1	1.060 (1.050-1.070)	<0.0001
ZNF259			9.422	2		0.009
CG	0.208	0.082	6.423	1	1.231 (1.048-1.445)	0.011
GG	0.462	0.232	3.954	1	1.587 (1.007-2.503)	0.047
Constant	-3.049	0.270	127.686	1		<0.0001

Conclusions: This study presents novel data and findings that may have important implications for assessing MetS risk in our population. For the first time in a Portuguese population, we demonstrated that ZNF259 genetic changes are significantly associated with more than 60% increased probability of having Metabolic Syndrome.

CO 77. TCF21 GENE AND CARDIOVASCULAR EVENTS IN A CORONARY POPULATION

Ana Débora Câmara de Sá[1], Maria Isabel Mendonça[1], Marina Santos[1], Margarida Temtem[1], Francisco Sousa[1], Eva Henriques[1], Sofia Borges[1], Sónia Freitas[1], Mariana Rodrigues[1], Graça Guerra[1], António Drumond[1], Ana Célia Sousa[1], Roberto Palma dos Reis[2]

[1]Hospital Dr. Nélio Mendonça. [2]Faculdade de Ciências Médicas de Lisboa/ NOVA Medical School.

Introduction: Recent research showed that TCF21 expression in precursor cells that migrate into the disease lesions contributes to the fibrous cap, stabilizing the lesions and preventing heart attacks. Targeted deletion of the transcription factor encoded by the TCF21 was associated with vascular smooth muscle cell disruption impairing the fibrous cap structure, increasing cardiovascular (CV) disease risk. Its association with CV events is unknown.
Objectives: Analyze the TCF21 rs12190287 variant G>C evaluating its association with atherosclerosis severity and the appearance of cardiovascular (CV) events.
Methods: We performed a prospective study with 1.716 coronary artery disease (CAD) patients (mean age 53.3 ± 7.8 years). TCF21 rs12190287 G>C was genotyped by TaqMan genotyping assay (Applied Biosystems) in all patients. The severity of CAD was graded according to the number of obstructed coronary arteries with at least 70% narrowed lumen. Chi-squared tests were used to determine differences in CAD severity by genotype. We performed a first multivariate logistic regression analysis to assess the independent risk variables associated with CAD severity. After that, we presented a second multivariate Cox regression to evaluate independent variables related to CV events. Kaplan Meier estimated the survival curves.
Results: 48.0% of patients with the risk genotype CC were associated with more than two obstructed coronary arteries (CAD severity) *vs.* 9.2% in the GG wild genotype (p = 0.002). Multivariate analysis (logistic regression) showed that the CC genotype had a high risk of CAD severity (OR = 2.95; p = 0.001) than GG. After Cox regression analysis, which takes into account the time to the first event, the CC genotype remained in the equation with an HR of 1.38; 95%CI 1.02-1.88; p = 0.040. The survival events free at ten years is 49.1% in the CAD patients with the GG genotype, then drops to 39.6% with the CC risk genotype.

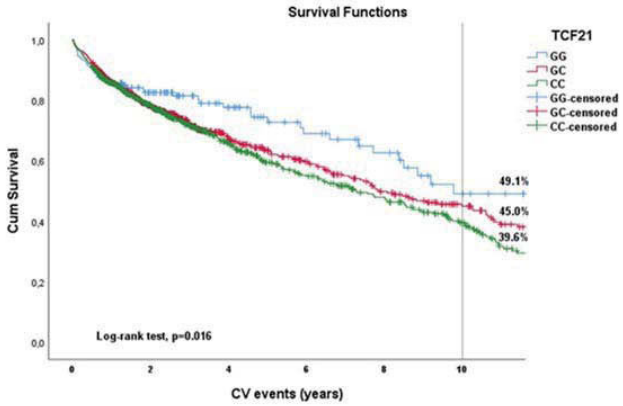


Fig. - This graph plots the Kaplan-Meyer survival curves for TCF21 genotypes

Variables independently associated with CV events occurrence (Cox regression)

Variables	B	S.E.	Wald	df	HR (95% CI)	p-value
Age	0.013	0.005	7.012	1	1.013 (1.003 – 1.023)	**0.008**
TCF21			5.977	2		0.050
GC	0.177	0.160	1.226	1	1.194 (0.873 – 1.633)	0.268
CC	0.324	0.158	4.222	1	1.383 (1.015 – 1.883)	**0.040**

Conclusions: This work shows that the GG wild genotype protects against CAD severity. In contrast, the CC genotype is associated with an increased risk of CAD severity. The patients with this allelic variant had a worse survival event free. Future research with the implementation of epigenetic and genetic therapeutics targeted to deleterious genes will allow the eradication of coronary heart disease worldwide.

CO 78. IDENTIFYING PLASMA LIPID SIGNATURES FOR CARDIOVASCULAR RISK ASSESSMENT IN HFPEF PATIENTS

Sílvia O. Diaz[1], António S. Barros[1], Pedro Palma[1], António Angélico-Gonçalves[1], Francisco Vasques-Nóvoa[1], Francisca Saraiva[1], José A. Belo[2], Otília V. Vieira[2], Adelino F. Leite-Moreira[1]

[1]Faculdade de Medicina da Universidade do Porto. [2]CEDOC-FCMUNL.

Introduction: The role of plasma lipids is well-established in cardiovascular diseases (CVD). Lipids may contribute to the development and progression of HFpEF by increasing inflammation and impairing the ability of the heart to relax and fill with blood. Still, a comprehensive evaluation of the plasma lipidome in patients with Heart Failure with preserved Ejection Fraction (HFpEF) is missing, predominantly for cardiovascular risk stratification.
Objectives: To profile the plasma lipidome of patients with stable HFpEF using top-down shotgun lipidomics and to explore its associations with CV events.
Methods: Sixty HFpEF patients from the *NetDiamond* cohort were included. A total of 101 lipids were measured, normalized to their total sum (to reduce bias between subjects), log-transformed (to reduce skewness) and standardized (to give the same importance to all lipids). The primary endpoint was a composite of cardiovascular death or hospitalization due to HF or acute HF episode. Clinical data (age, sex, estimated glomerular filtration rate (eGFR), BNP and use of statin) was condensed through principal component analysis (PCA) into a single score (PC1) to be leveraged as regression adjustment. The association between each plasma lipid and a cardiovascular event was explored through Cox regression analysis,

adjusted to the clinical data score (PC1). Models were internally validated with bootstrapping (resampling with repetitions, recomputed 1,000 times). Hazard ratios (HR), p-values and c-index were recovered.
Results: For a median follow-up of 39 months (maximum 59 months), 21 patients registered an event. A significant association was found and corroborated with bootstrapping for 8 lipids (4 phosphocholines (PC), 1 phosphoethanolamine (PE), 1 phosphatidylinositol (PI), 1 sphingomielin (SM), and 1 cholesterol ester (CE) and the primary endpoint event in our population. Lipids positively associated were (ordered by decreasing HR): PE18:0-18:2, PC18:0-22:5, PC14:0-18:1, PI18:0-18:2, PC(O)16:0-18:0, and PC16:0-22:5; while negative associations were found for SM42:1:2 and CE20:4. Median c-index ranged from 0.69 to 0.80, showing moderately robust predictive models.
Conclusions: Despite the small cohort and the low number of events, we identified lipids potentially associated with a cardiovascular event. These preliminary results revealed that plasma lipidomic might help stratify patients at risk of cardiovascular death, HF hospitalization, and acute HF episodes.

CO 79. VARIABILITY OF THE ANTITHROMBOTIC EFFECT OF ACETYLSALICYLIC ACID WITH THE ADMINISTRATION OF DIFFERENT DOSAGES: REALITY OR MYTH?

Joana Lima Lopes, Mariana Passos, Carolina Mateus, Inês Fialho, Vanessa de Oliveira, Diana Sousa Mendes, David Roque

Hospital Prof. Dr. Fernando da Fonseca, EPE/Hospital Amadora Sintra.

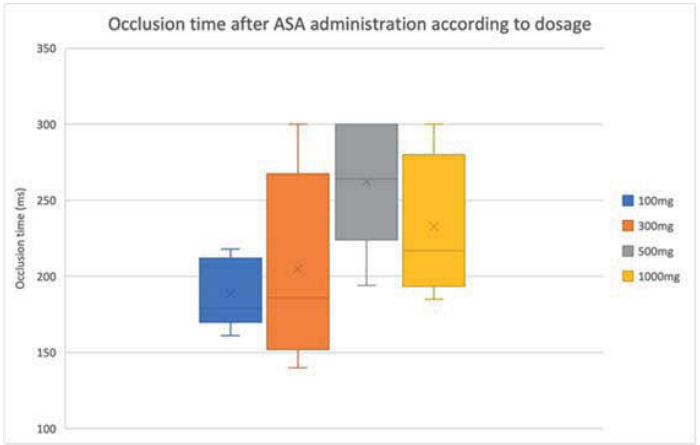
Introduction: We rely on the antithrombotic effect of acetylsalicylic acid (ASA) in a number of pathologies, although other beneficial effects are known, such as its anti-inflammatory properties, when administered in higher doses (500 mg, 1,000 mg per os). However, whether the anti-inflammatory effect decreases the antithrombotic potency of ASA is not known. This gap in evidence may lead to an unnecessary use of two drugs (one antithrombotic and one anti-inflammatory) that could be replaced by ASA alone. This scenario presents frequently: post-infarct pericarditis or when in doubt between non-ST segment elevation myocardial infarction *vs.* myopericarditis. In such cases, the use of ASA could assure both antithrombotic and anti-inflammatory effects. Since the antithrombotic effect of ASA is not scientifically proved for higher doses, currently we use ASA 100 mg as an antithrombotic agent and ibuprofen as an anti-inflammatory. This experimental study intends to assess whether ASA maintains its antithrombotic effect when administered in an anti-inflammatory dose.
Methods: Twenty healthy volunteers were recruited. They all had their platelet function assessed in a qualitative manner, using PFA-200 Innovance technology. The volunteers were randomized into four groups, with 5 participants each. The participants of groups 1, 2, 3 and 4 ingested ASA 100 mg, 300 mg, 500 mg and 1.000 mg respectively, in a blind experiment. One hour after ingestion (peak of action), the volunteers' platelet function was reassessed. PFA-200 evaluates platelet function through platelet occlusion time (OT), which is measured in milliseconds (ms). Normal platelet function translates into OT of 82-150ms. If the OT is higher than 150ms, the patient is anti-aggregated.
Results: Prior to ASA administration, 19/20 volunteers had OT within the reference range. Afterwards, in all four groups, volunteers reached OT > 150 ms, regardless of the ASA dose administered. Mean OT values for each group were 188 ms [SD-23], 205 ms [SD-63], 262 ms [SD-44] and 232 ms [SD-47], respectively. Overall SD was 32 ms.
Conclusions: ASA maintains its antithrombotic effect when administered in an anti-inflammatory dose. There is no clear correlation between the potency of antithrombotic effect and the ASA dose administered. This was a pilot study that supports the maintenance of the antithrombotic effect of ASA in higher doses, but further and larger studies are required to corroborate these results.

CO 80. KETONES' IMPACT ON A DYSMETABOLIC RAT MODEL OF HEART FAILURE WITH PRESERVED EJECTION FRACTION

Alexandre Gonçalves[1], Daniela Miranda[1], Cláudia Mendes[1], Carolina Silva[1], Inês Alves[1], Panagiotis Peppas[1], Mónica Zuzarte[2], Alexandre Rodrigues[1], Liliana Leite[1], José Sereno[1], Maria Vidigal[2], Adelino Leite-Moreira[1], Henrique Girão[2], Vasco Sequeira[3], Inês Falcão-Pires[1]

[1]Faculdade de Medicina da Universidade do Porto. [2]Faculdade de Medicina da Universidade de Coimbra. [3]Datenschutzerklärung - Universitätsklinikum Würzburg.

Heart Failure with Preserved Ejection Fraction (HFpEF) affects 1.1-5.5% of the general population whilst being associated with poor prognosis and hospitalization. This is particularly concerning given that, until very recently, pharmacological options were extremely limited. While the specific mechanisms through which these drugs reduce all-cause mortality remains unknown, data from the recent EMPEROR-Preserved trial has shown associations with increased ketone levels that may be key to the effects observed. Previous studies have shown that increasing ketone levels may have beneficial effects on cardiovascular field, but their potential impact on HFpEF remains unknown. In this study, we explore ketone increase as a potential therapeutical option for HFpEF. To this end, at 16 weeks of age, 30 ZSF1 Lean (Controls) and 30 ZSF1 Obese rats (a well characterized dysmetabolic HFpEF animal model), were randomly assigned to remain on control diet, change to a ketogenic diet (KD) or keep the regular chow whilst having ketone salts (KS) delivered through drinking water. Glucose and B-hydroxybutyrate levels were monitored throughout the study. Metabolic and functional assessments including oral glucose tolerance test, VO2max, echocardiography and PET/CT were conducted throughout the protocol, culminating with terminal procedures at 23-30 weeks of age. Fresh samples were used to study mitochondrial respiration and assess isolated cardiomyocyte function. By 23



CO 79 Figure

weeks of age, baseline hyperglycaemia was reduced by up to 48% with KD and KS on these diabetic HFpEF rats, while glycaemic tolerance was improved only under the KD. By itself, HFpEF appears to promote 11-Acetoacetate uptake similarly to both treatments under control conditions, hinting at the metabolic shift that must be occurring on the starving HFpEF hearts. Importantly, both KD and KS were shown to significantly reduce HFpEF-associated cardiac fibrosis and hypertrophy. The extent of these changes was further studied on isolated cardiomyocytes, where we observed improvements in calcium handling with KS (peak Ca2+ to 90% baseline) and contractile function with both therapies (time to peak, peak height, baseline sarcomere length and Tau). Lastly, these changes seemed to be accompanied by a significant reduction in cardiac complex II mitochondrial respiration on HFpEF with KS, which might constitute a defence mechanism against oxidative stress. Taken together, our data seem to suggest that increased ketone levels may alleviate or even reverse some of the cardiometabolic impairments associated with the HFpEF phenotype in this rat model and our follow-up studies may shed further light on this potential.

Sábado, 15 Abril de 2023 | 14:00-15:00

Sala Vega | Comunicações Orais - Sessão 17 -Síndromes coronárias crónicas

CO 81. VALIDATION AND POTENTIAL USEFULNESS OF THE UPDATED PROMISE MINIMAL RISK TOOL IN PATIENTS WITH SUSPECTED CORONARY ARTERY DISEASE UNDERGOING CORONARY CT ANGIOGRAPHY

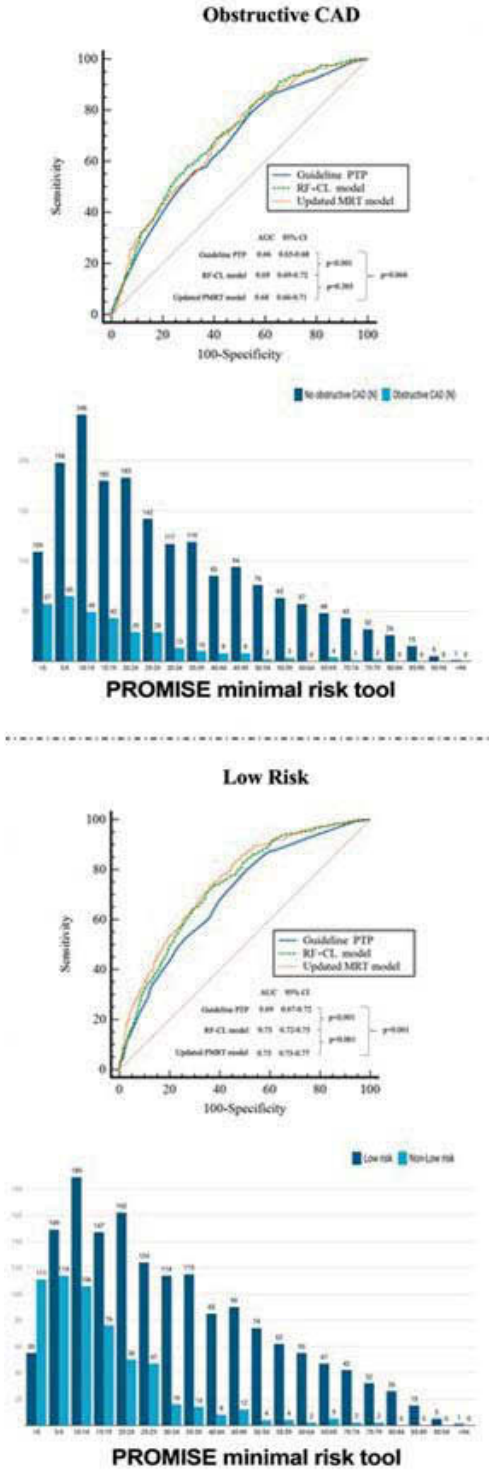
Maria Rita Giestas Lima[1], Pedro M. Lopes[1], Francisco Albuquerque[1], João Presume[1], Pedro Freitas[1], Cláudia Silva[1], Sara Guerreiro[1], João Abecasis[1], Carla Saraiva[1], Ana Coutinho Santos[1], Pedro Gonçalves[1], Miguel Mendes[1], António Ferreira[1], Hugo Marques[2]

[1]Centro Hospitalar Universitário de Lisboa Ocidental, EPE/Hospital de Santa Cruz. [2]Hospital da Luz Lisboa.

Introduction: The steady decline in test positivity among patients with suspected coronary artery disease (CAD) has raised interest in developing strategies to identify patients who may not require testing. The updated PROMISE minimal-risk tool (PMRT) was developed specifically for this purpose, but never tested in our population. The aim of this study was to assess the diagnostic performance of this new tool, and to compare it with the guideline-recommended pre-test probability (PTP) and with the risk factor-weighted clinical likelihood (RF-CL) model in a Portuguese cohort of symptomatic patients undergoing coronary computed tomography angiography (CCTA).

Methods: We conducted a two-centre cross-sectional study of symptomatic patients undergoing CCTA for suspected CAD. Key exclusion criteria were age < 30 years, known CAD, suspected acute coronary syndrome or symptoms other than chest pain or dyspnoea. A simplified version of the updated PMRT (without HDL-C), the guideline PTP, and RF-CL score were calculated for each patient. Obstructive CAD was defined as any luminal stenosis ≥ 50% on CCTA. 'Low risk' was defined as absence of obstructive CAD and coronary artery calcium (CAC) score < 100 (both conditions present, where CCTA results are unlikely to change patient management). The cut-off value of the PMRT with 95% positive predictive value for identifying patients with 'Low risk' was identified in ROC curve analysis.

Results: A total of 2,162 patients (mean age 60 ± 11 years, 59% female) were included. Overall, 14.9% (N = 323) of patients had obstructive CAD, and 73.5% (N = 1,589) fulfilled the criteria for 'Low risk'. Patients with 'Low risk' were more frequently female, had higher prevalence of non-anginal chest pain and had fewer cardiovascular risk factors. For obstructive CAD, the discriminative power of the updated PMRT was similar to the one provided by the guideline PTP and RF-CL models (Figure 1A). However, for identifying patients with 'Low risk', the updated PMRT showed greater discriminative power than the guideline PTP and RF-CL models. The PMRT cut-off value with 95% positive predictive value for detecting patients at "Low risk" was identified as > 46%. A total of 458 patients (21.2%) had a PMRT > 46%.



Conclusions: In this cohort of symptomatic patients undergoing CCTA, the updated PMRT showed similar discriminative power for obstructive CAD, but greater discriminative power to identify "Low risk" than the guideline-recommended PTP and the RF-CL models. The criterion that identified "Low Risk" with 95% positive predictive value was present in roughly one fifth of patients undergoing CCTA, who would be less likely to derive benefit from testing.

CO 82. DETECTION OF CORONARY ARTERY DISEASE USING EPICARDIAL ADIPOSE TISSUE RADIOMICS IN NON-CONTRAST COMPUTED TOMOGRAPHY

Fábio Sousa Nunes[1], Carolina Santos[2], Wilson Ferreira[1], Mónica Carvalho[1], João Pedrosa[3], Miguel Coimbra[3], Ricardo Ladeiras Lopes[2], Nuno Ferreira[1], Luís Vouga[1], Jennifer Mancio[4], Ricardo Fontes Carvalho[1]

[1]Centro Hospitalar de Vila Nova de Gaia/Espinho, EPE. [2]Faculdade de Medicina da Universidade do Porto. [3]Instituto de Engenharia de Sistemas e Computadores, Tecnologia e Ciência - INESC TEC. [4]King's College of London.

Introduction: Dysfunctional epicardial adipose tissue (EAT) is an active player in the pathophysiology of atherosclerosis. EAT can be quantified noninvasively by computed tomography (CT) and its volume and attenuation have been investigated as imaging biomarkers of coronary artery disease (CAD). Radiomic analysis allows thorough phenotyping of adipose tissue which has the potential of capturing the underlying tissue biology. The objective was to characterize the CTradiomic profile of EAT associated with coronary atherosclerosis and to derive the EAT radioproteomic signature of CAD.
Methods: We extracted radiomic features from the EAT in non-contrast CT images of 192 patients from the EPICHEART study (NCT03280433) to build a machine learning model to discriminate patients with CAD (i.e., > 50% stenosis in invasive angiography) from patients without CAD. Among the 1037 extracted radiomic features, we performed features selection to identify the best performing features for CAD classification and build a radiomic signature of CAD. Subsequently, a multivariate XGBoost model was trained using the entire dataset in a 6-fold stratified cross-validation. Furthermore, in a nested-case-control group of 21 patients with EAT proteomics, a spearman correlation was performed to determine the association between the EAT radiomics and proteomics of CAD.
Results: CAD patients showed accumulation of EAT with higher median gray level values and heterogeneous texture in non-contrast CT images. This phenotype was correlated with upregulation of pro-calcifying (Annexin-A2), pro-inflammatory (IGHM) and adipocyte fatty acid transport (FABP4) proteins. EAT radiomic signature of CAD added to calcium score (CCS) improved the performance of CCS alone and provided an area under the curve of 0.81 (95%CI: 0.69-0.93), sensitivity of 0.83, negative predictive value of 0.87, F1 score of 0.77 and accuracy score of 0.79 (Figure).

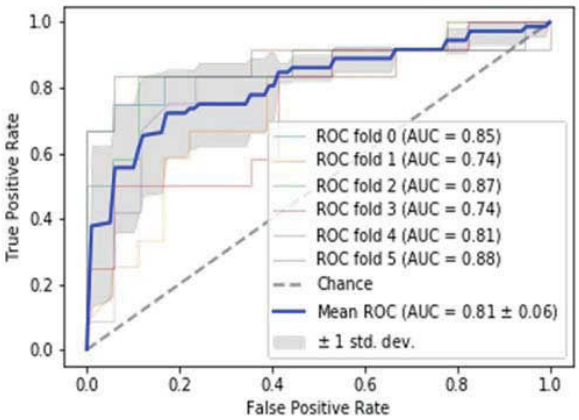


Figure 1. Receiver operating characteristics curve of epicardial adipose tissue radiomics combined with calcium score to discriminate CAD from non-CAD patients.

Conclusions: In non-contrast CT images, radiomic profiling of EAT detected significant EAT gray-level and texture differences between patients with and without CAD. This EAT radiomic phenotype was correlated with upregulation of inflammatory, calcifying and fatty acid import proteins and when added to CCS improved the detection of CAD, supporting CT radiomics interpretability and its potential diagnostic applications.

CO 83. THE ROLE OF CARDIOVASCULAR RISK FACTORS IN CORONARY VASOSPASM WITH FLUOROPYRIMIDINES

Isabel Cardoso, Vera Ferreira, Tânia Mano, Inês Guerreiro, Leonor Fernandes, André Grazina, Sofia Jacinto, Ricardo Carvalheiro, André Ferreira, Pedro Rio, Luís Almeida Morais, Rui Cruz Ferreira

Centro Hospitalar Universitário de Lisboa Central, EPE/Hospital de Santa Marta.

Introduction: Fluoropyrimidines are widely used in the treatment of solid tumours, including adenocarcinomas of gastrointestinal tract, lung and breast. Cardiac toxicity typical presents as chest pain, predominantly caused by vasospasm. The precise role of cardiovascular (CV) risk factors on the risk of coronary vasospasm is yet to be defined.

Table 1 Baseline Characteristics	
Age, yrs	72 (IQR 17)
Male	24 (59)
Median Stage of cancer	
I	1 (2)
II	5 (12)
III	17 (41)
IV	14 (34)
Upper GI cancer	10 (24)
Colorectal GI cancer	20 (49)
Lung cancer	2 (5)
Breast cancer	8 (20)
Thymus	1 (2)
Hypertension	34 (83)
Hyperlipidemia	22 (54)
Diabetes mellitus	17 (42)
Smoking	10 (24)
Ischemic heart disease	16 (39)
Previous acute coronary syndrome	11 (27)
CKD	5 (12)
Beta-blockers	17 (42)
ACE inhibitor/ARB	28 (68)
Nitrate	10 (24)
Calcium-channel blocker	11 (27)
Statins	26 (63)
Vasospasm presentation	
Patient 1 Typical chest pain ST segment elevation in the inferior leads Coronary angiography excluded CAD	
Patient 2 Typical chest pain during drug infusion Positive intracoronary provocative test	
Approach to patients with chest pain	
Patient 3 Typical chest pain Troponin T elevation Died before excluding CAD due to oncological disease progression	
Patient 4 One episode of chest pain previous and during treatment Stress echocardiography excluded ischemia Normal levels of troponin T Medical therapy optimization	
Patient 5 One episode of atypical chest pain Stress echocardiography excluded ischemia Normal levels of troponin T Medical therapy optimization	
Patient 6 STEMI Normal levels of troponin T Coronary angiography: three vessel disease CABG	
Patient 7 STEMI Coronary angiography: occlusion Angioplasty of the LAD	

Values are mean ± SD, media; IQR - interquartile range or % (n).
ACE = angiotensin-converting enzyme; ARB = angiotensin II receptor blocker. ASA= acetylsalicylic acid; CKD= chronic kidney disease; GI= gastrointestinal CAD=coronary artery disease
STEMI= ST-elevation myocardial infarction
LAD = left anterior descendent artery
CABG= coronary artery bypass grafting
CAT= computed tomography angiography

Objectives: To evaluate the prevalence and risk factors for coronary artery vasospasm in high-risk patients (pts) under treatment with fluoropyrimidines.
Methods: We conducted a retrospective analysis of all pts who received fluoropyrimidines (5-fluorocil and oral pro-drug capecitabine) at a single center cardio oncology clinic, between April 2021 and October 2022. Vasospasm was diagnosed based on the presence of typical *de novo* chest pain concomitant with treatment with fluoropyrimidines, new ST-segment changes or elevated biomarkers and/or positive intracoronary provocative test and exclusion of coronary artery disease.
Results: We analysed 41 patients with a median age of 72 (IQR 62-79) years old, mostly males (59%) with a high burden of CV risk factors (49% of the patients had more than 2 CV risk factors), 10 pts (24%) were current smokers (Table). 16 Pts (39%) had history of ischemic heart disease. Episodes of non-persistent chest pain were reported in 7 pts (17%), although vasospasm was only confirmed in 2 of these patients (5%) (Table). Active smoking was significantly associated with the occurrence of chest pain during treatment (p = 0.047). No association between CV risk factors and vasospasm was found (p = 0.67). No association was found between chest pain and use of beta-blockers (p = 0.42) or with ischemic heart disease (p = 0.69). No difference between the type of drug administered or route of administration (oral capecitabine or 5-fluorocil) and the presence of chest pain was verified (p = 0.70). A significant association was found between chest pain and chemotherapy suspension (p = 0.01). All patients diagnosed with vasospasm suspended therapy. Mortality during follow-up was 12%. Mortality was associated in 80% of the patients to progression of oncological disease, no deaths were attributed to cardiovascular events.

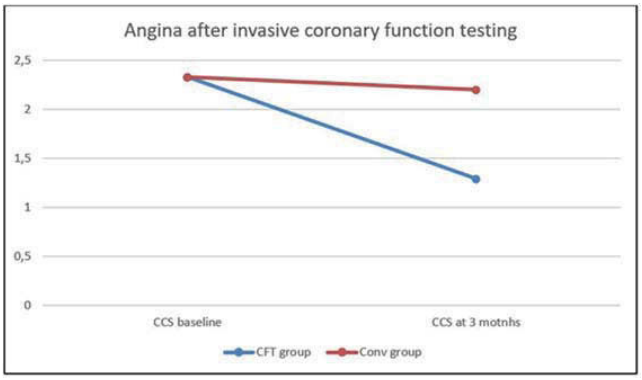
Conclusions: In our cohort of high-risk cardiovascular patients under fluoropyrimidine treatment, the prevalence of de novo chest pain was 17%, while, coronary vasospasm occurred only in 5%. These patients need a precise evaluation with tailored made decisions, because, as we proved, presenting de novo chest pain has major clinical impact leading to chemotherapy suspension. Active smoking was identified as a risk factor for chest pain during treatment.

CO 84. ANGINA BEYOND STRUCTURAL CORONARY DISEASE: TAILORING MEDICAL THERAPY USING CORONARY FUNCTION TESTING

André Paulo Ferreira, Miguel Marques Antunes, Vera Ferreira, Tiago Mendonça, Tiago Pereira-da-Silva, Hugo Rodrigues, Filipa Silva, Cristina Fondinho, Ana Santana, Rui Cruz Ferreira, Rúben Ramos

Centro Hospitalar Universitário de Lisboa Central, EPE/Hospital de Santa Marta.

Introduction: Invasive coronary function testing (CFT) performed in patients with ischemia with no obstructive coronary artery disease (INOCA), is helpful in determining the mechanism of angina. However, it still is neither widely accepted nor applied in many medical centers.
Objectives: The aim of this study was to test whether medical therapy guided by CFT improves angina symptoms of patients with INOCA in a real-world clinical environment.
Methods: Patients with INOCA that underwent coronary function testing between July 2021 and October 2022 were included in this single-center prospective study. They were compared to a contemporary cohort of INOCA patients that underwent invasive coronary angiography (ICA) without function testing (Conv group). A standardized protocol was used in all patients in the CFT group and consisted of the assessment of fractional flow reserve, coronary flow reserve, index of microvascular resistance, and of provocative testing with acetylcholine. Coronary vasomotion disorders were diagnosed based on the criteria proposed by the Coronary Vasomotor Disorders International Study Group. Medical therapy was tailored for the final diagnosis in the CFT group. The study's primary endpoint was angina symptoms variation from the baseline as assessed by the Canadian Cardiovascular Society Score (CCS).
Results: A total of 56 CFTs were performed in the CFT group during the study period. Patient mean age was 64 ± 12 years and 57.1% were female. A total of 111 standard ICAs were performed in the Conv group. There were no significant differences between the groups' demographics. In the CFT group, isolated epicardial vasospasm was found in 16 (28.6%) patients, isolated coronary microvascular dysfunction (CMD) in 9 (16.1%), and a combination of CMD and coronary vasospasm in 9 (16.1%) patients. Only 1 patient (1.8%) had isolated microvascular spasm. The intervention in the CFT group resulted in a modification to previously instituted medical therapy in 64.3% of patients at discharge, resulting in a significant reduction in the Canadian Cardiovascular Society Score (-1.04 ± 0.80 U in the CFT group *vs.* -0.13 ± 0.42 U in the Conv group, p < 0.001) at 3 months. After a median follow-up time of 6 months, major adverse cardiac events were similar between both groups (1.8% CFT group *vs.* 2.9% Conv group, p = 0.664).



Conclusions: An invasive, standardized, multi-parametric protocol for the evaluation of coronary vasomotion disorders is feasible and safe in clinical practice, and allows for individualized medical therapy, which may improve angina symptoms in INOCA patients at a short-term follow-up.

CO 85. A BETTER UNDERSTANDING OF CORONARY ARTERY DISEASE MOLECULAR BIOLOGY THROUGH AN INTERMEDIATE PHENOTYPE

Ana Débora Câmara de Sá[1], Maria Isabel Mendonça[1], Marina Santos[1], Margarida Temtem[1], Francisco Sousa[1], Sónia Freitas[1], Mariana Rodrigues[1], Eva Henriques[1], Sofia Borges[1], Graça Guerra[1], Ilídio Ornelas[1], António Drumond[1], Ana Célia Sousa[1], Roberto Palma dos Reis[2]

[1]Hospital Dr. Nélio Mendonça. [2]Faculdade de Ciências Médicas de Lisboa/ NOVA Medical School.

Introduction: Coronary Artery Disease (CAD) remains a common cause of death worldwide; over half of these deaths are asymptomatic until the first fatal presentation. Previous studies have often compared coronary artery calcification (CAC) with coronary stenosis or its sequelae. However, the genetic contribution to CAC in sub-clinical atherosclerosis is controversial.
Objectives: This study intended to assess the relationship between a set of single nucleotide polymorphisms associated with CAD (GWAS) and CAC score in an asymptomatic population.
Methods: Prospective study performed in an asymptomatic cohort from GENEMACOR population-based sample of 1207 subjects aged 51.7 ± 8.3, 73.8 male, without apparent prior CAD. CAC score was performed by cardiac computed tomography and reported as Agatston units according to the Hoff nomogram (Low, Moderate and High-risk categories). For the present work, we considered two groups: Group 1 (0 ≤ CAC < 100 and Percentile < 50) and Group 2 (CAC ≥ 100 or Percentile ≥ 50). We genotyped thirty-three single nucleotide polymorphisms (SNP) associated with CAD by TaqMan real-time PCR. Anthropometric, conventional, and biochemical risk factors were assessed. The association of these SNPs with CAC score groups were evaluated by bivariate and multivariate logistic regression analysis, and the dominant genetic model was considered for comparison.
Results: After bivariate analysis, only PHACTR1 rs1332844 C>T (CT+TT genetic model) showed a significative association with CAC score (OR = 1.45; 95%CI 1.09-1.94; p = 0.011). Multivariate logistic regression analysis, adjusted to traditional risk factors, genetic model and CAC score showed

Variables independently associated with high CAC Group (Logistic regression)

Variables	B	S.E.	Wald	df	OR (95% CI)	p-value
rs1332844 C>T (CT+TT)	0.405	0.154	6.922	1	1.500 (1.109-2.028)	0.009
Age	0.029	0.008	12.586	1	1.029 (1.013-1.046)	<0.0001
Smoking	0.665	0.145	20.954	1	1.945 (1.463-2.586)	<0.0001
Hypertension	0.371	0.136	7.467	1	1.449 (1.111-1.891)	0.006
Obesity	0.312	0.142	4.843	1	1.367 (1.035-1.805)	0.028
Diabetes	0.828	0.189	19.253	1	2.289 (1.581-3.314)	<0.0001
Constant	-2.810	0.436	41.464	1	0.060	<0.0001

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that PHACTR1 rs1332844 remained in the equation as significantly associated to CAC score (p = 0.009) together with age (0.0001), hypertension (0.006), diabetes (0.0001), smoking (0.001) and obesity (0.028).
Conclusions: PHACTR1 genetic variant is known to contribute to atherosclerosis and plaque formation. In the present study it showed a significant association with plaque calcium. More research in this field is critical to understanding the genetic basis of CAD through an intermediate phenotype, plaque calcification. We highlight this point since it can be crucial for the prognosis and therapy of the asymptomatic population.

Sábado, 15 Abril de 2023 | 15:00-16:00

Sala Vega | Comunicações Orais - Sessão 18 - Insuficiência cardíaca: tratamento

CO 86. CHANGES IN HEALTH-RELATED QUALITY OF LIFE AND TREATMENT EFFECTS IN CHRONIC HEART FAILURE: A META-ANALYSIS

António Afonso Angélico Gonçalves[1], Ana Rita Ferreira Leite[1], João Sérgio Neves[1], Francisca Saraiva[1], Liliana Brochado[1], Javed Butler[2], Milton Packer[3], Faiez Zannad[4], Francisco Vasques Nóvoa[1], Adelino Leite-Moreira[1], João Pedro Ferreira[1]

[1]Facultade de Medicina da Universidade do Porto. [2]Baylor Scott and White Research Institute, University of Mississippi. [3]Baylor University Medical Center, Dallas TX and Imperial College. [4]Inserm, Centre d'Investigations Cliniques - Plurithématique.

Introduction: Heart failure (HF) is associated with poor health status, high morbidity and mortality. A recent FDA guidance draft proposes patient-centered outcomes, such as health status, as acceptable endpoints for clinical trials. However, it is not well-established how health status changes correlate with treatment effects on "hard" clinical outcomes.
Objectives: To study the association between treatment-induced changes in health status, assessed by the Kansas City Cardiomyopathy Questionnaire-23 (KCCQ-23), and "hard" clinical outcomes in chronic HF.
Methods: Systematic search of phase III-IV RCTs in chronic HF, where the impact of pharmacological treatments on KCCQ-23 score and clinical outcomes throughout follow-up were evaluated. We studied the association between treatment-induced changes in KCCQ-23 and the corresponding treatment effect on clinical outcomes (composite of HF hospitalization or cardiovascular death, HF hospitalization, cardiovascular death, and all-cause death) using weighted, random effects meta-regression.
Results: Sixteen HF trials, published between 2009 and 2022, were included, enrolling a total of 65,664 participants. Treatment-induced KCCQ-23 changes were moderately correlated with treatment effects on HF hospitalization or cardiovascular mortality (regression coefficient (RC) = −0.047, 95%CI: −0.085 to −0.009, p = 0.016; R^2 = 49%), a correlation that was mainly driven by HF hospitalization (RC = −0.076, 95%CI: −0.124 to −0.029, p = 0.002; R^2 = 56%). The correlations between treatment-induced KCCQ-23 changes and cardiovascular death (RC = −0.029; 95%CI: −0.073 to 0.015; p = 0.20; R^2 = 10%) and all-cause death (RC = −0.019, 95%CI: −0.057 to 0.019, p = 0.32; R^2 = 0%) were weak and statistically non-significant.
Conclusions: Treatment-induced changes in KCCQ-23 were moderately correlated with treatment effects on HF hospitalizations but were not correlated with the effects on cardiovascular and all-cause mortality. Changes in patient-centered outcomes (i.e., KCCQ-23) may reflect symptomatic changes in the clinical course of HF that may lead to hospitalization, but do not appear to be strongly correlated with mortality. Large outcome trials should continue to assess HF hospitalization and mortality as a robust mean of evaluating treatment effects.

CO 87. EFFECTIVENESS AND SAFETY OF SACUBITRIL/VALSARTAN IN PATIENTS WITH CHRONIC KIDNEY DISEASE - A REAL-WORLD EXPERIENCE

Sara Couto Pereira, Tiago Rodrigues, Afonso Nunes-Ferreira, João R. Agostinho, Fausto J. Pinto, Dulce Brito

Centro Hospitalar Universitário de Lisboa Norte, EPE/Hospital de Santa Maria.

Introduction: Sacubitril/valsartan is a cornerstone treatment in patients with heart failure and reduced ejection fraction (HFrEF). Data regarding the effectiveness and safety of sacubitril/valsartan in patients with chronic kidney disease (CKD) are scarce. We aimed to evaluate the effectiveness and safety of sacubitril/valsartan in patients with HFrEF and CKD in a real-world setting.
Methods: We included consecutive ambulatory HFrEF patients followed in a HF clinic that initiated sacubitril/valsartan between February 2017 and October 2020, stratified by CKD (excluding those in stage 5/under dialysis). Demographic and clinical data, all-cause mortality and hospitalizations due to acute decompensated HF during the 12 months before sacubitril/valsartan initiation and during follow up were retrospectively evaluated. Primary outcomes were the incidence rate per 100 patient-years and the annualized

	CKD (n=77)			No CKD (n=102)			P-value
	S/V		RR (95% CI)	S/V		RR (95% CI)	
	Before	After		Before	After		
Incidence rate (per 100 person-years)							
Crude[a]	77.9	31.9	0.410 (0.216, 0.777)	66.3	16.3	0.246 (0.122, 0.495)	0.296
Adjusted[b]	67.7	28.8	0.425 (0.234, 0.773)	64.0	16.3	0.254 (0.133, 0.487)	0.261
Annualized LOS (days/year)							
Crude[a]	7.3	1.8	0.246 (0.161, 0.377)	6.0	1.1	0.178 (0.110, 0.287)	0.332
Adjusted[c]	6.5	1.6	0.250 (0.164, 0.379)	5.9	1.1	0.180 (0.112, 0.289)	0.319

Table 1. Effect of treatment initiation with Sacubitril/Valsartan on the incidence rate and annualized LOS of hospitalizations due to HF decompensation stratified by CKD at baseline
CKD: chronic kidney disease (eGFR < 60 mL/min/1.73m²); eGFR: estimated glomerular filtration rate; HF: heart failure; LOS: length of stay; RR: rate ratio; S/V: sacubitril/valsartan; [a] Model with treatment, CKD and interaction; [b] Model with treatment, CKD and interaction, and adjusted for age, sex, NYHA and anemia (final model); [c] Model with treatment, CKD and interaction, and adjusted for age, sex, ejection fraction, NYHA and anemia (final model)

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length of stay (LOS) of acute decompensated HF hospitalizations (HHF). Secondary outcomes were all-cause mortality, NYHA class improvement and titration of sacubitril/valsartan.

Results: We included 179 patients, 77 with CKD at baseline (11 in stage 4). CKD patients were older (72 ± 10 *vs*. 65 ± 12 years, p < 0.001), had higher NT-proBNP plasma values (4,623 ± 5,266 *vs*. 1,901 ± 1,835 pg/mL, p < 0.001) and high incidence of anaemia (p < 0.001), without other significant differences. Most of them were at NYHA functional class II (69% in CKD group *vs*. 79%, p = NS). During a mean follow up of 19 ± 11 months, a significant and similar improvement in NYHA class (-0.53, 95%CI: [-0.67, -0.38] in CKD patients *vs*. -0.55, 95%CI: [-0.67,-0.43], p = 0.670) and a significant reduction in the rate of HHF was observed after sacubitril/valsartan initiation (67.7 to 28.8 hospitalizations per 100 patient-years in CKD group, adjusted rate ratio = 0.425, 95%CI: [0.234, 0.773]; p = NS between the two groups, Table). There was a significant reduction in annualized LOS of 5 days in both groups (p = 0.319, Table). CKD patients had a higher rate of all-cause mortality during follow up, without significant differences compared to non-CKD patients (HR = 2.405, 95%CI: [0.841; 6.879], p = 0.102). There were no significant differences between the two groups regarding maximum dose of sacubitril/valsartan achievement and withdrawal during follow up.

Conclusions: In this real-world population study in patients with HFrEF and CKD sacubitril/valsartan was effective on reducing hospitalization rates and length of stay without affecting all-cause mortality.

CO 88. ISCHEMIC AND NONISCHEMIC HEART FAILURE WITH REDUCED EJECTION FRACTION: ASSESSING LEFT ATRIAL STRAIN IMAGING AFTER SACUBITRIL/VALSARTAN THERAPY

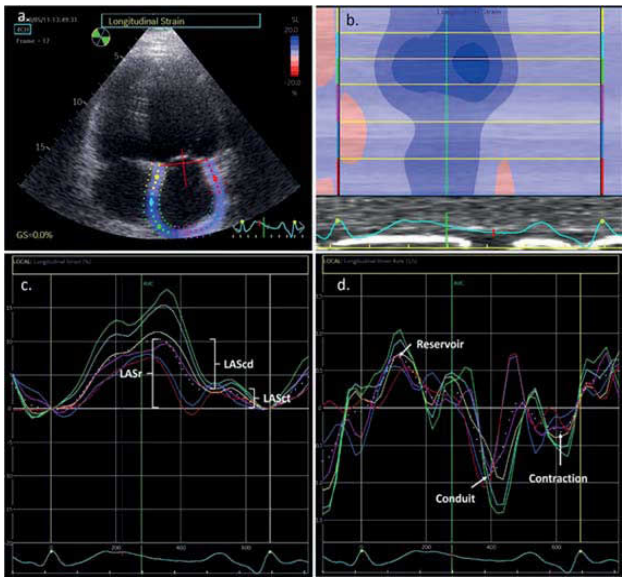
Pedro Garcia Brás, António Valentim Gonçalves, Rita Ilhão Moreira, Tiago Pereira da Silva, Isabel Cardoso, José Viegas, André Grazina, Sofia Jacinto, Rita Teixeira, Bárbara Teixeira, Ana Teresa Timóteo, Pedro Rio, Ana Galrinho, Rui Soares, Rui Cruz Ferreira, Luísa Moura Branco

Centro Hospitalar Universitário de Lisboa Central, EPE/Hospital de Santa Marta.

Introduction: Sacubitril/valsartan (SV) is currently a mainstay of heart failure with reduced ejection (HFrEF) therapy, with proven results in reverse left ventricular (LV) remodeling. However there is limited data regarding left atrial (LA) strain parameters assessment after SV therapy in different HFrEF etiologies. The aim of this study was to evaluate improvement in LA volume, strain and strain rate parameters before and after SV therapy in ischemic HFrEF patients (P) and nonischemic HFrEF P.

Methods: Prospective evaluation of echocardiographic data of HFrEF patients under optimized guideline-directed medical therapy. LA mechanics were assessed by 2D speckle-tracking at baseline and after 6 months of SV therapy. LA volume, reservoir phase strain (LASr), conduit phase strain (LAScd) and contraction phase strain (LASct) and respective phases' strain rate (SR) were compared (Figure).

Results: 35 P were evaluated, mean age 59 ± 11 years, 83% male gender, 40% atrial fibrillation and 43% with ischemic etiology. While there was a significant reduction in LA volume index (LAVi) in nonischemic HFrEF P (56.2 ± 26.9 mL/m² *vs*. 44.5 ± 15.8 mL/m², p = 0.005), there was only a mild nonsignificant reduction in ischemic HFrEF P (44.9 ± 12.6 mL/m² *vs*. 42.6 ± 16.2 mL/m², p = 0.442). There was a significant improvement in LASr both in nonischemic HFrEF P (10.08 ± 4.82% *vs*. 14.96 ± 7.76%, p = 0.001) and ischemic HFrEF P (13.53 ± 7.42% *vs*. 17.73 ± 7.89%, p = 0.011). While ischemic HFrEF P had a significantly improved LAScd (-6.39 [-8.48--4.38]% *vs*. -7.81 [-10.89--6.9]%, p = 0.033), nonischemic HFrEF P showed a trend to improvement (-5.47 [-9.53--4.22]% *vs*. -6.02 [12.5--4.22]%, p = 0.059). On the contrary, nonischemic HFrEF P showed a significantly improved LASct (-6.17 ± 4.44% *vs*. -10.62 ± 4.82%, p < 0.001) while ischemic HFrEF P showed a trend to improvement (-8.23 ± 3.58% *vs*. -11.14 ± 2.65%, p = 0.052). Regarding SR, the authors found an improved reservoir phase SR (0.47 ± 0.21 s-1 *vs*. 0.65 ± 0.24 s-1, p = 0.001) and contraction phase SR (-0.58 [-1.1-0.33] s-1 *vs*. -1.22 [-1.51--0.71] s-1, p = 0.016) in nonischemic HFrEF P, *versus* a statistically non-significant improvement in ischemic HFrEF P (reservoir SR 0.51 ± 0.24 s-1 *vs*. 0.64 ± 0.2 s-1, p = 0.065) and contraction phase SR (0.89 [-1.25--0.66] s-1 *vs*. -1.07 [-1.28-1.03] s-1, p = 0.285). However, there was a significant increase in conduit phase SR in ischemic HFrEF P (-0.46 [-0.63--0.29] s-1 *vs*. -0.55 [-0.7--0.41] s-1, p = 0.023), in contrast to nonischemic HFrEF P (-0.52 [-0.79--0.28] s-1 *vs*. -0.63 [-0.9--0.35] s-1, p = 0.184).



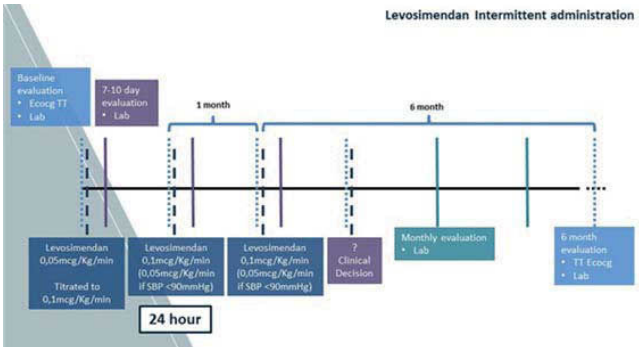
Conclusions: After 6 months of SV therapy, there was significant improvement in LA strain and strain rate parameters. Ischemic HFrEF P showed a significantly improved conduit function (LAScd and SR) while nonischemic HFrEF P revealed improved reservoir and contractile function (LASr, LASct, reservoir and contraction phase SR) as well as significant reduction in LAVi.

CO 89. LEVOSIMENDAN - SINGLE CENTER EXPERIENCE WITH INTERMITTENT 24H ADMINISTRATION

Miguel Azaredo Raposo, João R. Agostinho, Joana Brito, Beatriz Silva, Rafael Santos, Tatiana Guimarães, Hugo Corte Real, Fausto J. Pinto, Dulce Brito

Centro Hospitalar Universitário de Lisboa Norte, EPE/Hospital de Santa Maria.

Introduction: Advanced heart failure (AdHF) remains a challenging condition as effective treatment is restricted to heart transplant (HT) and left ventricle assist devices (LVAD). These therapies lack availability and are contraindicated or deemed futile in a significant number of patients (pts). Intermittent administration of the inodilator Levosimendan is a valuable strategy to reduce acute heart failure admissions and improve quality of life.
Objectives: To describe the experience of a tertiary hospital Heart Failure Unit with the intermittent intravenous (IV) administration of Levosimendan (24-hour infusion period).
Methods: Retrospective, single-centre study. A predefined protocol that suggested monthly administrations of Levosimendan was followed - Figure 1. At least 3 initial administrations were also suggested. The need for subsequent infusions and the respective schedule was guided by clinical and laboratorial parameters. Clinical, laboratorial and administration schedule data was collected. The year before the first Levosimendan infusion was compared to the following, regarding the number of unprogrammed HF admissions for each pt. One-year HF related mortality rate was estimated using the Seattle Heart Failure Model and was compared to the observed rate in the study population.
Results: From December 2017 to November 2022, a total of 20 pts underwent intermittent 24-hours Levosimendam administrations. The population had a mean age of 60 ± 21y and 80% were male. Ischemic heart disease (10 pts), dilated cardiomyopathy (9 pts) and valvular heart disease (1 pt) were the HF etiologies. Before the first infusion, mean left ventricle ejection fraction (LVEF) was 24% (IQR 24-28.5) and all patients had LVEF < 35%. 17(85%) pts were in NYHA functional class III and 3 (15%) in class IV. 13 (65%) pts were too old or had contraindication for HT or LVAD and 7 (35%) were either waiting HT or LVAD or being evaluated for these therapies. During a mean follow-up (FUP) time of 20.7 ± 15.7 months, mean number of infusions per patient was 6.75 ± 5.68. 6 pts had marked clinical improvement and had the protocol withheld after a mean number of 3.2 ± 1.5 infusions. 2 of those patients were waiting for HT evaluation which was suspended. Intermittent administrations led to a reduction in the number of HF hospitalizations (2.35, IQR 1.25-2.75 *vs.* 0.85, IQR 0-1; p = 0.001) during FUP. Overall mortality rate at the end of FUP was 45%. One pt underwent LVAD implant. The observed 1-year HF related mortality rate was 12.5%, compared to 16% estimated by the Seattle Heart Failure Model. No severe adverse events were reported.



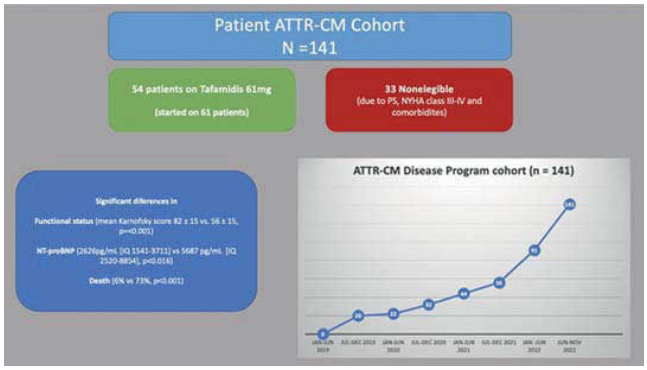
Conclusions: In this single center series of pts with AdHF, despite a doubtful impact in mortality, intermittent 24h Levosimendan administrations led to a significant reduction in HF hospitalizations. Also, a non-negligible proportion of pts actually improved and are stable without the need for advanced therapies.

CO 90. ATTR-CM IN A REAL-WORLD REFERRAL CENTER: A 3-YEAR EXPERIENCE DIAGNOSIS AND TREATMENT CHALLENGES

Ana Rita Bello, Sérgio Maltês, Mariana Paiva, Rita Amador, Andreia Marques, Catarina Oliveira, Carlos Aguiar, Miguel Mendes, Bruno Rocha

Centro Hospitalar Universitário de Lisboa Ocidental, EPE/Hospital de Santa Cruz.

Introduction: Transthyretin amyloid cardiomyopathy (ATTR-CM) is a rare and an underdiagnosed cause of heart failure (HF). Appropriate local diagnostic and treatment pathways in specialized outpatient clinics are critical to guarantee optimal patient management.
Objectives: To describe our center's three-year experience in diagnosing and treating an ATTR-CM cohort. Secondly, to assess the elegibility to disease-modifying treatment, as per center protocol, and patient outcomes.
Methods: This is a single-center retrospective registry including all-comers with HF due to ATTR-CM between 2019 and 2022. Diagnosis was established according to the previously published algorithm by Gilmore *et al.*, as per site protocol. Each patient had at least 2 hospital visits per-year.
Results: A total of 141 patients were included (mean age 82 ± 6 years-old; 84% male; median NT-proBNP 3,012 pg/mL [IQ 2077 - 7584]; 26% with left ventricle ejection fraction < 50%); median GLS -6.5% [-124 - -7.2]). The majority had ATTR-CM diagnosis confirmed by the non-invasive algorithm - all patients performed 99mTc-HMDP bone scintigraphy (all but one patient with grade 2-3 Perugini) and 13 patients (11%) had endomyocardial-biopsy confirmed ATTR-CM diagnosis. Genetic test was performed in 30% of the patients and gene variants were detected in 9 patients (6%) - most with a Val50Met (n = 5) mutation. A total of 61 patients (43.2%) were started on disease-modifying therapy with tafamidis 61 mg; 33 patients (23%) were considered non-eligible due to poor functional status, severe HF symptoms (NYHA III-IV) or other significant comorbidities. When assessing patients started on tafamidis, these showed a better functional status (mean Karnofsky score 82 ± 15 *vs.* 56 ± 15, p < 0.001; mean frailty score 3 ± 1 *vs.* 5 ± 2, p < 0.001), and lower NT-proBNP (2,626 pg/mL [IQ 1,541-3,711] *vs.* 5,687 pg/mL [IQ 2,520-8,854]). During a median follow up of 12 months [IQ 2.8 - 15]; 22 patients died, of these, 4 were previously prescribed tafamidis. No drug-related severe adverse events were reported. The number of patients in this follow-up increases every year, currently, at a rate of 47 patients per year.



Conclusions: Appropriate ATTR-CM recognition and patient management in specialized rare-disease programs is essential. Early diagnosis through implementation of in-hospital alert pathways may identify ATTR-CM at an earlier stage, thus allowing patients to initiate disease-modifying therapies before cardiac damage ensues and prognosis is irreversibly affected.

Sábado, 15 Abril de 2023 | 16:00-17:00

Sala Vega | Comunicações Orais - Sessão 19 - Saúde digital e economia da saúde

CO 91. THE WAITING 4 SURGERY STUDY - BURDEN OF IN-HOSPITAL CARE

Inês Gomes Campos, Inês Oliveira, Isabel Cruz, Bruno Bragança, Rafaela G. Lopes, Joel Ponte Monteito, Inês Gonçalves, Aurora Andrade

Centro Hospitalar do Tâmega e Sousa, EPE/Hospital Padre Américo, Vale do Sousa.

Introduction: Patients with coronary artery and valvular diseases with surgical indication represent a significant proportion of hospitalizations. The Waiting 4 Surgery study (W4S) aims to better study this group of patients, their burden of hospital care and identify those with event-free admissions. In this work, we analyze both the economical and hospital-care burden of this group of patients.
Methods: Retrospective study of consecutive patients admitted between 2019 and 2021 with coronary artery and/or aortic valve diseases waiting for coronary artery bypass graft (CABG), aortic valve replacement (AVR; surgical or percutaneous) or both. Total admission time and the cost associated with the hospitalization were analyzed. For event-free hospitalization, the following events were considered: death, re-infarction, cardiac pulmonary arrest (CPA), stroke, ventricular tachycardia, acute heart failure (AHF), rest chest pain and reintroduction of intravenous (IV) drugs. We performed a secondary cost analysis for patients with event-free hospitalization after the first 5 days of admission.
Results: Total of 184 patients were included, mean age 67.9 years, 70.1% male, 71.2% submitted to CABG and 20.7% to AVR (6.5% to both). During admission 23.9% of patients reintroduced IV drugs, 20.1% had chest pain, 5.4% had AHF and 2.2% had CPA. No deaths, strokes of re-infarctions were observed. The total time of hospitalization was 3,259 patients/days, representing an occupation rate of 18.6% and a total cost of 1,898,447€ (10,318€/patient and 632,816€/year). Mean admission time was 17.6 days. Total cost for CABG and AVR patients was 1,479 613€ and 594,562€, respectively. Total of 115 patients had an event-free hospitalization (62.5%). The total time of event-free hospitalization was 1,650 patients/days, representing an occupation rate of 9.42% and a total cost of 979 710€ (6,575€/patient and 326,570€/year). Mean event-free admission time was 14.3 days. Total cost for CABG and AVR in event-free patients was 863 155€ and 223,258€, respectively.
Conclusions: The W4S study demonstrates the impact patients waiting for surgery represent in hospital care: a very high economic and logistic burden. The majority of patients showed an event-free admission, and identifying such patients for early discharge and ambulatory management together with surgical centers should be a priority.

CO 92. TELEMONITORING AORTIC VALVULAR INTERVENTION WAITING LIST PATIENTS PROGNOSTIC VALUE

António Maria Rocha de Almeida, Miguel Carias Sousa, Cláudia Magro, Liliana Boieiro, Sandra Sofia, Rita Rocha, Francisco Cláudio, Marta Paralta Figueiredo, Kisa Congo, Lino Patrício

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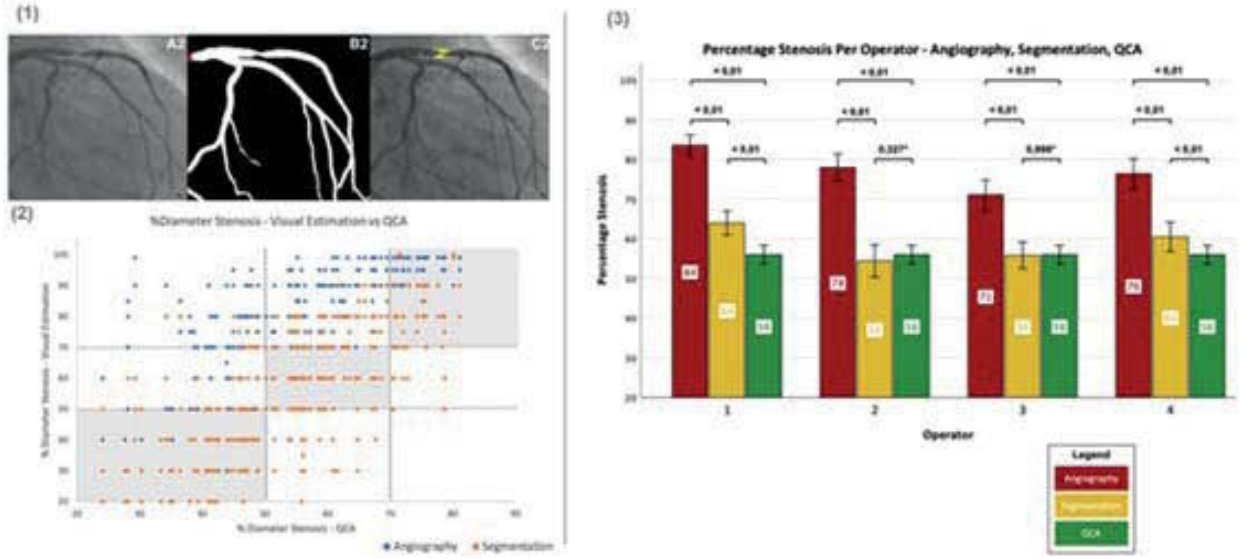
Introduction: Aortic stenosis is the most common valve disease requiring intervention. Severe aortic stenosis has very poor prognosis and early intervention is strongly recommended. However, the pathway needs to be optimized. According to a single clinical risk stratification, the intervention is scheduled, and the patient is listed in the waiting list. To prevent significant clinical and prognosis deterioration while waiting, a telemonitoring program was started, associated with a fast-track pathway to intervention. Telemonitoring program included vital signs, ECG, weight, and symptomatic daily assessment. It required the input of the parameters on platform. Weekly, each patient was contacted to verify his status. The monitoring continued one after month for follow-up. This study aims to evaluate the prognostic value of the telemonitoring program in management of aortic valve intervention waiting list patients.
Methods: Retrospective cohort of 125 patients listed to aortic valve intervention was divided into two groups: one that were on telemonitoring program, of 40 patients, and other of 110 patients that were traditionally schedule, for 18 months.
Results: Population of both groups were not statistical significantly different in terms of age or sex distribution ($p > 0.05$). Of the 125 patients, 108 were subjected to TAVI, 2 to surgical aortic valve replacement. The median waiting time on telemonitored group was 36 days [IR 46], with 3 deaths (7.5%), 2 of cardiovascular cause (5%). 6 patients (23%) were anticipated due to worsening of symptoms: 1 syncope (2.5%), 1 chest pain (2.5%), and 4 dyspnea (2.5%). None was hospitalized while waiting. The median waiting time on non-monitored group was 66 [IR 23] days, with 15 deaths (18%), 3 (4%) of cardiovascular, 6 (7%) of non-cardiovascular and 6 (7%) of unknown cause. 6 (7%) patients were hospitalized when they were listed for TAVI and 4 (5%) were previously listed and were hospitalized when TAVI was performed. There was a statistically significant decrease of mortality and hospitalization in the telemonitored group ($p = 0.05$). There was also a statistically significant shorter period of waiting time on the telemonitored group ($p < 0.05$), due to the anticipation of more symptomatic patients.
Conclusions: The telemonitoring allows the clinical reassessment and re-stratification of the patients on the waiting list. It permits a constant optimization and a dynamically reorganization of the waiting list, verifying whom might benefit more of an earlier intervention, to apply the fast-track pathway.

CO 93. ENHANCING THE EYES OF INTERVENTIONAL CARDIOLOGISTS: IMPACT OF ARTIFICIAL INTELLIGENCE IN OPERATOR ASSESSMENT OF CORONARY LESIONS

Beatriz Valente Silva[1], Miguel Nobre Menezes[2], João Lourenço Silva[3], Tiago Rodrigues[2], João Silva Marques[2], Cláudio Guerreiro[4], João Pedro Guedes[5], Manuel Oliveira Santos[6], Arlindo L Oliveira[3], Fausto J. Pinto[2]

[1]Centro Hospitalar Universitário de Lisboa Norte, EPE/Hospital de Santa Maria. [2]Santa Maria University Hospital CHULN, CAML, CCUL, Lisbon School of Medicine, Universidade de Lisboa. [3]INESC-ID/Instituto Superior Técnico, University of Lisbon. [4]Centro Hospitalar de Vila Nova de Gaia/Espinho, EPE. [5]Centro Hospitalar e Universitário do Algarve, EPE/Hospital de Faro. [6]Centro Hospitalar e Universitário de Coimbra, EPE/Hospitais da Universidade de Coimbra.

Introduction: The assessment of the severity of coronary stenosis is essential for revascularization decisions. Percentage stenosis can be assessed by visual assessment (%DSVE) or quantitative coronary angiography (QCA). However, multiple studies have shown that visual inspection tend to overestimate the percent diameter stenosis compared to QCA. We have previously developed an artificial intelligence (AI) model capable of accurate coronary angiography segmentation. In this study we aimed to assess the impact of segmentation in the operators' perception of lesion severity, by comparing the %DSVE evaluated by angiography *vs.* AI-segmented images.
Methods: Multicentric retrospective study of pts undergoing PCI or invasive physiology in four Portuguese centres. QCA was assessed with a validated software in the angiography images. A dedicated python script was written for measuring the diameters in the AI-segmented images, thus excluding differences between the two image groups. Operators then blindly assessed %DSVE in both the angiography and segmented images, in random order, with two separate sessions (at least a week apart) for each image group. Angiography QCA was used as reference.
Results: We included 123 lesions from a total of 90 patients. There were no significant differences between the angiography and AI-segmented images:



(1) - The three images represent a lesion with a measured QCA of 63% (C2). Average operator $\%DS_{VE}$ was 88% based on angiography (A2) vs 69% based on segmentation (B2)
(2) - Combined scatterplot of angiography and segmentation $\%DS_{VE}$ vs QCA. The difference between the two $\%DS_{VE}$ is visually clear, with much greater overlap with segmentation estimates
(3) - Comparison of visual assessment of stenosis diameter according to operator for both angiography and segmentation compared with QCA

CO 93 Figure

the median difference in lesion diameter was 0.1 mm and the mean QCA was 56 ± 13% *vs.* 55 ± 13% (p = 0.071) in the angiography *vs.* AI-segmented images, respectively. Thus, operators were able to proceed with %DSVE estimation because differences could only be attributed to visual perception rather than actual differences between the two groups. When considering QCA as reference, operators tended to overestimate lesion severity in angiography images (77% ± 20% *vs.* 56% ± 13%, p < 0.001) to a much greater degree than with segmentation (59% ± 20% *vs.* 56% ± 13%, p < 0.001). For lesions with a QCA between 50 and 70%, an even higher discrepancy was found (angiography: 83% ± 13% *vs.* 60% ± 5%, p < 0.001; segmentation: 63% ± 15% *vs.* 60% ± 5%, p < 0.001). Similar findings were observed for QCA < 50% lesions. For lesions with a %DSQCA > 70%, visual estimation was usually in agreement with QCA in both groups. Agreement between visual estimation and QCA across QCA strata (< 50%, 50-70%, > 70%) was approximately double in the segmentation group (60% *vs.* 30%; p < 0.001). Operator heterogeneity was also reduced with segmentation.

Conclusions: Our study suggests that visualization of segmented images seems to render visual estimation of stenosis severity more objective, significantly reducing the tendency to overestimate, while reducing operator heterogeneity. The visual assessment of coronary lesions with segmented images may therefore lead to a lower likelihood of unwarranted revascularization, while potentially increasing the use of functional assessment, as recommended by current guidelines.

CO 94. DIGITAL PATIENT TOOL FOR REPORTING QUALITY OF LIFE AFTER ATRIAL FIBRILLATION CATHETER ABLATION: OUTCOMES FROM A PORTUGUESE HEALTHCARE CENTRE

Rafael Silva Teixeira[1], Mariana S. Brandão[1], João Gonçalves Almeida[1], Paulo Fonseca[1], Cátia Isabel Costa[1], Ana Mosalina Manuel[1], Francisco Ramires[2], Madalena Plácido[2], Martim Sousa[2], Marco Oliveira[1], Helena Gonçalves[1], João Primo[1], Ricardo Fontes-Carvalho[1]

[1]Centro Hospitalar de Vila Nova de Gaia/Espinho, EPE. [2]PROMPTLY Health.

Introduction: Even though symptoms drive indication in AF ablation, they have not been consistently incorporated as standard primary outcomes in ablation trials. Only recently, attention has focused on the benefits of ablation on quality of life (QOL) associated with AF.

Objectives: To determine the magnitude and durability of clinical benefits provided by AF ablation.

Methods: We implemented a digital follow-up (FUP) program for patients (pts) with AF referred for ablation in our high-volume centre since December 2020. FUP included scheduled visits and remote monitoring through a new digital health platform allowing real-time interaction between patients and doctors. The primary outcome was QoL as measured by the AF Effect on QoL (AFEQT) summary score reported by pts using the digital patient-engagement tool. The primary outcome was analysed using a repeated-measures non-linear mixed model with random baseline score, time as fixed effects and month 12 response included as outcome variable. Subgroups analysis examined the effect of baseline AFEQT score on primary outcome.

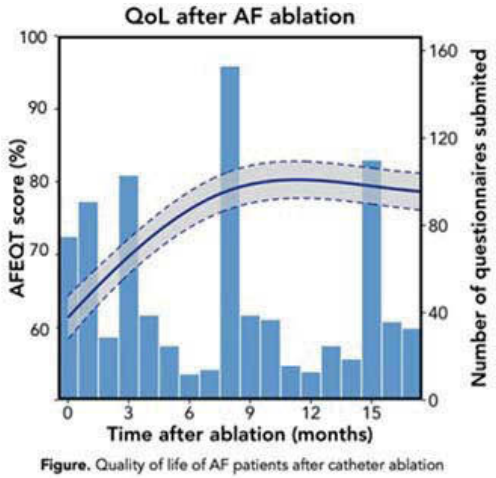


Figure. Quality of life of AF patients after catheter ablation

Results: From the 305 ablations performed, 253 pts were enrolled until September 2022 (age 60 ± 11 years, 33% female, 78% paroxysmal). During FUP time (mean 11.9 ± 5.8 months), 1,225 AFEQT questionnaires were collected from 222 different pts. Overall questionnaire completeness rate was 54.5%. Mean baseline AFEQT score was 64 ± 14 points and 80 ± 16 points at 12 months (absolute improvement of 18 ± 4 points, relative improvement of

33.2 ± 22.0%, p < 0.001). Absolute improvement in QoL varied as a function of baseline AFEQT score (p < 0.001). For patients with the lowest tertile (score range 0-57) the mean improvement was 15.6 ± 14.6 points, the middle tertile (score range 57-70) increased in 17.6 ± 1.9 points and the highest tertile had the highest absolute improvement (22.0 ± 2.3 points). Relative improvement was similar between subgroups (p = 0.07). During FUP, AF recurred in 34 pts (14.5%), 14 of which during the first month of FUP (6%). Less than 7% of pts had at least one emergency department visit (n = 16) and no deaths were reported.
Conclusions: Among pts with symptomatic AF, ablation led to significant improvements in QoL at 12 months, independent of baseline levels.

CO 95. DIGITAL FOLLOW-UP PROGRAM FOR PATIENTS UNDERGOING ATRIAL FIBRILLATION ABLATION: THE EXPERIENCE OF A PORTUGUESE CENTER

Mariana S. Brandão[1], Rafael Silva-Teixeira[1], João Gonçalves Almeida[1], Paulo Fonseca[1], Ana Mosalina Manuel[1], Francisco Ramires[2], Paulo Santos Ferreira[2], Martim Sousa[2], Marco Oliveira[1], Helena Gonçalves[1], João Primo[1], Ricardo Fontes-Carvalho[1]

[1]Centro Hospitalar de Vila Nova de Gaia/Espinho, EPE. [2]PROMPTLY Health.

Introduction: Atrial fibrillation (AF) carries significant burden in health expenditure worldwide. Digital health technology may improve healthcare delivery, but its applicability in clinical practice and related outcomes remain a gap in evidence.
Objectives: To report the implementation of a digital follow-up program (FUP) for patients (pts) submitted to AF ablation in a Portuguese center.
Methods: A digital FUP was implemented at a high-volume ablation center in 2020. The program featured: a web platform for professionals to record Clinician Reported Outcome Measurements (CROMs), during remote medical visits, and access Patient Reported Outcomes Measurements (PROMs); and an app for pts to report symptoms, vital signs, anthropometric and electrocardiographic data, and to complete questionnaires (AFEQT, Epworth, STOP-BANG, nutritional). Completeness rate was defined by the ratio of queries completed/queries sent at each timepoint. The mHealth App Usability Questionnaire (MAUQ) questionnaire was sent to pts and doctors; pts also received a Patient Reported Experience Measure (PREMs) 15 days after the ablation, from which a Net Promotor Score (NPS, -100 to 100) was calculated to express user's satisfaction. This retrospective analysis includes data collected from December 2020 to September 2022.
Results: From the 305 ablations performed, 253 pts were enrolled in the digital FUP: age 60 ± 11 years, 67% male, 78% paroxysmal AF, body mass index 27.4 ± 4.2 kg/m^2. During a mean follow-up time of 11.9 ± 5.8 months, 1120 CROMs were registered; 1,449 PROMs were collected, including 5,865 metrics reported by 90 different pts. App usage, measured by unique logins/month, was recorded in 54% of pts, of whom 13% submitted symptom checks weekly. 160 PREMs were registered; NPS scores for ablation and the app were 85.5 and 31.5, respectively [Fig.]. Questionnaires' overall completeness rate was: 54.5% for AFEQT, 14.4% for Epworth; and 20.8% for STOP-BANG, that identified 55% of pts at high risk for sleep apnea. Nutritional assessment was completed by 18.7%; obese/pre-obese status was found in 21% and 48%, respectively; 18 pts were enrolled in a nutritional program. All doctors "agreed"/"strongly agreed" to overall satisfaction with the app.
Conclusions: The digital FUP was feasible and aided comorbidities assessment. Strategies to improve patient's engagement and digital literacy are warranted. Further studies are needed to evaluate the platform's impact on clinical outcomes.

Sábado, 15 Abril de 2023 | 17:00-18:00

Sala Vega | Comunicações Orais - Sessão 20 - Tromboembolismo pulmonar agudo

CO 96. IN-HOSPITAL MORTALITY AND REPERFUSION RATE IN OCTAGENARIANS WITH HIGH-RISK PULMONARY EMBOLISM: A NATIONWIDE POPULATION-BASED COHORT STUDY IN PORTUGAL FROM 2010 TO 2018

Rita Calé[1], Raquel Ascenção[2], Carolina Bulhosa[3], Hélder Pereira[1], Margarida Borges[2], João Costa[2], Daniel Caldeira[2]

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Introduction: Reperfusion is the standard treatment in high-risk pulmonary embolism (HR-PE) to unload right ventricle and prevent mortality. However, several registries report reperfusion underuse and elderly patients are often undertreated due to the fear of bleeding with thrombolysis. The aim of

Figure. App usability questionnaire - patients' results.

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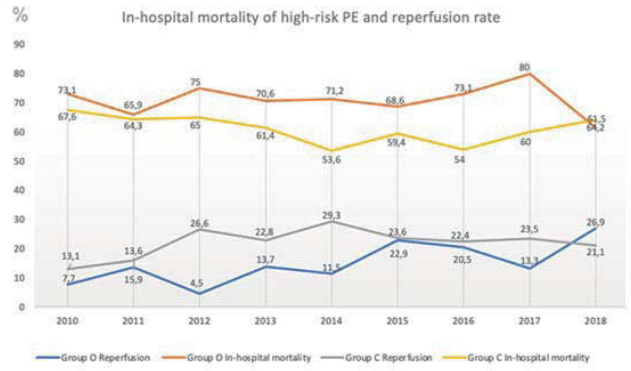
this study was to assess in Portugal, epidemiological data about the rate of reperfusion and mortality of HR-PE in octogenarians (≥ 80 years-old).
Methods: Nationwide population-based temporal trend study on the outcome of HR-PE in octogenarians who were admitted in hospitals of the National Health Service in Portugal between 2010 and 2018. International Classification of Diseases (ICD), 9th and 10th revision, were used. HR-PE was defined as patients with PE who developed shock or cardiac arrest. Patients were divided in two groups: O- octogenarians (≥ 80 years) and C- control group (18-79 years-old). Trends in the use of reperfusion treatment, defined by use of thrombolysis or pulmonary embolectomy, and trends in in-hospital mortality were assessed. Multivariate regression analysis was performed to evaluate the independent predictors to in-hospital mortality.
Results: From 2010-2018, 1,696 pts were hospitalized for HR-PE (group O- 447 pts; group C- 1,249 pts). The mortality in octogenarians with HR-PE was very high and has not significantly decreased over the years (73.1% in 2010 to 61.5% in 2018; R^2 = -0.135; p = 0.829; Figure). The in-hospital mortality is on average 10% higher compared to group C (71.1% *vs.* 60.9%; p = 0.001). Reperfusion therapy (all with systemic thrombolysis) was underuse in octogenarians, but its use has been increasing over the last few years (7.7% in 2010 to 26.9% in 2018, R^2 = 0.484; p = 0.022). There was no registry of surgical pulmonary embolectomy or catheter-directed therapy in group O. There was 1.5% (1 in 68 patients) of intracranial bleeding in octogenarians with HR-PE submitted to thrombolysis (*versus* 2.5% in group C; p = 0.597). In octogenarians, in-hospital mortality was significantly lower in pts who received thrombolytic treatment (52.9% *vs.* 74.2%; p = 0.0004). The independent predictors to in-hospital mortality were age (OR 1.02; 95%CI 1.1-1.02); Charlson Comorbidity Index (OR 1.09; 95%CI 1.04-1.13) and reperfusion (OR 0.56; 95%CI 0.44-0.72).



Legend of figure 1:
In-hospital mortality of high-risk PE in octogenarians and group control (<80 years-old) through the years 2010-2018. Mortality of high-risk PE remained constant and high over the years in both octogenarians (R^2=-0.135; p=0.829) and group C (R^2=-0.115; p=0.196). The rate of reperfusion in patients with high-risk PE was very low but has increased slightly over the years in octogenarians (R^2=0.484; p=0.022). The reperfusion rate maintained constant in group C (R^2=0.099; p=0.212).

Conclusions: In Portugal, systemic thrombolysis in octogenarians was underuse nevertheless its use has been increasing over the last few years. Thrombolytic therapy is associated with lower mortality in elderly with acceptable risk of intracranial bleeding.

CO 97. CLINICAL, ECHOCARDIOGRAPHIC, ANALYTICAL AND IMAGING PARAMETERS: WHICH ARE THE MAIN PROGNOSTIC FACTORS IN HOSPITALIZED PATIENTS WITH ACUTE PULMONARY EMBOLISM?

Fabiana Silva Duarte, Inês Coutinho dos Santos, M. Inês Barradas, André Viveiros Monteiro, Raquel Dourado, Dinis Martins

Hospital do Divino Espírito Santo, Ponta Delgada.

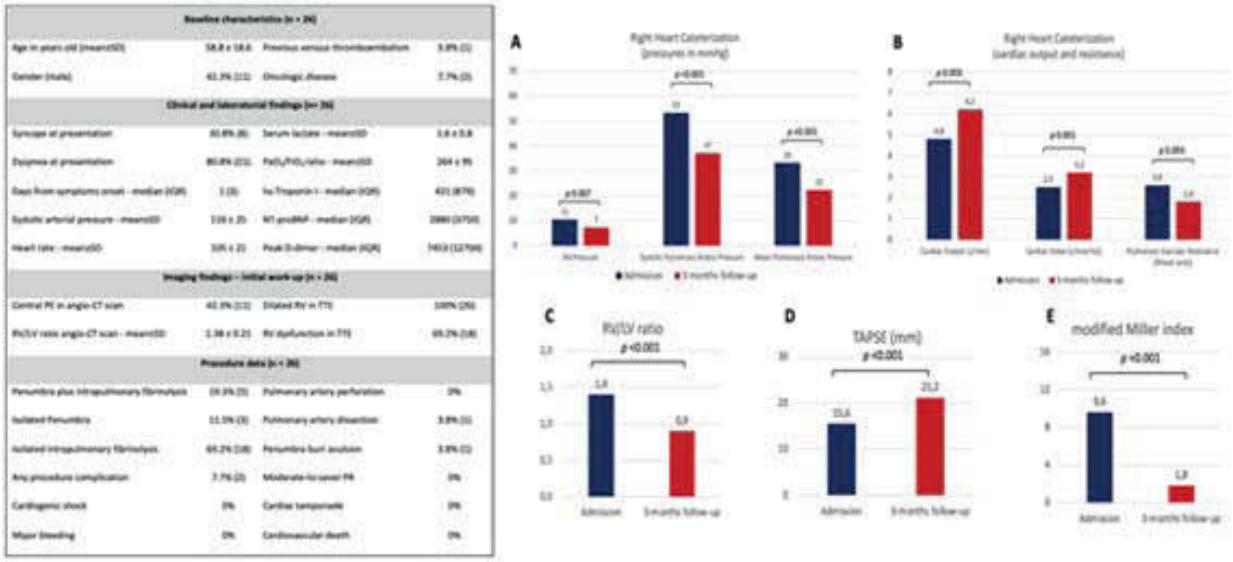
Introduction: Acute pulmonary thromboembolism (PE) is a life-threatening condition and an early diagnosis and adequate therapy are critical. Mortality in PE still remains very high in spite of progress in diagnostic tools. Several parameters for risk stratification have been reported with a variable importance on clinical practice.
Objectives: To compare the performance of different parameters (clinical, echocardiographic, analytical and imaging parameters) in predicting adverse in-hospital events in acute PE.
Methods: We retrospectively assessed consecutive patients from a single center registry who were hospitalized with acute PE. Four different parameters were determined: Clinical and echocardiographic (PESI class and PESI-Echo score), analytical (lactate and troponin I admission values) and anatomical imaging (central or peripheral thrombi location) parameters. A composite outcome of adverse in-hospital events (including cardiogenic shock, acute respiratory failure, severe bleeding events or in-hospital mortality) was determined. Discriminative power of each parameter was assessed by receiver operating characteristic curve analysis.
Results: A total of 131 patients (mean age of 67.6 ± 15.3 years-old, female 71%) were included. Regarding baseline comorbidities, 63.4% of the patients had hypertension, 27.4% had a recent hospitalization or major surgery and 19.8% had a medical history of active cancer. Besides anticoagulation, 7 patients (5.3%) underwent fibrinolysis. Overall in-hospital mortality was 8.4% and 3.8% of the patients had a severe bleeding event, respiratory failure or cardiogenic shock. According to the PESI classification, 29.8% of the patients were included in class V, 26.7% in class III and 17.6% in class II. PESI classification had a weak positive correlation with the outcome (p < 0.001; r = 0.37), like PESI-Echo score (p 0.018; r = 0.36). Attending to in-hospital adverse events, 72.2% occurred in PESI class V patients (p = 0.020). Both analytical parameters (lactate and troponin I) determined at hospital admission had a good discriminative power in predicting the composite in-hospital outcome. Discriminative power was superior for lactate and troponin I (AUC 0.864, 95%CI 2.8-187; p < 0.001) *vs.* imaging data (AUC 0.64, p = 0.12). Comparing all-four parameters, PESI-Echo score had the best discriminative power (AUC 1.0, p = 0.008), followed by PESI class (AUC 0.925) and lactate value at hospital admission (AUC 0.856). The cut-off value for PESI-Echo was 211.
Conclusions: Clinical, echocardiographic and analytical parameters showed overall good performance in stratifying in-hospital adverse events. Its routinely use for risk stratification had significant impact on prognosis.

CO 98. CATHETER-DIRECTED THERAPIES IMPACT ON INTERMEDIATE-HIGH- AND HIGH-RISK PULMONARY EMBOLISM PATIENTS

André Grazina, Bárbara Lacerda Teixeira, Luís Almeida Morais, António Fiarresga, Ruben Ramos, Lídia de Sousa, João Reis, Ana Galrinho, Ana Santana, Helena Teles Antunes, Duarte Cacela, Rui Cruz Ferreira

Centro Hospitalar Universitário de Lisboa Central, EPE/Hospital de Santa Marta.

Introduction: Intermediate-high- and high-risk pulmonary embolism (PE) patients treated with anticoagulation alone are associated with a considerable risk of circulatory collapse, death, or long-term pulmonary hypertension. Pulmonary Embolism Response Teams (PERT) have been created to deliver PE patients a better care. Catheter Directed Therapies (CDT), with mechanical thrombolysis and/or local fibrinolysis allow faster reperfusion and hemodynamic improvement without the systemic hemorrhagic effects of systemic fibrinolysis. The clinical evidence of its benefits is lacking.
Objectives: This analysis aims to describe the hemodynamics, morphological and perfusion improvement in intermediate-high- and high-risk acute PE patients submitted to CDT.
Methods: Prospective registry of consecutive intermediate-high- and high-risk PE patients submitted to CDT (mechanical thrombolysis with Penumbra aspiration system and/or intrapulmonary local fibrinolysis with alteplase) in a single tertiary center. A multiparametric follow-up protocol was designed to evaluate echocardiographic, CT-scan, pulmonary angiogram, and right heart catheterization data at admission and at 3 months after CDT. The paired samples t-Test was used for the analysis of the variables.
Results: 26 PE patients (42.3% male, mean age 59 years old) were submitted to CDT (19% combined Penumbra and local fibrinolysis, 12% isolated Penumbra and 69% isolated local fibrinolysis). Baseline characteristics,



CO 98 Figure

laboratorial, imaging and procedure data are summarized in the Figure. No major bleeding was seen during or after the procedure. 1 pulmonary artery dissection and 1 Penumbra burr partial avulsion occurred, both with conservative treatment with good result. 3 patients died during the follow-up (1 for oncologic disease, 1 for septic shock and 1 after discharge with undetermined cause). Of the remaining, 18 patients completed the 3-month follow-up protocol. At 3 months, a significant improvement was seen in the patients' hemodynamics with 3.3mmHg mean drop of RA pressure (p 0.007), 16.1 mmHg mean drop of systolic PA pressure (p < 0.001), 8.0 mmHg mean drop of mean PA pressure (p < 0.001), 1.4 L/min and 0.7 L/min/m^2 mean increases in cardiac output and index (p 0.003, p 0.001), and a tendency to a 0.8 Wood units decrease in the pulmonary vascular resistance (p 0.093). It was also seen an improvement in the perfusion defects with a mean drop of 7.9 points in the modified Miller index (p < 0.001) and an improvement in the RV function with a mean decrease of 0.5 in the RV/LV ratio by CT-scan (p < 0.001), a mean increase of 5.6 mm in TAPSE (p < 0.001) and a decrease of median NT-proBNP levels in 2,866 pg/ml (p < 0.001).

Conclusions: In patients with intermediate-high- and high-risk PE, the use of CDT with mechanical thrombolysis and/or local fibrinolysis is safe and associated with improvement in hemodynamics, RV function and perfusion defects.

CO 99. ACUTE AND MIDDLE-TERM OUTCOMES OF INTERMEDIATE-HIGH-RISK ACUTE PULMONARY EMBOLISM PATIENTS SUBMITTED TO CATHETER-BASED THERAPY - A SINGLE-CENTRE PILOT STUDY

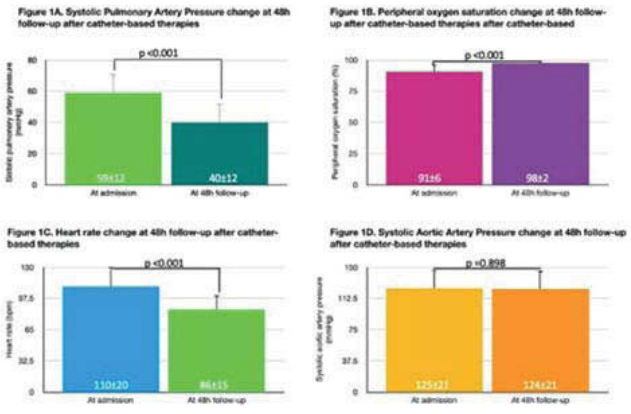
Mariana Sousa Paiva, Sílvio Leal, Daniel A. Gomes, Francisco Albuquerque, Afonso Félix de Oliveira, João Brito, Nélson Vale, Sérgio Madeira, Luís Raposo, Eduardo Infante Oliveira, Pedro de Araújo Gonçalves, Henrique Mesquita Gabriel, Rui Campante Teles, Manuel Sousa Almeida, Miguel Mendes

Centro Hospitalar Universitário de Lisboa Ocidental, EPE/Hospital de Santa Cruz.

Introduction: The increasing evidence of efficacy and safety of catheter-based approaches is changing the treatment paradigm of acute pulmonary embolism (PE). However, the demonstration of their clear prognostic benefit in intermediate-risk patients is still lacking. Our aim was to evaluate the acute and middle-term outcomes of patients with intermediate-high-risk acute PE submitted to catheter-based therapy.

Methods: Retrospective analysis of a single centre cohort study of patients with acute PE of intermediate-high-risk, undergoing percutaneous therapy through mechanical thrombectomy (MT), catheter-derived thrombolysis (CDL) or combined technique. PESI and sPESI scores at admission were calculated. Efficacy endpoints were defined as the change in systolic pulmonary artery pressure (sPAP), heart rate (bpm), systolic blood pressure (SBP) and peripheral oxygen saturation (SpO2) from baseline and 48 hours (mmHg). Safety endpoints were defined as rate of major adverse events, i.e., a composite of death, major bleeding, and device-related serious adverse events (SAE) (intraprocedural clinical deterioration, pulmonary vascular injury, and cardiac injury), at 30 days (%).

Results: From December 2019 to October 2022, 41 patients were submitted to catheter-based therapy for acute PE of intermediate-high-risk, 25 (61%) females, mean age of 60 ± 17 years old. At admission, all patients had RV dilatation and high serum troponin, and the majority (90%) exhibited RV systolic dysfunction. The average PESI was 110 ± 24, and average sPESI was > 1. In total, 10 patients underwent MT, 9 CDL and 22 a combined technique. The average procedure time was 115 ± 61 min. At 48h follow-up, sPAP (59 *vs.* 40 mmHg, p < 0.0001), HR (110 ± 20 *vs.* 85 ± 15 bpm, p < 0.0001) and SpO2 (91 ± 6% *vs.* 97 ± 2%, p < 0.001) were significantly reduced, whereas systolic blood pressure (125 ± 21 *vs.* 124 ± 21 mmHg, p = 0.858) did not differ significantly. In terms of safety at 30 days, the composite endpoint was observed in 15% (n = 7) of the patients, composed by 3 deaths, 2 non-fatal major bleedings, and 2 additional device-related SAE.



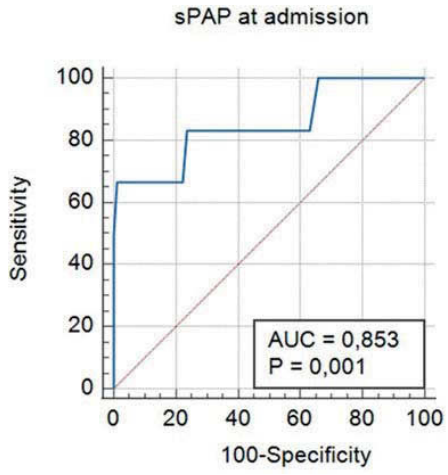
Conclusions: In our series, catheter-based therapy for intermediate-high-risk acute pulmonary embolism showed good acute and middle-term efficacy and safety results with a low 30-day mortality rate. Further studies with a broader population will reinforce these findings.

CO 100. PREVALENCE AND PREDICTORS OF CHRONIC THROMBOEMBOLIC PULMONARY HYPERTENSION FOLLOWING SEVERE FORMS OF ACUTE PULMONARY EMBOLISM

Joana Pargana[1], Rita Calé[2], Mariana Martinho[2], João Santos[2], Patrícia Araújo[2], João Morgado[2], Ernesto Pereira[2], Tiago Judas[2], Sofia Alegria[2], Filipa Ferreira[2], Francisca Delerue[2], Hélder Pereira[2]

[1]Faculdade de Medicina da Universidade de Lisboa. [2]Hospital Garcia de Orta, EPE.

Introduction and objectives: The true prevalence of chronic thromboembolic pulmonary hypertension (CTEPH) after pulmonary embolism (PE) in the Portuguese population remains unknown and underdiagnosis remains a concern. Therefore, we aimed to assess the prevalence and risk factors of CTEPH two years after a symptomatic high (HR) and intermediate-high risk (IHR) PE in a Portuguese referral center for pulmonary hypertension.
Methods: This retrospective cohort study included patients admitted with PE between 2014-2019 in a tertiary care hospital, according to the International Classification of Diseases (ICD-9 and ICD-10) and stratified at the hospital admission in HR and IHR criteria as recommended by European Society of Cardiology (ESC). We evaluated the prevalence of CTEPH in all consecutive pts hospitalized with severe forms of PE who survived 3 months after the acute PE event. Independent predictors of CTEPH were further evaluated by multivariable regression analysis.
Results: Of the 969 pts admitted with PE between 2014-2019, 194 were stratified as HR (5.4%) and IHR (14.7%) PE. After exclusion of the 54 pts who died and 11 pts without follow-up in the first 3 months, 129 pts were included in the analysis. During a median follow-up of 41.0 (24.0-58.5) months, overall prevalence of suspected CTEPH by clinical, Doppler echocardiography and V/Q lung scan was 6.2% (8 pts). CTEPH was confirmed by right heart catheterization in 4 of those pts (3.1%). Increased sPAP at admission (OR 1.12; 95%CI 1.04-1.22; p = 0.005) and the presence of varicose veins in the lower limbs (OR 7.47; 95%CI 1.53-36.41; p = 0.013) were predictors of CTEPH. sPAP at admission > 60 mmHg identified pts with CTEPH at the follow-up with a sensitivity and specificity value of 83.3% and 76.3%, respectively (Figure - ROC curve).



Conclusions: In our cohort, the prevalence of CTEPH in the survivors of severe forms of acute PE was 6.2%. The presence of varicose veins and sPAP at the admission of the index event were identified as early predictors of CTEPH and could assist to early recognition of CTEPH after PE. A systolic pulmonary artery pressure above 60 mmHg at the index event is highly suggestive of acute on chronic CTEPH.

Sábado, 15 Abril de 2023 | 18:00-19:00

Sala Vega | Comunicações Orais - Sessão 21 - Miocardiopatia hipertrófica

CO 101. OUTCOMES AND SAFETY OF DISOPYRAMIDE AND NADOLOL IN A COHORT OF HYPERTROPHIC CARDIOMYOPATHY PATIENTS

Isabel Cardoso, José Miguel Viegas, Pedro Brás, Miguel Marques Antunes, Rita Teixeira, André Grazina, Ana Galrinho, Luísa Branco, Ana Leal, Sílvia Aguiar Rosa, Rui Cruz Ferreira

Centro Hospitalar Universitário de Lisboa Central, EPE/Hospital de Santa Marta.

Introduction: Disopyramide is a class Ia antiarrhythmic, used simultaneously with beta-blockers, to reduce left ventricle outflow tract (LVOT) gradient in hypertrophic cardiomyopathy (HCM) patients (P). Although its efficacy has been proven it is not widely used, in part for risk of arrhythmias. Furthermore, the combination of disopyramide and nadolol has limited access in our country.
Objectives: To evaluate the efficacy and safety of disopyramide and nadolol in a cohort of obstructive HCM P.
Methods: We conducted a retrospective analysis of all HCM P treated with disopyramide and nadolol between January 2020 and October of 2022 at a cardiomyopathy clinic. Disopyramide and nadolol were initiated in symptomatic HCM patients with LVOT obstruction, refractory to maximally tolerated doses of beta-blockers and/or calcium-channel antagonists. The routine initial dose was 100 mg of disopyramide twice a day and nadolol 40 mg twice a day. An electrocardiogram (ECG) was performed at the day of disopyramide initiation and after one week to monitor the QT interval and heart rate (HR). In the absence of relevant corrected QT (cQT) interval prolongation disopyramide was titrated, as well as nadolol according to HR, to twice the dose. Correction for heart rate was made with Fridericia's formula. Clinical and echocardiographic revaluation was performed after 3 months.
Results: 16P were included, 9 females (56%), mean age 54 ± 24 years, 4P (25%) had atrial fibrillation (AF), 8P (50%) had an Implantable Cardioverter Defibrillator (ICD), 2P (13%) underwent Morrow myectomy and 2P alcoholic septal ablation. Regarding the previous medication: 5P (31%) were treated with bisoprolol, 6P (38%) with bisoprolol and verapamil, 2 with carvedilol and 1 with propranolol. The mean basal LVOT gradient was 90 ± 38 mmHg, mean N-terminal pro b-type natriuretic peptide (NT-proBNP) 1,238 ± 1,025 pg/ml. There was a significant reduction in LVOT gradient in P treated with disopyramide and nadolol, mean LVOT gradient after 3 months was 44 ± 30 mmHg (p = 0.047), 3P (19%) had LVOT gradient inferior to 30 mmHg. No recurrence of AF was identified. Of the patients started on disopyramide, 3 developed anticholinergic side effects: two xerostomia and one prostatism. In total 3P discontinued disopyramide: one due to cQT interval prolongation and 2 due to anticholinergic side effects. However, globally there was no significant cQT interval prolongation with disopyramide (p = 0.63) (Table).

	Pre-D+P	Post-D+P	p-value
Heart rate (bpm)	67 ± 11	60 ± 11	0.70
PR (ms)	184 ± 25	188 ± 29	0.67
QRS (ms)	120 ± 26	128 ± 34	0.89
cQT (ms)	426 ± 41	452 ± 44	0.63

Table 1. Electrocardiographic Characteristics Before and After Initiation of Disopyramide and Nadolol. D+P= Disopyramide+Nadolol

Conclusions: Disopyramide and nadolol significantly reduced LVOT gradient, with no significant cQT interval prolongation or major adverse events.

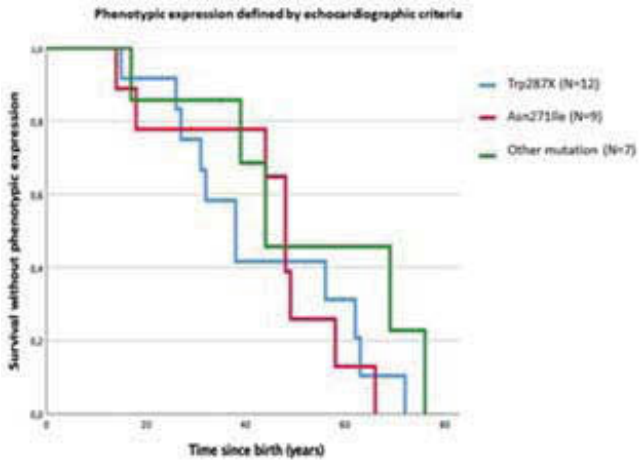
CO 102. PHENOTYPES AND NATURAL HISTORY OF TNNT2 GENE MUTATION CARRIERS WITH FAMILIAL HYPERTROPHIC CARDIOMYOPATHY: A LONG FOLLOW UP STUDY

Catarina Gregório[1], Beatriz Garcia[1], Sofia Morgado[2], Nuno Cortez Dias[1], Oana Moldovan[3], Fausto J. Pinto[1], Hugo Madeira[4], Dulce Brito[1]

[1]Santa Maria University Hospital CHULN, CAML, CCUL, Lisbon School of Medicine, Universidade de Lisboa. [2]Centro Hospitalar Universitário de Lisboa Norte, EPE/Hospital de Santa Maria. [3]Genetic Department, Santa Maria University Hospital CHULN, CAML, CCUL. [4]CCUL, Lisbon School of Medicine, Universidade de Lisboa.

Introduction and objectives: In hypertrophic cardiomyopathy (HCM), variants (Vs) in cardiac troponin T gene *(TNNT2)* have been associated with high risk of sudden cardiac death (SCD) and mild left ventricular hypertrophy (LVH*)*. We did a retrospective longitudinal observational study of a cohort with HCM and *TNNT2* Vs.
Methods: The study group comprised 11 probands with Vs in *TNNT2* gene (G+) and 17 G+ out of 51 relatives. Clinical, ECG and echocardiographic (echo) data, and 5-year estimation risk of SCD applying ESC score, were evaluated at the time of diagnosis (T0) and compared with those at the last follow up (Fup) visit (T1). Lifelong time to disease presentation was estimated by Kaplan-Meier survival analysis method.
Results: At T0, from the 28 genetic carriers, 20 had HCM phenotype (G+Ph+), 8 had no LVH (G+/Ph-). Four different *vs.* were identified by Next Generation Sequencing in the 11 families (F): p.Trp287ter [6F, n = 12]; p.Asn271Ile (2F, n = 9); p.Arg278Cys (2F, n = 5); and p.Lys66Asn (1F, n = 2). Two Vs were known as pathogenic/likely pathogenic; 2 are classified as VUS (Vs of unknown significance), but both co-segregated with the disease in the families. During a median Fup of 13 (8-19) years (y), penetrance of the 4 Vs was 86%. The 20 G+/Ph+ pts, 9 males, aged 44 (30-59)y, had maximal wall thickness (MWT) of 16.5 (14.0-21.0) mm; 6 pts had diffuse LVH and 3 were obstructive. Left atrial dimension (LAD) was 37.0 (33.4-43.3) mm. Three patients (pts) had normal ECG. Thirteen (65%) pts had an uneventful evolution; 7 (35%) needed hospitalization related to HCM, including 2 cases of septal myectomy and 2 that evolved to a dilated phase. No SCD occurred. There were 2 non-cardiac deaths. At T1, MWT was 19.0 (14.0-21.0) mm (p = NS *vs.* T0) but LAD increased significantly [46.3 (38.0-52.6) mm, p < 0.001]; 2 pts had atrial fibrillation; 4 were obstructive forms. The median ESC risk score [1.6 (1-2.6) at T0)] came to 1.9 (1-2.6) and similarly for all the different Vs. Only 4 out the 8 G+/Ph- pts developed LVH but, in the remaining, ECG abnormalities emerged. Groups did not differ in gender, age at diagnosis, and Fup time. All Vs behave similarly regarding echo expression (Figure).

Fig.1. Time to phenotypic expression of disease in twenty-eight *TNNT2* mutation carriers.



Conclusions: HCM associated with *TNNT2* mutations expressed phenotypically at all ages; ECG abnormalities were frequent even in the absence of LVH;LVH was variable, but mild to moderate in most patients; the natural history associated with these 4 variants in the *TNNT2* gene was benign in most patients. No SCD occurred.

CO 103. PERSISTING SYMPTOMS DESPITE OPTIMAL MEDICAL TREATMENT IN PATIENTS WITH OBSTRUCTIVE HCM NOT ELIGIBLE FOR SEPTAL REDUCTION THERAPY: INSIGHTS FROM AN INTERNATIONAL REGISTRY

Mariana S. Brandão[1], Niccolo' Maurizi[2], Brian Claggett[3], Euan A. Ashley[4], Adam S. Helms[5], Neal Lakdawala[6], Michelle Michels[7], Alexandre C. Pereira[8], Sara Saberi[9], Christopher Semsarian[10], James S. Ware[11], Sharlene M. Day[12], Carolyn Y. Ho[6], Iacopo Olivotto[13], on behalf of the Share Registry Investigators (Sarcomeric Human Cardiomyopathy Registry)

[1]Centro Hospitalar de Vila Nova de Gaia/Espinho, EPE. [2]Department of Cardiology, Lausanne University Hospital, Lausanne, Switzerland. [3]Cardiovascular Division, Brigham and Women's Hospital, Boston, MA, USA. [4]Stanford Center for Inherited Heart Disease, CA, USA. [5]Department of Internal Medicine, University of Michigan, USA. [6]Brigham and Women's Hospital, Heart and Vascular Center, MA, USA. [7]Department of Cardiology, Thoraxcenter, Erasmus Medical Center Rotterdam, Netherlands. [8]Heart Institute (InCor), University of Sao Paulo Medical School, Brazil. [9]Department of Internal Medicine, University of Michigan, USA. [10]Agnes Ginges Centre for Molecular Cardiology at Centenary Institute, University of Sydney, Australia. [11]National Heart and Lung Institute and Royal Brompton Cardiovascular Research Centre, Imperial College London, United Kingdom. [12]Department of Medicine, University of Pennsylvania, Philadelphia, USA. [13]Cardiomyopathy Unit, Careggi University Hospital, Florence, Italy.

Introduction: Patients with hypertrophic cardiomyopathy (HCM) and left ventricular outflow tract obstruction (LVOTO) who remain symptomatic despite optimal medical therapy (OMT) may not be eligible to, or compliant with, septal reduction therapies (SRT), including myectomy and alcohol septal ablation. This subset represents an unmet clinical need, potentially amenable to cardiac myosin inhibitors (CMI), new agents targeting the molecular basis of HCM.
Objectives: To evaluate the prevalence, in an international consortium, of patients with obstructive HCM with persisting symptoms despite OMT, fulfilling the enrollment criteria for the EXPLORER-HCM trial.
Methods: In this cross-sectional analysis, we enrolled HCM patients in New York Heart Association (NYHA) class ≥ II at the most recent evaluation, aged ≥ 18 years, with LVOT gradient ≥ 50 mmHg and left ventricular ejection fraction [LVEF] ≥ 55%. Patients on disopyramide were excluded, according to EXPLORER-HCM criteria.
Results: Of 10,225 HCM patients (85% Caucasian, 61.4% male, mean age at diagnosis 44 ± 20 years), 8,874 patients with complete data were included in the analysis, of whom 2067 (23%) had obstructive HCM [Figure]. Of these, 48% had symptoms at baseline, and 39.7% remained symptomatic despite OMT. SRT, mostly myectomy, was performed in 346 patients (42%) of this group. The remaining 474 (59%) patients were not treated invasively (age at diagnosis 54 ± 16 years, 47% male, 15% with pathogenic/likely pathogenic gene variants, mean LVEF 69 ± 7%, mean LVOT gradient 77 ± 39 mmHg). Of these 474, 16.7% (n = 79) were on Disopyramide. According to the EXPLORER-HCM enrollment criteria, 192 of the 474 patients (40%) were potentially eligible for CMI. Eligible patients were mostly female (51%), Caucasian (92%), and were older at diagnosis (56 *vs.* 53 years, p =.038). Most (75%) were in NYHA class II. At baseline, mean maximal wall thickness was 19 ± 5 mm, and LVOT gradient was 91 ± 31 mmHg; mean LVEF was 70 ± 7%; 83.3% had late gadolinium enhancement on cardiac magnetic resonance.
Conclusions: Most patients with obstructive HCM present persisting symptoms despite optimal medical therapy. Of these, less than half undergo SRT; 40% of the remaining symptomatic would be potential

candidates for CMI according to the EXPLORER-HCM criteria. More liberal criteria for CMI introduction (such as the possibility to combine them with disopyramide) would expand the indication by a further 17% in this group. Optimization of care in this pt subset is warranted.

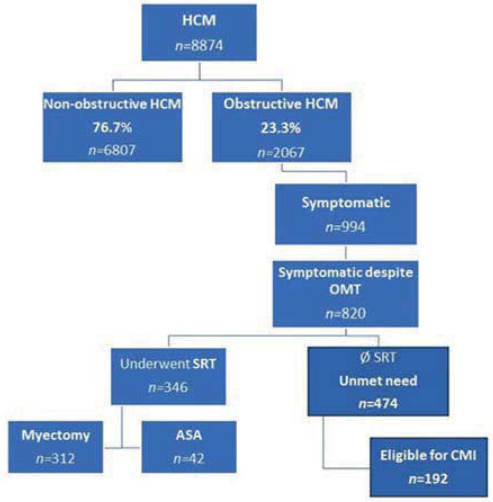


Figure 1. ASA: alcohol septal ablation. CMI: cardiac myosin inhibitor. HCM: hypertrophic cardiomyopathy. OMT: optimized medical therapy. SRT: septal reduction therapy

CO 104. ASSESSMENT OF MYOCARDIAL WORK IN SARCOMERE GENE MUTATION CARRIERS AND OVERT HYPERTROPHIC CARDIOMYOPATHY

Carla Marques Pires[1], Miltiadis Triantafyllou[2], Ricardo Prista Monteiro[3], George Joy[3], Ana Ferreira[3], Konstantinos Savvatis[3], Luís da Rocha Lopes[3]

[1]Hospital de Braga, EPE. [2]Halmstad Hospital. [3]Barts Heart Centre, Barts Health NHS Trust, London.

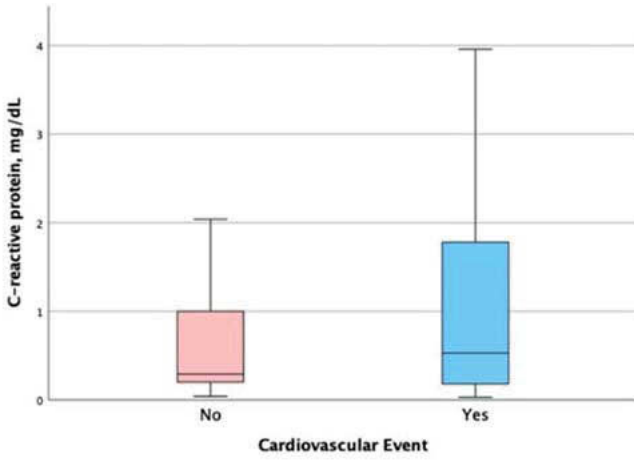
Introduction: Hypertrophic cardiomyopathy (HCM) is a common genetic heart disease defined by unexplained hypertrophy and often characterized by diastolic and systolic dysfunction. In recent studies, HCM patients were found to have impaired left ventricular (LV) myocardial work (MW), a more load-independent parameter compared to global longitudinal strain (GLS). MW was never studied in sarcomere mutation carriers.
Objectives: To compare MW between sarcomere mutation carriers, healthy controls and overt HCM.
Methods: A single centre study with a case-control design. The study population comprised 3 groups: overt HCM patients with a likely pathogenic/pathogenic sarcomere gene variant (n = 51), carriers (n = 51) and age and sex matched (to the carriers) healthy controls (n = 32). All participants (pts) underwent a transthoracic echocardiogram including myocardial deformation analysis to calculate global longitudinal strain (GLS) and MW. MW was calculated from same-day non-invasive blood pressure evaluation. Global work index (GWI), Global constructive work (GCW), Global work efficiency (GWE) and Global wasted work (GWW) were obtained.
Results: GWI (1,695 mmHg% *vs.* 1,869 mmHg%, p = 0.001) and GCW (1,993 mmHg% *vs.* 2,244 mmHg%, p < 0.001) were lower in sarcomere mutation carriers compared to controls. LVEF and GLS were similar between the two groups (p = 0.233). HCM pts were older (p < 0.001), less likely female (p = 0.01) and had a higher prevalence of cardiovascular (Cv) comorbidities, including hypertension (p < 0.001), compared with sarcomere gene mutation carriers. Global work index (GWI) (1,209 mmHg% *vs.* 1,695 mmHg%), global constructive work (1,456 mmHg% *vs.* 1,993 mmHg%, p < 0.001) and global work efficiency (GWE) (89% *vs.* 95%, p < 0.001) were significantly lower in overt HCM compared with sarcomere mutation carriers. GWW was higher (117 mmHg% *vs.* 95 mmHg%, p = 0.006) in overt HCM.
Conclusions: In this study, we show for the first time that MW indexes were significantly worse in sarcomere gene mutation carriers compared to controls. GLS and MW indexes were also significantly different between overt HCM and sarcomere gene mutation carriers. These data suggest that MW is more sensitive to early changes than GLS and could play a major role in the evaluation and follow-up of sarcomere mutation carriers.

CO 105. UNVEILING THE ROLE OF SYSTEMIC INFLAMMATION IN HYPERTROPHIC CARDIOMYOPATHY - A NEW PREDICTOR OF CARDIOVASCULAR EVENTS

Inês Pereira de Miranda, Filipa Gerardo, Mariana Passos, Carolina Mateus, Joana Lima Lopes, Inês Fialho, Marco Beringuilho, David Roque, Carlos Morais, João Bicho Augusto

Hospital Prof. Dr. Fernando da Fonseca, EPE/Hospital Amadora Sintra.

Introduction: Hypertrophic cardiomyopathy (HCM) is an important cause of major cardiovascular events. Appropriate risk stratification is still lacking, with some patients still being overtreated (risk of inappropriate ICD therapies and other ICD-related complications) while others undertreated (risk of sudden cardiac death). Inflammation could play a crucial role in risk stratification.
Objectives: To test systemic inflammation biomarkers in HCM patients to predict long-term cardiovascular events.
Methods: We included all consecutive HCM patients seen at our institution in a 10-year period. We collected data regarding demographic and clinical aspects, as well as systemic inflammation markers such as erythrocyte sedimentation rate (ESR), C-related protein, ferritin and albumin (the latter an inverse/negative marker of inflammation). We analyzed the structural phenotype of HCM using echocardiography and cardiac MRI imaging. Our primary endpoint was a composite of cardiovascular events that included admission for acute/decompensated heart failure, malignant arrhythmia, cardiac syncope, cardiovascular or sudden cardiac death, myocardial infarction, ischemic stroke and/or complete heart block.
Results: A total of 106 HCM patients were included, 52 were male (49.1%), with a mean age of 70 ± 16 years (range 27-95 years). Of note, median CRP levels across all patients were 0.45 (interquartile range 0.19-1.64) mg/dL and median ferritin values were 266 (interquartile range 97-316) ng/mL. The best regression model (using backwards conditional input method) was consistent with a role of CRP (odds ratio [OR] 0.60 [95%CI 0.37-1.00], p = 0.048) and ferritin (OR 1.01 [1.00-1.01], p = 0.049) as independent predictors of primary endpoint. Patients who had a cardiovascular event had significantly higher values of CRP (median 0.53 [0.18-1.78] *vs.* 0.29 [0.20-1.00] mg/dL p = 0.023) and ferritin (median 309 [76-276] *vs.* 177 [155-477] ng/mL, p = 0.032).



Conclusions: Low-grade systemic inflammation is a predictor of cardiovascular events in HCM and likely plays a role in the pathogenesis of the disease. Given the unmet need for therapies in HCM, modulating this inflammatory response could be a novel useful treatment target.

Domingo, 16 Abril de 2023 | 08:30-09:30

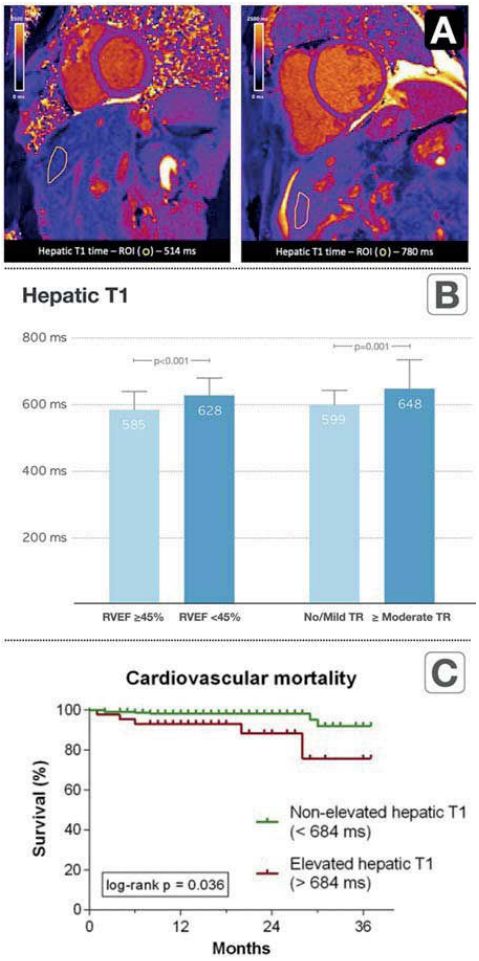
Sala Aquarius | Comunicações Orais - Sessão 22 - Ressonância magnética e cardiologia nuclear

CO 106. HEPATIC T1 MAPPING: A NEW EASILY OBTAINED BIOMARKER FOR HEART FAILURE PATIENTS UNDERGOING CARDIAC MAGNETIC RESONANCE

Rita Reis Santos, Mariana S. Paiva, Pedro Freitas, Sérgio Maltês, Rita Carvalho, Joana C. Pereira, Miguel Domingues, Ana C. Santos, Cláudia Silva, Sara Guerreiro, João Abecasis, Carla Saraiva, Miguel Mendes, António M. Ferreira

Centro Hospitalar Universitário de Lisboa Ocidental, EPE/Hospital de Santa Cruz.

Introduction: Hepatic venous pressure overload and subsequent liver damage are frequent in patients with Chronic Heart Failure (CHF) but are difficult to quantify except in the late stages of disease. Myocardial T1 mapping is now commonly performed in patients undergoing cardiac magnetic resonance (CMR), with short axis images usually intercepting the liver, therefore allowing the opportunistic measurement of hepatic T1 values. The aim of this study was to quantify hepatic T1 values in HF patients undergoing CMR, and to assess its clinical and prognostic significance as a biomarker in this setting.



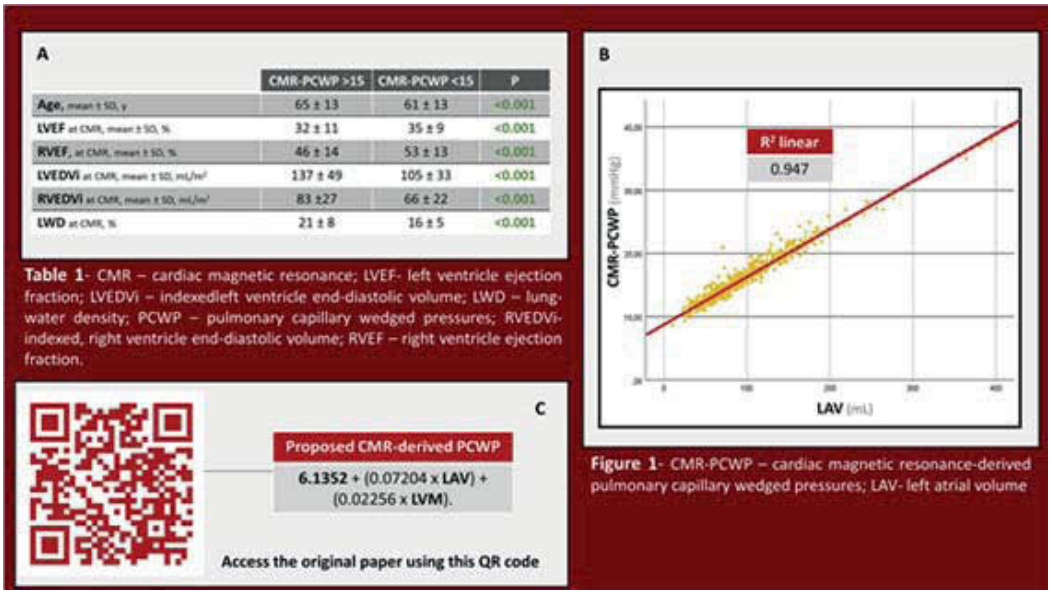
Methods: Consecutive patients with CHF (LVEF £ 50%) who underwent CMR at a single centre since Jan2019 were retrospectively identified. Those with known chronic liver disease, cardiac amyloidosis or suspected alcoholic cardiomyopathy were excluded. Native myocardial T1 mapping [MOLLI 5(3)3 sequence] basal short axis images were used to measure hepatic T1, with the region of interest drawn in the liver, avoiding organ vessels. A control group of subjects without known cardiovascular disease (n = 57) was used to define the limits of normality for hepatic T1 values. The clinical significance of hepatic T1 values was assessed by its relationship with markers of right-sided CHF, and its prognostic value by the association with cardiovascular mortality.
Results: A total of 267 patients (mean age 62 ± 15 years, 69% men, 38% with ischemic cardiomyopathy) were included. Median LVEF was 35% (IQR 26 - 44%) and median RVEF was 51% (IQR 40 - 59%). Overall, 46 patients (17%) had hepatic T1 values above 684 ms (the upper limit of normal for controls). Patients with elevated hepatic T1 had significantly higher RV volumes and lower RVEF (all p values < 0.03). Hepatic T1 values were significantly higher in patients with RVEF < 45% and in those with moderate or severe tricuspid regurgitation (Figure), and were also inversely correlated with RVEF (Spearman R -0.20, p < 0.001). During a median follow-up period of 17 months (IQR 11-24), there were 11 cardiovascular deaths. Elevated hepatic T1 was associated with an increased risk of this endpoint (HR 3.04, 95%CI 1.02-9.11, p = 0.047).
Conclusions: Hepatic T1 values can be easily measured in standard myocardial T1 maps, are associated with markers of right-sided heart failure, and have prognostic value in patients with HF. Further studies are warranted to assess the potential clinical usefulness of this new biomarker.

CO 107. CRITICAL APPRAISAL OF A NON-INVASIVE MODEL TO DERIVE PULMONARY CAPILLARY WEDGE PRESSURE FROM CARDIAC MAGNETIC RESONANCE IN HEART FAILURE PATIENTS - LOOK BEFORE YOU JUMP

Sérgio Maltês, Mariana Sousa Paiva, Rita Reis Santos, Bruno M.L. Rocha, Gonçalo J.L. Cunha, Joana Pereira, Rita Carvalho, Miguel Domingues, Cláudia Silva, Sara Guerreiro, Pedro Freitas, João Abecasis, Miguel Mendes, António M. Ferreira

Centro Hospitalar Universitário de Lisboa Ocidental, EPE/Hospital de Santa Cruz.

Introduction: Cardiac magnetic resonance (CMR) is increasingly used to assess heart failure (HF) patients, but the hemodynamic information it provides is somewhat limited. Recently, a large study proposed a physiological model to estimate pulmonary capillary wedge pressure from CMR data (CMR-PCWP). Our goals were to assess the clinical determinants and correlates of this new tool, as well as to determine its prognostic significance in HF patients.
Methods: Consecutive patients with HF and left ventricular ejection fraction (LVEF) < 50% were identified in a single center CMR registry. Standard measurements of left ventricular mass (LVM) and biplanar left atrial volume (LAV) were used to calculate CMR-PCWP as per the proposed model: 6.1352 + (0.07204 × LAV [mL]) + (0.02256 × LVM [g]). We evaluated the correlation between CMR-PCWP and other parameters, including lung water density (LWD- lung-to-liver signal ratio in parasagittal HASTE images). The prognostic significance of CMR-PCWP was assessed using a composite endpoint of all-cause death or HF hospitalization.
Results: A total of 578 patients (mean age 63 ± 14years, 72% male, mean LVEF 34 ± 10%, 45% ischemic etiology) were included. Mean CMR-PCWP was 16 ± 4 mmHg, with 298 patients (52%) showing values ≥ 15 mmHg. Patients with elevated CMR-PWCP were older, had lower LVEF and RVEF, higher ventricular volumes and higher LWD values (Table, Figure A). CMR-PCWP showed a moderate correlation with LWD (Spearman's R 0.42, p < 0.001) and a reasonable discriminative power to identify those with elevated LWD (AUC ROC curve 0.695, p < 0.001). During a median follow-up of 25 (13-51) months, there were 69 deaths and 72 HF hospitalizations. CMR-PCWP was an independent predictor of the primary endpoint (HR 1.08, 95%CI 1.04-1.12, p < 0.001), alongside with age (HR 1.02 per year, 95%CI 1.004-1.040, p = 0.014), NYHA (HR 1.34 per class, 95%CI 1.07-1.68, p = 0.010) and NT-proBNP (HR 1.004 per 100 pg/mL, 95%CI 1.002-1.006, p < 0.001). However, a very



CO 107 Figure

strong correlation was found between CMR-PCWP and LAV, where 95% of the variance (R^2 = 0.947, Figure B) of CMR-PCWP is explained solely by LAV. The discriminative power of CMR-PCWP and LAV to predict events was similar (AUC 0.67 *vs.* 0.67, p-value for comparison = 0.724).
Conclusions: In this cohort of patients with HF and LVEF < 50%, CMR-derived PCWP seems to be a mere surrogate of LAV and is unlikely to add any useful diagnostic or prognostic information to other already established CMR measurements.

CO 108. UTILIZATION OF 18-FDG-PET/CT IN THE DIAGNOSIS OF PROSTHETIC VALVE ENDOCARDITIS

Gonçalo Ferraz Costa, Gonçalo Terleira Batista, Diogo Fernandes, Eric Monteiro, Joana Guimarães, Ana Luísa Silva, Mariana Simões, Tatiana Santos, Ana Vera Marinho, Gracinda Costa, Rodolfo Silva, Lino Gonçalves, Maria João Ferreira

Centro Hospitalar e Universitário de Coimbra, EPE/Hospitais da Universidade de Coimbra.

Introduction: The diagnosis of infective endocarditis (IE) remains a clinical challenge. Diagnostic accuracy of the modified Duke criteria is suboptimal for native valve endocarditis (NVE) and even worse in the presence of prosthetic valve infection (PVE). We aim to evaluate the diagnostic performance of 18F-FDG PET in patients with suspected IE referred to perform PET/CT.
Objectives: We aim to understand the diagnostic value of 18F-FDG PET/CT in suspected PVE.
Methods: A retrospective study was performed at a tertiary center with 18F-FDG PET/CT and included all referred patients for this exam for suspected IE between May 2016 and January 2022. The choice to perform 18F-FDG PET/CT and the IE suspicion were based on the attending endocarditis team and did not follow a standardized protocol. Baseline demographic characteristics of patients, including all relevant clinical data, were collected from hospital records at hospital admission. The final diagnosis of IE (gold standard) was established by consulting the final diagnosis attributed to the patient by the Endocarditis team at the time of hospital discharge or death, after possession of clinical, microbiological, and imaging information as well as clinical response. Sensitivity, specificity, and positive and negative predictive values of 18F-FDG PET/CT in the evaluation of PVE were estimated.
Results: In total, 87 patients were included (mean age of 62 ± 19 years, 62% of the male gender), of which 38 had at least one prosthetic valve. In the latter group, approximately 71% were male, with a median age of 63 (IQR 59-77) years. 26% were diabetic, 66% had dyslipidaemia and 74% were hypertensive. Regarding the prothesis characteristics, 71% had an aortic position, 18% mitral position and the rest had multiple valve prothesis. 58% had biological valves, 5% of the patients had both mechanical and biological and one patient (3%) had a Mitraclip. Additionally, one single patient had prosthetic material due to previous truncus arteriosus surgical correction. Fever was present in 84% of patients and 16% had signs of heart failure. Moreover, 13% had evidence of vascular phenomena. One patient, who also had an implanted cardiac device, had pocket infection signs. Laboratory results showed a mean CRP of 14.3 mg/dL and mean leucocyte count of 10.8 G/L. Only 47% had a positive blood culture. 37.5% had echocardiographic findings suggesting IE with the presence of vegetations in 77% of these. According to the Duke Criteria, 55% were classified as “possible diagnosis”, 29% with “definitive diagnosis” and 13% as “rejected diagnosis”. Of the suspected PVE patients, compatible findings in 18F-FDG PET/CT observed in 25 patients. Calculated sensibility was 95% and specificity was 86%.
Conclusions: Our study suggests that 18F-FDG PET/CT is a great imaging tool of for patients with PVE suspicion.

CO 109. DIAGNOSTIC VALUE OF 18-FDG-PET/CT IN THE DIAGNOSIS OF CARDIAC IMPLANTABLE DEVICES

Gonçalo Terleira Batista, Gonçalo Ferraz Costa, Ana Luísa Silva, Mariana Simões, Tatiana Santos, Eric Monteiro, Joana Guimarães, Diogo Fernandes, Rafaela Fernandes, Ana Vera Marinho, Gracinda Costa, Rodolfo Silva, Lino Gonçalves, M.J. Ferreira

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Introduction: The diagnosis of infective endocarditis (IE) remains a clinical challenge. Diagnostic accuracy of the modified Duke criteria is suboptimal, particularly in the presence of cardiac implantable electronic devices (CIED).
Objectives: We aim to understand the diagnostic value of 18F-FDG PET/CT in suspected CIED infection.
Methods: A retrospective analysis was performed at a tertiary center with 18F-FDG PET/CT and included all referred patients for this exam for suspected IE between May 2016 and January 2022. The choice to perform 18F-FDG PET/CT and the IE suspicion was based on the attending endocarditis team and did not follow a standardized protocol. Baseline

demographic characteristics of patients, including all relevant clinical data, were collected from hospital records at hospital admission. The final diagnosis of IE (gold standard) was established by consulting the final diagnosis attributed to the patient by the Endocarditis team at the time of hospital discharge or death, after possession of clinical, microbiological, and imaging information as well as clinical response. Sensitivity, specificity, and positive and negative predictive values of 18F-FDG PET/CT in the evaluation of CIED infection were estimated.
Results: In total, 87 patients were included (mean age of 62 ± 19 years, 62% of the male gender), of which 10 had CIED. In this subgroup, approximately 45% were male, with a median age of 75 (IQR 60-83) years. Moreover, 40% were diabetic, 65% had dyslipidemia and 75% were hypertensive. Regarding the CIED, pacemaker was the most common device found (65%), followed by cardiac resynchronization therapy defibrillator (15%), cardiac defibrillator (10%), and cardiac resynchronization therapy pacemaker (5%). Fever was present in 80% of patients and 40% had signs of heart failure. However, only one patient presented with signs of pocket infection. Laboratory results showed a mean C-reactive protein of 15.9 mg/dL and a mean leucocyte count of 10.5 G/L. Only 55% had a positive blood culture and 40% had echocardiographic findings suggesting IE with 26% presenting with moderate-severe valve regurgitation. According to the Duke Criteria, 60% were classified as "possible diagnosis", 20% with "definitive diagnosis"; and 20% as "rejected diagnosis". Of the suspected CIED infection patients, compatible findings in 18F-FDG PET/CT were observed in 7 patients. Calculated sensibility was 78% and specificity was 100%.
Conclusions: Our study suggests that 18F-FDG PET/CT is a great imaging tool for patients with CIED infection suspicion.

CO 110. AORTIC VALVE MICROCALCIFICATION ASSESSED BY 18F-SODIUM FLUORIDE POSITRON EMISSION TOMOGRAPHY/ COMPUTED TOMOGRAPHY: IS THERE A LINK BETWEEN VALVE UPTAKE AND CARDIOVASCULAR RISK?

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Introduction: Positron emission tomography-computed tomography (PET-CT) with 18F-sodium fluoride (18F-NaF) has been used in clinical research to characterize active microcalcification in aortic valve disease. However, its role in apparently healthy patients remains unknown. We aimed to characterize the aortic valve uptake of 18F-NaF in patients with high cardiovascular (CV) risk without known aortic valve disease.
Methods: Forty high CV-risk individuals without previous CV events or known aortic valve disease were scanned with 18F-NaF PET-CT. Aortic valve uptake of 18F-NaF was evaluated in 3-D multiplanar fusion images, considering top to bottom of the aortic valve for the establishment of circular regions of interest (ROI) around the valve. Maximum and mean standardized uptake values (SUV) estimated for each slice and the whole valve were corrected for blood-pool activity (mean of five ROI in the mid lumen of superior vena cava) by subtraction (corrected uptake per lesion, CUL) and division (tissue to background ratio, TBR). All patients underwent transthoracic echocardiography for aortic valve evaluation.
Results: The patients presented a mean age of 64.63 ± 8.87 years and 65% were males. The mean SCORE2 was 13.28 ± 8.48 and the mean ASCVD was 32.30 ± 20.55. Median CUL was 0.52, IQR 0.41-0.64, and median TBR was 1.62, IQR 1.47-1.75. The mean peak aortic valve velocity was 1.71 ± 0.41 m/s while the mean peak and mean gradients were 12.18 ± 5.47 mmHg and 6.50 ± 3.13 mmHg, respectively. Only 2 patients fulfilled the echocardiographic criteria for mild aortic stenosis. Patients were grouped according to the 50th percentile of both the ASCVD risk score and the SCORE2. Maximum SUV was associated with higher CV risk predicted by ASCVD risk score (1.60, IQR 1-30-2.10 *vs.* 1.30, IQR 1.25-1.55; p < 0.01) and SCORE2 (1.60, IQR 1.30-1.95 *vs.* 1.30, IQR 1.15-1.65; p = 0.02), but not mean SUV. After correction for blood-pool activity, higher CV risk was associated with increased CUL both for ASCVD risk score (0.59, IQR 0.52-0.92 *vs.* 0.44, IQR 0.28-0.53; p < 0.01) and SCORE2 (0.59, IQR 0.52-0.84 *vs.* 0.43 0.27-0.53; p < 0.01). Higher CV risk was also associated with increased TBR, both for ASCVD risk score (1.71, IQR 1.59-1.77 *vs.* 1.51, IQR 1.25-1.66; p < 0.01) and SCORE2 (1.70, IQR 1.59-1.77 *vs.* 1.51, IQR 1.25-1.66; p < 0.01). There were no significant correlations between echocardiographic variables and neither maximum SUV, mean SUV, CUL, nor TBR.
Conclusions: Increased aortic valve uptake of 18F-NaF is associated with higher CV risk predicted by ASCVD risk score and SCORE2. In this cohort without known aortic valve disease, there was no link between aortic valve uptake of 18F-NaF and echocardiographic variables. Further studies with larger populations must confirm these findings and evaluate the potential role of increased aortic valve uptake of 18F-NaF in predicting disease progression.

Domingo, 16 Abril de 2023 | 08:30-09:30

Sala Vega | Comunicações Orais - Sessão 23 - Intervenção valvular aórtica percutânea

CO 111. COMPARISON OF MORTALITY SCORES PERFORMANCE IN TRANSCATHETER AORTIC VALVE REPLACEMENT: SUITING UP TO PERCUTANEOUS INTERVENTION

Pedro Alves da Silva, Beatriz Silva, Joana Brito, Ana Margarida Martins, Beatriz Garcia, Catarina Oliveira, Miguel Raposo, Ana Abrantes, Catarina Gregório, Daniel Cazeiro, Cláudia Jorge, Miguel Nobre Menezes, Pedro Carrilho-Ferreira, Pedro Pinto Cardoso, Fausto J. Pinto

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Introduction: As transcatheter aortic valve replacement (TAVR) is increasingly relevant for patients with severe symptomatic aortic stenosis, having a reliable procedure specific risk-prediction tool is paramount to provide high-quality care. Surgical scores as the EuroScore II and the Society of Thoracic Surgeons (STS) score II have been widely used to identify patients with high surgical risk in whom percutaneous treatment might be more favorable. However, current literature lacks a consensual specific predictive model for short-term and mid-term prognosis in patients undergoing transcatheter aortic valve implantation (TAVI).
Objectives: We aimed to access short and midterm (30 days and one year) mortality and to access the ability of a directly adapted score in estimating mortality in a real-world population.
Methods: We conducted a retrospective observational study in patients who implanted TAVR in a single center. Surgical mortality scores - EUROSCORE II and STS score II - and adapted score Society of Thoracic Surgeons (STS)/ American College of Cardiology (ACC) transcatheter valve therapy (TVT) score were used to estimate mortality. Predictive abilities of these three scores were compared using area under the receiver operating characteristics (ROC) curve for 30-day and one year mortality.
Results: From January 2018 to December 2021, 416 patients were submitted to TAVR procedure in our center. The mean age was 83+-6 years old and 229 (55%) were female. 94% had hypertension, 80% dyslipidemia, 40% diabetes *mellitus*, 35% coronary artery disease, 32% chronic kidney disease. Mean ejection fraction was 56%. During a mean follow-up (FUP) of 816 ± 492 days, 30-day mortality was 1.7% and after 1 year mortality rate was 12.2% (higher than reported in PARTNER 3 trial, 8.5%). The Mean EuroSCORE was 3.4 ± 3.2, mean STS-II 3.9 ± 1.8 and mean value for STS/ACC-TVT score was 3.55 ± 1.34.

ROC curve analysis showed a significantly higher discriminative power of STS/ACC-TVT (AUC 0.749, 95%CI 0.681-0.818) compared with surgical scores (p = 0.001) (Figure). We also divided population into quartiles and compared the mortality rate at 30 days and 1 year in each quartile using either STSII or STS/ACC-TVT; As can be seen in figure 2, mortality rates correlated better with the STS/ACC-TVT score than with the STS score.

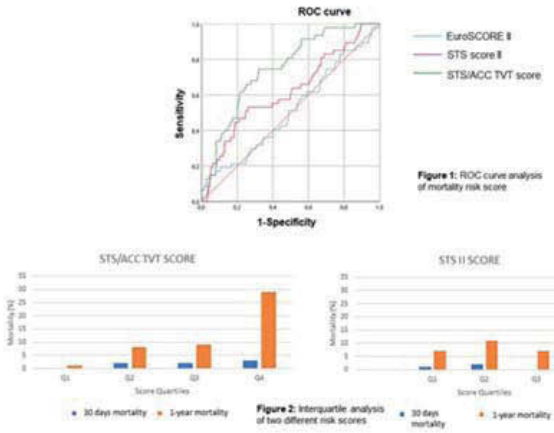

Figure 1: ROC curve analysis of mortality risk score

Figure 2: Interquartile analysis of two different risk scores

Conclusions: A score adapted to a TAVI population showed better predictive capacity than traditional surgical scores. Less preponderance of previous surgical status, relevance of access site and more adapted weight of age might explain the best performance of STS/ACC-TVT score. Surgical scores are helpful in choosing treatment option, but adapted scores are better to predict pos-TAVR mortality.

CO 112. OVERCOMING AGE BORDERS: TAVI FOR NONAGENARIANS - A SINGLE CENTER EXPERIENCE

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Introduction: Transcatheter aortic valve implantation (TAVI) is now recommended as the standard treatment for the elderly with severe aortic stenosis (AS). Nonetheless, there is scarce data regarding short- and middle-term outcomes in patients ≥ 90 years.
Objectives: The aim of our study was to describe procedural characteristics and clinical outcomes of a cohort of nonagenarians submitted to TAVI at our center.
Methods: Single-center retrospective analysis on prospectively collected data of consecutive patients ≥ 90 years that integrated our program, undergoing TAVI from 2008 to 2021. Successful TAVI, procedural complications, and 30-day/1-year mortality rates were defined according to the VARC-2 definition. We performed a sub-group analysis by dividing the cohort in tertiles according to the date of the procedure.
Results: Ninety patients were included with a mean age 92 ± 2 years, 69% women, and a mean EuroSCORE II of 6 ± 3% (Table). A total of 34 patients (38%) had coronary artery disease, 28 (31%) had chronic kidney disease (CKD), 12 (13%) had peripheral artery disease, and 11 (12%) had a previous stroke. At baseline, mean aortic gradient was 54 ± 17 mmHg and 73 (81%) patients had preserved left ventricular ejection fraction. The transfemoral approach was used in most patients (96%), and in 75 (83%) a self-expanding valve was implanted. TAVI was successfully implanted in all patients. The median in-hospital time was 9 (IQR 5-23) days and most common side effects were need for permanent pacemaker implantation (n = 15, 17%) and access-related bleeding (BARC 2 and 3a types) in 11 (12%) patients. All-cause mortality at 30 days and 1 year were 7% and 14%, respectively. The mean survival was 3.0 ± 2.0 years, comparing favorably to the expected mean survival for the cohort based on life expectancy tables (weighted mean of 2.8 ± 0.4, Portuguese National Institute of Statistics), although not reaching statistical significance. Furthermore, in our sub-group analysis, we observed that 30d and 1y mortality has gradually improved over the years (p < 0.05 for the 1st *vs.* 2nd and 3rd tertiles, Table).

Table 1. Baseline characteristics and outcomes in nonagenarians submitted to TAVI between 2008 and 2021

Clinical characteristics	Total patients (n=90)
Age – years	92±2
Female sex – no. (%)	62 (68.9)
EuroSCORE II* – %	6±3
NYHA class – no. (%)	
II	38 (42.2)
III or IV	52 (57.8)
Coronary artery disease – no. (%)	34 (37.8)
Previous myocardial infarction – no. (%)	10 (11.1)
Previous coronary intervention – no. (%)	
CABG	2 (2.2)
PCI	24 (26.7)
Permanent pacemaker – no. (%)	11 (2.2)
Echocardiography	
Mean aortic-valve gradient – mmHg	54 ±17
Mean LVEF – (%)	55±9
Procedural characteristics	
Self-expandable valve – no. (%)	73 (81.1)
Transfemoral access – no. (%)	86 (95.6)
Clinical outcomes	
Vascular complications – no. (%)	5 (5.6)
Major bleeding – no. (%)	4 (4.4)
New pacemaker – no. (%)	15 (16.6)
Stroke or TIA – no. (%)	3 (3.3)
30-day all-cause mortality – no. (%)	6 (6.6)
1st tertile (November 2009 – December 2016)	4 (4.4)[a]
2nd tertile (January 2017 – December 2018)	2 (2.2)[b]
3rd tertile (January 2019 – December 2021)	0 (0)[c]
1-year all-cause mortality – no. (%)	13 (14.4)
1st tertile (November 2009 – December 2016)	8 (8.9)[c]
2nd tertile (January 2017 – December 2018)	2 (2.2)[d]
3rd tertile (January 2019 – December 2021)	3 (3.3)[d]

Plus-minus values are means ± standard deviation. CABG denotes coronary-artery bypass grafting, COPD chronic obstructive pulmonary disease, LVEF left ventricular ejection fraction, NYHA New York Heart Association, PCI percutaneous coronary intervention, TIA transient ischemic attack, TAVI transcatheter aortic-valve implantation.
* Frailty was determined by the heart team according to prespecified criteria.
† Moderate or severe mitral regurgitation was defined as regurgitation of grade 3+ or higher.
[a,b,c,d] Each subscript letter denotes a subset of categories whose column proportions do not differ significantly from each other at the 0.05 level.

Conclusions: In our cohort of nonagenarian patients with severe aortic stenosis, TAVI procedures were performed successfully, with low risk of severe complications, and excellent age-adjusted survival rates. These data illustrate that age alone should not discourage adequate treatment of these patients.

CO 113. AORTIC INSUFFICIENCY IN PATIENTS WITH AORTIC STENOSIS SUBMITTED TO TAVR: DOES IT INFLUENCE THE OUTCOME?

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Introduction: Transcatheter aortic valve replacement (TAVR) has become a mainstay therapy for high-risk patients with symptomatic severe aortic stenosis (AS). Many of the landmark trials that studied the role of TAVR in patients with severe AS did not include subjects with mixed aortic valve disease (MAVD), and hence it has been challenging to extrapolate the excellent outcomes of TAVR to this group of patients. The incidence of MAVD is expected to increase because of an aging population and an associated increase in the incidence of degenerative heart valve disease. The natural course of these patients seems to be worse than those with either pure AS or AR and prior studies evaluating the utility of TAVR in treating MAVD have had mixed results, and the outcomes remain unclear.

Objectives: In this analysis we sought to report the short-term outcomes after TAVR among patients with MAVD compared to those with pure AS.
Methods: Single center, retrospective, observational study including patients who underwent transfemoral-access TAVR for severe valve AS. Data was collected from the electronic medical records. Patients were classified according to the nature of the valve disease: mixed aortic valve disease (MAVD), defined as severe AS and at least moderate aortic regurgitation (AR) or pure severe AS (with no or trivial AR). The primary endpoint was the composite of all-cause mortality, heart failure hospitalization or stroke.
Results: A total of 244 patients (median age 83 years, 45.9% male) were included in this analysis. Among these, 62 patients (25%) had MAVD. Overall, patients with MAVD had less prevalence of diabetes *mellitus*, and previous percutaneous coronary intervention and showed lower left ventricular ejection fraction (LVEF); higher NTproBNP at admission and higher length of stay (Table). The MAVD group also had a higher prevalence of post-TAVR AR (24.6% *vs*. 12.8%; p = 0.029), but no differences were observed in the primary endpoint, despite pure AS showing numerically higher rates of events (13.5% in pure AS group *vs*. 8.1% in the MAVD group, p = 0.142).

Table 1.

	All patients (n = 244)	Pure AS (n = 182)	MAVD (n = 62)	*p value*
Age – yrs	83 [78-86]	83.0 [78.5-86]	83.0 [75.8-85.0]	*0,249*
Male sex	112 (45.9)	86 (47.3)	26 (41.9)	*0.468*
Body mass index	26.7 [23.9-29.7]	27.3 [24-30]	25.4 [23.1-27.7]	***0.048***
Hypertension	194 (79.5)	147 (80.8)	47 (75.8)	*0.403*
Diabetes mellitus	78 (32)	66 (36.3)	12 (19.4)	***0.014***
Dyslipidemia	174 (71.3)	131 (72)	43 (69.4)	*0.693*
Smoking history	25 (10.2)	16 (8.8)	9 (14.5)	*0.199*
Atrial fibrillation	86 (35.4)	65 (35.9)	21 (33.9)	*0.772*
Previous ACS	27 (11.1)	19 (10.4)	8 (12.9)	*0.593*
Previous PCI	76 (31.1)	64 (35.2)	12 (19.4)	***0.020***
Previous CABG	12 (4.9)	9 (4.9)	3 (4.8)	*0.973*
Pulmonary disease	29 (11.9)	20 (11)	9 (14.5)	*0.459*
PVD	60 (24.6)	48 (26.4)	12 (19.4)	*0.268*
Hemoglobin, g/dL *	12.2 [10.9-13.3]	12.2 [10.9-13.3]	11.9 [11.0-13.3]	*0,598*
Creatinine, mg/dL *	0.98 [0.80-1.41]	0.97 [0.81-1.41]	0.99 [0.79-1.40]	*0,964*
NTproBNP, pg/mL *	2205 [940-5547]	1873 [876-4645]	3281 [989-7912]	***0,025***
AV Mean Gradient, mmHg	45 [40-55]	45 [40-55]	45 [40-56]	*0,869*
LVEF, %	56 [47-60]	57 [50-60]	55 [44-60]	***0,020***
Other significant valve disease	82 (34.3)	60 (33.7)	22 (36.1)	*0.738*
Transcatheter aortic valve				
Self-expanding	209 (85.7)	154 (84.6)	55 (88.7)	*0.427*
Need for pacemaker	51 (20.1)	39 (21.4)	12 (19.4)	*0.674*
Vascular complications	21 (8.6)	15 (8.2)	6 (9.7)	*0.728*
Post-TAVR AR	38 (15.8)	23 (12.8)	15 (24.6)	***0.029***
Length of stay (days)	4 [3-5]	3 [3-5]	4 [3-7.3]	***0.002***
Primary endpoint	33 (13.5)	28 (15.4)	5 (8.1)	*0.142*

Values are median [interquartile range] or n (%)
* Values at admission
ACS, Acute coronary syndrome; AR, Aortic regurgitation; AV, Aortic valve; LVEF, Left ventricular ejection fraction; PVD, Peripheral vascular disease; PVL, Paravalvular leak; TAVR, Transcatheter aortic valve replacement.

Conclusions: TAVR in MAVD is not associated with worse outcomes, despite higher prevalence of post-TAVR AR and lower LVEF. This could be explained by LV remodeling induced by concomitant AR, making it easier for these patients to tolerate post-TAVR AR.

CO 114. AF IN TAVR PATIENTS: DOUBLE TROUBLE MEANS DOUBLE CARE

Catarina Gregório, Pedro Alves da Silva, Beatriz Valente Silva, Joana Brito, Ana Margarida Martins, Ana Beatriz Garcia, Catarina Simões de Oliveira, Ana Abrantes, Miguel Azaredo Raposo, João Santos Fonseca, Miguel Nobre Menezes, João Silva Marques, Cláudia Jorge, Pedro Carrilho Ferreira, Fausto J. Pinto, Pedro Cardoso

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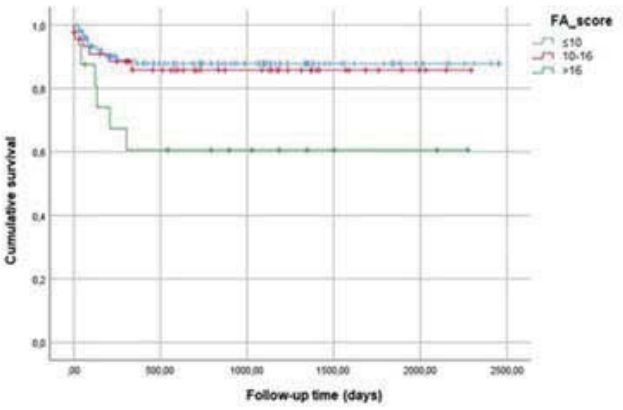
Introduction: Atrial fibrillation (AF) and aortic stenosis share multiple common risk factors and aortic valve stenosis itself is associated with a higher rate of AF. Patients submitted to transcatheter aortic valve replacement (TAVR) are particularly frail and AF is associated with increased mortality, ischemic and hemorrhagic events. Thus, a thorough approach, especially in such a frail population, is warranted to reduce morbi-mortality. Bearing this in mind, a risk assessment tool derived from ENVISAGE-AF trial was recently developed to stratify the mortality risk of AF patients after completion of successful TVR.
Objectives: To characterize a population of patients with AF who implanted TAVR and test a newly proposed mortality score to estimate prognosis in this population.
Methods: Single-center observational retrospective study including consecutive pts with AF who implanted TAVI from 2017 to 2021. Clinical data was collected at baseline and during follow-up. The AF mortality score groups pts in three crescent strata of severity (0-10; 11-16; > 16) by summing seven variables: age, creatinine clearance, duration of AF, NYHA class, alcohol consumption, peripheral artery disease and prior major bleeding. Kaplan Meyer survival analysis was performed using SPSS statistics.
Results: For 5 years, 621 pts underwent TAVR, of which 189 (30.4%) had previously diagnosed AF. 102 pts were female, mean age of 82.6 ± 6.1 years. More than half (53%) had permanent AF, 28% paroxysmal AF and 19% persistent AF. During a mean follow up of 953 days, 8 (4.2%) pts suffered a major hemorrhagic event, two pts had ischemic arterial events (peripheral and mesenteric) and no venous thrombotic events were observed. As anticipated, the event rate was high: at 1 year follow-up, 27 were admitted for cardiovascular events (3 with acute myocardial infarction and 4 with stroke). 26 pts died after 1-year (13.7%) and 30 died during available FUP (15.8%). The aforementioned AF mortality score was applied to our pts at baseline, before TAVR: 63%, 17.5% and 8.5% of patients were categorized as low, moderate or high risk. Patients in the high risk group (score > 16) had a significantly higher rate of events during follow-up - figure1. Lower and intermediate groups failed to show a clear separation in terms of risk estimation between them, which may be attributed to the paucity of events in these two groups.



Conclusions: AF and aortic stenosis are both burdensome diseases and AF increases the risk of events in the TAVR population. We showed that a newly proposed score that stemmed from ENVISAGE-AF can effectively select pts at high risk of mortality, in whom close clinical surveillance should be particularly rigorous.

CO 115. WHEN VALVE NEEDS ELECTRICAL WIRES - ESTIMATING PACEMAKER IMPLANTATION AFTER TAVR

Ana Margarida Martins, Pedro Alves da Silva, Joana Brito, Beatriz Valente Silva, Catarina Oliveira, Beatriz Garcia, Ana Abrantes, Miguel Raposo, Catarina Gregório, João Fonseca, Fernando Ribeiro, Tiago Rodrigues, João Silva Marques, Miguel Nobre de Menezes, Pedro Carrilho Ferreira, Cláudia Jorge, Pedro Cardoso, Fausto J. Pinto

Santa Maria University Hospital CHULN, CAML, CCUL, Lisbon School of Medicine, Universidade de Lisboa.

Introduction: Widespread availability and expanded indication of transcatheter aortic valve replacement (TAVR) modified the paradigm of

aortic stenosis. Despite an elevated success rate, there are procedure related complications that need to be considered. One of the most frequent is conduction defects requiring permanent pacemaker (PPM) implantation resulting in prolonged hospital length of stay and hospitalization cost. Several risk factors for PPM implantation after TAVR have been described, and, recently, the Emory Risk Score (ERS) was developed as a predictive tool for need of new PPM implantation post-TAVR in patients (pts) who implanted a balloon-expandable valve. Our aim was to evaluate risk factors associated with PPM after TAVR and to validate the ERS in our population after implantation of both balloon-expandable and self-expanding valves.

Methods: We conducted a retrospective, observational and single center study involving pts submitted to TAVR between 2018 and 2021. Clinical, ECG and procedural data was obtained at time of TAVR and during follow-up. The predictive discrimination of the scoring system for the risk for PPM placement after TAVR was evaluated using receiver-operating characteristic (ROC) curve analysis. To estimate additional predictors of PPM implantation we used Cox proportional hazards regression models.

Results: We gathered a total of 416 pts (mean age 82 ± 6.1 years, 55% female). The most frequently implanted valves were Evolut Pro and Sapien 3 ultra in 39.4% and 26.6% of pts. During follow-up 110 pts (26%) needed device implantation (94% double chamber pacemaker; 6% CRT-P or CRT-D), most frequently due to AV block. On univariate analysis, QRS width was the only factor predictive of pacemaker implantation (HR 1.018, 95%CI 1.007-1.028; p = 0.027). We found no other clinical, ECG or procedural characteristics to be predictive of device implantation. The ERS is composed of 4 variables - history of syncope, right complete branch block, QRS width > 140 mseg and valve oversizing > 16% - and revealed a good sensitivity and specificity in estimating device implantation. We applied this score to our population and ROC curve analysis showed a significant prediction capacity (AUC 0.761 95%CI 0.699-0.822, p = 0.031). This analysis was also performed analysing separately both subgroups of self-expandable valves (Medtronic Evolut and Evolut R) and balloon expandable valves (Edwards Sapiens). ROC curve analysis in both showed a good correlation with events (Figure).

Conclusions: PPM is one of the most common complications following TAVR. In our population, the ERS accurately predicted the need for PPM. Routine use of such tools may stratify pts at higher risk of pacemaker implantation and thus best define patient allocation and resource utilization to reduce number of hospitalization days.

Domingo, 16 Abril de 2023 | 09:30-10:30

Sala Vega | Comunicações Orais - Sessão 24 - Tomografia computorizada cardíaca

CO 116. COMPUTED TOMOGRAPHY-DERIVED MYOCARDIAL EXTRACELLULAR VOLUME IN PATIENTS WITH SEVERE AORTIC STENOSIS: CORRELATION WITH MARKERS OF VENTRICULAR DYSFUNCTION

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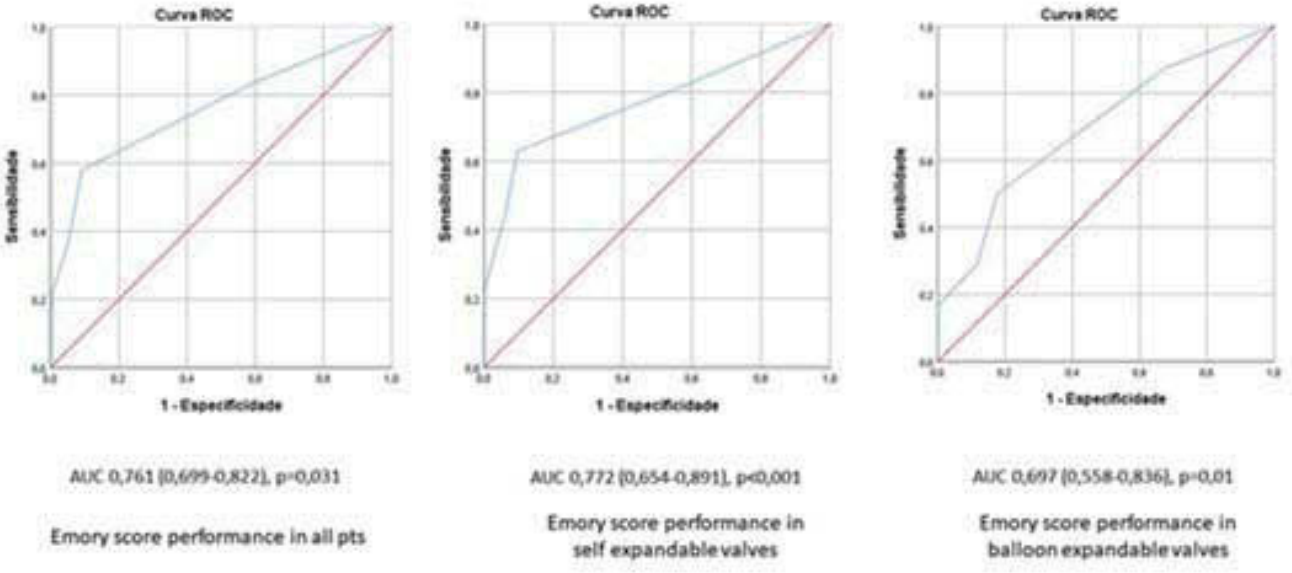
Introduction: Myocardial fibrosis is a potential adverse prognostic marker in patients with severe aortic stenosis (AS) and can be quantified using non-invasive imaging measures, such as the extracellular volume fraction (ECV). Although computed tomography (CT) for transcatheter aortic valve replacement (TAVR) planning was originally developed to assess the aortic valve complex and access routes, it has evolved to include the measurement of ECV for myocardial tissue characterization.

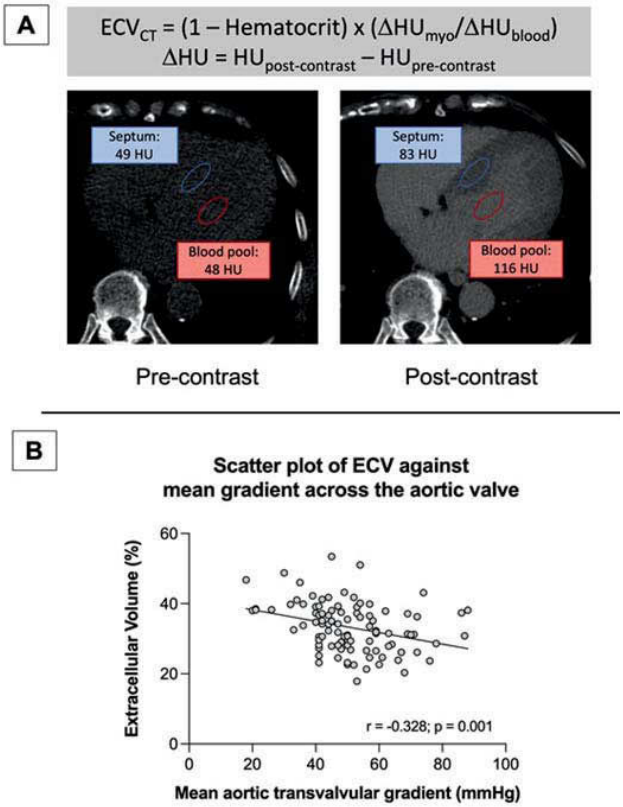
Objectives: This study aimed to determine associations between CT-derived ECV (ECV_{CT}) and clinical and echocardiographic markers of ventricular function in patients with severe AS referred for TAVR-planning CT.

Methods: Single-center prospective study enrolling all consecutive patients with severe symptomatic AS referred for TAVR-planning CT between April and November 2022. CT was performed on a 192-slice dual-source 3rd generation scanner (Siemens Somatom Force) and ECV_{CT} was acquired during TAVR-planning using an additional 5-minute post-contrast low-radiation-dose prospective acquisition. ECV_{CT} was calculated as the ratio of change in CT attenuation (Hounsfield units [HU]) of the septal myocardium and the left ventricle (LV) blood pool before and after contrast administration, according to the equation: $ECV_{CT} = (1 - \text{hematocrit}) \times (DHU_{myo}/DHU_{blood})$ (Figure 1A).



CO 115 Figure

Results: A total of 102 patients were included (mean age 81 ± 7 years; 46% male; mean valvular transaortic gradient 51 ± 14 mmHg; mean aortic valve area 0.7 ± 0.2 cm^2; mean LV ejection fraction (EF) by 2D echocardiogram 57 ± 11%). No patient had a clinical diagnosis of cardiac amyloidosis. Overall, the mean ECV_{CT} value was 33.4 ± 7.0%. Myocardial ECV_{CT} values significantly differed between AS subtypes, with higher values in patients with low-gradient AS (n = 13, 13%; ECV_{CT} 40.3 ± 4.8% *vs.* 32.4 ± 6.7%, p < 0.001) (Figure 1B). Additionally, myocardial ECV_{CT} values correlated with markers of LV and right ventricular (RV) dysfunction, including lower LV EF (r = -0.354, p < 0.001), worse LV global longitudinal strain (r = 0.420, p = 0.002), reduced TAPSE (r = -0.230, p = 0.043) and RV S wave by tissue doppler imaging (r = -0.321, p = 0.010) and higher NT-proBNP values (r = 0.347, p = 0.002).



Conclusions: In patients with severe AS scheduled for TAVR-planning CT, ECV_{CT} values are significantly higher in those with low-gradient AS and correlated with several measures of biventricular dysfunction. This CT parameter may be useful to identify a subgroup of patients with higher risk of adverse prognosis.

CO 117. A NOVEL MARKER OF CARDIOVASCULAR RISK STRATIFICATION: THE ROLE OF TOTAL CARDIOVASCULAR CALCIUM SCORE USING CARDIAC CT

Mariana Passos, Inês Pereira de Miranda, Filipa Gerardo, Inês Fialho, Joana Lima Lopes, Carolina Mateus, Marco Beringuilho, Pedro Magno, José Loureiro, David Roque, Carlos Morais, João Bicho Augusto

Hospital Prof. Dr. Fernando da Fonseca, EPE/Hospital Amadora Sintra.

Introduction: It is widely accepted that coronary and valve calcification measured by cardiac CT, individually, are associated with cardiovascular events and mortality. However, the role of an encompassing marker of cardiovascular atherosclerosis could be more representative of the real cardiovascular risk.

Objectives: To determine the prognostic value of a combined coronary, valvular and aortic calcium score to predict long-term major adverse cardiac and cerebrovascular events (MACCE).

Methods: We conducted a single center study on 316 consecutive patients who underwent cardiac CT scan between January 2018 and December 2019. We excluded patients with poor imaging quality, constrictive pericarditis, prosthetic valves and/or devices. The calcium score of coronary arteries (CA), mitral valve (MV), aortic valve (AoV), ascending aorta (AAo) and aortic arch (AAc) were calculated from non-contrast ECG-gated CT using the Agatston method and were combined to derive a valvular (VA = MV+AoV), total cardiac (TC = CA+VA) and total cardiovascular (TCV = TC+AAo+AAc) calcium scores (Fig.1A). The primary endpoint was a composite of MACCE, defined as all-cause death, stroke, myocardial infarction and hospital admission for heart failure.

Results: A total of 275 CT scans were suitable for analysis. Mean age was 59.6 ± 12.3 years, 48.4% were female. A total of 183 (66.7%) patients presented calcification in at least one location. Patients with calcification on any of the prespecified locations had higher prevalence of hypertension, dyslipidemia and type 2 diabetes *mellitus* (DM) than those without any calcium (p < 0.05). After a median follow-up of 3.18 [IQR 2.84-3.69] years, 40 (14.5%) patients had met the primary endpoint. Regression analyses demonstrated that all CA, VA, TC and TCV scores were independent predictors of MACCE (p < 0.05 for all). The best prediction models included calcium score (all combinations), age, sex, type 2 DM and smoking status (Figure 1B). The model with TCV score was the most powerful predictor of MACCE (χ^2 47.8), followed by TC score (χ^2 43.1). Of interest, the model with CA score had the poorest performance (χ^2 35.4).

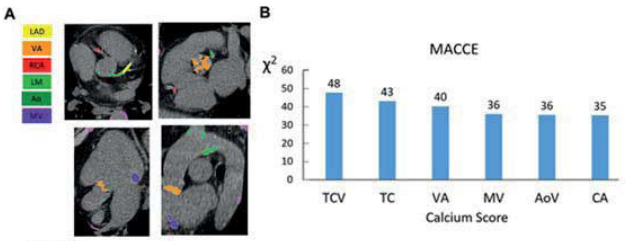


Figure 1:

A: Example of a calcium score calculated from non-contrast CT using the Agatston method.

B: Model that includes the presented calcium score + all the following: age, sex, type 2 diabetes and smoking status.

Ao = aorta; AoV = aortic valve; CA = coronary arteries; LAD = left descending artery; LM = left main; MV = mitral valve; RCA = right coronary artery; TC = total cardiac; TCV = total cardiovascular; VA = valvular.

Conclusions: Coronary calcium score is a quick way to stratify risk in clinical practice, but its performance is too focused on coronary events. Total cardiovascular calcium score, however, is more encompassing, also quick to measure, and a more truthful depiction of the patient's cardiac and cerebrovascular risk, potentially allowing a more tailored and timely approach to risk factors in clinical practice.

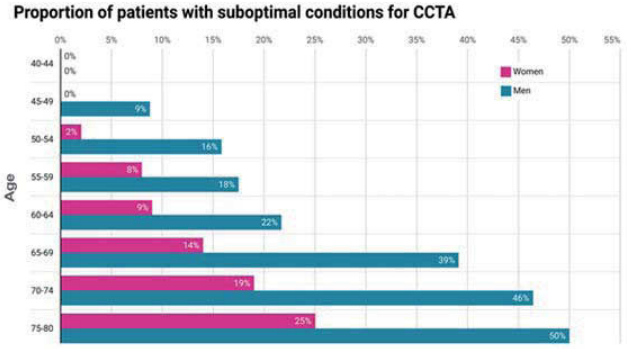
CO 118. CHOOSING BETWEEN CORONARY CT ANGIOGRAPHY AND FUNCTIONAL TESTS IN PATIENTS WITH SUSPECTED CORONARY ARTERY DISEASE - MIND THE (GENDER) GAP

Mariana Sousa Paiva, João Presume, Pedro Freitas, Pedro Lopes, Daniel A. Gomes, Rita Reis Santos, Sara Guerreiro, João Abecasis, Ana Coutinho Santos, Carla Saraiva, Miguel Mendes, António M. Ferreira

Centro Hospitalar Universitário de Lisboa Ocidental, EPE/Hospital de Santa Cruz.

Introduction: There is a need for a simple method to choose between a functional *vs.* anatomical test as first line approach to patients with suspected coronary artery disease (CAD). While European Guidelines base the decision on pretest probability (PTP) without a clear threshold, American Guidelines rely uniquely on age, with a 65-year-old cut-off for both genders. The aims of this study were: 1) to assess the proportion of patients undergoing coronary CT angiography (CCTA) in whom a functional test could have been more suitable due to extensive coronary artery calcification (CAC)

and/or inconclusive CCTA results; 2) compare PTP *vs.* age to predict the presence of these suboptimal conditions for CCTA.
Methods: Individuals 40-80 years old were identified in a single center registry of patients with stable chest pain or dyspnea who underwent CCTA. Patients with known CAD, severe valvular disease, or irregular heart rhythms were excluded. PTP of obstructive CAD was calculated using age, sex, and symptom typicality. Patients were considered to have suboptimal conditions for CCTA if extensive CAC was present (defined conservatively as an Agatston score > 400) or if one or more segments > 2mm were deemed non-evaluable despite CAC score ≤ 400.
Results: A total of 884 patients (57% women, mean age 62 ± 10 years) were included. Symptoms consisted of chest pain in 705 patients (80%). The median PTP of obstructive CAD was 22% (IQR 14-32). Overall, 162 patients (18%) had suboptimal conditions for CCTA due to CAC score > 400 (n = 140), or ≥ 1 non-evaluable segments (n = 22). The proportion of patients with suboptimal conditions for CCTA was significantly higher in men than in women (27% *vs.* 12%, respectively; p < 0.001). For both genders, the discriminative power to predict suboptimal CCTA conditions was significantly higher for age than for PTP (c-statistic in men 0.74 *vs.* 0.64, p < 0.001; in women 0.71 *vs.* 0.62, p = 0.012). In every age group, the proportion of patients with suboptimal conditions for CCTA was at least 2 times higher in men than in women, with a 10-15 year gap between genders (Figure).



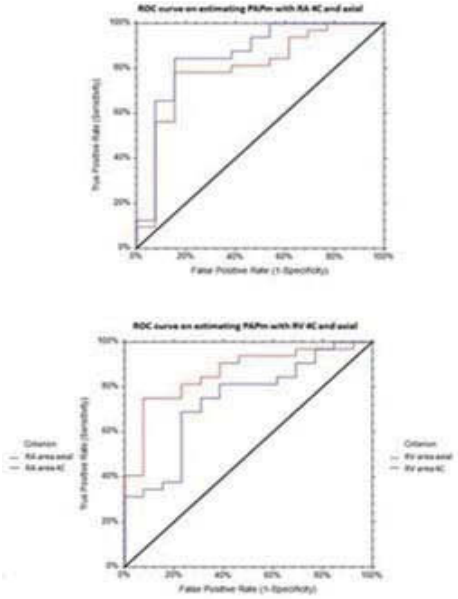
Conclusions: Suboptimal conditions for a fully diagnostic CCTA were found in 18% of patients, were more strongly associated with age than with PTP, and were at least 2 times more frequent in men than in women across all age groups. These findings support the use of an age cut-off for anatomical *vs.* functional testing in men, and the use of CCTA as first line test in most women regardless of age.

CO 119. ANGIOCT IN PULMONARY HYPERTENSION - SHOULD WE RENDER MULTIPLE VIEWS?

Miguel Azaredo Raposo, Pedro Alves da Silva, Joana Brito, Beatriz Silva, Catarina Oliveira, Ana Abrantes, Catarina Gregório, Joana Rigueira, João Inácio, Rui Plácido, Fausto J. Pinto, Ana G. Almeida

Centro Hospitalar Universitário de Lisboa Norte, EPE/Hospital de Santa Maria.

Introduction: Cardiac AngioCT has established itself as an essential method of cardiac imaging over the latest years, namely in the pulmonary hypertension (PH) field. PH is a multifactorial disease and its diagnosis relies on invasive hemodynamic parameters by right heart catheterization (RHC). AngioCT acquires cardiac and great vessel images in its standard views - axial and four-chamber (4C) rendered - and has the potential to replace the need for some invasive diagnostic procedures.
Objectives: To compare data from measurements obtained with AngioCT in 4C and axial views with hemodynamic parameters in PH patients.
Methods: Consecutive pts with precapillary PH were submitted to angioCT and RHC within a median interval of 6 months. AngioCT measurements in both axial and 4C views and hemodynamic parameters from RHC were collected. ROC curve analysis was used to evaluate the association between CT measurements and an established cut-off of mean pulmonary artery pressure (mPAP) of 35 mmHg.
Results: We selected 47 patients (mean age: 64 ± 16 years, 60% male) 12 with group 1 PH and 37 with group 4 PH. Patients had a mean mPAP of 44 ± 16 mmHg, NT-proBNP 1,109 ± 1,860 ng/mL, 56% were in OMS functional class (FC) II and 21% in FC III. Right ventricular area (RVA) and right atrial area (RAA) in axial and 4C views significantly correlated with mPAP (RVA axial: r 0.463, p = 0.001; RVA 4C: r 0.405, p = 0.006, RAA axial: r 0.374, p = 0.01; RAA 4C: r 0.595, p < 0.001), independently from pts' PH clinical group. In ROC analysis, both RVA in axial and 4C view had a significant association with mPAP ≥ 35 mmHg (AUC 0.839, p < 0.001; AUC 0.740 p = 0.012, respectively) and pulmonary vascular resistance (RVP). Likewise, RAA in axial and 4C view were associated with mPAP ≥ 35 mmHg (AUC 0.56, p < 0.000; AUC 0.856 p < 0.001; AUC 0.785, p = 0.003 respectively). Neither of these views showed superiority in predicting severe PH (RV 4C and axial, p = 0.08; RA 4C and axial, p = 0.18).



Conclusions: Our findings support that in PH population, axial view is no different from 4C view measurements and that they have equivalent associations with hemodynamic parameters. These results may obviate the need to render 4C chamber in several settings and thus optimize time and resources.

CO 120. REPRODUCIBILITY OF EPICARDIAL ADIPOSE TISSUE RADIOMICS IN NON-CONTRAST COMPUTED TOMOGRAPHY

Fábio Sousa Nunes[1], Carolina Santos[2], Wilson Ferreira[1], Mónica Carvalho[1], João Pedrosa[3], Miguel Coimbra[3], Nuno Ferreira[1], Ricardo Ladeiras Lopes[2], Luís Vouga[1], Jennifer Mancio[4], Ricardo Fontes Carvalho[1]

[1]Centro Hospitalar de Vila Nova de Gaia/Espinho, EPE. [2]Faculdade de Medicina da Universidade do Porto. [3]Instituto de Engenharia de Sistemas e Computadores, Tecnologia e Ciência - INESC TEC. [4]King's College of London.

Introduction: Many factors can negatively impact radiomic features reproducibility, and, consequently, their diagnostic & prognostic accuracy. Although several deep learning solutions for automatic pericardial segmentation already exist, the impact of contouring variability on epicardial adipose tissue (EAT) radiomic features values is not known.
Methods: We segmented the pericardium in 192 non-contrast CT scans manually by a trained operator and using the semi-automatic pericardial segmentation Syngo.via Frontier Cardiac Risk Assessment Research Prototype

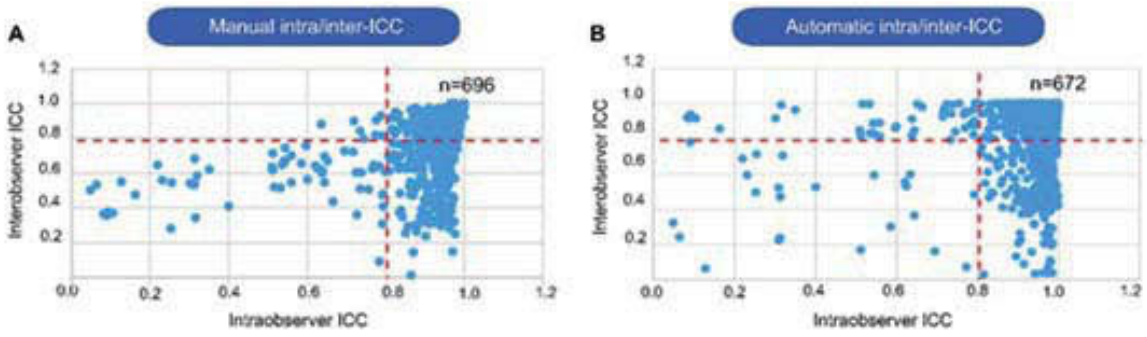


Figure 1: **Intra-correlation coefficient (ICC) among 1037 EAT radiomic features.** (A) Comparison manual 2 operators (B) Comparison manual vs semi-automatic.

CO 120 Figure

(Siemens Healthinees, Erlangen, Germany). The same operator repeated the segmentation in 20 random cases (intra-observer), which were also segmented by another operator with same level of training (inter-observer). Intraclass coefficient correlation (ICC) was used to measure the variability between EAT radiomic features extracted after segmentation by all the methods.

Results: Manual segmentation rendered 961 (93%) and 699 (67%) features with a very good intra-observer and inter-observer ICC (> 0.80), respectively. The inter-observer variability between manual *vs.* semi-automatic segmentation was not different: there were 692 (67%) features with ICC > 0.80. Very good intra- & inter-observer ICC were found in 696 features obtained by manual segmentation (A) and 672 with manual *vs.* semi-automatic method (B). Full data analysis will provide a detailed description of the most reliable features per each feature family.

Conclusions: We observed very good intra-and inter-observer ICC and similar results between the manual and semi-automatic segmentation methods. This study supports current recommendation for semi-automatic segmentation of large dataset and will yield a better understanding the most stable EAT radiomic features with a potential for clinical translation.

Domingo, 16 Abril de 2023 | 10:30-11:30

Sala Vega | Comunicações Orais - Sessão 25 - Prevenção cardiovascular e reabilitação

CO 121. THE PREDICTIVE ABILITY OF THE NEW EUROPEAN SCORE2 IN PRIMARY PREVENTION OF AN ASYMPTOMATIC POPULATION

Margarida Temtem[1], Maria Isabel Mendonça[1], Marina Santos[1], Débora Sá[1], Francisco Sousa[1], Sofia Borges[1], Sónia Freitas[1], Eva Henriques[1], Mariana Rodrigues[1], António Drumond[1], Ana Célia Sousa[1], Roberto Palma dos Reis[2]

[1]Hospital Dr. Nélio Mendonça. [2]Faculdade de Ciências Médicas de Lisboa/ NOVA Medical School.

Introduction: The European Society of Cardiology updated SCORE (Systematic Coronary Risk Evaluation) to the new SCORE2 algorithm, recommended for cardiovascular risk assessment in individuals without known cardiovascular disease (CVD) or diabetes to predict a ten-year risk of mortality or any CV events.

Objectives: Evaluate the applicability of the new European SCORE2 in an asymptomatic moderate-risk region population for Major Adverse Cardiovascular Events (MACE) prediction.

Methods: Our study population comprises 1113 asymptomatic individuals without known CAD (mean age 53.3 years, 73.9 male) enrolled from the prospective arm of the GENEMACOR Study with a follow-up period over 5.9 ± 4.3 years. The population was categorized according to SCORE2 into three risk groups (low-intermediate < 5%; high 5-10%; very high > 10%). We defined the primary endpoint of all-cause cardiovascular events (death and any CVD non-fatal event). Chi-square evaluates the traditional risk factor's percentage, Harrel C statistics assess how good the risk model is in CV events discrimination, and Kaplan-Meier estimates the survival.

Results: The study population presented dyslipidemia (68.8%), hypertension (51.0%), smoking (23.8%), family history (13.2%) and physical inactivity (43.0%). SCORE2 value at ten years of follow-up was 6.0 ± 3.3. C-index with 95%CI showed good events discrimination ability (C index = 0.725; 95%CI 0.645-0.805). At ten years of follow-up, Kaplan-Meier analysis estimated that event-free occurred in 99% of individuals in the low/moderate category, 89% in the high and only 73% in the very high-risk category.

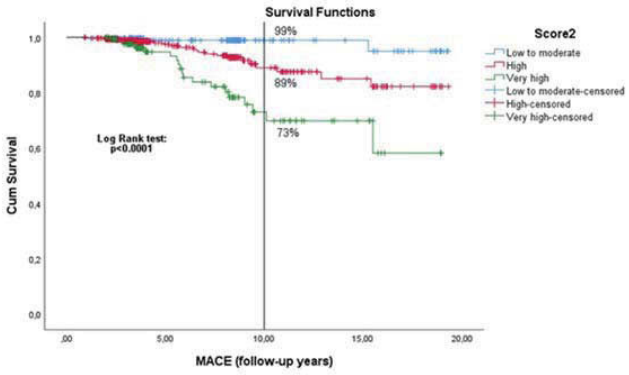


Fig. - This graph shows the Kaplan-Meier curves for the three risk groups at ten years

Events discrimination ability

Models	Events occurrence
	C-index (95% CI)
European Score2	0.725 (0.645 – 0.805)

Conclusions: SCORE2 algorithm showed a good quality discrimination model into risk categories (low/moderate, high and very-high-risk) and presented a good ability to predict future events in our population.

CO 122. ATTAINMENT OF LDL-CHOLESTEROL GOALS IN PATIENTS WITH PREVIOUS MYOCARDIAL INFARCTION: A REAL-WORLD CROSS-SECTIONAL ANALYSIS

Daniel A. Gomes, Mariana Sousa Paiva, Pedro Freitas, Francisco Albuquerque, Rita Lima, Rita Reis Santos, João Presume, Rita Bello, Sérgio Maltês, Marisa Trabulo, Carlos Aguiar, Jorge Ferreira, António M. Ferreira, Miguel Mendes

Centro Hospitalar Universitário de Lisboa Ocidental, EPE/Hospital de Santa Cruz.

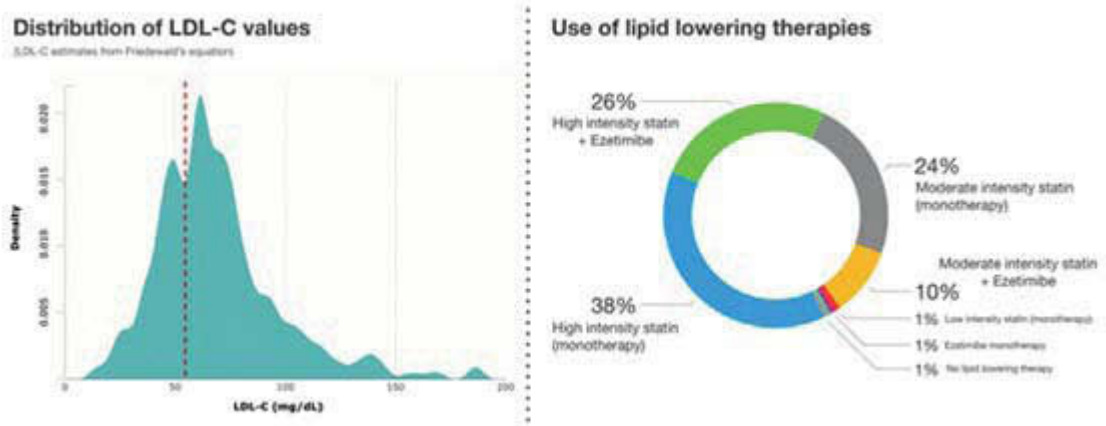
Introduction: ESC guidelines recommend an LDL-cholesterol (LDL-C) < 55 mg/dL for patients with established cardiovascular disease. While the Friedewald's equation to estimate LDL-C is still widely used, the newer Martin-Hopkins' formula has shown greater accuracy. The aims of this work were: 1) to assess the proportion of patients reaching their LDL-C goal and the therapies used, and 2) to assess the impact of using the Martin-Hopkins' method instead of Friedewald's formula on the proportion of controlled patients.
Methods: Single-centre cross-sectional study including consecutive post-myocardial infarction patients followed by 20 different cardiologists in a tertiary hospital. Data were collected retrospectively from clinical appointments that took place after April 2022. Only those with an available ambulatory lipid profile performed at the hospital's lab were considered. For each patient, LDL-C levels and goal attainment were estimated by both Friedewald's and Martin-Hopkins' equations.
Results: A total of 400 patients were included (age 67 ± 13 years, 77% male, 31% diabetics). The last myocardial infarction had occurred a median of 4.5 years before the appointment. Using Friedewald's equation, median LDL-C under therapy was 64 mg/dL [IQR (50-81)]. Overall, 125 patients (31%) had LDL-C within target (Figure 1A). High intensity statins were used in 256 patients (64%), 146 (37%) were under ezetimibe, and 2 (0.5%) were under PCSK9 inhibitors. Combination therapy of high intensity statin + ezetimibe was used in 102 patients (26%) (Figure 1B). These patients had a median LDL-C of 61mg/dL [IQR (45-75)], with 35% attaining LDL-C levels < 55 mg/dL, and 11% remaining above 100 mg/dL. Applying the Martin-Hopkins method would reclassify a total of 31 patients (7.8% of total). Among those deemed controlled by the Friedewald's equation, 27 (21.6%) would have a Martin-Hopkins' LDL-C above the target, while 4 (1.5%) of the uncontrolled patients would have a recalculated LDL-C < 55 mg/dL. The following medical appointment was scheduled a median of 8 months (IQR 6-11) later.
Conclusions: In this cross-sectional study, less than one third of post-myocardial infarction patients followed in a tertiary hospital's cardiology clinic had LDL-C values within the goal, with a prescription pattern suggesting a large underutilization of readily available therapies. Applying the Martin-Hopkins' formula to calculate LDL-C would reclassify roughly one fifth of presumably controlled patients into the non-controlled group.

CO 123. CLINICAL AND GENETIC CHARACTERISTICS OF PATIENTS WITH A CLINICAL DIAGNOSIS OF FAMILIAL HYPERCHOLESTEROLEMIA IN PORTUGAL

Ana Margarida Medeiros, Ana Catarina Alves, Joana Rita Chora, Beatriz Raposo Miranda, Mafalda Bourbon

Instituto Nacional de Saúde Dr. Ricardo Jorge.

Objectives: Familial Hypercholesterolemia (FH) is a common genetic disorder of lipid metabolism with an increased risk of coronary artery disease (CAD) due to lifelong exposure of elevated LDL-C levels. FH is caused by pathogenic/likely pathogenic (P/LP) variants in *LDLR*, *APOB*, *PCSK9*. Variants in FH phenocopies genes (*LDLRAP1*, *APOE*, *LIPA*, *ABCG5*, *ABCG8*), LDL-C polygenic risk score (PRS) and hyper-Lp(a) can mimic the FH phenotype. In this work we present the clinic and genetic results of the Portuguese FH Study cohort.
Methods: A biochemical and genetic study was performed to 1005 index-cases (IC) with clinical diagnosis of FH, referred to the Portuguese FH Study until December 2021. Since 2017, genetic diagnosis is performed by an NGS panel with 8 genes and 6-SNPs to determine PRS.
Results: A total of 106 IC (18%) with clinical diagnosis of FH had suffered a premature CV event with a mean age of 43.9 ± 9.2 years. Mean LDL-C values for adults was 232.4 ± 86.8 mg/dL and for children 191.3 ± 57.4 mg/dL. FH was genetically confirmed in 418 IC (406 heterozygous (HtFH), 4 true-homozygous, 7 compound-heterozygous, 1 double-heterozygous), all carrying P/LP variants in the 3 genes causing FH. Cascade screening identified 581 HtFH, one compound-heterozygous and one *LDLR-APOB* double-heterozygous. In the FH-negative cohort (N = 590), 33% have hyper-Lp(a), 17% have high PRS, 1% have other monogenic cause and 1% have one pathogenic variant in *ABCG5/ABCG8*. Also, 5% carry variants of unknown significance (VUS) in FH genes and 5% carry VUS (in heterozygosity) in FH phenocopies genes. In the remaining 38% FH-negative IC the cause of dyslipidemia was not identified. In the group of adults IC FH-positive CAD and premature CAD (pCAD) were statistically significant higher in the group with hyper-Lp(a) when compared with IC with normal Lp(a) levels (CAD: 31.5% *vs.* 13.6%, p = 0.005; pCAD: 27% *vs.* 9%, p = 0.002). The same results were obtained for the FH-negative cohort (CAD: 27% *vs.* 16.7%, p = 0.038; pCAD: 24.5% *vs.* 14%, p = 0.029).
Conclusions: FH was confirmed genetically in 41% of the cohort. In 50% of the negative ICs the FH phenotype can be caused by hyper-Lp(a) or high PRS. A small part of these has heterozygous pathogenic variants in *ABCG5/8* that should be further investigated since it could be the cause of hypercholesterolemia. The use of the described NGS FH diagnostic panel is important to identify FH/FH-phenocopies and personalize each patient's treatment accordingly to reduce their increased risk of CAD.



CO 122 Figure

CO 124. GLOBAL CARDIAC MICROCALCIFICATION ACTIVITY AS A MEASURE OF THE CARDIOVASCULAR RISK BURDEN: AN EXPLORATORY STUDY USING SODIUM FLUORIDE IN HIGH CARDIOVASCULAR RISK PATIENTS

João Borges-Rosa[1], Manuel Oliveira-Santos[1], Andreia Gomes[1], Ana Rita M. Gomes[1], Diogo de Almeida Fernandes[1], Eric Alberto Monteiro[1], Gonçalo Ferraz Costa[1], Gustavo M. Campos[1], Joana Guimarães[1], Rodolfo Silva[1], Antero Abrunhosa[2], Miguel Castelo-Branco[2], Lino Gonçalves[1], Maria João Ferreira[1]

[1]Centro Hospitalar e Universitário de Coimbra, EPE/Hospitais da Universidade de Coimbra. [2]Instituto de Ciências Nucleares Aplicadas à Saúde.

Introduction: Sodium fluoride (18F-NaF) uptake in positron emission tomography with computed tomography (PET-CT) identifies active microcalcification both in atherosclerotic plaques and the aortic valve. We aimed to evaluate global cardiac microcalcification activity with 18F-NaF, as a measure of the microcalcification burden, in high cardiovascular (CV) risk patients. Additionally, as an exploratory endpoint, we evaluated the association between global cardiac microcalcification and diastolic dysfunction.
Methods: High CV-risk individuals without previous CV events from a single centre were prospectively scanned with 18F-NaF PET-CT. Total cardiac 18F-NaF uptake was measured as global molecular calcium score (GMCS), which was calculated by summing the product of mean standardized uptake value and volume of the region of interest on every slice within the borders of the heart. The result was then divided by the number of slices to adjust for the volume.
Results: We included sixty-five patients with a mean age of 64.0 ± 9.0 years and 38.5% females. There was a high rate of CV risk factors, including hypertension (95.4%), diabetes (84.6%), dyslipidemia (78.5%), obesity (58.5%), smoking (26.2%) chronic kidney disease (18.5%), and family history of premature coronary disease (9.2%). The mean 10-year risk of fatal and nonfatal cardiovascular events predicted by ASCVD risk score was 30.54 ± 18.4. Median GMCS was 221.42 [IQR 144.55-317.58]. Individuals with > 5 CV risk factors (46.2%) had increased overall GMCS compared to those with a lower number of CV risk factors (295.29, IQR 159.37-356.87 *vs.* 186.16, IQR 122.57-281.78; p = 0.03). Thirty-three patients underwent diastolic dysfunction evaluation by echocardiography. All patients had normal left ventricle ejection fraction, mean of 62.86 ± 3.58%. Mean E/A was 0.88 ± 0.27, mean septal e' velocity 0.07 ± 0.02 m/s, mean lateral e' velocity 0.08 ± 0.02 m/s, and mean average E/e' 10.7 ± 3.3. The mean peak tricuspid regurgitation velocity was 2.14 ± 0.59 m/s and the median indexed left atrium volume was 37, IQR 29-44 mL/m^2. After applying the algorithm for diagnosis of diastolic dysfunction in subjects with normal ejection fraction, 21.2% had diastolic dysfunction and 36.4% had a normal diastolic function, while 42.4% were indeterminate. There was no correlation between echocardiographic variables of diastolic function and GMCS, except for indexed left atrium volume (r = 0.83, p < 0.01). There was no association between GMCS and diastolic function categories.
Conclusions: In a high CV risk cohort, the global cardiac microcalcification assessed by GMCS was associated with the burden of CV risk factors. Additionally, despite a strong positive correlation between GMCS and indexed left atrium volume, we found no association between GMCS and echocardiographic variables of diastolic function.

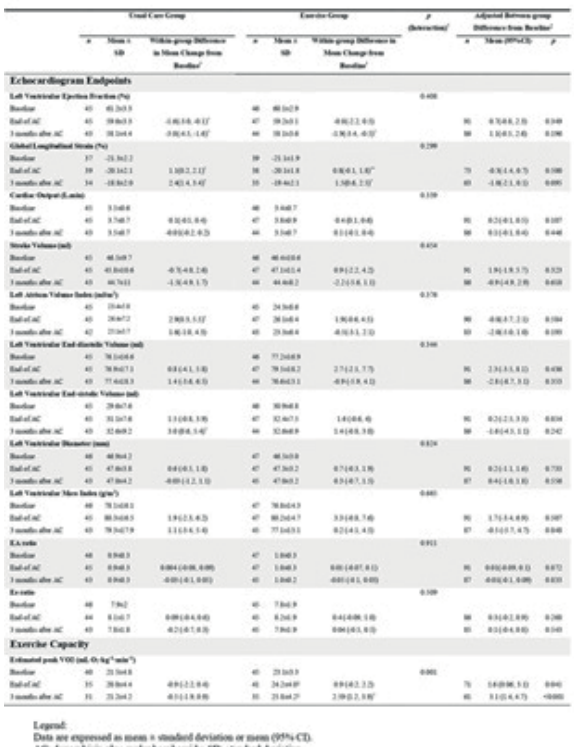
CO 125. EFFECTS OF EXERCISE TRAINING ON CARDIAC TOXICITY MARKERS IN WOMEN WITH BREAST CANCER UNDERGOING CHEMOTHERAPY WITH ANTHRACYCLINE: A RANDOMIZED CONTROLLED TRIAL

Pedro Antunes[1], Ana Joaquim[2], Francisco Sampaio[2], Eduardo Vilela[2], Madalena Teixeira[2], Jorge Oliveira[2], António Ascensão[3], Andreia Capela[2], Anabela Amarelo[2], Cristiana Marques[2], Sofia Viamonte[2], Alberto Alves[4], Dulce Esteves[1]

[1]Universidade da Beira Interior. [2]Centro Hospitalar de Vila Nova de Gaia/Espinho, EPE. [3]Universidade do Porto. [4]Universidade da Maia.

Introduction: Breast cancer (BC) survivors treated with anthracycline-containing chemotherapy have increased risk of cardiac dysfunction. It is well established that exercise training is effective to mitigate some chemotherapy-related side effects. Recently, exercise training has also been suggested as a potentially approach to prevent anthracycline-related cardiac dysfunction, but clinical-based evidence is scarce.
Objectives: We here analyzed the effects of a supervised exercise training program (SETP) on cardiac toxicity markers in women with early-stage BC receiving anthracycline-containing chemotherapy.
Methods: Ninety-three women with early-stage BC were randomized to a SETP plus usual care (exercise group, n = 47) or usual care alone (UC group, n = 46). The SETP consisted of 3 sessions per week (planned exercise sessions ranged from 60 to 72), combining aerobic and resistance training, conducted concurrently across the chemotherapy length. The primary endpoint was the change in left ventricular ejection fraction (LVEF) from baseline to the end of anthracycline-containing chemotherapy. Secondary endpoints included global longitudinal strain (GLS) and other echocardiographic parameters, exercise capacity [estimated peak oxygen consumption (pVO2)], circulating biomarkers (NT-proBNP and troponin I), and safety of the SETP. These study endpoints were assessed at the end of anthracycline-containing chemotherapy, and 3 months after this point.
Results: All patients were prescribed 4 cycles of doxorubicin plus cyclophosphamide (AC). Mean adherence to SETP frequency was 63.2 ± 26.9%. There were no between-group differences in LVEF change at the end of AC [mean difference: 0.7%, 95% confidence interval (CI): -0.8, 2.3; p = 0.349] or 3 months after AC [1.1% (95%CI: -0.5, 2.6; p = 0.196] (Table). Compared to the UC group, estimated pVO2 significantly increased in the exercise group at the end of AC (1.6 mLO2·kg−1·min−1; 95%CI: 0.06, 3.1; p = 0.041) and 3 months after AC (3.1 mLO2·kg^{-1}·min^{-1}; 95%CI: 1.4, 4.7; p < 0.001) (Table). No between-group differences were found in other secondary endpoints. No serious adverse events occurred during exercise sessions.

Table 1: Change in Echocardiogram Endpoints and Exercise Capacity (Intention-to-treat Analysis)



Legend:
Data are expressed as mean ± standard deviation or mean (95% CI).
AC: doxorubicin plus cyclophosphamide; SD: standard deviation.

[1]Within-Group Difference in Mean Change and Interaction was based on linear mixed models, controlling for group, time and interaction (fixed effects).
[2]Adjusted Between-Group Difference was based on linear mixed models, controlling for group, time and interaction (fixed effects) and for baseline outcome, heart rate, and total cumulative doxorubicin dose (covariate) in echocardiogram endpoints, and for baseline outcome and total cumulative doxorubicin dose (covariate) in estimated peak VO2.
*Denotes a significant p-value<0.05.
**Denotes a significant p-value<0.1.
[3]Denotes a significant p-value<0.05 between groups.

Conclusions: Although no significant exercise-related effects were seen on cardiac toxicity markers (LVEF and GLS), exercise training demonstrated to be safe and significantly improved exercise capacity in BC patients undergoing anthracycline-containing chemotherapy.
Trial registration: ISRCTN32617901.

Domingo, 16 Abril de 2023 | 11:30-12:30

Sala Vega | Comunicações Orais - Sessão 26 - Doenças do miocárdio

CO 126. CARDIAC AMYLOIDOSIS SCREENING: STILL A LONG WAY TO GO

Filipa Gerardo, Carolina Saca, Aurora Monteiro, Pedro Santos, Carolina Carvalho, Mariana Passos, Inês Fialho, Inês Miranda, Carolina Mateus, Joana Lima Lopes, Marco Beringuilho, Daniel Faria, Renata Ribeiro, João Augusto

Hospital Prof. Dr. Fernando da Fonseca, EPE/Hospital Amadora Sintra.

Introduction: There are several red flags for cardiac amyloidosis (CA) that can be used for a stepwise amyloidosis screening strategy based on cardiac and extracardiac findings.
Objectives: To identify the incidence of patients that meet the screening criteria for CA in a real-world population, as defined by consensus document from the European Society of Cardiology (ESC) Working Group on Myocardial and Pericardial Diseases. **Methods:** We conducted a single-centre retrospective study during a 2-year time frame to identify suspected cases of CA and determine the incidence of in-hospital screening criteria. Demographic, clinical and echocardiography data was reviewed for all cases. Keeping with the aforementioned ESC consensus documents, patients were considered appropriate for screening if the left ventricular posterior wall thickness was ≥ 12mm and if one of the following was present: heart failure ≥ 65 years; aortic stenosis ≥ 65 years; hypotension or normotensive if previously hypertensive; sensory involvement or autonomic dysfunction; peripheral polyneuropathy; proteinuria; skin bruising; bilateral carpal tunnel syndrome; ruptured byceps tendon, subendocardial/transmural late gadolinium enhancement or increased extracellular volume; reduced longitudinal strain with apical sparing; decreased QRS voltage to mass ratio; pseudo Q waves on ECG; atrioventricular conduction disease or possible family history.
Results: A total of 221 electronic medical charts were reviewed. Of these, 133 (60.2%) met the criteria for screening for CA and 68 (32.4%) had at least 2 criteria. 104 patients (49.5%) had heart failure ≥ 65 years, 57 patients (27.1%) had proteinuria and 50 patients (23.8%) had aortic stenosis ≥ 65 years. Of this cohort, only 5 patients (2.8%) underwent screening for TTR CA with diphosphonate (HMDP) scintigraphy and free light chain screening and 2 met the criteria for CA (2 out of 5, 40%). These 5 patients fulfilled a total of 14 criteria. Of interest, global longitudinal strain < -15% was found in 20 patients (10%) and 9 of these (45%) had apical sparing pattern.
Conclusions: There is a notably high proportion of patients that meet the screening criteria for cardiac amyloidosis in the real-world. However, appropriate work-up and screening is still lacking for most, suggesting a need for increased awareness amongst physicians.

CO 127. TRANSTHYRETIN-DIRECTED ANTISENSE OLIGONUCLEOTIDE THERAPY EFFECTS ON ATTRV MYOCARDIOPATHY - A SINGLE-CENTER EXPERIENCE

Catarina Gregório[1], João R. Agostinho[1], Ana Beatriz Garcia[1], Joana Brito[1], Pedro Alves da Silva[1], Beatriz Valente Silva[1], Ana Margarida Martins[1], Catarina Simões de Oliveira[1], Ana Abrantes[1], Miguel Azaredo Raposo[1], João Santos Fonseca[1], Miguel Santos[2], Catarina Campos[2], Conceição Coutinho[1], Isabel Conceição[2], Fausto J. Pinto[1]

[1]Santa Maria University Hospital CHULN, CAML, CCUL, Lisbon School of Medicine, Universidade de Lisboa. [2]Neurology Department, Centro Hospitalar Universitário de Lisboa Norte, EPE/Hospital de Santa Maria.

Introduction: Hereditary transthyretin amyloidosis (ATTRv) is a multisystemic disease with a heterogenous presentation that includes cardiomyopathy and polyneuropathy. Important advances have been made regarding disease-modifying therapies. Inotersen and patisiran are transthyretin-directed antisense oligonucleotide approved for the treatment of polyneuropathy. However, their effects on cardiomyopathy related parameters are not well defined.
Objectives: To study the effect of patisiran and inotersen on cardiac function and structure in a population with ATTRv and evidence of cardiac involvement at baseline.
Methods: Single center retrospective study of patients with ATTRv and definite or possible diagnosis of amyloid cardiomyopathy (defined either by a positive bone scintigraphy or interventricular septum or posterior wall dimension ≥ 12 mm or index left ventricular mass ≥ 95 g/m^2 in female and ≥ 115 g/m^2 in male in the absence of abnormal loading conditions). Demographic, clinical, therapeutic and echocardiographic data was recorded. Wilcoxon Test was used to evaluate disease progression.
Results: A total of 46 patients were treated with either patisiran (32) or inotersen (14). From those, 8 patients fulfilled criteria for amyloid cardiomyopathy (7 had a positive bone scintigraphy and 1 patient had left ventricle hypertrophy without an abnormal loading condition), 3 were medicated with inotersen and 5 with patisiran. The median age was 76 years (IQR 68.8-79) and 88% were male. Globally, at baseline, median left ventricular ejection fraction was 60% (IQR 54-60), index left ventricular mass (LVM), 168 g/m^2 (IQR 120-182), posterior wall (PW) dimension, 13 mm (IQR 12-15), interventricular septum (IVS), 17 mm (IQR 13-19) and left atrial volume (LAV) 45 mL/m^2 (IQR 38-67). Median NTproBNP was 1,148 pg/ml (IQR 595-3397) and 7 patients were in NYHA functional class I and 1 in class II. At follow-up (FUP), a significant reduction in LVM was noted (145 g/m^2; IQR 113/187; p < 0.043). NYHA class worsened (class I: 3; class II: 5; p = 0.046), however, although not significantly, NTproBNP decreased (795 pg/ml; IQR 425-1726). The small sample size precluded any comparison between both medications. However, NTproBNP reduction was manly driven by patisiran group (3,071 pg/ml; IQR 1,079-5,891 *vs.* 555 pg/ml; 425-555 pg/ml) and LVM reduction by inotersen's (142 g/m^2; IQR 120-142 *vs.* 115 g/m^2; IQR 108-115). During the FUP none of these patients had a heart failure related admission or died.
Conclusions: This small sized sample study of patients with ATTRv myocardiopathy suggest that transthyretin-directed antisense oligonucleotide therapy may halt cardiac involvement progression and may even induce cardiac reverse remodeling.

CO 128. SODIUM-GLUCOSE COTRANSPORTER 2 INHIBITORS IN PATIENTS WITH TRANSTHYRETIN AMYLOID CARDIOMYOPATHY - RESULTS FROM A PATIENT SERIES

Daniel Inácio Cazeiro, João R. Agostinho, Pedro Alves da Silva, Joana Brito, Beatriz Valente Silva, Ana Beatriz Garcia, Ana Margarida Martins, Catarina Simões de Oliveira, Catarina Gregório, Ana Abrantes, Miguel Azaredo Raposo, Pedro Morais, Isabel Conceição, Dulce Brito, Fausto J. Pinto

Santa Maria University Hospital CHULN, CAML, CCUL, Lisbon School of Medicine, Universidade de Lisboa.

Introduction: Transthyretin amyloid cardiomyopathy (ATTR-CM) is a disease characterized by the accumulation of insoluble amyloid fibrils composed of misfolded transthyretin protein in the myocardium. Tafamidis 61 mg once daily was the first therapy approved for ATTR-CM treatment. However, its beneficial effects on prognosis and quality of life are only apparent after at least 15 months of treatment. Sodium-glucose cotransporter 2 inhibitors (SGLT2i) were recently proven to be effective on reducing heart failure (HF) admissions in patients (pts) with HF independently of left ventricular ejection fraction. However, the effects of SGLT2i in ATTR-CM patients are not known.
Objectives: To study the tolerance and clinical effect of SGLT2i therapy on top-of tafamidis 61 mg daily in pts with ATTR-CM.
Methods: We performed a retrospective analysis comparing a group of ATTR-CM pts treated with tafamidis 61 mg that were started on SGLT2i with a control group composed of pts with ATTR-CM treated with tafamidis

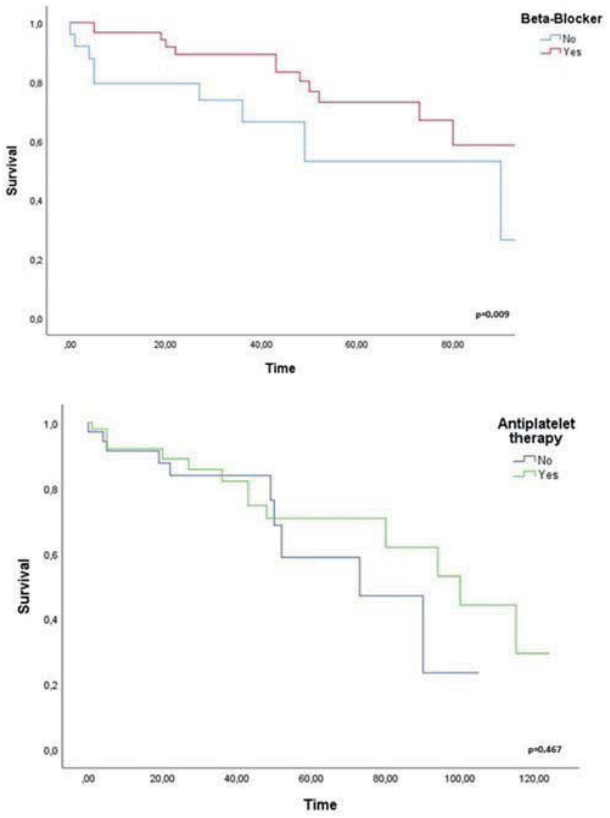
61 mg that were not started on SGLT2i. Clinical characteristics, estimated glomerular filtration rate (eGFR), plasma NTproBNP levels, loop diuretic doses and HF admissions were compared within the study group before and after SGLT2i start, and between both groups.
Results: Twenty-four pts were enrolled (median age 82 years; 92% male). The study group included 14 pts and the control group included 10 pts. The mean follow-up (FUP) time was 5 months (IQR 3-7months). In the study group, after SGLT2i initiation a significant decrease in NYHA functional class was noted (before: NYHA I – 1 pt; NYHA II – 10 pts; NYHA III – 3 pts *vs.* after: NYHA I – 2 pts; NYHA II – 12 pts; p = 0.046). eGFR, NTproBNP and diuretic doses did not change after therapy initiation. However, only one HF admission was registered in the 5 months before SGLT2i initiation and none afterwards. Comparing the study group with the control group no significant differences were found regarding NYHA functional class, EGFR, NTproBNP or diuretic doses at FUP. However, at the beginning of FUP pts of the control group seemed to present a milder form of HF when considering NTproBNP, although this difference was not statistically significant (NTproBNP: 793 pg/ml, IQR 360-3,664 *vs.* 1,208 pg/ml, IQR 764-3,302). In the control group, one pt had two HF admissions.
Conclusions: Despite the small sample size, the present study showed that SGLT2i may be associated with NYHA functional class improvement in patients with ATTR-CM related HF. Despite no impact on HF admissions in this study, SGLT2i may have a potential role in ATTR-CM treatment, and studies with larger populations are needed.

CO 129. BETA-BLOCKERS AND ANTIPLATELET THERAPY IN TAKOTSUBO SYNDROME - TO DO OR NOT TO DO?

Pedro Rocha Carvalho, Isabel Moreira, Marta Catarina Bernardo, Catarina Carvalho, Catarina Ferreira, Fernando Gonçalves, Pedro Magalhães, José Paulo Fontes, Ilídio Moreira

Centro Hospitalar de Trás-os-Montes e Alto Douro, EPE/Hospital de São Pedro.

Introduction: Sympathetic nerve stimulation and catecholamine storm are the main players in the pathogenesis of Takotsubo Syndrome (TTS), however, the impact of beta-blockers (BB) remains uncertain. Conversely, despite recent evidence suggesting a lack of benefit, antiplatelet therapy is still extensively prescribed in patients with TTS.
Objectives: To study if BB and antiplatelet therapy use after discharge in patients with TTS are associated with lower long-term major cardiovascular events.
Methods: Retrospective study with patients discharged with the diagnosis of TTS in a single center from January/2013 to November/2022. The primary outcome was a composite of cardiovascular mortality, heart failure hospitalization, stroke, and TTS recurrence (MACCE).
Results: A total of 103 patients were included in this study (85.7% females; mean age 71 ± 12 years old), 84.8% presenting with chest pain and 41.2% presenting with ST-segment elevation on electrocardiogram. During hospitalization, 37 had heart failure, 9 had a cardiogenic shock, 4 had left ventricular outflow tract obstruction, 7 patients needed ionotropic support, 14 needed mechanical ventilation and 4 died. Compared with the other without BB, patients discharged on BB (69.9%) had similar age (69.0 ± 12 *vs.* 73 ± 12 years, p = 0.093), cardiovascular risk factors, ST-segment elevation at admission (36.6% *vs.* 53.8%, p = 0.14), pro-BNP levels at admission [2800 [IQR 741;6,039 mg/dl] *vs.* 3,996 [IQR 1,224;10,031 mg/dl], p = 0.23] and peak T troponin (0.4 IQR [0.22;0.70]) *vs.* 0.54 IQR [0.30;1.5]), p = 0.10. There was no difference in left ventricular ejection fraction on admission (39.5% *vs.* 39%, p = 0.74) and at discharge (54% *vs.* 54%, p = 0.85). However, there was a higher percentage of men in the group of patients without BB therapy (8.3% *vs.* 30.8%, p = 0.005). Antithrombotic therapy given during hospitalization and on discharge was similar in patients with and without beta-blocker prescription. During a median follow-up of 41 months [14;59], 24 patients (27.3%) experienced a MACCE event. On adjusted Cox regression analysis, patients under BB therapy showed a significantly lower risk for MACCE events (adjusted HR: 0.338; 95%CI: 0.135 to 0.849), however, this was not true for antiplatelet therapy (HR: 0.733; 95%CI: 0.315 to 0.1.704, p = 0.477).



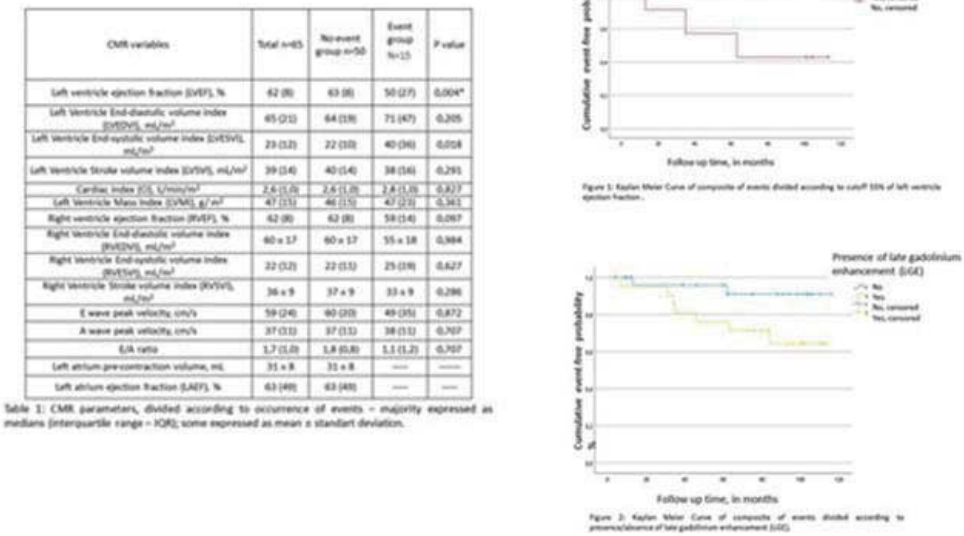
Conclusions: In this study, patients discharged on beta-blockers had a significant risk reduction of cardiovascular mortality, heart failure hospitalizations, stroke or takotsubo syndrome recurrence. Antiplatelet therapy, however, failed to show a similar risk reduction benefit.

CO 130. CARDIOVASCULAR MAGNETIC RESONANCE IN NEUROMUSCULAR DISORDERS - LOOKING AHEAD

Ana Amador, Catarina Martins da Costa, João Calvão, Catarina Marques, André Cabrita, Ana Pinho, Luís Santos, Cátia Oliveira, António José Madureira, Elisabete Martins, Teresa Pinho, Filipe Macedo

Centro Hospitalar Universitário de S. João, EPE.

Introduction: Neuromuscular disorders (NMD) have a wide range of different cardiac presentations. Cardiac magnetic resonance (CMR) has an established role in diagnosis and risk stratification. We sought to access how CMR performs in predicting events in a real cohort of NMD patients (pts).
Methods: We included consecutive patients followed in a tertiary clinical center with neuromuscular disorders (NMD) from January 2012 to December 2018. Clinical and CMR data were collected. During follow-up (FUP), we considered major adverse cardiovascular events (MACE) as a composite of device implantation, ventricular tachycardia/appropriate shock therapy and death.
Results: A total of 65 patients (pts) were included, 33 (51%) women, with mean age of 32 ± 16 years. Most patients had myotonic dystrophy (34, 52%), followed by limb-girdle muscular dystrophy (22; 34%); the remained 9 (13%) had other NMD. About half had inferior limbs predominantly affected and 74% had none, mild or moderate functional impairment. Regarding cardiac manifestations, 18% had cardiac symptoms, 97% were in sinus rhythm, median PR and QRS duration were 169 (IQR 47) and 101 (IQR 11), respectively; median BNP was 26 (IQR 25) mg/dl. Regarding CMR, 43.3% of pts had ≥ one abnormality. Six pts had left ventricle dilation and 7 had left ventricle ejection fraction (LVEF) 55%. Three pts had significant hypertrophy (> 12 mm) and there were isolated cases of hypertrabeculation, segmental alterations or right ventricle dilation. Regarding tissue characterization, 2 pts had T2 hyperintensity, 8 had early gadolinium enhancement (EGE) and 22 had late



CO 130 Figure

gadolinium enhancement (LGE). LGE was located mainly intramyocardium (45%) or subepicardial (36%) and the most affected segments were basal and medium inferolateral (40%). During a median FUP of 77 (IQR 33) months there were 7 deaths, 8 implanted devices (4 pacemakers and 4 CRT-D, 3 in primary prevention) and one sustained ventricular tachycardia in holter; there were no shock therapies. Table 1 describes some CMR parameters according to the occurrence of events. Using Kaplan Meier curves, there were associations between LVEF < 55% and presence of LGE with occurrence of all events (log rank test, p = 0.002 and p = 0.045, respectively), but no association were found with age, LGE pattern nor number/distribution of affected segments. Using Cox Regression, we found that the LVEF < 55% was associated with 6 fold higher risk of events (HR crude 6.15; 95%CI 1.65-22.93), that remained significant after adjusting for LGE (HR adjusted 4.81, 95%CI 1.07-15.9).
Conclusions: In our cohort, CMR LVEF < 55% and the presence of LGE were significantly associated with events during FUP, reinforcing the role of this technique on risk stratification of NMD populations.

Domingo, 16 Abril de 2023 | 12:30-13:30

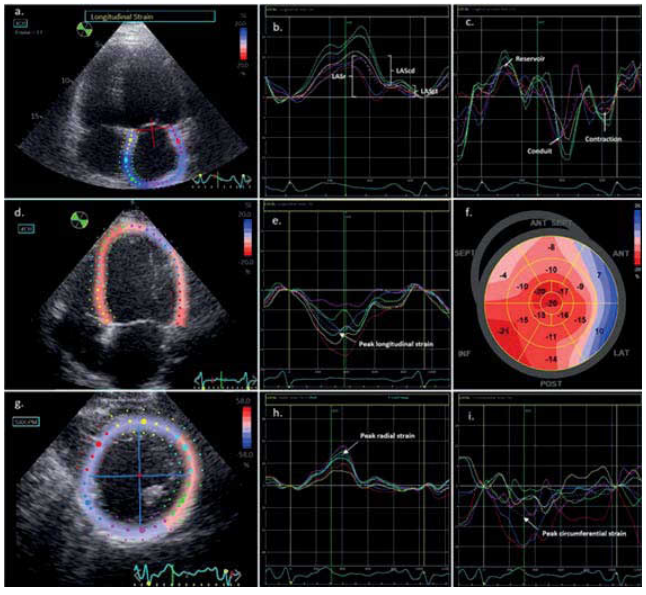
Sala Vega | Comunicações Orais - Sessão 27 - Ecocardiografia

CO 131. LEFT ATRIAL AND LEFT VENTRICULAR STRAIN IMAGING EVALUATION OF HEART FAILURE WITH REDUCED EJECTION FRACTION PATIENTS UNDER SACUBITRIL/VALSARTAN: ATRIAL FIBRILLATION SUBSTUDY

Pedro Garcia Brás, António Valentim Gonçalves, Rita Ilhão Moreira, Tiago Pereira da Silva, Luísa Moura Branco, Pedro Rio, Tânia Mano, João Reis, Alexandra Castelo, Vera Ferreira, Isabel Cardoso, Ana Teresa Timóteo, João Abreu, Rui Cruz Ferreira

Centro Hospitalar Universitário de Lisboa Central, EPE/Hospital de Santa Marta.

Introduction: While sacubitril/valsartan (SV) is increasingly used in heart failure with reduced ejection fraction (HF), data is limited regarding its improvement in left atrial (LA) and left ventricular (LV) strain parameters, particularly in patients (P) with atrial fibrillation (AF). Our aim was to evaluate the difference in LA and LV strain before and after 6 months of SV therapy in HF P in sinus rhythm (SR) and in AF.
Methods: Prospective evaluation of HF P under optimized guideline-directed medical therapy. LA and LV parameters were assessed by 2D speckle-tracking at baseline and after 6 months of SV therapy. LA reservoir strain (LASr), conduit strain (LAScd) and respective phases' strain rate (StR) as well as LV longitudinal, radial and circumferential (circ) strain (Figure) and respective StR were evaluated in SR P and AF P *vs.* baseline.



Results: 35 P, mean age 59 ± 11 years, 83% male and 40% in AF. There was a significant improvement in LASr (13.85 ± 5.9% *vs.* 19.78 ± 6.5%, p < 0.001), LAScd (-6.00 [-8.26--4.38]% *vs.* -7.25 [-10.84--4.75]%, p = 0.024) and reservoir StR (0.54 ± 0.20 s^{-1} *vs.* 0.74 ± 0.15 s^{-1}, p = 0.001) with SV therapy *vs.* baseline in SR P. Although there was a trend to improvement in AF P, it was not statistically significant: LASr (7.00 ± 3.64% *vs.* 9.04 ± 4.5%, p = 0.08), LAScd

(-6.25 [-10.78--3.91]% *vs.* -7.35 [-14.38--5.26]%, p = 0.056), reservoir StR (0.38 ± 0.23 s^{-1} *vs.* 0.46 ± 0.24 s^{-1}, p = 0.135) and conduit StR (-0.34 [-0.6--0.27] s^{-1} *vs.* -0.42 [-0.72--0.34] s^{-1}, p = 0.09). Results were similar concerning longitudinal LV function in SR P: Peak longitudinal strain (-6.12 ± 1.97% *vs.* -9.98 ± 2.60%, p < 0.001), systolic strain rate (StRs) (-0.32 ± 0.11 s^{-1} *vs.* -0.50 ± 0.12 s^{-1}, p < 0.001), early diastolic strain rate (StRe) (0.24 [0.17-0.41] s^{-1} *vs.* 0.50 [0.27-0.65] s^{-1}, p = 0.001). AF P improved peak longitudinal strain (-4.48 ± 1.68% *vs.* -7.79 ± 2.33%, p < 0.001) and StRe (0.27 [0.20-0.41] s^{-1} *vs.* 0.44 [0.25-0.52] s^{-1}, p = 0.014). Regarding radial function there was significant improvement in SR P: peak radial strain (5.87 [4.89-9.43]% *vs.* 11.28 [7.64-14.28]%, p = 0.001), StRs (0.68 ± 0.25 s^{-1} *vs.* 0.95 ± 0.3 s^{-1}, p = 0.002) and StRe (-0.66 ± 0.31 s^{-1} *vs.* -1.1 ± 0.62 s^{-1}, p = 0.005). In AF P while peak radial strain significantly improved (5.22 [3.98-9.21]% *vs.* 12.85 [8.77-14.85]%, p = 0.005), there was no improvement in StRs and StRe. Circ function was significantly higher compared to baseline in SR P: peak circ strain (-7.49 ± 2.3% *vs.* -10.68 ± 2.4%, p < 0.001), StRs (-0.79 [-1.1--0.62] s^{-1} *vs.* -0.98 [-1.25--0.77] s^{-1}, p = 0.009) and StRe (0.84 ± 0.26 s^{-1} *vs.* 0.98 ± 0.23 s^{-1}, p = 0.025) while AF P did not significantly improve peak circ strain (-8.0 ± 2.4% *vs.* -8.22 ± 1.72%, p = 0.855), StRs or StRe.

Conclusions: After 6 months of SV therapy there was a significant improvement in LA and global LV strain parameters in SR P and peak longitudinal and radial strain in AF P. These findings suggest that SV may have a higher effect in reverse LA and LV remodeling in P in SR compared to P in AF.

CO 132. LEFT ATRIAL STRAIN AND INTEGRATED BACKSCATTER: PREDICTORS OF RECURRENCE AFTER PAROXYSMAL, PERSISTENT, AND LONG-STANDING PERSISTENT ATRIAL FIBRILLATION CATHETER ABLATION

Pedro Garcia Brás, Pedro Silva Cunha, Ana Teresa Timóteo, Guilherme Portugal, Ana Galrinho, Sérgio Laranjo, Madalena Coutinho Cruz, Bruno Valente, Pedro Rio, Ana Sofia Delgado, Margarida Paulo, Manuel Brás, Rui Cruz Ferreira, Mário Oliveira, Luísa Moura Branco

Centro Hospitalar Universitário de Lisboa Central, EPE/Hospital de Santa Marta.

Introduction: Left atrial (LA) strain by two-dimensional (2D) speckle tracking (STE) allows for the characterization of LA myocardial deformation. Integrated backscatter (IBS) is a promising tool for noninvasive quantification of myocardial fibrosis. The aim of this study was to compare LA phasic strain, strain rate and IBS between paroxysmal (PAF), persistent (PersAF), and long-standing persistent AF (LsAF) and evaluate its association with AF recurrence post-index catheter ablation (CA).

Methods: Analysis of consecutive patients with symptomatic PAF and PersAF who underwent index CA and had performed an echocardiogram in our

Figure 1

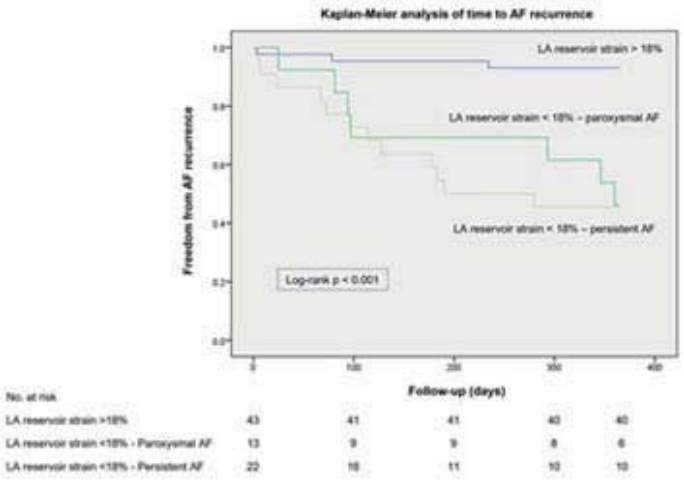
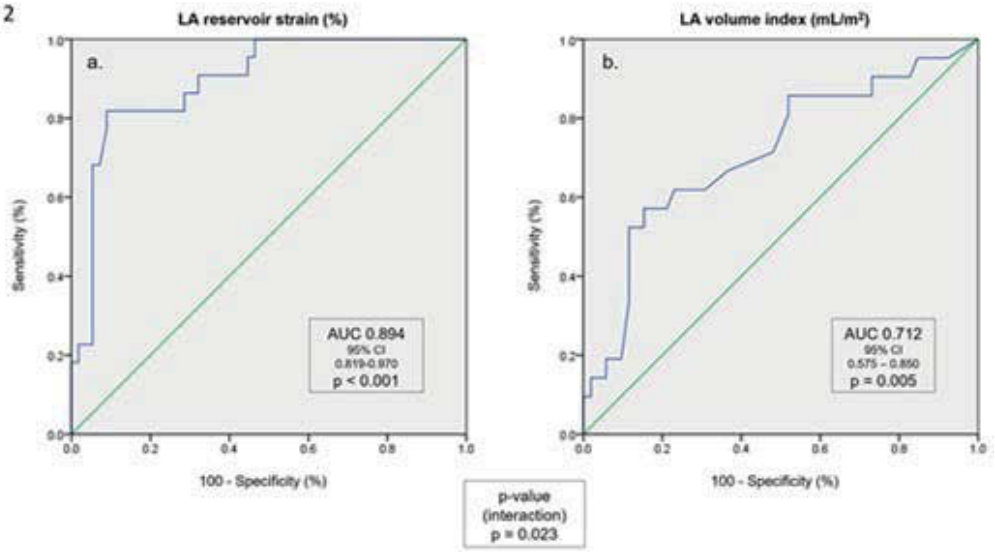


Figure 2



CO 132 Figure

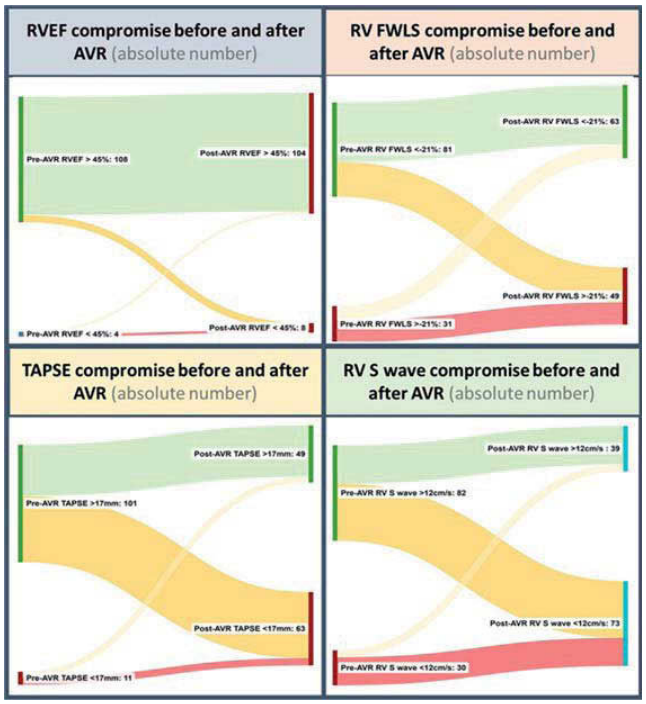
center prior to AF CA. LA longitudinal strain in the reservoir phase (LASr), conduit phase (LAScd) and contraction phase (LASct), the respective phases' strain rate and IBS were assessed by 2D STE at baseline. AF recurrence was documented with 12-lead ECG, 24h Holter monitoring or external loop recorder.
Results: We analyzed 78 patients, 31% with PersAF (46% LsAF), 65% male, mean age 59 ± 14 years, who underwent CA and were followed-up for 12 months. AF recurrence occurred in 22 (28%) patients. Lower values of LA strain and strain rate were found in patients with PersAF, especially in LsAF, both in the reservoir (LASr 9.2 ± 4.9 *vs.* 23.9 ± 9.4, p < 0.001) and conduit (LAScd -5.3 ± 2.8 *vs.* -11.3 ± 7.3, p < 0.001) phases, comparing to patients with PAF. LA strain was lower in patients with AF recurrence in all phases of the cardiac cycle (LAsct was only evaluated in patients in sinus rhythm during the echocardiogram). IBS values were not significantly different in patients with AF recurrence after CA (111.1 ± 24.2 *vs.* 105.9 ± 33.5, p = 0.044). In a multivariable model, LASr (HR 0.82, 95%CI 0.75-0.90, p < 0.001) and LAScd (HR 1.084, 95%CI 1.02-1.15, p = 0.010) were independent predictors of AF recurrence after CA. The strain rates in the reservoir and contractile phases were also linked with AF recurrence. A LASr of < 18% was associated with a significantly higher rate of AF recurrence both in patients with PAF and with PersAF (Figure 1 - Kaplain-Meier curves) with a sensitivity of 86% and a specificity of 70%. Analyzing the ROC curves for AF recurrence, LASr presented a higher predictive power when compared to LA volume index (AUC 0.894 *vs.* AUC 0.712, p = 0.023) (Figure 2). In patients with PAF in sinus rhythm during the echocardiogram, LASct also correlated with AF recurrence. PAF patients who experienced AF recurrence had a higher baseline IBS (109.3 ± 22.1 dB *vs.* 94.7 ± 14 dB, p = 0.016); however, IBS was not a significant predictor of AF recurrence after CA (HR 0.99 [95%CI 0.98-1.01], p = 0.482).
Conclusions: Patients with PersAF and LsAF showed a significantly impaired LA phasic strain. LA phasic strain parameters were predictors of AF recurrence after CA, independently of LA volume. LASr < 18% showed a higher predictive power for AF recurrence compared to LA volume. IBS was not associated with AF recurrence.

CO 133. SERIAL GLOBAL AND LONGITUDINAL RV FUNCTIONAL ASSESSMENT IN SYMPTOMATIC, SEVERE AORTIC STENOSIS UNDERGOING AVR

Sérgio Maltês

Centro Hospitalar Universitário de Lisboa Ocidental, EPE/Hospital de Santa Cruz.

Introduction: Right ventricular (RV) dysfunction is currently regarded as an end-stage marker of of cardiac damage in patients with severe aortic stenosis (AS). However, global RV assessment prior to and after aortic valve replacement (AVR) has largely been neglected and little is known about RV response after AVR.
Objectives: to describe the prevalence of RV dysfunction in a group of patients with severe AS referred to surgical AVR, and to evaluate post-operative evolution, as assessed by both CMR and echocardiography.
Methods: Single-center prospective cohort study of patients with isolated severe symptomatic high-gradient AS submitted to surgical AVR. Those with previous known cardiomyopathy were excluded. All patients performed same day transthoracic echocardiogram (TTE) and CMR both before surgery and at the 3rd to 6th post-operative month. Global RV dysfunction was defined by an RVEF < 45% at CMR. Echocardiographic evidence of RV dysfunction was defined by: tricuspid annular plane excursion (TAPSE) < 17 mm, free wall longitudinal strain (FWLS) > - 21% or RV S' wave by tissue Doppler imaging < 12 cm/s.
Results: A total of 112 patients were included (mean age 71 ± 8 years; mean valvular transaortic gradient 61 ± 18 mmHg; mean indexed aortic valve area 0.4 ± 0.1 cm^2/m^2; mean indexed systolic volume 48 ± 11 mL/m^2, mean LV ejection fraction by CMR pre and post-AVR: 60 ± 10% and 59 ± 8%; mean pulmonary artery systolic pressure pre-AVR: 35 ± 10 mmHg). Only four of the patients (3.4%) had pre-operative stage 4 cardiac damage (RV dysfunction) as assessed by CMR. Moreover, only FWLS at TTE was significantly related to CMR RVEF at both pre-operative (Spearman R = -0.337, p < 0.001) and post-operative evaluation (Spearman R = -0.217, p = 0.026). Contrary to CMR RVEF (58 ± 15% *vs.* 57 ± 8%, p = 0.461), there was a significant worsening of all TTE parameters at post-operative evaluation - overall, 32%, 20% and 25% of patients met one, two or three echocardiographic parameters of RV dysfunction (Figure).



Conclusions: RV dysfunction is common after AVR is patients with severe AS as assessed by common TTE parameters, but this is not accompanied by significant impairment of RVEF. Overall, only FWLS showed a consistent, albeit only moderate, correlation with RVEF at pre and post-AVR. These results highlight the limitations of longitudinal function indexes in evaluating post-surgical global RV function.

CO 134. WHAT HAPPENS TO MYOCARDIAL WORK AFTER TRANSCATHETER AORTIC VALVE REPLACEMENT?

Francisco Barbas de Albuquerque, Bárbara Lacerda Teixeira, Ana Galrinho, António Valentim Gonçalves, Inês Rodrigues, André Grazina, Alexandra Castelo, André Paulo Ferreira, Tiago Mendonça, Rúben Ramos, António Fiarresga, Duarte Cacela, Rui Cruz Ferreira

Centro Hospitalar Universitário de Lisboa Central, EPE/Hospital de Santa Marta.

Introduction: Novel echocardiographic speckle-tracking techniques such as global longitudinal strain (GLS) and myocardial work (MW) have been used in many cardiac conditions for myocardial functional assessment. In severe aortic stenosis (SAS) this evaluation is more challenging since left ventricular (LV) systolic pressure (SP) does not equal non-invasive systolic pressure (NISP) owing to the fixed obstruction of a stenotic valve. Few studies have evaluated the immediate impact of transcatheter aortic valve replacement (TAVR) in patients with SAS.
Objectives: To assess differences in GLS and MW parameters values, pre- and post-TAVR, in patients with SAS.
Methods: One-single center retrospective analysis of consecutive patients with SAS submitted to TAVR, between January 2018 and December 2021, who performed transthoracic echocardiography (TTE) before and after the procedure. NISP was determined at TTE performance. For pre-TAVR assessment, corrected SP by adding the mean aortic gradient was introduced in the software for MW parameters calculations, namely global work index (GWI), global constructive work (GCW), global wasted work (GWW) and global work efficiency (GWE). Continuous variables were assessed for normality using Shapiro-Wilk test. Normal variables were represented as

mean and standard deviation (SD) and compared using a paired-sample t-test. Non-normal variables were represented as median and interquartile range (IQR) and compared using a Wilcoxon-Signed rank test. Statistical significance was defined as two-sided p value < 0.05. All statistical analysis were done with JASP® (version 0.16.0.0).
Results: 50 patients entered the primary analysis. Mean age was 82 years and 56% were female sex. Before TAVR, mean aortic gradient was 49 ± 15 mmHg, mean aortic valve area was 0.76 ± 0.22 cm^2 and LV ejection fraction was 52 ± 11%. The table represents the mean GLS and MW parameters values pre- and post-TAVR from our study population. Patients had significant lower values of GWI (1,764.4 ± 704.9 vs. 1,197 ± 372.6, p < 0.001) and GCW (2,309.5 ± 810.9 vs. 1,627.8 ± 488.5, p < 0.001) post-TAVR when compared with the pre-TAVR values. There were no significant differences in GLS (p = 0.837), GWW (p = 0.055) and GWE (p = 0.438) values pre- and post-TAVR.

Table 1.	Pre- and post-TAVR GLS and Myocardial Work data		
Parameter	Pre-TAVR	Post-TAVR	*p* value
GLS (%)	13.2 ± 3.9	12.8 ± 4.8	0.837
GWI (mmHg%)	1764.4 ± 704.9	1197 ± 372.6	**< 0.001**
GCW (mmHg%)	2309.5 ± 810.9	1627.8 ± 488.5	**< 0.001**
GWW (mmHg)	306 [220.5-493]	264.5 [191.8-385.5]	0.055
GWE (%)	82.3 ± 10	82.2 ± 6	0.438
Systolic BP (mmHg)	171 ± 25	125 ± 16	**< 0.001**

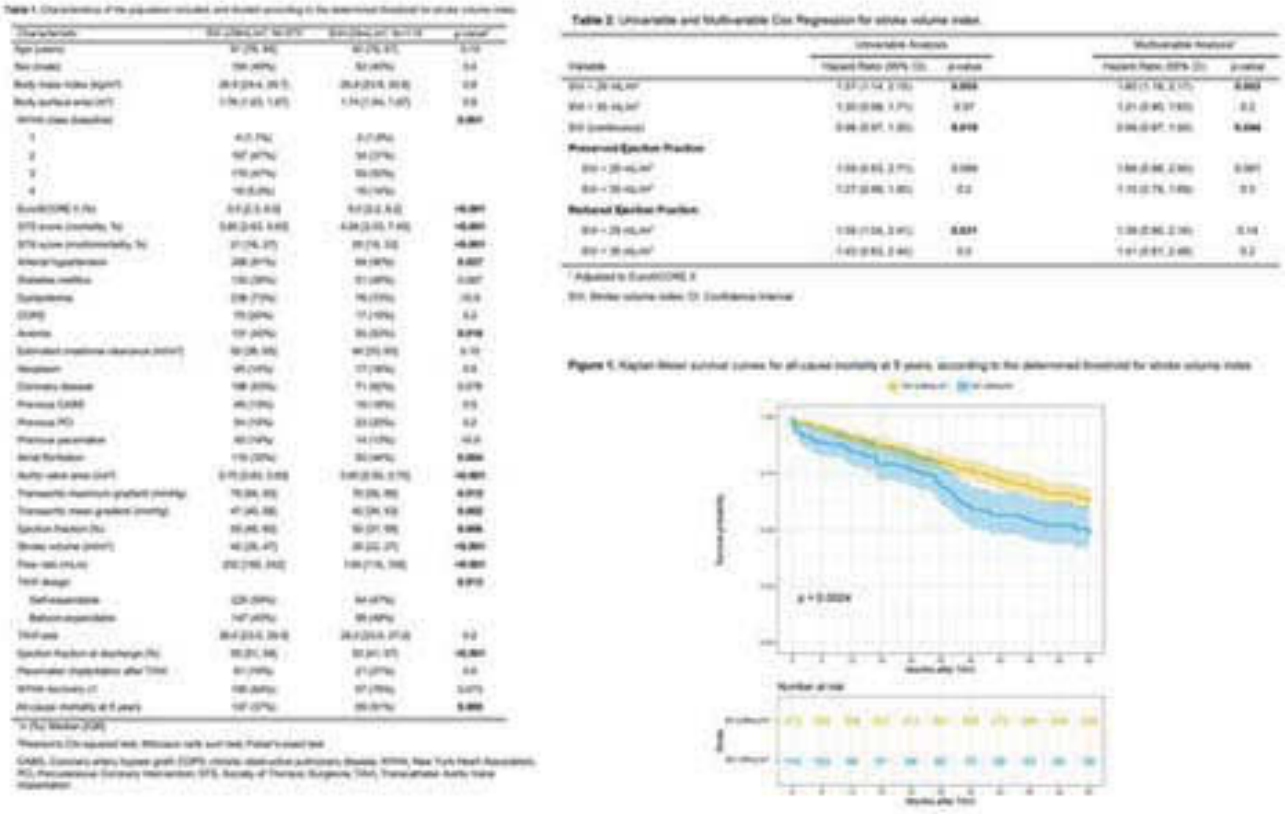
Conclusions: In our study population, GLS was impaired in patients with SAS and it remained identical after TAVR, suggesting un underlying myopathy that does not reverse immediately after the procedure. Furthermore, MW as assessed by GWI was significantly reduced after TAVR. This reflects the reduced workload needed after the procedure.

CO 135. PROFILING RVOT SYSTOLIC FLOW MORPHOLOGY IN PRECAPILLARY PULMONARY HYPERTENSION

Ana Abrantes, Beatriz Valente Silva, Pedro Alves da Silva, Joana Brito, Ana Beatriz Garcia, Catarina Simões de Oliveira, Ana Margarida Martins, Catarina Gregório, Miguel Azaredo Raposo, João Santos Fonseca, Marta Vilela, Daniel Inácio Cazeiro, Joana Rigueira, Rui Plácido, Fausto J. Pinto, Ana G. Almeida

Santa Maria University Hospital CHULN, CAML, CCUL, Lisbon School of Medicine, Universidade de Lisboa.

Introduction: In patients (pts) with pulmonary hypertension (PH), right ventricular outflow tract (RVOT) systolic Doppler flow envelope is frequently abnormal, showing a mid-systolic notch that suggests elevation of pulmonary vascular resistance (PVR). Recent studies have demonstrated that other parameters, such as time-to-notch, may be indicators of elevated pulmonary artery pressures (PAP) and disease severity, conveying an important prognostic value.
Objectives: To evaluate the correlation between RVOT systolic flow morphology and hemodynamic parameters in pts with PH.
Methods: Retrospective, single-center study of consecutive pts diagnosed with pulmonary arterial hypertension (PAH) and chronic thromboembolic PH (CTEPH). We included pts who performed right heart catheterization (RHC) and transthoracic echocardiogram (TTE) within a six month period. RVOT systolic Doppler flow envelope was analyzed by measuring the ejection time (ET), time-to-notch (TN), pulmonary acceleration time (PAT), deceleration slope, pre- and post-notching velocity peak. Clinical, epidemiological, TTE and RHC data were recorded. For statistical analysis, Student's T tests, Chi-square and non-parametric tests were performed when appropriate.
Results: We included 79 pts, 42 with PAH (53%) and 37 with CTEPH (47%). 52 pts were women (66%) with a mean age of 58.06 ± 15.3 years.



CO 136 Figure

The mean follow-up (FUP) was 3.6 ± 2.8 years. Most pts (92.3%) were symptomatic with a WHO functional status of II or III, despite specific PH treatment (69.4% PDE5 inhibitors, 63% endothelin receptor antagonists). In our analysis a higher TN correlated negatively with hemodynamic parameters such as mPAP (p = 0.02), PVR (p = 0.015), and mean right atrial pressure (mRAP), (p = 0.02). Similarly, pts with higher ET showed lower mPAP and sPAP in right ventricular catheterization (p = 0.044, p = 0.05 respectively). As previously reported, lower PAT showed a positive association with sPAP (p = 0.008), pulse pressure in pulmonary artery (p = 0.028), mRAP (p = 0.022), cardiac index (p = 0.01) and pulmonary vascular resistance (p = 0.04). When attempting to stratify TN and ET we noted a positive correlation with higher COMPERA score during FUP and lower clinical events, despite lack of clear statistical significance (p = 0.1). Regarding the remaining RVOT flow variables no statistically significant correlations were found.
Conclusions: This study shows that TN and ET accurately correlate with PAP and PVR, mirroring disease severity. Therefore, RVOT systolic flow profile is a non-invasive parameter that can be used as a valid tool when evaluating patients with PH.

Domingo, 16 Abril de 2023 | 13:30-14:30

Sala Vega | Comunicações Orais - Sessão 28 - Doença valvular e endocardite

CO 136. DEFINING A PROGNOSTICALLY RELEVANT THRESHOLD FOR STROKE VOLUME INDEX IN SEVERE AORTIC STENOSIS PATIENTS UNDERGOING TRANSCATHETER VALVE IMPLANTATION

Diogo Santos Ferreira[1], Silvia Diaz[2], Isabel Fernandes[2], Cláudio Guerreiro[1], Mariana Brandão[1], Fábio Nunes[1], Rafael Teixeira[1], Eulália Pereira[1], Francisco Sampaio[1], Gustavo Pires-Morais[1], Bruno Melica[1], Lino Santos[1], Alberto Rodrigues[1], Pedro Braga[1], Ricardo Fontes-Carvalho[1]

[1]Centro Hospitalar de Vila Nova de Gaia/Espinho, EPE. [2]Faculdade de Medicina da Universidade do Porto.

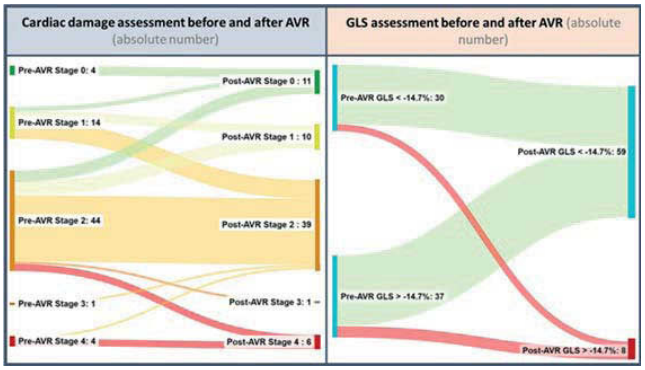
Introduction: The most commonly used parameter to define low-flow conditions in patients with severe aortic stenosis (SAS) is a stroke volume index (SVi) below 35 mL/m^2. Low-flow status has been associated with a worse prognosis, including in patients undergoing transcatheter aortic valve implantation (TAVI). However, recent studies have suggested different cut-offs defining a low-SVi associated with worse survival after valvular intervention.
Objectives: Assess the prognostic impact of SVi before TAVI in SAS treatment and determine a relevant threshold in this context.
Methods: A single-centre retrospective analysis of all TAVI performed in 2011 and 2019 was conducted. Cases without pre-intervention echocardiograms available were excluded. The primary endpoint was defined as time to all-cause death of last follow-up over the five years after intervention. Surv_cutpoint from survival package in R was used to evaluate optimal low-SVi cutpoints associated with worse survival in SAS patients undergoing TAVI. Low-flow patients were compared with normal-flow counterparts using the determined low-SVi definition. The prognostic value of low-SVi at different cut-offs was assessed using Kaplan-Meier curves and log-rank test, as well as Cox proportional hazard model adjusted for EuroSCORE II. Patients were further divided as having preserved or reduced ejection fraction (EF, < 52%). p < 0.05 was considered statistically significant.
Results: From 657 TAVI performed, 488 (74%) cases were included, with a median follow-up of 56 months. There was not a statistically significant association between SVi < 35 mL/m^2 and higher mortality after TAVI (p = 0.07). An optimal cutpoint of low-SVi was defined at < 29 mL/m^2 (n = 115, 24%), and these patients were in more advanced New York Heart Association (NYHA) class, had a higher estimated surgical risk, had a higher prevalence of hypertension, anemia and atrial fibrillation. Low-SVi patients also had lower EF, lower functional aortic valve area and lower transvalvular gradients, and were more frequently treated with balloon-expandable valves. SVi < 29 mL/m^2 was associated with worse survival after intervention, including after adjusting to EuroSCORE II [hazard ratio (HR) 1.60 (1.18-2.17), p = 0.003], and in a reduced [HR 1.58 (1.04-2.41), p = 0.031], but not preserved, EF subset. When analyzed as a continuous variable, a higher SVi was associated with better survival after TAVI [HR 0.98 (0.97-1.00), p = 0.019].
Conclusions: SVi is a prognostically-relevant measure in SAS patients undergoing TAVI. Contrary to a classically defined threshold of < 35 mL/m^2, a SVi < 29 mL/m^2 was associated with higher mortality after treatment in our population.

CO 137. CARDIAC DAMAGE EXTENT IN PATIENT WITH ISOLATED SEVERE AORTIC STENOSIS REFERRED TO SURGICAL AORTIC VALVE REPLACEMENT: IS IT REVERSIBLE AFTER SURGERY?

Sérgio Maltês, João Abecasis, Rita Reis Santos, Maria Rita Lima, Sara Guerreiro, Telma Lima, Pedro Freitas, Regina Ribeiras, Maria João Andrade, José Pedro Neves, Miguel Mendes

Centro Hospitalar Universitário de Lisboa Ocidental, EPE/Hospital de Santa Cruz.

Introduction: Aortic stenosis (AS) may lead to progressive and adverse cardiac remodeling. A recently proposed staging classification regarding extravalvular cardiac damage in AS patients undergoing aortic valve intervention was shown to have significant prognosis implications. However, cardiac damage evolution and reversibility after intervention remain unknown.
Objectives: To assess extravalvular cardiac damage evolution after surgical aortic valve replacement (SAVR) in patients with isolated severe AS.



Methodology: we performed a single-center, prospective cohort study enrolling consecutive patients with severe AS undergoing SAVR. Those with previous cardiomyopathy or concomitant severe valve dysfunction beyond AS were excluded. All patients performed transthoracic echocardiogram (TTE) and cardiac magnetic resonance (CMR) within 3 months before SAVR as well as at the 3rd to 6th post-operative month. Patients were classified according to the extent of cardiac damage into 4 groups: stage 0: no damage; stage 1: left ventricle (LV) hypertrophy (indexed LV mass > 95 g/m^2 [women] or > 115 g/m^2 [men]), LV diastolic (E/e' > 14) or systolic (ejection fraction < 50%) dysfunction; stage 2: dilated left atrium (> 34 mL/m^2) or atrial fibrillation; stage 3: pulmonary hypertension (systolic pulmonary artery pressure ≥ 60 mmHg); stage 4: significant right ventricle (RV) dysfunction. Global longitudinal strain (GLS) was also assessed to further characterize the extent of LV damage - a GLS > -14.7% was considered abnormal. Due to the impact of on-pump cardiac surgery on RV systolic longitudinal function, RV ejection fraction assessed by CMR (< 45%) was used to define significant post-operative RV dysfunction.

Results: A total of 67 patients were included (mean age 71 ± 8 years; 50% male; mean valvular transaortic gradient 60 ± 19 mmHg; mean indexed aortic valve area 0.4 ± 0.01 cm^2/m^2; mean LV ejection fraction by TTE 58 ± 9%). Overall, a significant number of patients still showed some sign of structural cardiac damage after surgery - 14 *vs.* 10 on stage 1, 44 *vs.* 39 on stage 2, 1 *vs.* 1 on stage 3 and 4 *vs.* 4 patients on stage 4 after SAVR (Figure). However, a statistically significant improvement in the number of patients at stage 0 after surgery (4 *vs.* 11, paired McNemar test p = 0.016) was observed, as well as a significant improvement in GLS (mean GLS pre and post AVR -14.8 ± 3.6% *vs.* -16.6 ± 3.3%, respectively; 45 *vs.* 21% patients with abnormal GLS before and after AVR, p = 0.001).
Conclusions: Extravalvular cardiac damage is common in a selected cohort of severe AS patients and potentially reversible after SAVR. A significant improvement in GLS was observed after surgery, suggesting that longitudinal strain may be afterload dependent and amenable for improvement post-AVR.

CO 138. TRANSCATHETER AORTIC VALVE IMPLANTATION INFECTIVE ENDOCARDITIS CHARACTERIZATION AND OUTCOMES

André Grazina, Barbara Lacerda Teixeira, Alexandra Castelo, Francisco Barbas Albuquerque, André Ferreira, Ana Raquel Santos, Tiago Mendonça, Inês Rodrigues, Ruben Ramos, António Fiarresga, Duarte Cacela, Rui Cruz Ferreira

Centro Hospitalar Universitário de Lisboa Central, EPE/Hospital de Santa Marta.

Introduction: Transcatheter aortic valve implantation (TAVI) is nowadays a well-established procedure for the treatment of severe aortic stenosis (AS). Infective endocarditis (IE) after TAVI is a rare but potentially fatal complication. Registries report incidences of IE after TAVI from 0% to 14%. Severe infections and peri-valvular involvement seem to be frequent, requiring surgical intervention and valve-in-valve procedures in 11.4% and 6.4% of the cases, respectively. Data on microbiological profile, infection severity, outcomes and appropriate treatment of these patients remains sparse.
Objectives: This analysis aims to describe the IE incidence after TAVI as well as to characterize the population regarding microbiological profile, infection severity and outcomes.
Methods: Retrospective descriptive analysis of patients submitted to TAVI in a single tertiary Portuguese center.
Results: 642 consecutive patients underwent TAVI. During the follow-up, 12 patients developed prosthetic aortic valve IE (rate of 1.9%). Baseline characteristics, microbiological profile, clinical manifestations, and outcomes are summarized in table 1. Mean age is 77.7 years old, 83% of the patients are male and comorbidities are frequent with diabetes in 42%, chronic kidney disease in 42%, coronary artery disease in 45%, left ventricular dysfunction in 33% and permanent pacemaker in 42% of the patients. Blood cultures revealed gram-positive bacteria in 42% (*Staphylococcus* in 25%), gram-negative bacteria in 33% and absence of microorganisms in 25% of the cases. Valvular vegetations were present in most of the cases with leaflet destruction and severe aortic regurgitation in 1 patient. 3 patients had peri-prosthetic involvement, all with prosthetic dehiscence and severe leak and 1 with aortic pseudoaneurysm. Embolic events occurred in 25% of the patients, mainly to central nervous system. The median time to development of IE after TAVI was 114 days, with 4 patients developing IE less than one month after TAVI. Despite the relative high rates of severe infection, with peri-valvular involvement and embolic phenomenon, none of the patients was accepted to surgical treatment and valve-in-valve procedures was not attempted. 1 patient with severe leak was submitted to percutaneous leak closure with technical success. All the remaining underwent antibiotic treatment alone. The mortality rates were 17% at 30 days and 50% at 1 year.
Conclusions: Infective endocarditis remains a rare but severe complication of TAVI procedures, with high mortality rates. Patients are often old, frail and unsuitable for surgical intervention. Efforts should be made to better prevent IE and to define appropriate antibiotic regimens in these patients. The use of valve-in-valve procedures to treat prosthetic dehiscence with leak is lacking data.

Baseline characteristic			
Age in years old (mean±SD)	77.3 ± 8.8	Previous stroke (n)	8% (1)
Gender (male)	83% (10)	Atrial fibrillation (n)	25% (3)
BMI in Kg/m² (mean±SD)	25.3 ± 3.5	Permanent PM (n)	42% (5)
Arterial hypertension (n)	100% (2)	Euroscore II (IQR)	3.7 (2.1)
Dyslipidemia (n)	75% (9)	STS Score (IQR)	3.2 (1.2)
Diabetes (n)	42% (5)	Basal NYHA class (mean±SD)	2.8 ± 0.6
CKD, KDIGO stage ≥ 3 (n)	42% (5)	Mean aortic gradient in mmHg (mean±SD)	50.0 ± 16.7
hemodialysis (n)	8% (1)		
Coronary artery disease (n)	42% (5)	LVEF <50% (n)	33% (4)
previous MI (n)	17% (2)	Bicuspid aortic valve (n)	8% (1)
previous CABG (n)	17% (2)		
Peripheral artery disease (n)	17% (2)	Valvular calcium score (IQR)	2200 (1544)
Microbiological profile			
Staphylococcus epidermidis (n)	17% (2)	Enterococcus *spp* (n)	8% (1)
Staphylococcus aureus (n)	8% (1)	Gram-negative bacteria (n)	33% (4)
Streptococcus *spp* (n)	8% (1)	Blood culture-negative (n)	25% (3)
Clinical manifestations/ findings			
Valvular vegetations (n)	75% (9)	Intraprosthetic severe AR (n)	8% (1)
Periprosthetic involvement (n)	25% (3)	Embolic phenomenon (n)	25% (3)
Dehiscence; severe leak (n)	25% (3)	Central Nervous System (n)	17% (2)
Pseudoaneurysm (n)	8% (1)	Splenic (n)	8% (1)
Abscess (n)	0% (0)	Peripheric/ limbs (n)	0% (0)
Outcomes			
Total follow-up, days (IQR)	365 (214)	Antibiotic treatment alone (n)	92% (11)
Time to IE, days (IQR)	114 (163)	Cardiac surgery (n)	0% (0)
30-day mortality (n)	17% (2)	Valve-in-valve procedure (n)	0% (0)
1-year mortality (n)	50% (6)	Percutaneous leak closure (n)	8% (1)

Table 1. TAVI infective endocarditis baseline characteristics, microbiological profile, clinical manifestations, and outcomes

CO 139. IN-HOSPITAL MORTALITY IN INFECTIVE ENDOCARDITIS: A SCORE COMPARISON

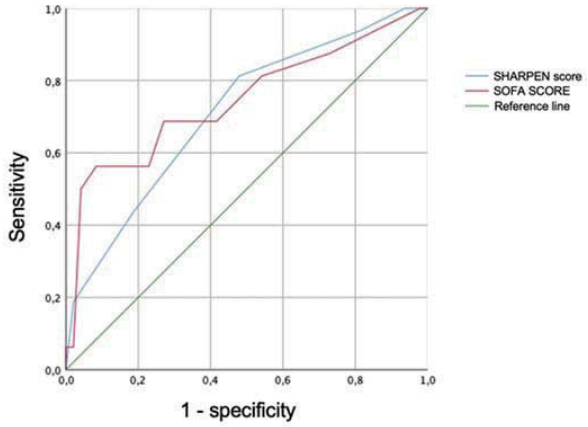
João Gouveia Fiuza, Vanda Devesa Neto, Gonçalo R. M. Ferreira, Joana Laranjeira Correia, Júlio Gil Pereira

Centro Hospitalar Tondela-Viseu, EPE/Hospital de São Teotónio.

Introduction: Infective endocarditis (IE) is associated with high level of mortality. It is crucial to promptly identify patients with higher risk. SHARPEN score (Systolic BP, Heart failure, Age, Renal function, Pneumonia, Elevated peak CRP, and Non-intravenous drug abusers) was developed to predict in hospital mortality (IHM) in patients presenting with IE. SOFA score is commonly used to predict clinical outcomes of critically ill patients.
Objectives: Evaluate SHARPEN's score (ShS) performance and how it compares to the SOFA score (SS) in predicting in-hospital mortality.
Methods: Retrospective study of 64 patients admitted for IE in a Cardiology Department from 2018 to 2022. Baseline characteristics, microbiological and imaging findings and disease severity were analyzed. SHARPEN score was calculated at admission, and each patient was classified as low-moderate (ShLM) (2-10 points) or high (ShH) (11-20 points) risk. The SOFA score was also calculated at admission, and the population was divided into two groups: SC 0-6 points (SSL) and SC ≥ 7 points (SSH). Chi-square and Mann-Whitney U were used for comparison between groups and IHM. Discrimination for in-hospital mortality was assessed with the ROC curve.

Results: Mean age was 68 ± 77 years; 67.2% were men. IHM was 25%. 56.3% of patients had ShH. 28.1% of patients had SSH. Patients in ShH group had greater prevalence of previous diagnosis of heart failure (50% *vs.* 7.1%; χ^2 = 13.465; p < 0.01; OR = 13), acute kidney injury (91.7% *vs.* 32.1%; χ^2 = 24.737; p < 0.01; OR = 23.22), anemia during hospital stay (100% *vs.* 82.1%; χ^2 = 6.973; p = 0.01), admission lower hemoglobin (p < 0.01), higher leucocyte and creatinine measurements (p = 0.05 and p < 0.01, respectively). Patients in SSH group had greater prevalence of chronic kidney disease (44.4% *vs.* 10.87%; χ^2 = 9.01; p < 0.01, OR 6.56), acute kidney injury (88.9% *vs.* 56.52%; χ^2 = 6; p = 0.02; OR = 6.15) and higher admission creatinine (p = 0.02). Patients with ShH were associated with a significant higher IHM and presenting 4.7 times higher likelihood of IHM compared with ShLM (36% *vs.* 11%; χ^2 = 5.418; p = 0.02; OR = 4.71). Patients with SSH had a 5.6 times higher likelihood of IHM compared with SSL (50% *vs.* 15.2%; χ^2 = 8.348; p = 0.01; OR = 5.57). When comparing ShS and SS they were statistically significative and similar in predicting IHM (AUC 0.712, p = 0.01 *vs.* AUC 0.745, p = 0.01, respectively).

Fig. 1 – ROC curve



Conclusions: In our population both scores performed equally well at identifying patients with increased risk of IHM. Both scores are adequate at predicting higher risk of adverse outcomes.

CO 140. A LIGHT AT THE END OF THE TUNNEL - COULD INFECTIVE ENDOCARDITIS EPIDEMIOLOGY AND BURDEN BE CHANGING FOR THE BETTER?

Rafaela Fernandes, Mariana Simões, Ana Rita Gomes, Gustavo Campos, João Rosa, Vanessa Lopes, Eric Monteiro, Gonçalo Costa, Joana Guimarães, Diogo Fernandes, Carolina Saleiro, Ana Sofia Martinho, Luís Paiva, Joana Moura Ferreira, Lino Gonçalves

Centro Hospitalar de Coimbra, EPE/Maternidade Bissaya Barreto.

Introduction: Infective endocarditis (IE) is not a common disease but has high morbidity and mortality rates. In Portugal, the burden of IE is increasing due to the epidemiological profile changes, an aged population with severe comorbidities and a greater number of prosthetic valve and device-related infections.
Methods: Retrospective observational study that included all cases of IE in adult patients, admitted to Cardiology wards in a University Hospital Centre between 2005 and 2021. The patients were divided into two cohorts (cohort 1: patients admitted from 2005 to 2013, cohort 2: patients admitted from 2014 to 2021). Our purpose was to characterize the epidemiological profile of this disease. A revision of informatized clinical files was performed and statistical analysis was conducted using SPSS software.
Results: A total of 230 patients were included, with 95 patients in cohort 1 and 135 in cohort 2. The median hospital stay was 41 (ID = 34) days, and the median follow-up time was 607 (ID = 1,946) days. A male predominance was observed (cohort 1 with 73/76.8% patients and cohort 2 with 95/70.4% patients). The median age was 62(ID = 22) years in cohort 1 and 67 (ID = 21) years in cohort 2. The in-hospital mortality rate was higher in cohort 1 (30.5% in cohort 1 *versus* 20% in cohort 2). Cohort 2 has a higher number of patients with prosthetic valves (11/8.1%). *Staphylococcus epidermidis* (10/10.5%) and *Staphylococcus aureus* methicillin-susceptible (MSSA) (10/10.5%) were the more frequent causative agents identified in cohort 1. In cohort 2 the most frequent microorganisms identified were *Staphylococcus aureus* methicillin-resistant (MRSA) (18/13.3%) and *Enterococcus faecalis* (15/11.1%). In 33 (24.4%) patients from cohort 2, IE was considered a nosocomial infection.
Conclusions: The slightly higher age in cohort 2 is indicative of an older population, with more comorbidities and a rapidly increasing rate of nosocomial infections. There is no doubt that nowadays, IE is even more severe. However, in our study we found that the prognosis is improving. Our in-hospital mortality rate has decreased in the last years, probably because of a better diagnosis, and improved medical and surgical treatments.

Domingo, 16 Abril de 2023 | 14:30-15:30

Sala Vega | Comunicações Orais - Sessão 29 - *Score* cálcio coronário

CO 141. CORONARY ARTERY CALCIUM SCORE IS A PREDICTIVE TOOL FOR CARDIOVASCULAR EVENTS IN AN ASYMPTOMATIC POPULATION

Francisco Sousa[1], Maria Isabel Mendonça[1], Margarida Temtem[1], Marco Serrão[1], Marina Santos[1], Débora Sá[1], Sofia Borges[1], Sónia Freitas[1], Eva Henriques[1], Mariana Rodrigues[1], António Drumond[1], Ana Célia Sousa[1], Roberto Palma dos Reis[2]

[1]Hospital Dr. Nélio Mendonça. [2]Faculdade de Ciências Médicas de Lisboa/ NOVA Medical School.

Introduction: Recent research highlights the role of the coronary artery calcium score (CAC Score) in evaluating the severity of subclinical atherosclerosis in asymptomatic individuals without apparent cardiovascular disease (CVD). However, the influence of the CAC score on the prognosis of an asymptomatic population is not consensual.
Objectives: Investigate the role of the CAC score as a predictive tool for the occurrence of cardiovascular events in an asymptomatic population without known CVD.
Methods: 1,195 asymptomatic subjects (mean age 55.1 ± 6.9 years, 73.8% male) selected from the prospective arm of the GENEMACOR study were followed up during 5.9 ± 4.3 years. CAC score was performed by cardiac computed tomography and reported as Agatston units according to the Hoff Nomogram in low, moderate and high-risk categories. The bivariate analysis evaluated CV events in the three CAC score risk categories and in traditional risk factors (TRFs) individually. Multivariable Cox proportional hazard ratios (HR) with 95% confidence intervals (95%CI) assessed the variables independently associated with CV events occurrence. Kaplan-Meier estimated the survival in the CAC risk categories.
Results: None of the TRFs showed significant differences in the CV events percentages. As the CAC score category increases, the percentage of CV events rises (p < 0.0001). After Cox regression analysis, the high CAC risk category remained a strong CV events predictor (HR = 3.71; 95%CI 1.66-8.27; p = 0.001), along with age and smoking (Table). At fifteen years of follow-up, 95.3%, 92.8%, and 84.3% survived in the low, moderate and high-risk categories, respectively (long rank test; p < 0.0001).

Table – Variables independently associated with events occurrence (Cox regression)

Variables	B	S.E.	Wald	df	HR (95% CI)	p-value
CAC score			11.219	2		0.004
Moderate	0.454	0.468	0.942	1	1.575 (0.629-3.944)	0.332
High	1.310	0.409	10.247	1	3.706 (1.662-8.266)	0.001
Smoking	0.715	0.354	4.078	1	2.044 (1.021-4.092)	0.043
Age	0.089	0.024	13.293	1	1.093 (1.042-1.146)	<0.001

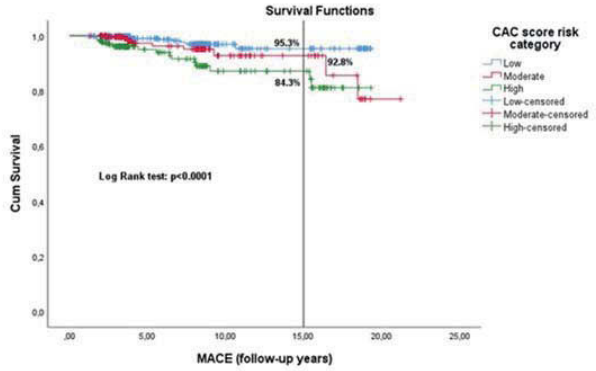


Fig. - This graph plots the Kaplan-Meier curves for the three risk groups at fifteen years

Conclusions: The presence of coronary calcifications indicated a worse prognosis in our asymptomatic population. CAC score is an excellent predictive tool for the asymptomatic subjects with coronary atherosclerosis in progression and could help initiate preventive therapy.

CO 142. INFLUENCE OF AGE ON THE DIAGNOSTIC VALUE OF CORONARY ARTERY CALCIUM SCORE FOR RULING OUT CORONARY STENOSIS IN SYMPTOMATIC PATIENTS

Francisco Albuquerque[1], Pedro Lopes[1], Pedro Freitas[1], Pedro de Araújo Gonçalves[1], João Presume[1], Sara Guerreiro[1], João Abecasis[1], Ana Coutinho Santos[1], Carla Saraiva[1], Miguel Mendes[1], Hugo Marques[2], António Ferreira[1]

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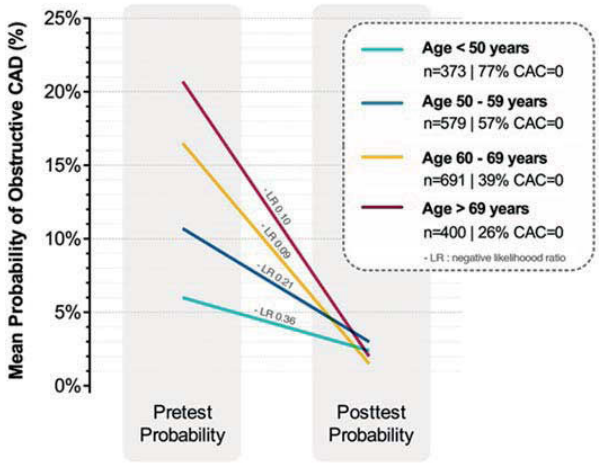
Introduction: The 2021 Guideline for the Evaluation of Chest Pain supports the use of coronary artery calcium (CAC) score as a reasonable first-line test to identify patients with a low likelihood of obstructive coronary artery disease (CAD) who may not require additional testing (class IIa, LOE B). However, a recent study from a large cohort of Northern European patients raised concerns about the added diagnostic value of CAC = 0 in younger patients. The aim of this study was to assess the influence of age on the value of CAC = 0 in symptomatic patients undergoing coronary computed tomography angiography (CCTA).
Methods: We conducted a two-center cross-sectional study assessing symptomatic patients with suspected CAD who underwent CAC score and CCTA. Key exclusion criteria were age < 30 years, known CAD, suspected acute coronary syndrome, or symptoms other than chest pain or dyspnea. Pretest probability of obstructive CAD was calculated based on age, sex and symptom typicality, according to the guideline-recommended method. Obstructive CAD was defined as any luminal stenosis ≥ 50% on CCTA. The diagnostic likelihood ratios and negative predictive values (NPV) were used to assess the diagnostic value of a CAC score of 0 to rule out obstructive CAD.
Results: A total of 2,043 patients (mean age 60 ± 11 years, 60% women) of whom 990 (48.5%) had a CAC score of 0 were included in the analysis. Symptom characteristics were: 38% non-anginal chest pain, 30% atypical angina, 19% dyspnea, and 13% typical chest pain. Overall, the prevalence of obstructive CAD was 12.8% (n = 262). Pretest probability of obstructive CAD increased progressively with age, from 6.0% in patients young than 50 years to 20.7% in those 70 years or older. Contrariwise, the prevalence of patients with a CAC score = 0 decreased from 77% in patients younger than 50 years, to 26% in those who where 70 years or older. The added diagnostic value of a CAC score = 0 was lower in younger patients, with negative likelihood ratios ranging from 0.36 (64% decrease in the likelihood of CAD) in patients younger than 50 years, to 0.09 and 0.10 (~90% decrease in the likelihood of CAD) in those aged 60-69 years and 70 years or older, respectively (Figure). Despite this, the prevalence of obstructive CAD among patients with a CAC score = 0 was low across all age groups: 2.4% (i.e., NPV = 97.6%) in those younger than 50 years, 3.0% (NPV = 97.0%) among those aged 50-59 years, 1.5% (NPV = 98.5%) in patients between 60-69 years, and 2.0% (NPV = 98.0%) among those 70 years or older.



Conclusions: In a cohort of symptomatic patients undergoing CCTA for suspected CAD, the added diagnostic value of a CAC score of zero decreases significantly at younger ages. However, this "diminishing return" of CAC in younger patients if offset by their lower pretest probabilities, yielding high negative predictive values independently of age.

CO 143. COULD A HIGH EPICARDIAL ADIPOSE TISSUE VOLUME INCREASE THE ABILITY OF THE CALCIUM SCORE TO DISCRIMINATE CARDIOVASCULAR EVENTS IN AN ASYMPTOMATIC POPULATION?

Margarida Temtem[1], Maria Isabel Mendonça[1], João Adriano Sousa[1], Marco Serrão[1], Marina Santos[1], Débora Sá[1], Francisco Sousa[1], Sónia Freitas[1], Sofia Borges[1], Eva Henriques[1], Mariana Rodrigues[1], António Drumond[1], Ana Célia[1], Roberto Palma dos Reis[2]

[1]Hospital Dr. Nélio Mendonça. [2]Faculdade de Ciências Médicas de Lisboa/ NOVA Medical School.

Introduction: Evidence indicates that an elevated calcium score (CAC) is a risk marker for subclinical atherosclerosis and cardiovascular (CV) events in the asymptomatic population. Recent research has shown that high epicardial adipose tissue (EAT) volume is associated with coronary calcification and CV events It is unknown whether the association between the two risk markers improved the ability to predict CV events.
Objectives: Evaluate whether a high EAT volume added to the CAC score improves the predictive ability to discriminate CV events in an asymptomatic population without apparent cardiovascular disease (CVD).
Methods: A prospective cohort was performed with 1,024 participants (mean age 51.6 ± 8.2 years, 75.6% male) selected from controls of the GENEMACOR Study. CAC score was performed by cardiac computed tomography, and CAC severity was reported as an absolute Agatston unit stratified for age and sex-percentile (according to the Hoff Nomogram). EAT volume was measured with a quantitative semi-automated procedure using a postprocessing

workstation-TeraRecon Aquarius Workstation (version 4.4.7, TeraRecon, Inc., San Mateo, CA, USA). We evaluated the discriminative ability of the CAC model without (model 1) and with EAT volume (model 2) using the ROC curve along with respective AUC and Harrel C statistics. Categorical free Net Reclassification Improvement (cfNRI) and Integrated Discrimination Index (IDI) reclassified patients.
Results: CAC model showed a C Index of 0.733 (95%CI 0.633-0.833), which increased to 0.756 (95%CI 0.638-0.874) when EAT volume was included in the model. The difference between the two C indexes was significant (delta C statistic = 0.023; p = 0.020). CfNRI reclassified 63.6% of the population (p = 0.0003), and IDI improved the discrimination when EAT was included in CAC model (IDI = 0.011; p = 0.015).

Evaluation of the incremental value of EAT to the CAC model

	Estimate	95% CI	P-value
C-statistic Model 1	0.733	0.633 – 0.833	-
C-statistic Model 2	0.756	0.638 – 0.874	-
ΔC-statistic	0.023		***0.020***
cfNRI, %	63.6	29.4 – 97.8	***0.0003***
IDI	0.011	0.002 – 0.021	***0.015***

Conclusions: Our findings displayed that the CAC score associated with a high EAT volume increased the predictive and discriminative ability to event occurrence. Improving the identification of high-risk patients at a subclinical stage could avoid atherosclerosis progression and events occurrence through preventive measures.

CO 144. "PROGNOSTIC CHANGE" OF ADDING CORONARY CALCIUM SCORE AND GENETIC RISK SCORE TO EUROPEAN SCORE2 IN A MODERATE RISK REGION

Margarida Temtem[1], Roberto Palma Reis[2], Marco Serrão[1], Marina Santos[1], Débora Sá[1], Francisco Sousa[1], Mariana Rodrigues[1], Sónia Freitas[1], Eva Henriques[1], Sofia Borges[1], Graça Guerra[1], Ilídio Ornelas[1], António Drumond[1], Ana Célia Sousa[1], Maria Isabel Mendonça[1]

[1]Hospital Dr. Nélio Mendonça. [2]Faculdade de Ciências Médicas de Lisboa/ NOVA Medical School.

Introduction: Cardiovascular disease is a public health issue remaining the leading cause of death worldwide. One of its main contributors is coronary artery disease (CAD), a complex multifactorial disease with the influence of hereditary and environmental factors. It's crucial to improve cardiovascular risk assessment which is a real challenge in our daily clinical practice. SCORE 2 enhanced the identification of individuals at higher risk of developing CAD, but it remains scanty. Coronary Artery Calcification (CAC) score and Genetic contributions could improve CV risk stratification in primary prevention.
Objectives: Evaluate the impact of including CAC score and Genetic Risk Score (GRS) to the European SCORE2 in MACE prediction and cardiovascular risk stratification in our asymptomatic population.
Methods: 945 asymptomatic subjects (mean age 52.9 ± 6.8 years, 74.0% male) selected from the prospective arm of the GENEMACOR study were followed up during 5.4 ± 4.1 years. The population was categorized according to SCORE2 into three risk groups (low-intermediate < 5%; high 5-10%; very high > 10%). CAC score was performed by cardiac computed tomography and reported as Agatston units according to the Hoff Nomogram in low, moderate and high-risk categories. The GRS was created from 33 genetic variants associated with CAD by GWAS, choosing those with a hazard ratio (HR) higher than 1. Multivariable Cox proportional hazard ratios (HR) with 95% confidence intervals (95%CI) assessed the variables independently associated with CV events occurrence. We evaluated the discriminative ability of the Score2, CAC score and GRS using the Harrel C statistics.
Results: Cox regression analysis showed that the highest categories of SCORE2, CAC and GRS remained in the equation with an HR of 16.6 (p = 0.008), HR of 3.6 (p = 0.006) and HR of 3.2 (p = 0.022), respectively, when compared with the lowest categories. C-statistic demonstrated that the predictive value for MACE was 0.671 for SCORE2, increased to 0.799 (p = 0.002) when adding CAC score and improved to 0.808 (p = 0.012) when adding mGRS (Table), showing a better discrimination capacity for MACE.

Variables independently associated with events occurrence (Cox regression)

Variables	B	S.E.	Wald	df	HR (95% CI)	p-value
Score2			8.505	2		0.014
High	1.989	1.041	3.651	1	7.306 (0.950-56.181)	0.056
Very high	2.808	1.066	6.943	1	16.570 (2.053-133.749)	0.008
CAC score			10.446	2		0.005
Moderate	-2.276	0.683	0.164	1	0.759 (0.199-2.894)	0.686
High	1.269	0.462	7.555	1	3.556 (1.439-8.786)	0.006
GRS above median	1.166	0.509	5.241	1	3.210 (1.183-8.714)	0.022

CAC Score – Coronary artery calcium Score; GRS – Genetic Risk Score; CI – Confidence interval. Statistically significant for p<0.05.

Incremental discriminative capacity

Models	Total events occurrence	
	C-index (95% CI)	P-value
Score2	0.671 (0.585 – 0.757)	
Score2 + CAC Score	0.799 (0.709 – 0.889)	**0.002**
Score2 + CAC Score + GRS	0.808 (0.714 – 0.902)	**0.012**

CAC Score – Coronary artery calcium Score; GRS – Genetic Risk Score; CI – Confidence interval. Statistically significant for p<0.05.

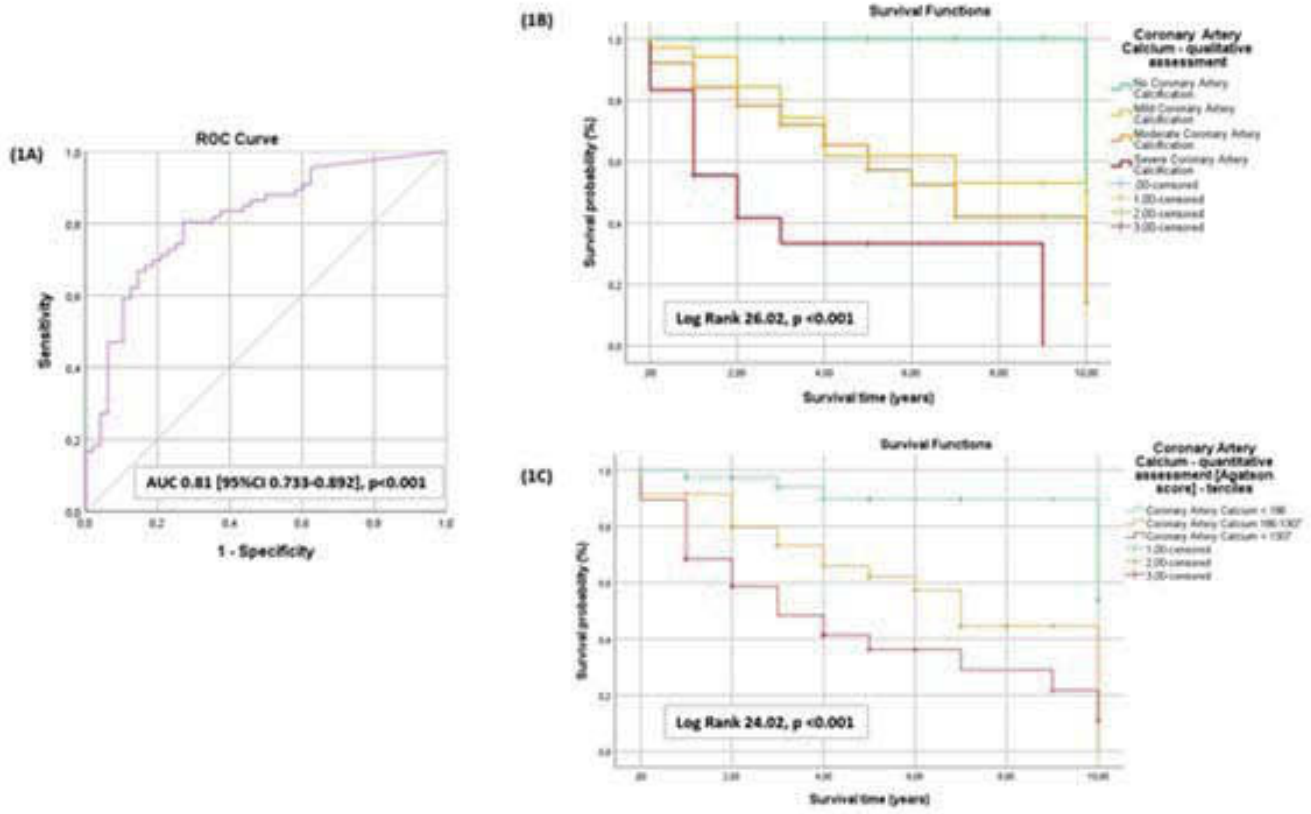
Conclusions: Our results highlight the importance of adding CAC score and mGRS to SCORE2 in primary prevention to improve cardiovascular risk stratification and MACE prediction. Larger prospective multicenter cohorts with longer follow-up should reproduce and validate these findings.

CO 145. CORONARY ARTERY CALCIUM IDENTIFIED ON NON-GATED CHEST CT SCANS - A WASTED OPPORTUNITY TO AVOID THE TRAGEDY

Beatriz Valente Silva[1], Miguel Nobre Menezes[2], Rui Plácido[2], Cláudia Jorge[2], Joana Rigueira[2], Joana Brito[2], Pedro Alves da Silva[2], Catarina Oliveira[2], Ana Margarida Martins[2], Beatriz Garcia[2], Ana Abrantes[2], João Fonseca[2], Miguel Raposo[2], Catarina Gregório[2], Ana Almeida[2], Fausto J. Pinto[2]

[1]Centro Hospitalar Universitário de Lisboa Norte, EPE/Hospital de Santa Maria. [2]Centro Hospitalar Universitário de Lisboa Norte, EPE/Hospital de Santa Maria, Santa Maria University Hospital CHULN, CAML, CCUL, Lisbon School of Medicine, Universidade de Lisboa.

Introduction: Coronary artery calcium (CAC) is an independent predictor of cardiovascular events. While it is traditionally performed utilizing gating with specific acquisition parameters, CAC can be identified in non-gated standard chest computed tomography (CT). This study aimed to assess CAC on chest CTs, evaluating its correlation with coronary lesions on coronary angiography (CAG) and prognosis.
Methods: We retrospectively reviewed patients (pts) who underwent CAG due to acute coronary syndrome (ACS) who had undergone a prior non-gated non-contrast chest CT. CAC was qualitatively evaluated by visual assessment (mild/ moderate/severe) and quantitatively assessed using Agatson score and stratified by terciles. Evaluation was performed by an investigator blinded to CAG report.
Results: We included 114 pts after reviewing 1000 CAGs: 67% male, mean age 68 years, 78% hypertension, 62% dyslipidemia, 38% chronic kidney disease, 38% diabetes. The mean time difference between CT and CAG was 23 months. CAG was performed due to unstable angina in 33% of pts, NSTEMI in 52% and STEMI in 16%. Significant lesions were found in 57% (69% performed PCI and 17% surgical revascularization). CAC was visual classified as mild, moderate and severe in 31%, 33% and 16% of pts, respectively. Moderate or severe CAC was an independent predictor of significant lesions on CAG [OR 22, 95%CI 8-61, p < 0.001] and all-cause mortality [OR 4, 95%CI 2-9, p = 0.001]. Pts with severe CAC had higher peak troponin than those with mild/moderate CAC (1,780 *vs.* 315 ng/L, p = 0.024). Quantitative CAC score accurately predicted significant lesions (AUC 0.81, p < 0.001; Figure 1A), with higher scores in this subgroup (1,308 *vs.* 120, p < 0.001) and strongly correlated with SYNTAX score (p < 0.001). Survival analysis stratified by severity of CAC assessment is shown in Figure 1B and 1C. The most severely calcified artery in the CT often matched the culprit vessel of future ACS, with 79%, 60% and 50% concordance for left anterior descending, circumflex,



CO 145 Figure

and right coronary artery, respectively. While significant CAC was identified in 80% of CTs, formal reporting was as low as 25%, even with severe CAC, where only 2/18 reports mentioned it. Furthermore, only 62% pts were on statin therapy at the time of CAG.
Conclusions: CAC evaluation in chest CTs was feasible and strongly associated with the extent/severity of coronary artery disease on CAG, as well as mortality. Notwithstanding, CAC underreporting was frequent and statin therapy underused, suggesting a simple and common opportunity for preventive care.

Sexta-feira, 14 Abril de 2023 | 14:00-15:30

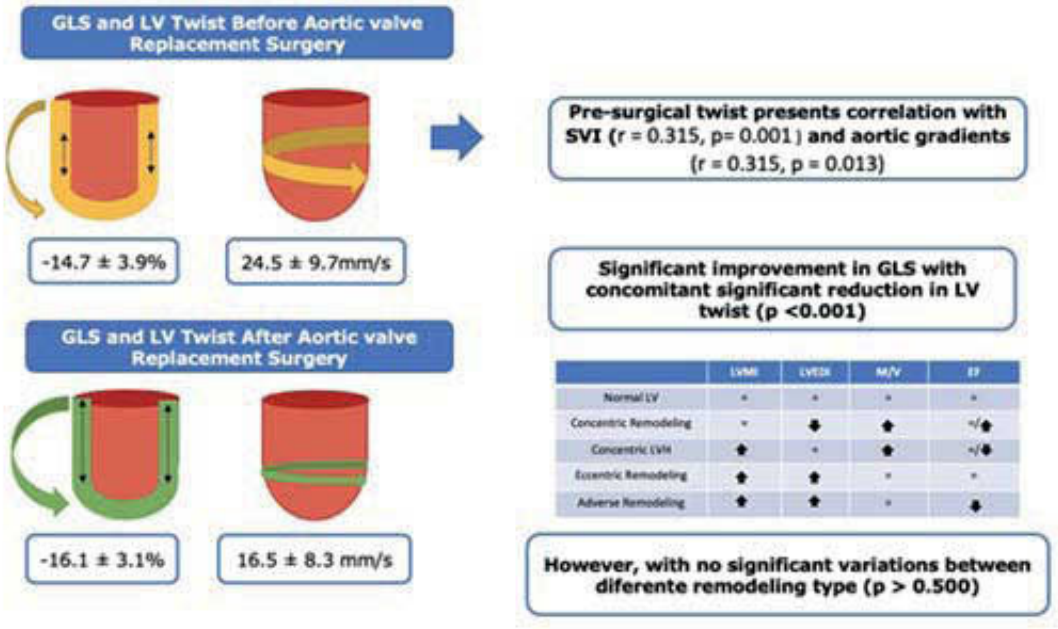
Sala Aquarius | Prémio do Jovem Investigador

CO 146. LEFT VENTRICULAR TWIST IN PATIENTS WITH SEVERE AORTIC STENOSIS: MEANING AND EVOLUTION AFTER SURGERY

Ana Rita Bello[1], João Abecasis[1], Sérgio Maltês[1], Rita Reis Santos[1], Rita Lima[1], Carla Reis[1], Luís Oliveira[2], Sara Guerreiro[1], Pedro Freitas[1], António Ferreira[1], José Pedro Neves[1], Miguel Mendes[1]

[1]Centro Hospitalar Universitário de Lisboa Ocidental, EPE/Hospital de Santa Cruz. [2]Universidade NOVA de Lisboa.

Introduction: Structural and functional left ventricular (LV) remodeling is the result of myocardial adaptation to chronic pressure overload in patients with severe aortic stenosis (AS). Changes in LV Rotational dynamics are supposed to occur due to increased afterload in order to maintain LV ejection fraction (EF) in this setting. However, data regarding rotational dynamics with AS severity and their evolution after aortic valve replacement (AVR) are scarce.
Objectives: To describe LV twist in patients with severe AS according to LV remodeling and assess its evolution after surgical AVR.
Methods: Single center prospective cohort study of patients with classical isolated severe AS referred to surgical AVR. Complete transthoracic echocardiography (TTE) and cardiac magnetic resonance (CMR) were performed before surgery for both valvular and LV remodeling assessment. TTE was performed at the 3rd to 6th post-operative month. LV twist was defined as the peak difference in systolic rotations of LV apex and base as viewed from the apex and calculated at bidimensional strain in short axis views. LV remodeling was categorized by CMR according to Figure 1. Correlation analysis was performed for indexes of AS severity and LV function.
Results: A total of 80 patients with classical high flow, high gradient, preserved LV EF (46% male; mean age 71 ± 8 years old; mean aortic valve [AV] gradient 61 ± 17.6 mmHg, mean AV area 0.73 ± 0.18 cm^2, mean LVEF: 58 ± 9%) were included. LV twist before surgery was 24.5 ± 9.7% and this was modestly correlated with both LV flow (r = 0.315, p = 0.001) and AV gradients (r = 0.315, p = 0.013). Rotational indexes were no different across distinct types of LV remodeling. After AVR there was a significant decrease in LV twist (24.5 ± 9.7% *vs*. 16.5 ± 8.3%, p < 0.001), despite significant improvement in global longitudinal strain (-14.7 ± 3.9% *vs*. -16.1 ± 3.1%, p < 0.001) and maintenance of preserved LVEF (58 ± 9% *vs*. 60 ± 8%, p = 0.07).
Conclusions: As LV twist has an inverse relation to GLS after AVR, this may represent a compensatory mechanism for LVEF preservation in patients with severe AS. Rotational mechanics seems to be independent from structural LV remodeling in this setting.



CO 146 Figure

CO 147. PRIORITIZE-TAVI SCORE - A NOVEL CLINICAL TOOL "PREDICTING MORTALITY OR URGENT TAVI" ON WAITING LIST

Francisco Albuquerque, Daniel Gomes, Pedro Freitas, Maria Rita Lima, Miguel S. Domingues, João Brito, Luís Raposo, Tiago Nolasco, Henrique Mesquita Gabriel, Maria João Andrade, Regina Ribeiras, António Ferreira, Pedro de Araújo Gonçalves, Manuel de Sousa Almeida, Rui Campante Teles

Centro Hospitalar Universitário de Lisboa Ocidental, EPE/Hospital de Santa Cruz.

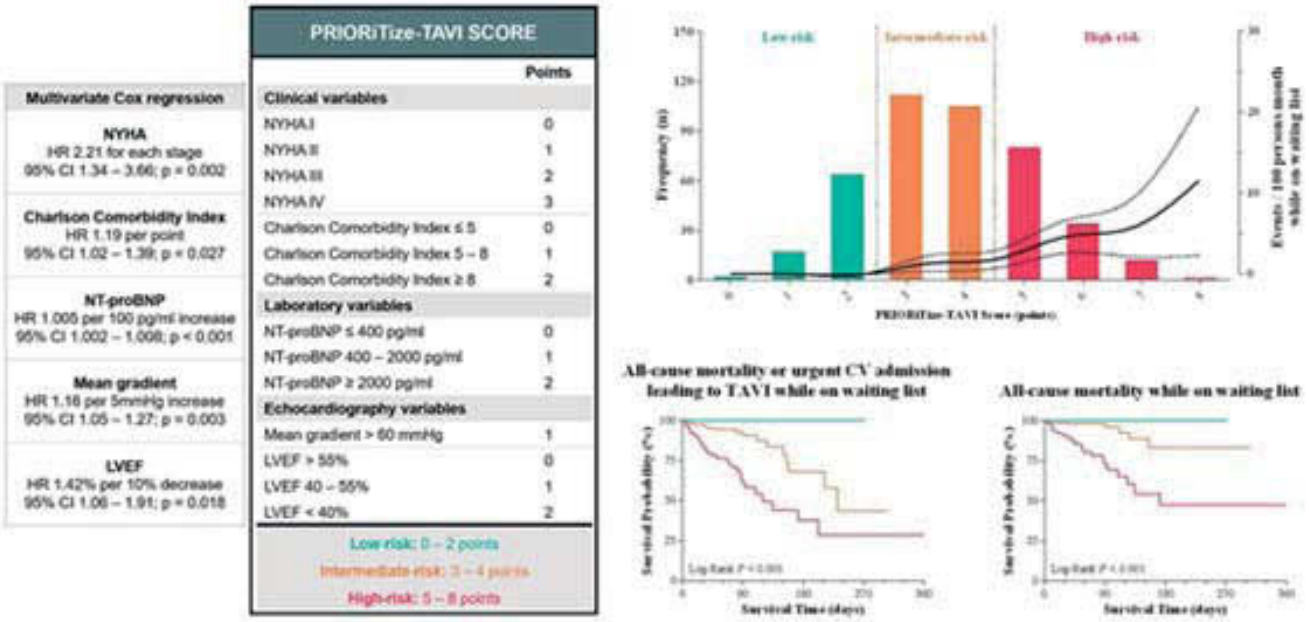
Introduction: Waiting list (WL) for transcatheter aortic valve implantation (TAVI) has been increasing and prioritization strategies are lacking. We sought to derive a simple clinical score to predict increased risk of adverse outcomes in patients waiting for TAVI.
Methods: Single-center retrospective study of all consecutive ambulatory patients accepted for TAVI (Jan/2017-Jun/2022). Patients were admitted to active WL after Heart Team meeting and waiting time was defined as the interval between the date of the meeting and the date of TAVI or the primary outcome. The primary outcome was a composite of all-cause mortality while on WL or urgent CV admission leading to TAVI. Demographic, clinical, echo and CT-angio variables were collected, including the Charlson Comorbidity Index which accounts for age, renal disease, and comorbidities. A raw risk score weighted on β-coefficients was developed after identifying independent predictors of the primary outcome at multivariate analysis (Cox Regression). The raw score was simplified to a point system weighted on the positive and negative predictive values of each variable. Discrimination ability was assessed by the area under the ROC curve (AUC). Internal validation was performed with bootstrapping (1000 samples). Kaplan-Meier (KM) survival analysis according to risk categories was performed.
Results: We identified 427 patients (83 ± 6 years; 56% female; ES II 4.4% [IQR 3.1-6.2%]). Median WL time was 44 days (IQR 26 - 76 days). While on active WL, 54 patients (12.6%) attained the primary endpoint (34 deaths and 20 urgent admissions for TAVI). Five independent predictors of the primary endpoint were identified: Charlson Comorbidity Index; NYHA class; NT-proBNP; LVEF and aortic mean gradient (see figure for adjusted hazard ratios). The simplified point system and its distribution across the cohort are depicted in the figure. Patients were stratified into 3 risk strata: low (< 2 points; n = 83 [20%]; 0 events [0%]); intermediate (3-4 points; n = 217 [51%]; 18 events [8.3%]) and high-risk patients (5-8 points; n = 127 [29%]; 36 events [28.3%]). There were no significant differences between the discriminative power of the raw score and the simplified model (AUC 0.77 [95%CI 0.71-0.83] *vs.* AUC 0.77 [95%CI 0.71-0.83]; p for comparison = 0.96). KM survival curves showed a progressive survival disadvantage along strata: 0 events per 100 persons-month in the low-risk; 2 events (95%CI 1-3) per 100 persons-month in the intermediate-risk; and 5 events (95%CI 3-7) per 100 persons-month in the high-risk group. Similar results were obtained by restricting the analysis to all-cause mortality.
Conclusions: A score to predict the risk of adverse events in patients waiting for TAVI was developed from five easy to ascertain variables. Risk strata provided by the PRIORiTize-TAVI model may inform medical decision-making for priority assignment of patients in waiting list.

CO 148. CORONARY ARTERY CALCIUM SCORE AS A GATEKEEPER FOR FURTHER TESTING IN PATIENTS WITH LOW PROBABILITY OF OBSTRUCTIVE CORONARY ARTERY DISEASE: A COST-EFFECTIVENESS ANALYSIS

Daniel A. Gomes, Francisco Albuquerque, Pedro Lopes, Pedro Freitas, Cláudia Silva, Sara Guerreiro, João Abecasis, Ana Coutinho Santos, Carla Saraiva, Jorge Ferreira, Pedro de Araújo Gonçalves, Hugo Marques, Miguel Mendes, António M. Ferreira

Centro Hospitalar Universitário de Lisboa Ocidental, EPE/Hospital de Santa Cruz.

Introduction: Current guidelines recommend not to routinely test patients with chest pain and low pretest probability (PTp < 15%) of obstructive coronary artery disease (CAD) but envisage the use of risk modifiers such as coronary artery calcium score (CACS) to refine patient selection for testing. The aim of this study was to assess the cost-effectiveness (CE) of three different testing strategies in the approach to symptomatic patients with low PTP of obstructive CAD: A) not test; B) perform CACS, withholding testing if = 0 and proceeding to coronary CT angiography (CCTA) if > 0; and C) perform CCTA in all cases, without prior CACS.
Methods: We developed a CE model using data from a two-centre study of 1385 patients with non-acute chest pain and PTp < 15% who underwent CACS



CO 147 Figure

immediately followed by CCTA. Key input data included the proportion of patients with obstructive CAD on CCTA (10.3%), the proportion with CACS = 0 (57%), and the negative predictive value of CACS for obstructive CAD on CCTA (98.9%), which was considered the gold standard for this simulation. The CE of each strategy was defined as the cost per correct diagnosis. Direct costs were calculated using the price list from the Portuguese National Health Service. Indirect costs, including incidental findings, were estimated according to the literature. The cost attributable to a false-negative was set at 3-times the cost of a false-positive, as customary.

Results: Not testing would correctly classify 89.7% of cases, and would cost €121,433 per 1,000 patients, due to the costs imputed to false negatives. Using CACS as a gatekeeper for CCTA would correctly diagnose 98.9% of cases, and cost €247,116 per 1,000 patients. Employing CCTA as first line test would correctly classify all patients, at a cost of €271,007 per 1,000 diagnosed patients. Overall, the added cost for an additional correct diagnosis was €1,366 for CACS ± CCTA strategy *vs.* no testing, and €2,172 for CCTA *vs.* CACS ± CCTA. The corresponding cost-effectiveness thresholds (CET) were €943 - €3,450 for men; and €1,527 - €1,972 for women (Table).

PTP < 15%	Testing strategy	Costs (€ per 1.000 patients)	Correct diagnoses (%)	False-negatives (%)	ICER (€ per additional correct diagnosis)
Overall	Defer testing	€121.433	89.7%	10.3%	€1.366
	CACS±CCTA	€247.116	98.9%	1.1%	€2.172
	CCTA	€271.007	100.0%	0.0%	
Male sex	Defer testing	€147.370	87.5%	12.5%	€943
	CACS±CCTA	€258.621	99.3%	0.7%	€3.450
	CCTA	€282.771	100.0%	0.0%	
Female sex	Defer testing	€114.358	90.3%	9.7%	€1.527
	CACS±CCTA	€244.130	98.8%	1.2%	€1.972
	CCTA	€267.799	100.0%	0.0%	

Conclusions: Not testing patients with low PTP of obstructive CAD should be disfavored unless the CET is below €1,366 per correct diagnosis. First-line CCTA yields the most correct diagnoses and is cost-effective above CET over €2,172 per additional correct diagnosis. Using CACS as a gatekeeper for further testing is cost-effective between these thresholds, which are wider for men than for women. These findings may inform decisions on testing, but the most suitable strategy will ultimately depend on the costs and amount of missed diagnoses stakeholders are willing to accept.

CO 149. INTRAVASCULAR IMAGING MODALITIES IN CORONARY INTERVENTION: INSIGHTS FROM 3D-PRINTED PHANTOM CORONARY MODELS

Catarina Simões de Oliveira, Tiago Rodrigues, Joana Brito, Pedro Alves da Silva, Beatriz Valente Silva, Ana Margarida Martins, Beatriz Garcia, Ana Abrantes, Miguel Raposo, Catarina Gregório, Helena Santiago, Daniela Ricardo, Fausto J. Pinto, João Silva Marques

Santa Maria University Hospital CHULN, CAML, CCUL, Lisbon School of Medicine, Universidade de Lisboa.

Introduction: Several studies have been performed comparing luminal measurements between OCT and IVUS, with conflicting results. OCT is consistently found to have smaller minimal lumen area (MLA) measurements However, head-to-head comparative assessment in clinical practice is difficult. 3D-printing allows creation of anatomically correct models that have an appropriate elastic response and obey geometric scaling laws. Those models offer a unique opportunity to accurately assess the performance of intravascular imaging modalities.

Objectives: Compare the diagnostic performance of intravascular imaging modalities using a standard 3D-printed coronary artery in a pulsatile flow realistic simulator. Assess if OCT underestimates intravascular dimensions against IVUS and explore potential causes and corrections.

Methods: A standard realistic left main (LM) anatomy with an eccentric ostial left anterior descending artery (LAD) lesion was replicated using 3D-printing and connected to a realistic pulsatile flow simulator that was used in the cath lab. After provisional stenting and optimization according to a standardized study protocol, intravascular imaging was obtained. Modalities included 20MHz digital IVUS (IVUS), 60 MHz rotational IVUS (IVUS HD) and OCT. Imaging data was blindly reviewed and analyzed offline. We assessed luminal area and diameters at standard locations for coregistration (distal LAD, MLA, distal LM bifurcation and LM stent edge).

	MLA (mm)		distal LM (mm)		prox LM stent edge (mm)		distal LAD (mm)	
	Dmin	Dmax	Dmin	Dmax	Dmin	Dmax	Dmin	Dmax
cOCT	2,53±0,56	2,87±0,74	5,24±1,09	6,05±1,32	5,36±1,21	5,89±1,99	3,21±0,45	3,64±0,54
IVUS	2,51±0,60	2,88±0,79	5,58±0,90	6,10±1,32	5,36±0,79	6,20±1,25	3,5±0,66	3,79±0,30
IVUS HD	2,61±0,74	3,03±0,83	5,24±0,77	5,99±1,11	5,20±1,00	5,96±0,45	3,42±0,35	4,04±0,61

Figure 1: OCT and IVUS measures

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Results: OCT measurements using auto-calibration significantly underestimated luminal areas when compared to IVUS (mean diff 3.0 ± 1.9 mm^2; p < 0.0001) and IVUS HD (mean diff 2.7 ± 1.3 mm^2; p < 0.0001). No significant differences were found between IVUS and IVUS HD luminal areas (p = 0.921). A significant systematic dimensional error was found in OCT auto-calibration by comparing known reference diameter of guiding catheter (1.8 mm) to measured mean diameter (1.68 ± 0.04 mm) (p = 0.004). By applying a correction factor based on the reference guiding catheter area to OCT (cOCT) the luminal areas became not significantly different compared to IVUS (p = 0.058) and IVUS HD (p = 0.07). Also, by applying a geometric correction to OCT dimensions resulted in clinically non-significant differences between cOCT, IVUS and IVUS HD diameters (Table).
Conclusions: Our findings suggest that automatic spectral calibration method for OCT is inaccurate and results in a systematic underestimation of luminal dimensions. Guiding catheter dimensions are easily and precisely known and can be used as reference for geometric calibration. When guiding catheter correction is applied the performance of OCT estimation of phantom model dimensions is significantly improved. These results may be clinically relevant and need to be clinically validated.

CO 150. DEVELOPMENT OF A MACHINE LEARNING MODEL USING 12-LEAD ECG TO IMPROVE ACUTE DIANOSIS OF PULMONARY EMBOLISM

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Introduction: Pulmonary embolism (PE) is a life-threatening condition. Given the lack of specificity in symptoms and clinical decision rules, diagnostic uncertainty in PE remains high and in most of the cases requires confirmation by computed tomography pulmonary angiogram (CTPA). This could be critical to decide fibrinolysis indication in hemodynamic unstable patients (pts) with PE suspicion in out-of-hospital setting or if CTPA is not immediately available. The implementation of artificial intelligence (AI) in medical diagnosis has attracted major attention last

	Wells score + D-Dimer threshold of 500 ng/mL	Geneva score + D-Dimer threshold of 500 ng/mL	Wells score + age-adjusted D-Dimer cut-off	Geneva score + age-adjusted D-Dimer cut-off	YEARS algorithm	PEGeD algorithm	Artificial intelligence model
Sensitivity, % (95% CI)	90 [75-97]	90 [75-97]	90 [75-97]	90 [75-97]	88 [72-96]	87 [72-96]	50.00 [33-67]
Specificity, % (95% CI)	12 [5-23]	12 [5.47-22.82]	18 [10-30]	18 [10-30]	29 [19-42]	31 [20-43]	100 [94-100]
PPV, % (95% CI)	37 [27-48]	37 [27-48]	39 [29-50]	39 [29-50]	42 [31-53]	42 [31-54]	100 [82-100]
NPV, % (95% CI)	67 [35-90]	67 [35-90]	75 [48-93]	75 [48-93]	79 [58-94]	80 [59-93]	77.38 [67 -86]
AUC (95% CI)	0.51 [0.39-0.63]	0.54 [0.43-0.65]	0.51 [0.39-0.63]	0.54 [0.43-0.65]	0.58 [0.47-0.69]	0.59 [0.48-0.70]	0.75 [0.64-0.86]

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years. Electrocardiography (ECG) signals and patterns can be detected by AI networks with precision. The purpose of this study was to develop an AI model for predicting PE using 12-lead ECG.

Methods: We extracted 1,014 ECGs of pts admitted to emergency department who underwent CTPA due to PE suspicion: 911 ECGs were used for development of the AI model (derivation cohort) and 103 ECGs were used for testing the PE prediction model (validation cohort). An AI algorithm based on an ensemble neural network was developed using 12-lead ECG signal. The primary endpoint was the diagnosis of PE. To evaluate the performance of the AI model, we compare the performance of AI model against the recommend clinical prediction rules for PE based on clinical probability and D-dimer measurement (Wells and Geneva criteria combined with fixed and age-adjusted D-dimer cut-off, YEARS and PEGeD algorithms).

Results: On validation cohort, AI model achieves greater specificity to detect PE than the commonly used clinical prediction rules ($p < 0.001$) (Table). The AI model showed a specificity of 100%, which is particularly relevant in the context of fibrinolysis decision. Although the sensitivity of the AI model is lower ($p = 0.001$), the biggest gain of this model is to provide security to the physician to establish a definitive diagnosis. Globally, the AI model performed significantly better than all the other models (AUC 0.75, $p < 0.001$), which had nearly no discriminative power. The incidence of typical PE ECG features (S1Q3T3, right bundle branch block and V1-V3 T wave inversion) was similar in pts with and without PE, meaning that AI model provided information beyond these findings and can improve PE prediction. ECGs were included regardless of cardiac rhythm (including pacing), so these findings can be generalized to all pts. Model performance is similar across gender.

Conclusions: In this study we developed and validated a deep learning-based AI algorithm for PE detection using a 12-lead ECG with superior performance when compared to traditional clinical prediction rules.