COMUNICAÇÕES ORAIS (CO)

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Sexta-feira, 22 Abril de 2022 | 08:30-09:30

Sala Aquarius | Comunicações Orais (Sessão 1) - Arritmias 1 - Taquicardia ventricular

CO 1. SINUS RHYTHM ENDOCARDIAL MAPPING FOR CHANNELS' IDENTIFICATION IN ISCHEMIC VENTRICULAR TACHYCARDIA USING A MODIFIED ELECTROPHYSIOLOGICAL TRIAD

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Introduction: In a previous study it was demonstrated that an electrophysiological triad was able to identify critical isthmus in atrial flutter (AFL) patients. This triad is based in the Carto® electroanatomical mapping (EAM) version 7, which displays a histogram of the local activation times (LAT) of the tachycardia cycle length (TCL), in addition to the activation and voltage maps.

Objectives: This study aimed to prospectively assess the ability of a modified electrophysiological triad to identify and localize the ventricular tachycardia's (VT) channels and entrance zones during sinus rhythm mapping.

Methods: Prospective analysis of a unicentric registry of individuals who underwent ischemic VT ablation with Carto® EAM, all in sinus rhythm. All patients with non-ischemic etiology, lack of high-density EAM or lack of mapping in any of the left ventricle walls or structures were excluded. Areas of late potentials and possible channels of re-entry were compared to a modified electrophysiological triad constituted by: areas of low-voltage (< 0.5 mV), a site of deep histogram valley (LAT-Valley) with less than 20% density points relative to the highest density zone and a prolonged LAT-Valley duration that included 10% or more of the total activation time mapped. We also assessed the relationship between the pre-valley bar (the LAT histogram bar immediately before the prolonged LAT-Valley) and the channel entrances.

Results: A total of 14 patients (14 men, median age 70 IQR 64-78 years) were included. All patients presented with ischemic VT and 86% had a previous inferior myocardial infarction. The median number of collected points were
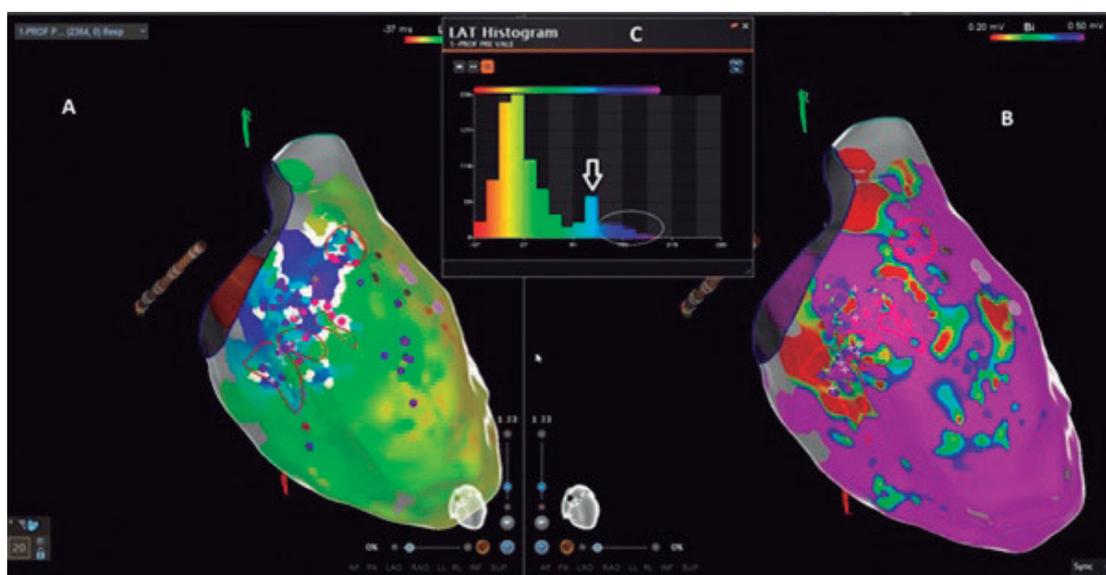
CO 1 Figure

1,733 (IQR 1,363-2,729). All sinus rhythm maps presented with at least 1 LAT-Valley in the analysed histograms. All arrhythmias were effectively treated after undergoing radiofrequency in the LAT-Valley location, either by blocking the channel entrances or scar homogenization ablation strategy. Also, the pre-valley bar in the histogram marked all the channel entrances in the scar borders. No patient had relapse after a clinical follow up of over 6 months.
Conclusions: In a prospective analysis, a modified electrophysiological triad was able to identify the scar channels in sinus rhythm in all patients. The pre-valley bar in the histogram disclosed the channel entrances. Further studies are needed to assess the usefulness of this algorithm to simplify catheter ablation and improve clinical outcomes.

CO 2. ASSESSMENT OF WAVEFRONT ACTIVATION DURATION ACROSS THE RIGHT VENTRICULAR OUTFLOW TRACT IN PATIENTS WITH IDIOPATHIC PREMATURE VENTRICULAR CONTRACTIONS USING NONINVASIVE ELECTROCARDIOGRAPHIC MAPPING: A VALIDATION STUDY

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Introduction: Previous studies have reported that wavefront propagation speed across the right ventricular outflow tract (RVOT) can distinguish premature ventricular contractions (PVCs) with a RVOT origin from PVCs with a left ventricular outflow tract (LVOT) origin.
Objectives: Validate the non-invasive electrocardiographic mapping (ECGI) for assessment of RVOT activation duration (AD) during PVCs and assess its value as a predictor of the origin of the PVCs.
Methods: We studied 17 consecutive patients, 8 males, median age 56 (40-64) years that underwent ablation of frequent (> 10,000 per 24 h) idiopathic PVCs with inferior axis and had an ECGI performed before ablation. The ECGI was performed with the Amycard system, and the invasive mapping was performed with Carto or Ensite system. Isochronal activation maps of the PVCs were obtained with the activation direction method (ADM) of the ECGI, and with the Carto and Ensite systems. Total RVOT AD was measured as the time interval between the earliest and the latest activated region. Agreement between the two methods was performed using linear regression and a Bland-Altman plot. The cutoff value of AD to predict PVC origin was calculated with ROC curve.
**Results:** PVCs originated from the RVOT in 10 (50%) patients. The median (Q_1-Q_3) RVOT AD measured with ECGI was 50 (38-69) ms and with invasive map 54 (35-71) ms. The agreement between both methods was good with an R^2 of 0.750, p < 0.0001. Figure displays the Bland-Altman plot (panel A) and an example of the same patient assessed with invasive mapping (panel B) and ECGI (panel C). The AD was significantly higher in PVCs from the RVOT *vs.* LVOT, both with ECGI and invasive map, respectively 65 (56-76) *vs.* 37 (31-37) ms, p < 0.0001 and 69 (59-77) *vs.* 35 (30-40) ms, p < 0.0001. The cutoff value of 43 ms for AD measured with ECGI predicted the origin of the PVCs with a sensitivity and specificity of 100%.
Conclusions: We found good agreement between ECGI and invasive map. The AD obtained with ECGI was accurate to predict the origin of the PVCs.

CO 3. LATE GADOLINIUM ENHANCEMENT IS A STRONG PREDICTOR OF LIFE-THREATENING ARRHYTHMIAS IN PATIENTS WITH NON-ISCHEMIC DILATED CARDIOMYOPATHY UNDERGOING ICD IMPLANTATION FOR PRIMARY PREVENTION OF SUDDEN CARDIAC DEATH

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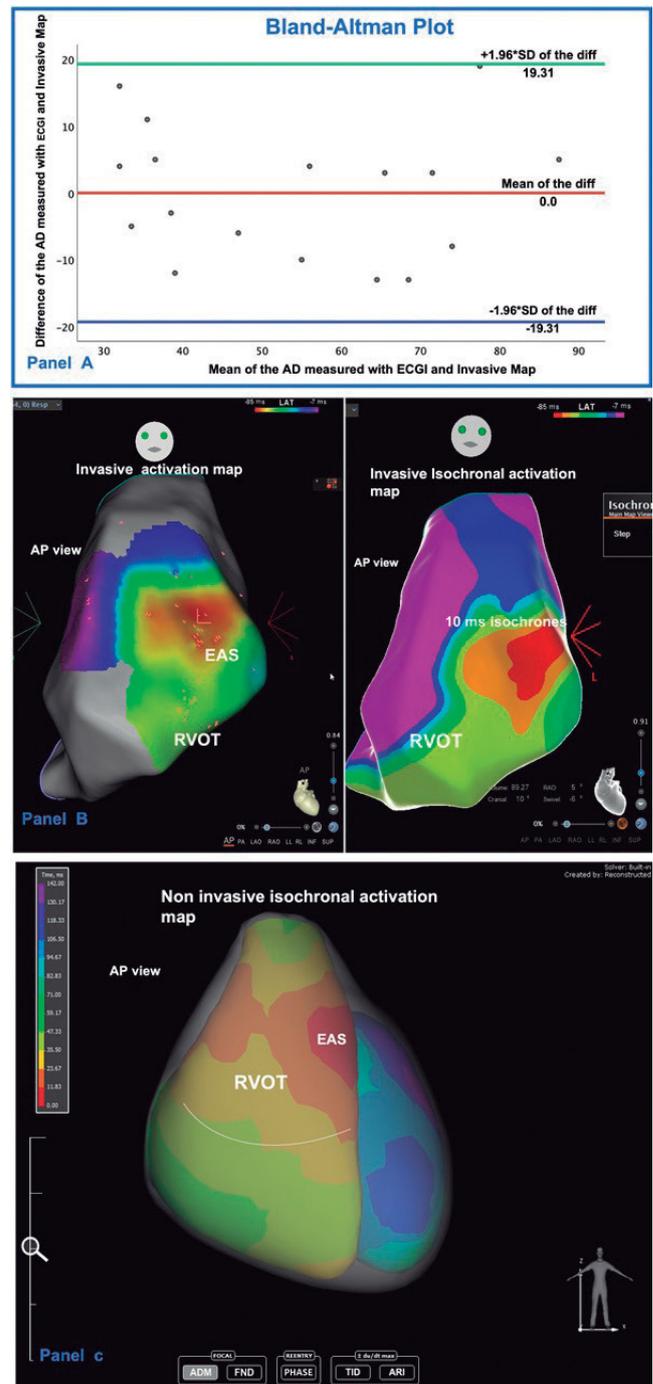
CO 2 Figure

Introduction: The usefulness of implantable cardioverter defibrillators (ICD) for primary prevention of arrhythmic sudden cardiac death (SCD) in patients with non-ischemic dilated cardiomyopathy (DCM) has been questioned. Efforts to improve risk stratification have included scores such as the 'MADIT-ICD benefit score', and the use of late gadolinium enhancement (LGE) in cardiac magnetic resonance (CMR). The purpose of this study was to evaluate the potential usefulness of these two tools to assess the risk of life-threatening arrhythmias in patients with non-ischemic DCM undergoing ICD implantation for primary prevention of SCD.
Methods: We conducted a single-center retrospective study of consecutive patients who underwent contrast-enhanced CMR before ICD implantation for primary prevention of SCD. Patients with ischemic cardiomyopathy were used as reference. Patients with non-dilated cardiomyopathies were excluded. The arrhythmic component of the MADIT-ICD benefit score (VT/
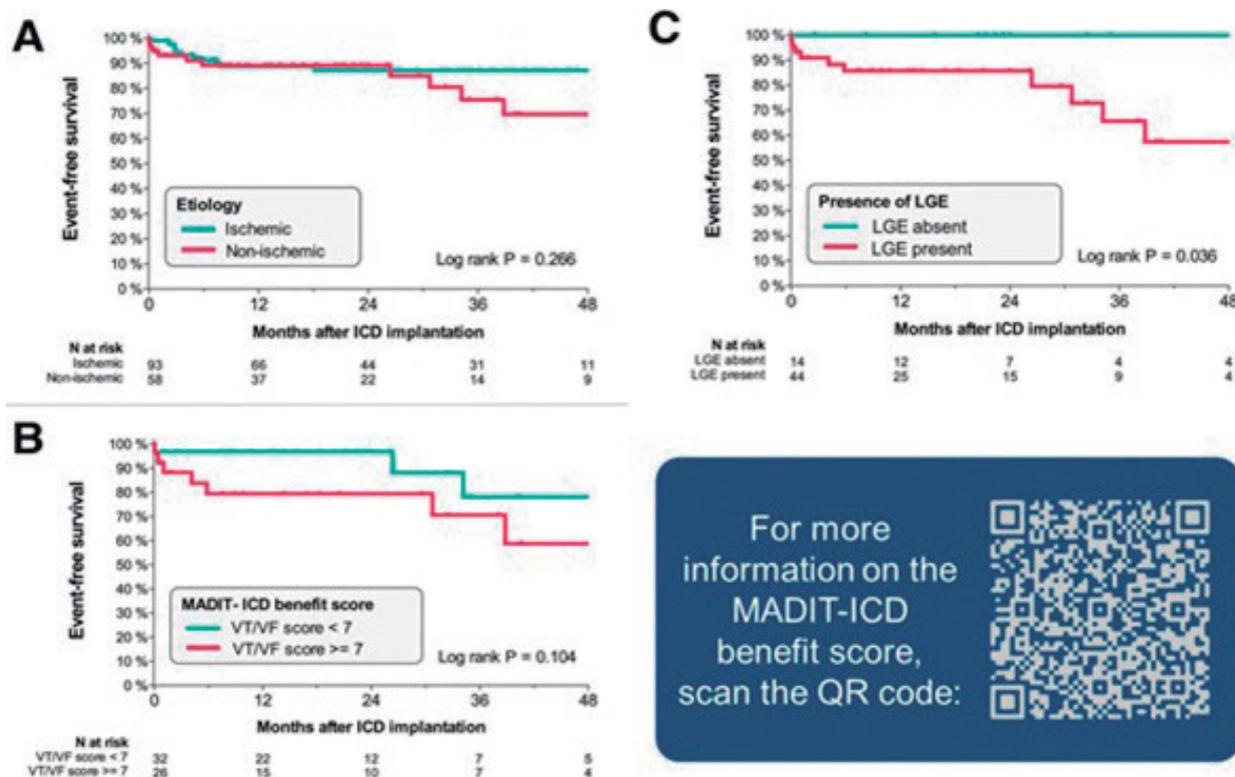
CO 3 Figure

VF score) was calculated for each patient, and considered high if ≥ 7, as recommended. The primary endpoint was the occurrence of SCD or life-threatening arrhythmias (VF or VT > 200 bpm). Follow-up was performed by device interrogation in all patients except those who suffered SCD.

Results: A total of 151 patients (93 ischemic, mean age 62 ± 13 years, 75% male) with mean left ventricular ejection fraction (LVEF) of 27 ± 8% were included. Overall, 72% (n = 67) ischemic and 45% (n = 26) non-ischemic patients had scores ≥ 7 and were considered high-risk. LGE was present in all patients with ischemic cardiomyopathy, and in 76% (n = 44) of patients with non-ischemic DCM. During a median follow-up of 21 (8-38) months, 21 patients (13.9%, 11 ischemic and 10 non-ischemic) met the primary endpoint. Overall, the event-free survival of non-ischemic patients was similar to that of ischemic patients (log rank p = 0.269) (Fig. 1A). In patients with non-ischemic DCM, there were 7 arrhythmic events (26.9%) in those with MADIT-ICD VT/VF scores ≥ 7, and 3 events (9.4%) in those with scores < 7 (log rank p = 0.104) (Fig. 1B). In the same population, there were 10 arrhythmic events (23%) in patients with LGE, but no events in patients without LGE (log rank p = 0.036) (Fig. 1C). LVEF was similar in patients with and without arrhythmic events (26 ± 8 *vs.* 27 ± 7%, p = 0.717), and in those with and without LGE (26 ± 7 *vs.* 28 ± 9%, p = 0.342).

Conclusions: The presence of LGE is a strong predictor of life threatening arrhythmias in patients in non-ischemic DCM undergoing ICD implantation for primary prevention, seemingly outperforming the clinical MADIT-ICD benefit score.

CO 4. IS IT POSSIBLE TO PREDICT MORTALITY AND RECURRENCE OF VT AFTER ABLATION? - PAINESD RISK SCORE APPLICABILITY VS NEW PREDICTORS

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Introduction: Catheter ablation (CA) prevents ventricular tachycardia (VT) recurrences in patients (pts) with structural heart disease (SHD), and might have a favorable outcome, but is associated with severe short-term complications. Identification of pts at high risk of periprocedural acute haemodynamic decompensation has important implications at procedural planning. The PAINESD risk score is a promising tool to predict VT ablation procedure-related mortality.

Objectives: To evaluate the accuracy of the PAINESD risk score to predict short-term mortality after structural VT ablation and to compare it with other conventional clinical predictors.

Methods: Prospective, observational, single-centre study of consecutive pts with SHD (ischemic or nonischemic), referred for VT-CA. High-density substrate maps were collected, through endocardial, epicardial or combined endo-epicardial approaches according to clinical data and operator preference. The primary endpoint was 30-day mortality or hemodynamic decompensation. Univariate Cox regression analysis was used to identify relevant clinical predictors and to compare them with the PAINESD risk score. Multivariable Cox proportional hazards regression models were used to estimate predictors of 30-day mortality.

Results: A total of 102 pts with SHD referred for VT ablation were evaluated (mean age: 67 ± 11 years, 94% male, 78.4% in NYHA class I-II; mean LVEF was 34 ± 11%). The baseline PAINESD risk score was 12.39 ± 5.8, 19.6% at low risk, 36.3% at intermediate risk and 27.5% at high risk of adverse events. Overall 30-day mortality was 4.9%. The PAINESD did not predict 30-days mortality or hemodynamic decompensation (p = 0.93). Indeed, a non-significant trend to higher short and long-term mortality was noticed in high-risk score pts (Fig.). On univariate analysis age > 65 years (p = 0.019), LVEF < 35% (p = 0.049), body mass index < 28 kg/m² (p = 0.019), CKD (p = 0.001) and previous VT ablation (p = 0.022) were prognostic predictors. On multivariate analysis, only LVEF< 35% (HR 2.225; 95%CI 1.004-4-774, p = 0.038) and CKD (HR 3.35; 95%CI: 1.31-8.51, p = 0.011) were independent predictors of short-term prognosis.

Conclusions: In our population, LVEF< 35% and CKD were the strongest predictors of short-term mortality. PAINESD risk score was not accurate in predicting adverse events. New score systems must be derived for prognostic stratification in this population, incorporating the reduction on the actual short-term event rates after VT ablation.

	Univariate HR (95% CI)	P value	Multivariate HR(95% CI)	P value
Age ≥ 65 yo	3.162 (1.205 – 8.301)	0.019	1.69 (0.55-5.15)	0.36
LVEF < 35%	2.9093 (1.002-4.373)	0.045	2.225 (1.004-4-774)	0.038
Previous VT ablation	2.425 (1.14-5.18)	0.022	2.130 (0.974-4.659)	0.058
IMC > 28	2.553 (1.165-5.597)	0.019	2.89 (0.99-8.47)	0.53
CKD*	4.06 (1.80-9.17)	0.001	3.344 (1.315-8.507)	0.011
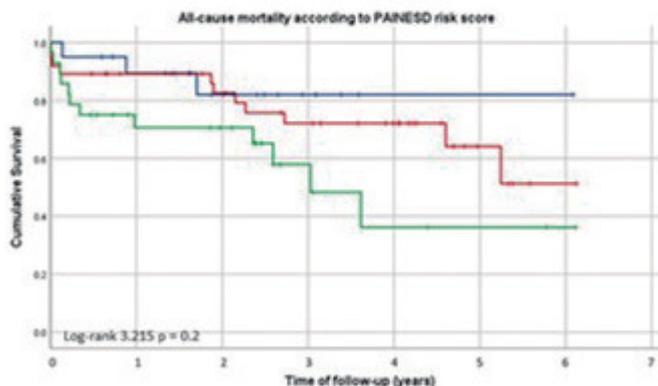
CO 4 Figure

CO 5. EPICARDIAL MAPPING AS FIRST INTENTION APPROACH FOR STRUCTURAL VENTRICULAR TACHYCARDIA ABLATION

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Introduction: In several structural arrhythmogenic diseases that comprise intricate endocardial, intramural and epicardial substrates, endocardial ablation of ventricular tachycardia (VT) is not sufficient and epicardial ablation has lately become a complementary and necessary tool.
Objectives: To evaluate the clinical characteristics of patients (pts) most suitable for first intention epicardial VT ablation.
Methods: Single-center prospective study of consecutive pts with structural heart disease undergoing first intention epicardial VT mapping between August 2015 and June 2021. Decision for epicardial approach was based on the etiology, VT electrocardiogram (ECG) and cardiac magnetic resonance (CMR) results. Under general anesthesia, subxiphoid access using a Tuhoy needle was done using fluoroscopic guidance and with high-density epicardial mapping was performed. Epicardial ablation was performed if relevant arrhythmogenic findings were locally confirmed.
Results: First intention epicardial VT ablation was attempted in 18 pts (mean age 59.8 ± 12 years, 94% male) of whom 16 had non-ischemic dilated cardiomyopathy (NICM,idiopathic:11; post-myocarditis:4; hereditary:1) and 2 had right ventricular arrhythmogenic cardiomyopathy. Mean LVEF was 33% and 79% had a previous ICD (53% in primary prevention). 69% were referred for ablation due to arrhythmic storm (1 pt in cardiogenic shock). Epicardial access was achieved in 17 pts (94%), without acute complications. In 35% pts with NICM the decision for epicardial approach was based on the detection of subepicardial CMR delayed-hyperenhancement and relevant epicardial arrhythmic substrate was confirmed by mapping in all cases. In 3 pts radiofrequency (RF) applications were not performed at epicardium, as no abnormal electrograms were locally detected, and an additional endocardial approach was prosecuted. The mean overall procedure and fluoroscopic time were 123 and 28 min, respectively, with a mean RF application time of 51 min. After the procedure, 1pt required pericardial drainage due to inflammatory pericardial effusion. No other acute complications occurred. During a mean follow-up of 2.8 ± 1.8 years, only 3 pts (17%) had VT

recurrence; 5 pts (28%) died due to end-stage heart failure and 2 pts (11%) underwent heart transplantation.
Conclusions: In NICM a first intention epicardial VT ablation performed by experienced operators/centers is efficient, particularly if guided by CMR findings, and presents a favorable safety profile.

Sexta-feira, 22 Abril de 2022 | 08:30-09:30

Sala Vega | Comunicações Orais (Sessão 2) - DAC e Cuidados Intensivos 1: Síndromes Coronárias Agudas

CO 6. ACUTE MYOCARDIAL INFARCTION DURING COVID-19 ERA: PATIENT CHARACTERISTICS, PRESENTATION AND OUTCOMES

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Introduction: COVID-19 pandemic has been associated with a negative impact on care of acute myocardial infarction (AMI) patients (pts). Despite that, impact on pts characteristics, presentation, treatment and in-hospital outcomes are not well established.
Methods: Prospective study of pts admitted in a tertiary hospital due to type-1 AMI. Pts were consecutively enrolled during a 6-month period in 2021 (n = 196) and during a similar period of time in 2019 (n = 122). Data was based on a pts well-structured interview within 48h after admission and review of medical records. Data collected in these 2 periods allowed us to compare AMI pts during pre-COVID-19 (PC) *vs.* late-COVID-19 (C) pandemic times.
Results: Age and gender distribution was similar between groups (C: 62 ± 13 years/78% males; PC: 64 ± 13 years/76% males), as well as ST/Non-ST-Elevation Myocardial Infarction (STEMI/NSTEMI) proportion (C: 51%/49%; PC: 55%/45%). C pts presented more cardiovascular (CV) comorbidities (43

Healthcare facility*[1]	PC	C
Public hospital emergency	65,7%	90,7%
Private healthcare services	18,6%	5,7%
Primary Health Care services	15,7%	3,6%
Mean of transport*[2]	**PC**	**C**
Particular vehicle	79,4%	44,8%
Public transports	12,7%	0,5%
Ambulance	6,3%	52,6%
Walking	1,6%	2,1%

Figure 1 – First healthcare facility contacted by AMI pts and mean of transport used to do so.
PC: pre-COVID-19 times; C: late-COVID-19 times
*[1]: p<0,001; *[2]: p<0,001 (Chi-square tests)

CO 6 Figure

vs. 30%; p = 0.03). A typical chest pain was described more often by C pts (94 *vs.* 84%; p = 0.002) with a higher level of pain intensity (0-10 scale) reported (8 ± 2 *vs.* 7 ± 2; p = 0.02). Coronariography (C: 97%, PC: 96%) and revascularization (C: 80%, PC: 81%) were equally performed. C pts presented more AMI-complications (27 *vs.* 15%; p = 0.01) and a worse Killip (K) class (K ≥ 2: 22% C *vs.* 13% PC pts; p = 0.05). In-hospital mortality (C: 2%, PC: 1%; p = 0.7), cardiac arrest (C: 4%, PC: 1%; p = 0.3) and length of hospital stay (C: 5 ± 5 days (d); PC: 6 ± 5d) were not significantly different. Significant differences were found in the type of first healthcare facility contacted by pts (Fig.; p < 0.001), as well as means of transport used (Fig.; p < 0,001). Nevertheless, differences regarding activation of emergency medical services (C: 54%, PC: 50%; p = 0.5) or time to first medical contact (C: 116 ± 229 minutes (min); PC: 110 ± 311 min; p = 0.3) were not found.
Conclusions: COVID-19 pts presenting with AMI showed a significant worse in-hospital outcomes in our study. Also, these pts had a higher burden of CV disease and a more typical and intense symptom presentation. Therefore, it can be hypothesized that "sicker" pts continued to look for help when presenting AMI symptoms, while "healthier" pts and the ones with less typical and intense symptoms possibly avoided contact with health care services during COVID-19 pandemic. Finally, it is worth noting a more frequent recurrence to public emergency department rather than to private or primary health care services during pandemic times.

CO 7. STEMI WITH MID-RANGE EJECTION FRACTION - A GROUP OF INTERMEDIATE RISK NOT TO BE FORGOTTEN

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Introduction: Reduced left ventricular ejection fraction (LVEF) < 40% is an important negative prognostic factor in the setting of ST-elevation acute myocardial infarction (STEMI). On the other hand, data concerning mid-range ejection fraction (mrEF) post-STEMI are scarce and consequently, recommendations concerning reassessment of LVEF or administration of neurohormonal medication in this group of STEMI patients (pts) are still lacking.
Objectives: To assess the current treatment and prognosis of STEMI with mrEF.
Methods: We conducted a retrospective study including all consecutive pts hospitalized for STEMI and submitted to primary percutaneous coronary intervention in our centre in 2018. Pts were divided into 3 groups according to their LVEF assessed before hospital discharge: preserved EF (pEF: LVEF ≥ 50%), mid-range EF (mrEF: LVEF 40-49%) and reduced EF (rEF: LVEF < 40%). We analysed clinical characteristics, treatment, evolution of LVEF post-STEMI and clinical outcomes - death, myocardial infarction (MI) and hospitalization for heart failure (HF) – of the mrEF group and compared it with pEF.
Results: 188 pts with a mean age of 61 years were hospitalized for STEMI in our centre in 2018. The majority (58%, n = 109) had pEF; 29% (n = 55) had mrEF and 13% (n = 24) were in the rEF group. Pts in the mrEF group had similar baseline characteristics to the other groups. However, compared with pEF, culprit-lesion was more often located in left main or left anterior descending arteries (80 *vs.* 35%, p < 0.001) and NT-proBNP levels were higher

in the mrEF pts (2,270 *vs.* 881 pg/mL, p < 0.001). At discharge, all mrEF patients were medicated with a renin-angiotensin-aldosterone blocker and 91% with a beta-blocker. After a median of 8 months, LVEF improved a mean of 4% (± 9%) in the mrEF group. However, in 12.5% of these pts, LVEF worsened to < 40% (*vs.* 0 in the pEF group, p = 0.006). At a median follow-up of 2.6 years, there was an increase in mortality according to the EF group (pEF 4 *vs.* mrEF 13 *vs.* rEF 48%, log-rank test: p < 0.001, Fig.) with a hazard ratio (adjusted for age) of 3.75 (95%CI 1.1-12.8, p = 0.035) for mrEF *vs.* pEF.
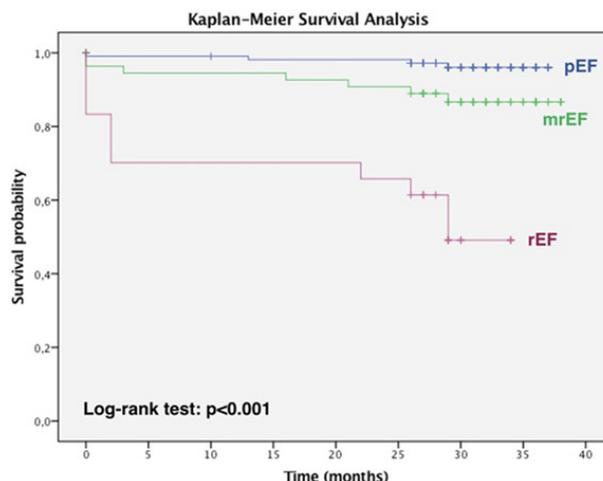
Conclusions: This study confirms previous reports of the worse prognosis of STEMI with mrEF and suggests the existence of a continuum of risk of adverse clinical outcomes according to LVEF. Therefore, this group of intermediate risk might also benefit from neurohormonal medication, which is only specifically recommended for rEF pts in current STEMI guidelines. It also highlights the importance of a closer follow-up (with reassessment of LVEF) of mrEF pts since a non negligeable proportion ultimately progress to rEF and may require additional medical treatment or even an implantable cardioverter defibrillator. Further research with larger groups is required to identify predictors of worsening LVEF and assess the impact of neurohormonal modulation in this population.

CO 8. PRECISE-DAPT SCORE FOR BLEEDING PREDICTION AFTER ACUTE CORONARY SYNDROME IN PATIENTS TREATED WITH PERCUTANEOUS CORONARY INTERVENTION FOR MULTIVESSEL DISEASE

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Introduction: PRECISE-DAPT (PD) is a recently validated score for long-term bleeding prediction after percutaneous coronary intervention (PCI) with

stenting in patients undergoing double antiplatelet therapy (DAPT). Our purpose was to evaluate if PD could predict bleeding events and mortality in patients hospitalized due to acute coronary syndrome (ACS) undergoing PCI for multivessel disease at index hospitalization.

Methods: Retrospective analysis of 804 patients admitted to a Cardiology ward due to ACS, planned to undergo PCI and treated with DAPT (aspirin + P2Y12 inhibitor) for a minimum of 12 months. Bleeding event was defined as any Thrombolysis in Myocardial Infarction criteria (TIMI) minor or major bleeding. Kaplan-Meier survival plots were used to evaluate the predictive power of PD score on 12-month bleeding events (12MB) and 12-month mortality (12MM). Cox-regression analysis was used to evaluate the independent prognostic value of the PD score on the mentioned outcomes.

Results: 191 patients were excluded either due to DAPT< 12 months, left main disease or Heart Team decision for conservative management/bypass graft surgery. Mean patient age was 65 (± 13); 75.8% were men. 38% had ST-elevation myocardial infarction. 78% were treated with potent P2Y12 inhibitors. 77%, 18.8% and 4.2% of patients, respectively, were submitted to PCI of 1, 2 and 3 or more vessels. 12MB event rate was 4.7%. 12MM was 8.2%. Kaplan-Meier analysis stratified by high *vs.* non-high bleeding risk using PD score (PD < or ≥ 25) revealed significantly lower median time to 12MB in high-risk subgroup (349.8 ± 2.8 *vs.* 362.2 ± 2.8 days, bleeding rate: 8.2 *vs.* 1.6%, χ^2: 24.606, p < 0.01). High-risk PD score predicted 12MB events in patients treated with PCI, irrespective of the number of vessels treated (bleeding events 8.1 *vs.* 1.4%, χ^2:12.688, p < 0.01 for 1 vessel PCI; 13.3 *vs.* 2.8%, χ^2:4.106, p = 0.04 for 2 vessel PCI; 0 *vs.* 33.3%, χ^2: 4.530, p = 0.03 for ≥ 3 vessels PCI). 12MM analysis revealed that high bleeding risk patients had significantly lower median time to death (305 ± 5.7 *vs.* 353 ± 2.6 days, mortality rate: 19.9 *vs.* 4.4%, χ^2: 63.35, p < 0.01). Only high-risk patients submitted to 1 vessel-PCI, however, had significantly lower median time to death (314 ± 10.1 *vs.* 361 ± 1.9, mortality rate: 17.6 *vs.* 2.0%, χ^2: 37.111, p < 0.01) after stratified analysis. Cox regression analysis revealed that PD score was an independent predictor of 12MB (HR: 1.183, p < 0.01), even when accounting for other bleeding risk factors, such as platelet count, alcoholism, hypertension and type of arterial access used for PCI.

Conclusions: Patients treated with PCI after ACS with a high bleeding risk, as assessed by PD score, have significantly higher risk of 12MB events, irrespective of the number of vessels treated at the index event. PD might be a useful tool for long-term bleeding prediction, and may support the decision of DAPT duration after ACS in multivessel disease.

CO 9. RESUSCITATED CARDIAC ARREST IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION IS ASSOCIATED WITH INCREASED INFARCT SIZE AND WORSE OUTCOMES

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Introduction: Resuscitated cardiac arrest (RCA) during the acute ischaemic phase is a relatively frequent but often undervalued complication of acute myocardial infarction (AMI). The aim of this study was to evaluate the clinical and prognostic impact of aborted cardiac arrest in AMI patients and investigate its correlation with infarct size.

Methods: We conducted a single-centre retrospective study enrolling consecutive patients admitted for AMI, from January 2016 to December 2018. RCA was defined as the need for advanced life support measures and defibrillation, either out-of-hospital or in-hospital, up until culprit vessel revascularisation. Infarct size was estimated using peak serum troponin T, impact on left ventricular ejection fraction (LVEF ≤ 50%) and echocardiographic wall motion index (WMI). Clinical outcomes included cardiogenic shock (SCAI C or more), need for mechanical circulatory support (MCS), major bleeding events (BARC ≥ 3) during in-hospital phase and all-cause mortality during follow-up.

Results: A total of 571 patients were included (65 ± 13 years old, 72% male). Overall, 237 had anterior STEMI, 39 patients (6.8%) suffered RCA (21 out of hospital), 60 progressed into cardiogenic shock throughout the hospitalisation, 7 needed MCS, and 52 had BARC ≥ 3 bleeding. During a mean follow-up of 32 months, 96 patients died. RCA was significantly associated with higher peak serum troponin T (4,802 [1,950;9,420] *vs.* 2,659 [555;6,708] ng/L – p = 0.004), higher proportion of patients with reduced or mildly reduced LVEF (60 *vs.* 36,5%, p = 0.018) and higher WMI (1.7 [1.4;2.3] *vs.* 1.5 [1.2;1.8], p = 0.016). Moreover, RCA was also associated with higher risk of cardiogenic shock occurrence (64.1 *vs.* 6.6% - p < 0.001 - OR 25.357 (12.115-53.073)), higher need for MCS (7.9 *vs.* 0.8% - p < 0.001 - OR 11.271 (2.427-52.343)) and higher incidence of BARC ≥ 3 bleeding events (28.2 *vs.* 8.4% - p < 0.001 - OR 4.705 (2.185-10.128)) (Table 1). On univariate Cox regression, RCA showed significant association with all cause death, which remained highly significant after multivariable adjustment (OR 2.431 (1.181;5.002); p = 0.016).

Table 1 – *In-hospital and follow-up outcomes in patients admitted for acute myocardial infarction with and without aborted cardiac arrest*

|	Patients with aborted cardiac arrest (n=39)	Patients without aborted cardiac arrest (n=532)	Results
Peak serum troponin T (ng/dL)	4802 [1950;9420]	2659 [555; 6708]	p=0.004
Echo wall motion index score	1.71 [1.38;2.33]	1.5 [1.22;1.76]	p=0.016
Left ventricle ejection fraction			p=0.018
-Preserved (%)	40.0	63.5	
-Mildly reduced (%)	33.3	20.4	
-Reduced (%)	26.7	16.1	
Killip class IV (%)	64.1	6.6	p <0.001 OR 25.357 (12.115-53.073)
Need for mechanical circulatory support (%)	7.9	0.8	p <0.001 OR 11.271 (2.427-52.343)
In-hospital major bleeding events - BARC ≥3 (%)	28.2	8.4	p <0.001 OR 4.705 (2.185-10.128)
Death during follow-up (%)	48.7	14.5	Univariate - p<0.001: OR 5.603 (3.370;9.314);

CO 9 Figure

Conclusions: The occurrence of aborted cardiac arrest in patients with AMI was associated with increased morbidity and mortality. This may be driven by a larger area of arrhythmia prone ischemic myocardium.

CO 10. SGLT2 INHIBITION IN ACUTE MYOCARDIAL INFARCTION WITH LEFT VENTRICULAR SYSTOLIC DYSFUNCTION

Beatriz Valente Silva, Pedro Alves da Silva, Pedro Silvério António, Sara Couto Pereira, Joana Brito, Ana Beatriz Garcia, Ana Margarida Martins, Catarina Simões de Oliveira, Rafael Santos, Joana Rigueira, Doroteia Silva, Nuno Lousada, João Agostinho, Fausto J. Pinto, Dulce Brito

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

Introduction: The EMPEROR-Reduced and the DAPA-HF trials showed positive effects of sodium-glucose cotransporter 2 inhibitors (SGLT2i) on heart failure (HF) admissions and cardiovascular mortality, establishing this class of drugs as part of the foundational therapy (FT) in patients (pts) with HF and reduced left ventricular ejection fraction (LVEF). However, their effect in the setting of acute myocardial infarction (AMI) is not documented. **Methods:** Quasi-experimental study that included consecutive pts started on SGLT2i (empagliflozin or dapagliflozin) during an index hospitalization due to AMI complicated by reduced LVEF (< 50%). The control group consisted of pts admitted due to AMI not treated with SGLT2i, matched for AMI type, Killip-Kimball classification (KK), LVEF, at-discharge NYHA functional class, age, number of diseased coronary vessels and gender. The primary outcome was 1-year all-cause mortality, HF hospitalization or outpatient treated HF decompensation, whichever occurred first. For statistical analysis Chi-square, Mann-Whitney test, Cox regression and Kaplan-Meier survival analysis were used.
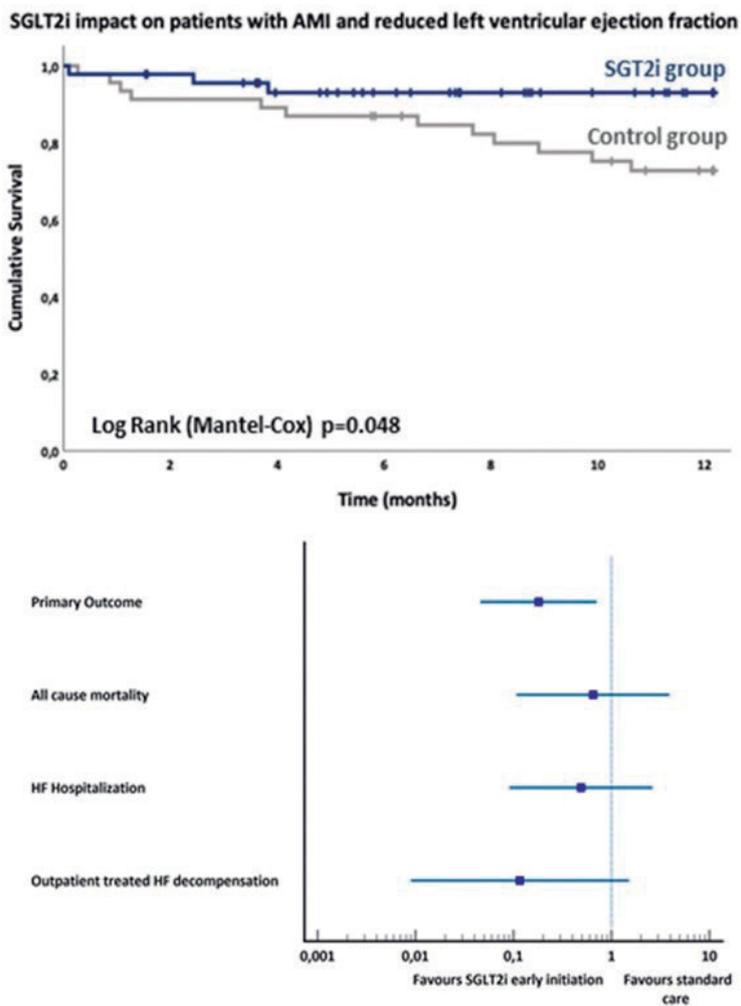
	SGLT2i group	Control group
Primary outcome	12 (26%)	3 (6,5%)
All cause mortality	2 (4,3%)	4 (8,7%)
HF hospitalizations	2 (4,3%)	7 (15,2%)
Outpatient treated HF descompensation	1 (2,2%)	6 (13%)

CO 10 Figure

Results: Both groups included 46 pts (mean age: 65 ± 12 years; female: 26%). There were no statistically significant differences between groups regarding co-morbidities, except diabetes (80.4% in the SGLT2i group *vs.* 30.4%, p < 0.001). Populations were homogeneous regarding LVEF (38 ± 8 *vs.* 36 ± 10%), AMI type (76.1% pts had STEMI in both groups), admission KK (KK 1: 65.2% in both groups), NYHA II (54.3 *vs.* 56.5%) and single vessel coronary artery disease (63.04% in both groups): anterior descending artery (62.2 *vs.* 69.5%) and right coronary artery (21.7 *vs.* 17.3%) disease. There were no differences regarding other FT classes at discharge nor regarding NTproBNP or creatinine. After a mean follow-up (FUP) of 286 ± 107 days, the primary outcome was significantly less frequent in the SGLT2i group (6.5 *vs.* 26%; HR 0.18; IQR 0.05-0.7; p = 0.014) (Fig.). At the end of FUP both groups were homogeneous in terms of ongoing FT, although a trend was observed toward higher prescription rates of mineralocorticoid receptor antagonists and sacubitril/valsartan in the SGLT2i group. NYHA functional class was significantly lower in the SGLT2i group (p = 0.022).

Conclusions: This quasi-experimental study suggests that early initiation of SGLT2i in pts with AMI and reduced LVEF may lead to lower HF related events, lower all-cause mortality and better functional class 1 year after initial coronary event.

Sexta-feira, 22 Abril de 2022 | 09:30-10:30

## Sala Aquarius | Comunicações Orais (Sessão 3) - Doença valvular

CO 11. REVERSE LEFT VENTRICULAR REMODELING AFTER AORTIC VALVE REPLACEMENT FOR AORTIC STENOSIS: SYSTEMATIC REVIEW AND META-ANALYSIS

Fábio Sousa Nunes[1], Catarina Marques[2], André Beco[3], João Ricardo Silva[3], Miguel Carvalho[2], Bernardo Sousa Pinto[3], Francisca Saraiva[3], Adelino Leite Moreira[2], Carla Sousa[2], Filipe Macedo[2]
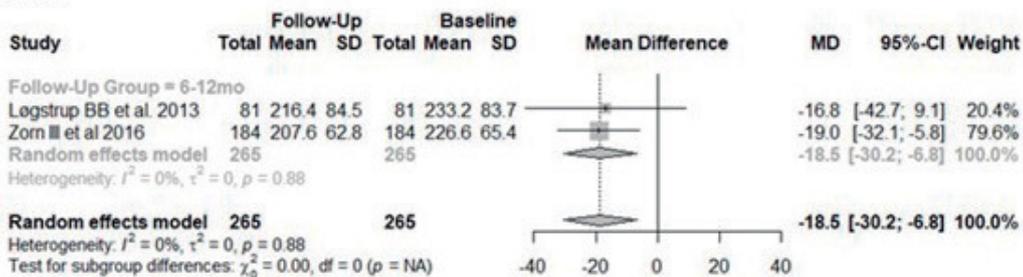
[1]Centro Hospitalar de Vila Nova de Gaia/Espinho, EPE. [2]Centro Hospitalar Universitário de S. João, EPE. [3]Faculdade de Medicina da Universidade do Porto.

Introduction: Reverse Left Ventricle (LV) remodeling after Aortic Valve Replacement (AVR), in patients with aortic stenosis, is well documented
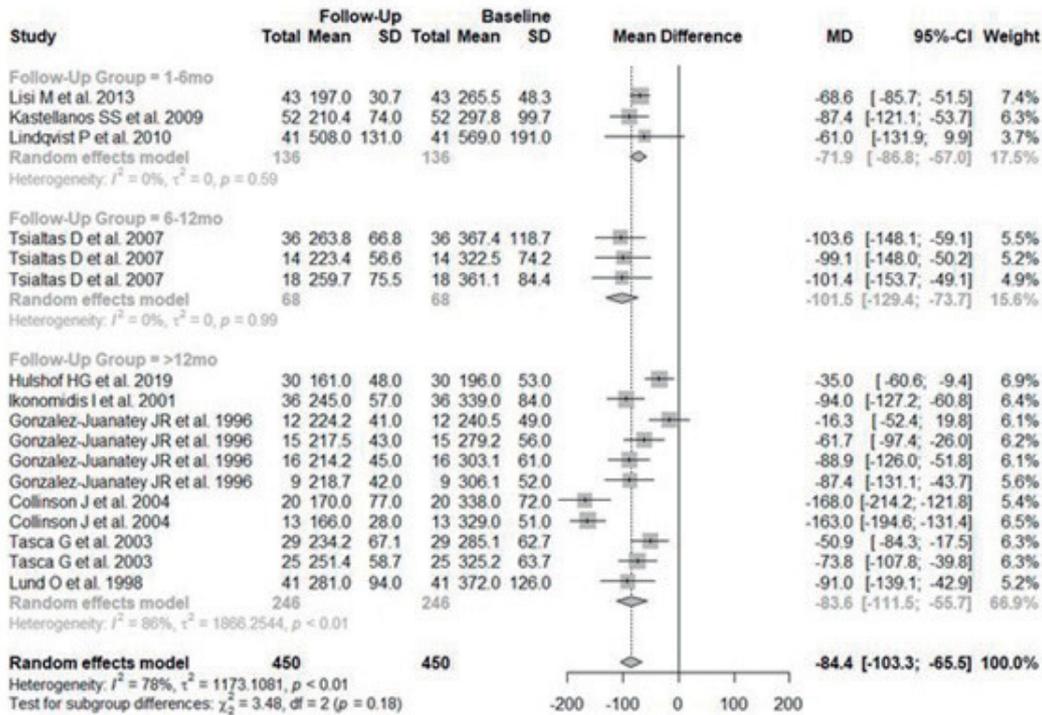
CO 11 Figure

as an important prognostic factor. With this systematic review and meta-analysis, we aimed to characterize the response of the unloaded LV after AVR.

Methods: We searched on MEDLINE/PubMed, Web of Science, and Embase for studies reporting echocardiographic findings before and at least 1 month after AVR for the treatment of aortic stenosis. 4493 abstracts were screened for inclusion. Main factors of interest were structural and dynamic measures of the LV after AVR. We performed a random-effects meta-analysis to compute standardized mean differences (SMD) between follow-up and baseline values for each outcome.

Results: 33 studies met the eligibility criteria, yielding 2368 patients. AVR resulted in reduced mean aortic gradient (SMD: -41.9 mmHg, 95%CI: -44.0 to -39.8, I2 = 95.8%), LV Mass (for surgical AVR, SMD: -84.4 g, 95%CI: -103.3 to -65.5, I2 = 73.8%; whereas for transcatheter AVR, SMD – 18.5 g, 95%CI -30.2 to – 6.8, I2 = 0%, see image), End-Diastolic LV Diameter (SMD: -1.95 mm, 95%CI: -3.0 to -0.9, I2 = 89.4%), End-Diastolic LV Volume (SMD: -13.0 mL, 95%CI: -18.6 to -7.4, I2 = 49.8%). LV Ejection Fraction increased after AVR, particularly for patients with baseline decreased LVEF (SMD: +9.5%, 95%CI 8-11.1%, I2 = 31.9%). Notably, there was no significant interaction of follow-up time in LV mass, End-Diastolic LV Diameter and End-Diastolic LV volume, suggesting that LV reverse remodeling occurs in the first months after AVR, with few changes thereafter.

Conclusions: This is the largest systematic review and meta-analysis on LV reverse remodeling after AVR for aortic stenosis. This review presents the expected changes in echocardiographic LV parameters for various timepoints, which may be helpful for the follow up of the typical AVR patient. Notably, this review suggests that LV reverse remodeling occurs in the first months after AVR, hit few changes thereafter.

CO 12. A PRELIMINARY ANALYSIS REGARDING FUNCTIONAL MITRAL REGURGITATION GRADING WITH ECHOCARDIOGRAPHY AND CMR: IN SEARCH OF SIMILARITIES AND RESOLVING DISCORDANCES

Sérgio Maltês, Maria Rita Lima, Rita Reis Santos, Pedro Freitas, Pedro M. D. Lopes, Liliana Marta, Sara Guerreiro, João Abecasis, António Ferreira, Regina Ribeiras, Maria João Andrade, Miguel Mendes

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

Introduction: Functional mitral regurgitation (fMR) severity grading by 2D transthoracic echocardiography (TTE) can be a complex task, especially in patients where PISA assumptions are not met (eg. non-circular orifice or multiple jets). Cardiac magnetic resonance (CMR) can provide further insight on the hemodynamic burden of fMR by accurately determining mitral regurgitant fraction (RegFrac). Our goal was to investigate the concordance and disagreement between the two modalities in assessing fMR.

Methods: Single-center prospective study of fMR patients performing same-day TTE and CMR from February to December 2021. MR severity was classified according to 2020 ACC consensus: grade I (mild; EROA < 0.20 cm²), grade II (moderate; EROA 0.20-0.29 cm²), grade III (moderate-to-severe; EROA 0.30-0.39 cm²) and grade IV (severe; EROA ≥ 0.40 cm²). MR assessment by CMR was determined through regurgitant volume (RVol) and RegFrac quantification. A RegFrac ≥ 35% (recently shown as the best cut-off for prognostication) was considered hemodynamically significant.

Results: A total of 36 patients were included (age 65 ± 14y; 74% male; mean left ventricle [LV] ejection fraction by TTE and CMR 35 ± 13% and 34 ± 11%, respectively). Mean RVol and EROA by TTE were 28 ± 11mL and 0.18 ± 0.8cm². Mean RVol and Regfrac by CMR were 20 ± 13mL and 25 ± 12%, respectively. A moderate correlation between RVol by TTE and CMR was found (Pearson's R 0.58, p = 0.001). According to TTE, there were 20 patients (56%) with grade I fMR, 12 patients (33%) with grade II fMR and 4 patients (11%) with grade III fMR. All patients considered to have mild (grade I) fMR by TTE had a RegFrac < 35% at CMR. However, amongst those with moderate and moderate-to-severe (grades II and III) fMR, there were 8 patients (50%) with hemodynamic significant fMR (RegFrac ≥ 35%) at CMR (Fig.). Those with RegFrac ≥ 35% by CMR had higher indexed LV diastolic (165 ± 24 *vs.* 139 ± 48 mL/m²) and systolic (116 ± 31 *vs.* 95 ± 48 mL/m²) volumes and higher pulmonary artery systolic pressures (48 ± 14 *vs.* 41 ± 16 mmHg) when compared with patients whose RegFrac was < 35%, even though statistically significance was not reached.

Conclusions: Using the criterion of RegFrac ≥ 35%, CMR re-classifies (half for each side) the patients with moderate and moderate-to-severe regurgitations by TTE. Recognizing, overcoming and resolving the disagreements between the techniques is the way forward to reach excellence.

CO 13. CLINICAL AND ECHOCARDIOGRAPHIC VERY LONG-TERM OUTCOMES AFTER PERCUTANEOUS MITRAL BALLOON VALVULOPLASTY IN SEVERE RHEUMATIC MITRAL STENOSIS

João Presume, Mariana Paiva, Daniel Gomes, Francisco Albuquerque, Joana Ferreira, Sara Guerreiro, Liliana Marta, Pedro Freitas, Marisa Trabulo, João Abecasis, Maria João Andrade, Pedro Araújo Gonçalves, Manuel Almeida, Miguel Mendes, Regina Ribeiras

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

Introduction: Mitral balloon valvuloplasty (MBV) is the guideline recommended treatment for symptomatic severe mitral stenosis (MS) with suitable anatomy, but is often deemed transitory. However, data on very-long term echocardiographic follow-up is scarce. The aim of our study was to describe clinical and echocardiographic outcomes in patients previously submitted to MBV for rheumatic MS.

Methods: We conducted a single-centre retrospective study enrolling patients previously submitted to MBV for rheumatic MS from 1990 until 2021. Follow-up was registered until the last echocardiographic re-evaluation available. Patients without electronic health records available were excluded. The primary endpoint was a composite of all-cause death or need of surgery.
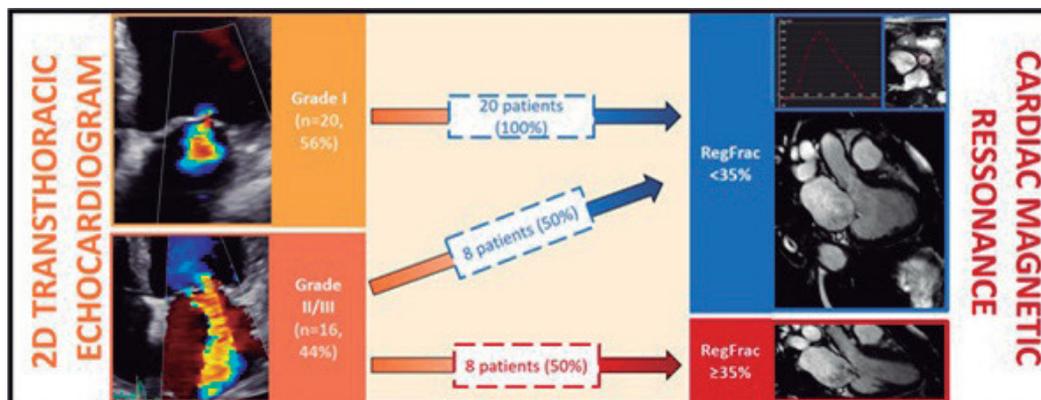
CO 12 Figure

Figure 1 - Echocardiographic long-term outcomes on alive non-operated patients previously submitted to mitral balloon valvuloplasty for rheumatic mitral stenosis.
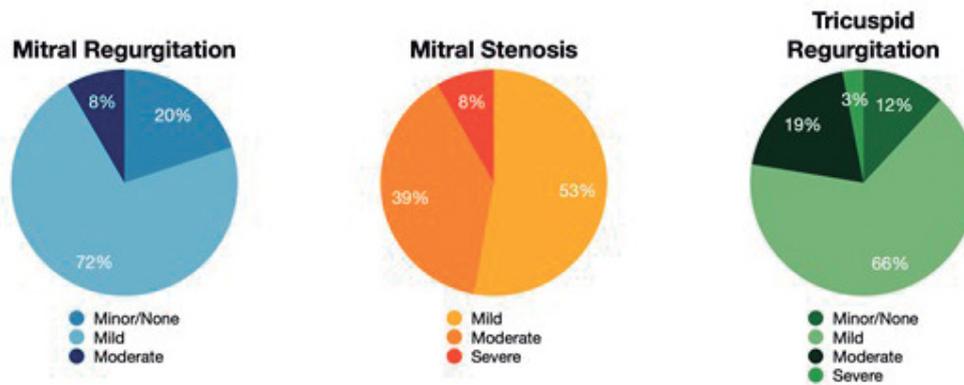
CO 13 Figure

Results: A total of 193 patients were included (15.5% male, with a mean age of 52 ± 15 years at the time of MBV, 60.6% with permanent atrial fibrillation). During a mean follow-up of 11 ± 8 years, 87 (45.1%) patients implanted a mitral valve prosthesis, 4 (2.1%) were submitted to surgical mitral valvuloplasty and 30 (15.5) died without being reintervention. Moreover, a total of 23 (11.9%) embolic events were registered - 21[st]rokes, 1 pulmonary embolism and 1 acute lower limb embolism. Overall, 133 patients (68.9%) survived more than 5 years, 95 (49.2%) more than 10 years and 56 (26.9%) more than 15 years since MBV without meeting the primary endpoint. The maximum follow-up without intervention was 32 years. Concerning patients submitted to surgery, the mean time from MBV until operation was 9.4 ± 7.3 years (minimum 8 days; maximum 29.3 years). In regard to echocardiographic long-term outcomes on alive non-operated patients (mean follow-up of 12 ± 9 years), 52.8% remain with mild MS, 91.6% with mild or no mitral regurgitation and 77.6% with mild or no tricuspid regurgitation. Furthermore, only 20.4% have right ventricle dysfunction (defined as a TAPSE < 17 mm), 18.3% have pulmonary hypertension (pulmonary artery systolic pressure > 45 mmHg), and 6.8% have residual interatrial communication.

Conclusions: MBV is a minimally invasive procedure that has an important benefit in a very significant proportion of patients with rheumatic mitral stenosis, with potential benefit that may last more than three decades without need for another invasive intervention.

CO 14. PERCUTANEOUS VALVE COMMISSUROTOMY FOR MITRAL STENOSIS PATIENTS: A 20 YEARS FOLLOW-UP

Ricardo Alves Pinto, Miguel Martins Carvalho, Tânia Proença, Catarina Costa, Ana Filipa Amador, João Calvão, Catarina Marques, André Cabrita, Luís Santos, Ana Pinho, Cátia Priscila, 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 surgery in the treatment of patients with clinically significant mitral stenosis (MS). Although rheumatic MS incidence
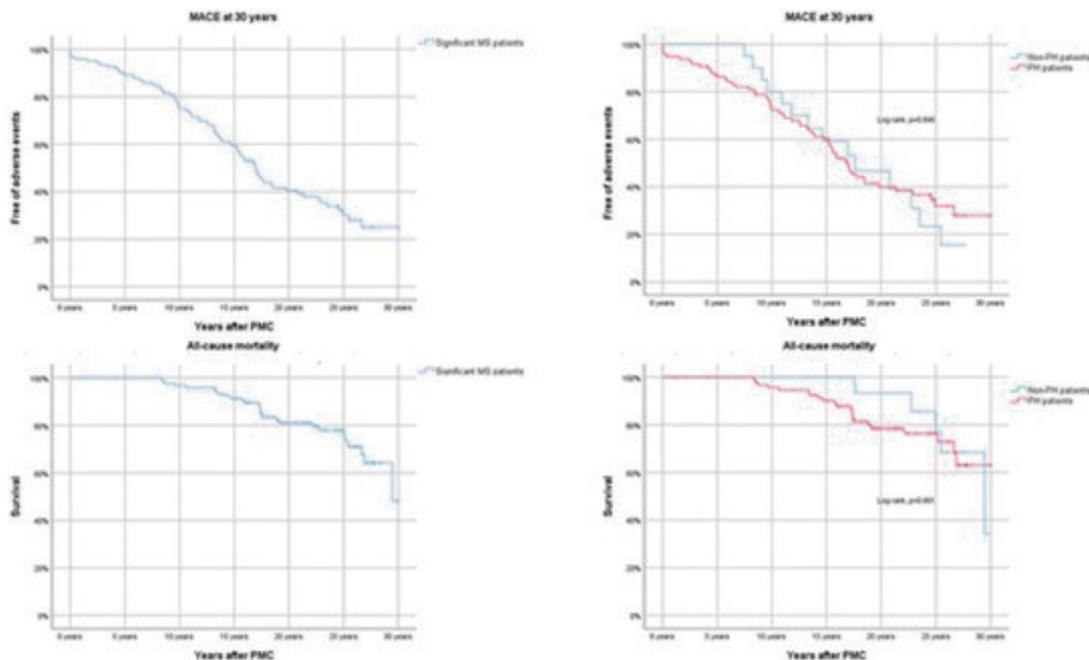
CO 14 Figure

has decreased in developed countries, it remains a prevalent healthcare problem in Cardiology clinics.

Objectives: To evaluate the early and long-term results of PMC in patients with rheumatic MS and to compare long-term events between patients with and without pulmonary hypertension (PH).

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 long-term follow-up. MACE was a composite of adverse events defined as all-cause mortality, mitral valve re-intervention or hospitalization for a cardiovascular cause.

Results: A total of 124 patients were enrolled: 87% were female, with a mean age at the time of repair of 46 ± 11 year-old and a mean follow-up of 20 ± 6 years. Before the procedure, 34% were in NYHA class ≥ III and 81% had a Wilkins score ≤ 8; all patients had preserved biventricular systolic function, 83% presented PH, mean transvalvular gradient (TVG) and mitral valve area (MVA) were 12.8 mmHg and 1.0 cm^2, respectively. Most of the procedures were successful (91%) and without complications (94%), with a mean MVA improvement of 0.9 cm^2 and reduction of 8.5 mmHg in TVG and 9.7 mmHg in pulmonary artery systolic pressure (PASP) after PMC. During long-term follow-up, 42% of patients were submitted to re-intervention (most of them surgically) and 24% died. In patients non-submitted to re-intervention, TVG and PASP remained similar with early post-procedure evaluation (p = 0.109 and p = 0.777, respectively), while MVA reduced over time, yet still statistically superior to baseline MVA (1.6 cm^2 *vs.* 1.0 cm^2, p < 0.001). Concerning time-to-event analysis, approximately 80% of patients kept uneventful after 10 years; after 30 years, more than 20% continued MACE-free and approximately 50% were alive. Regarding PH presence at time of PMC, there was no significant difference in MACE events and all-cause mortality between the two groups (Log Rank, p = 0,846 and p = 0.661, respectively).

Conclusions: PMC was safe and effective in clinically significant rheumatic MS. After a long-term follow-up patients maintained the reduction in TVG and PASP and a smaller but significative improvement in MVA. Most of the patients were free from adverse events after 10 years and half were alive after 30 years. There was no difference in all-cause mortality and in a composite of all-cause death, mitral valve re-intervention or cardiovascular hospitalization concerning PH presence.

CO 15. CONTRACTILE RESERVE: A KEY FACTOR IN AORTIC STENOSIS

Miguel Azaredo Raposo, Pedro Silvério António, Joana Rigueira, Sara Couto Pereira, Beatriz Valente Silva, Pedro Alves da Silva, Ana Beatriz Garcia, Ana Margarida Martins, Catarina Simões de Oliveira, Catarina Gregório, Ana Abrantes, Susana Gonçalves, Daniel Caldeira, Cláudio David, Fausto J. Pinto, Ana G. Almeida

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

Introduction: Stress echocardiography (SE) is essential in the workup of patients(pts) with aortic stenosis (AS) with reduced left ventricular ejection fraction and low systolic volume. Our aim was to determine the prognostic impact of contractile reserve (CR) in low-flow low-gradient (LFLG) AS.

Methods: Retrospective, single-center study of consecutive pts with LFLG AS (mean transvalvular gradient < 40 mmHg, LVEF < 50%, indexed stroke volume (SVi) ≤ 35 mL/m^2 and an aortic valve area (AVA) ≤ 1 cm^2) submitted to SE between 01/2014 and 06/2021. Epidemiological, clinical and echocardiographic data were recorded. Patients were stratified by the presence of CR, defined as ≥ 20% increase in SVi during SE. Primary endpoint was defined as time to first major event (composite endpoint of all-cause mortality and heart failure (HF) hospitalization). Predictors of major events were analyzed by t-Student test and Cox regression.

Results: Fifty-seven pts were included, (40 male, 75.6 ± 8.5 years of age). Regarding cardiovascular risk factors, 48 pts had hypertension, 42 dyslipidemia, 28 diabetes and 28 coronary artery disease (CAD). At baseline, 34 pts were in NYHA functional class II and 20 pts in NYHA III. The mean follow-up (FUP) period was 22.6 ± 24.6 months. Exercise SE was performed in 2 pts and dobutamine SE in 55 pts. At rest, the mean LVEF was 34 ± 10.7%, SVi 32 ± 8.7 ml/m^2, median transvalvular gradient 25.5 ± 9 mmHg,

AVAi 0.48 ± 0.14 cm/m^2. During stress the mean SVi was 38 ± 10.9 ml/m^2, median transvalvular gradient 34 ± 13 mmHg, AVAi 0.54 ± 0.17 cm/m^2. CR was present in 39 pts. During SE, 28 pts had true severe AS, 11 pts moderate AS, 5 pseudo-severe AS and the remaining were inconclusive. Twenty-six pts underwent valve implantation (VI), most of which percutaneous aortic VI. The absence of CR revealed to be a predictor of worst prognosis, with more major events in FUP (Log Rank 5.237, p = 0.022), especially in pts who were not submitted to VI. At univariate analysis, NYHA class (p = 0.009) and the absence of CR (p = 0.016) were the only predictors for the primary endpoint. The absence of CR was the sole independent predictor at multivariate analysis (HR 0.349; 95%CI 0.176-0.692, p = 0.003).
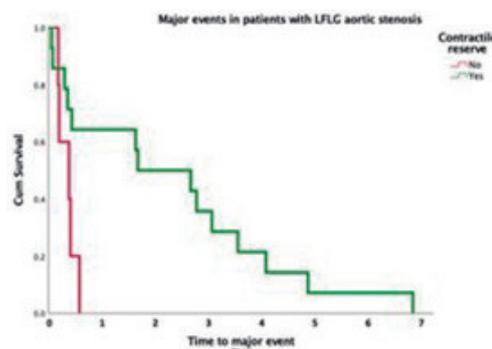

Figure 1: Major events in patients with LFLG AS according to contractile reserve in stress echocardiogram.

Conclusions: NYHA functional class and CR were predictors of major events in pts with LFLG AS. The absence of CR was the only independent predictor at multivariate analysis. This study shows the importance of clinical and SE assessment of CR for prediction of major events in these pts.

Sexta-feira, 22 Abril de 2022 | 09:30-10:30

Sala Vega | Comunicações Orais (Sessão 4) - Cardiopatias Congénitas, Doença Vascular Pulmonar e Embolia Pulmonar 1 - Foco no TEP e Hipertensão Pulmonar

CO 16. ACUTE PULMONARY EMBOLISM CATHETER-DIRECTED THERAPY: FIRST RESULTS OF A MULTIPARAMETRIC FOLLOW-UP PROTOCOL

André Grazina, Luís Almeida Morais, António Fiarresga, Ruben Ramos, Lídia de Sousa, João Reis, Ana Galrinho, José Miguel Viegas, Isabel Cardoso, Rita Teixeira, Helena Teles Antunes, Rita Barata Moura, 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. Although systemic fibrinolysis decreases this risk, it significantly increases the risk of major bleeding. 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, are innovative techniques, that allow faster reperfusion and hemodynamic improvement without the systemic hemorrhagic effects of systemic thrombolysis. The clinical evidence of its benefits is still limited.

Parameters	Admission	3 months	Mean difference	significance
NT-proBNP (pg/ml)	5251	341	-4909	p 0.107
TAPSE (mm)	15.2	20.7	+5.5	p 0.030
CT-scan RV/LV ratio	1.32	0.85	-0.47	p 0.002
RA pressure (mmHg)	10.0	7.3	-2.7	p 0.007
PA systolic pressure (mmHg)	61.1	43.8	-17.3	p 0.013
PA mean pressure (mmHg)	38.2	25.5	-12.7	p 0.012
Cardiac Output (L/min)	4.71	6.72	+2.01	p 0.039
Cardiac Index (L/min/m²)	2.41	3.41	+1.00	p 0.029
Modified Miller Index	8.6	1.8	-6.8	p 0.005

Table 1. Admission and 3-months parameters in Pulmonary Embolism patients submitted to acute-phase catheter director therapy. (NT-proBNP – N-terminal pro-hormone B-type natriuretic peptide; CT – computed tomography; RV – right ventricle; LV – left ventricle; RA – right atrium; PA – pulmonary artery)

CO 16 Figure

Objectives: This analysis aims to describe the initial experience of CDT in intermediate-high- and high-risk acute PE patients and compare their evolution in a predefined multiparametric follow-up protocol.

Methods: During 2021, consecutive intermediate-high- and high-risk PE patients considered suitable for CDT from our PERT, were prospectively enrolled in a single tertiary center. CDT options included mechanical thrombolysis using the Penumbra aspiration system and local alteplase perfusion (1 mg/h, for 12 hours) through a 5F McNamara catheter in the pulmonary artery (PA). A multiparametric protocol was designed to include baseline characteristics, blood tests, transthoracic echocardiogram (TTE), CT-scan, pulmonary angiogram and right heart catheterization (RHC) data collected at admission and at 3 months after CDT. The paired samples t-Test was used for the analysis of the variables.

Results: Of the 14 patients, 2 patients died (one for oncologic disease and the another from unknown cause after hospital discharge). Of the remaining, on the date, 6 patients (50% male, mean age 52.2 years old) have completed the follow-up and were included in this analysis. CT-scan showed a decrease in the right ventricle/left ventricle ratio by 0.47 (1.32 *vs.* 0.85, p 0.002). TTE showed a significant increase in TAPSE by 5.5 mm (15.2 *vs.* 20.7, p 0.03). RHC showed a significant reduction in right atrium and PA systolic and mean pressures by 2.7 mmHg (10.0 *vs.* 7.3, p 0.007), 17.3 mmHg (61.1 *vs.* 43.8, p 0.013) and 12.7 mmHg (38.2 *vs.* 25.5, p 0.012), respectively, as well as a significant increase in cardiac output and index by 2.01 L/min (4.71 *vs.* 6.72, p 0.039) and 1.00 L/min/m² (2.41 *vs.* 3.41, p 0.029), respectively. Pulmonary angiogram showed a reduction in clot burden, using the modified Miller Index, in 6.8 points (8.6 *vs.* 1.8, p 0.005).

Conclusions: This analysis shows encouraging data of our early experience of CDT in PERT selected intermediate-high and high-risk PE patients. In this follow-up analysis we verified a clinical, laboratorial and hemodynamic improvement with significative reduction in pulmonary vasculature pressures, thrombus burden and right ventricular function.

CO 17. COMPERA SCORE REVISED: BETTER RISK ESTIMATION TO BETTER TAILOR THERAPEUTICS IN PRECAPILLARY HYPERTENSION

Pedro Alves da Silva, Sara Couto Pereira, Pedro Silvério António, Joana Brito, Beatriz Valente Silva, Catarina Simões de Oliveira, Ana Margarida Martins, Ana Beatriz Garcia, Miguel Azaredo Raposo, Ana Abrantes, Tatiana Guimarães, Nuno Lousada, Fausto J. Pinto, Rui Plácido

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

**Introduction:** Pulmonary hypertension is a complex and often multifactorial disease, associated with mortality and morbidity, despite advances in therapeutic this last decade. Risk stratification is key in order to best follow and treat such patients; Current risk assessment tools divide patients as low, intermediate or high risk. However, most pts falls into the intermediate risk category and very recent data from the COMPERA Registry Investigators suggested that a 4-strata risk definition is more useful in categorizing these pts.

Objectives: To analyse the performance of a newly proposed 4-strata model in predicting outcomes in a population with precapillary hypertension.

Methods: Retrospective observational study of a population followed in a PH reference center. Clinical, laboratory, echocardiographic and cath data were collected at baseline and follow-up. Risk score derived from the COMPERA Registry was applied, in its 3 and 4-strata version to our population. Survival was calculated with Kaplan-Meier curves.

		COMPERA risk score							
		1		2		3		4	
		Count	N. %	Count	N. %	Count	N. %	Count	N. %
Death	No	52	96.3%	27	77.1%	8	53.3%	0	0.0%
	Yes	2	3.7%	8	22.9%	7	46.7%	4	100.0%
Event	No	40	74.1%	10	28.6%	1	6.7%	0	0.0%
	Yes	14	25.9%	25	71.4%	14	93.3%	4	100.0%

Table 1 – Events correlation with 4-strata COMPERA score

ROC curve on estimating events with 4-strata COMPERA
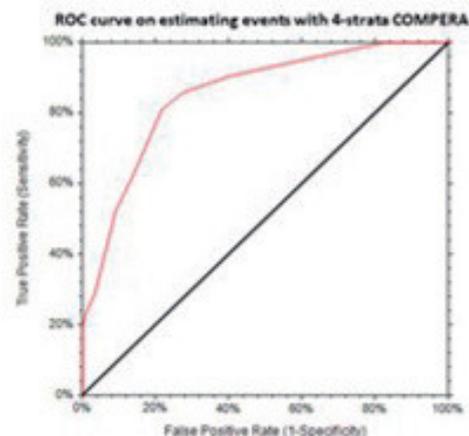
Results: We analysed a population of 108 pts with precapillary hypertension - divided between PAH (49.1%) and CTEPH (50.9%) – mean age 63.1 ± 23 years, 61% were females. Regarding therapeutics, 64.8% were under endotelin

antagonists, 58.3% phosphodiesterase inhibitors, 12.03% prostanoids, 19.4% riociguat and 7.6% selexipag. Both groups were homogenic, with no statistical differences, except for therapeutic with riociguat (p = 0.03). COMPERA score – using 3-strata (low, intermediate and high risk) and 4-strata (low, intermediate low, intermediate high and high risk) - were applied with data at beginning and during follow-up and then correlated with survival and a composite endpoint of death and hospitalization (Table 1). Kaplan Meier survival curves were obtained and an evident separation of the four groups were identified at early follow-up, a trend that was maintained during a 7-year follow-up. It is interesting to see that such trend was obtained in a population with PAH and in a broader population including also CTEPH. A ROC curve was obtained and showed a good sensitivity (AUC = 0.8525) in estimating the risk of events when applied at beginning and end of follow-up (Fig. 2).

Conclusions: In our population, a 4-strata risk assessment tool was able to better predict outcomes (mortality and admissions) in a population with precapillary pulmonary hypertension. Its implantation will help us on selecting some pts who might benefit early double therapy.

CO 18. MULTIDIMENSIONAL CT APPROACH TO PREDICT HEMODYNAMICS IN PULMONARY HYPERTENSION

Joana Brito, Pedro Alves da Silva, Beatriz Valente Silva,
Sara Couto Pereira, Pedro Silvério António, Ana Beatriz Garcia,
Ana Margarida Martins, Nuno Lousada, João Inácio, Tatiana Guimarães,
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Introduction: Mean pulmonary artery pressure (mPAP) measured by right heart catheterization (RHC) is the current cornerstone on pulmonary hypertension (PH) diagnosis. Non-invasive imaging techniques as angioCT allow for an excellent visualization of heart chambers and great vessels, and its measures may be associated with hemodynamic parameters, obviating the need for some invasive procedures.

Objectives: To evaluate the association between angioCT measurements with hemodynamics, clinical and laboratory data in a precapillary PH population.

Methods: Consecutive patients (pts) with precapillary PH followed in a tertiary center were evaluated with angioCT and RHC performed within a maximum time interval of 6 months. Clinical, laboratorial, imagiological and hemodynamic data were collected from all pts at baseline and follow-up. Statistical analysis was performed with Pearson analysis and Mann-Whitney. ROC curve analysis was applied to estimate the best angioCT parameters cut-offs for severe PH (mPAP > 35 mmHg).

Results: Our cohort included 47 pts (mean age: 64 ± 16 years, 60% male) 12 with clinical group I and 37 with clinical group 4. Pts had a mean mPAP of 44 ± 16 mmHg and a mean NT-proBNP of 1,109 ± 1,860 ng/mL, 56% were in functional class (FC) II and 21% in FC III. A significant correlation was observed between mean mPAP and angioCT parameters - septal angle (r 0.595, p < 0.001), right ventricle axial area (r 0.463, p = 0.001), right atrium (RA) axial area (r 0.374, p 0.010), RV free wall thickness (r 0.359, p = 0.037) and RV axial diameter (r 0.416, p = 0.013). For a mPAP over 35 mmHg the optimal cut-off for the previously correlated parameters were the following: septal angle value of 149° (AUC 0.788, Sn 67%, Sp 89%), RV axial area of 22.71 (AUC 0.839, Sn 73.5%, Sp 92.3%), RA axial area of 20.9 mm² (AUC: 0.785, Sn 76.5%, Sp 61.1%) and RV free wall thickness of 6.45 mm (AUC: 0.751, Sn 40%, Sp 100%). AngioCT parameters correlated not only with hemodynamics but also with clinical and laboratory parameters, as a higher RV and RA axial area had a significant positive correlation with NT-proBNP (p = 0.042 and p < 0.001) as well as with worse FC (p = 0.043 and p = 0.01). Higher septal angle and a thicker RV free wall also showed a positive correlation with worse FC (Table).
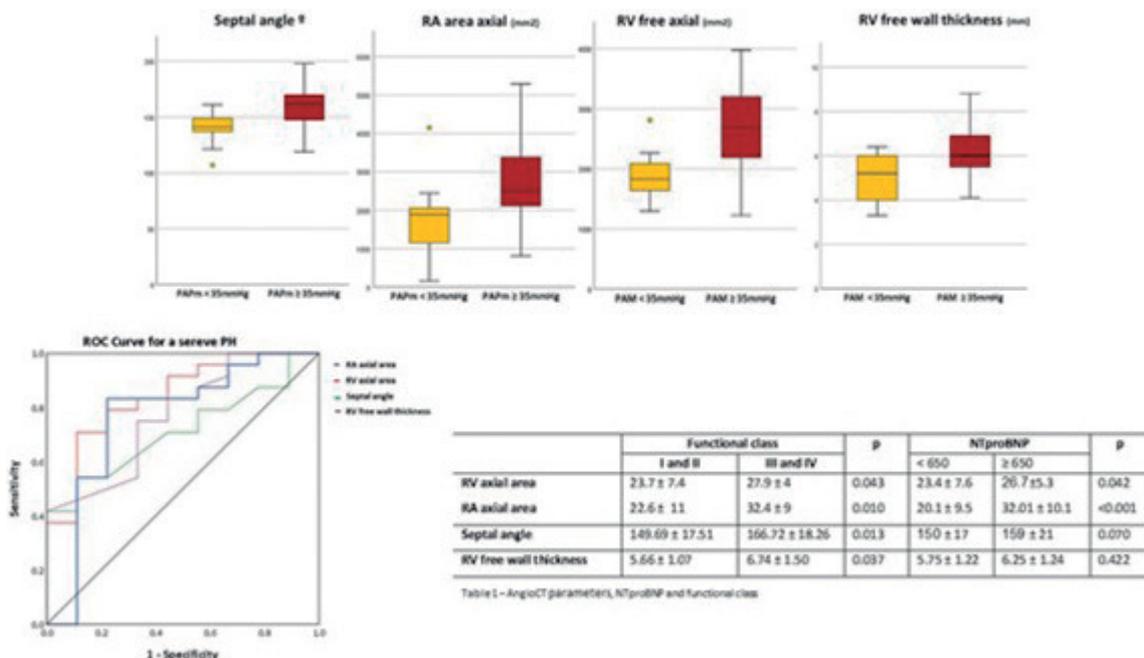
Conclusions: In this pilot trial with PH pts, non-invasive dimensional parameters acquired by CT-Angio significantly correlated with hemodynamic parameters assessed by RHC – namely mPAP - functional class and NTproBNP.

CO 19. PULMONARY HYPERTENSION IN CONNECTIVE TISSUE DISEASES WITH OVERT OF FEATURES OF VENOUS/CAPILLARIES INVOLVEMENT: CLINICAL IMPLICATIONS AND PROGNOSTIC IMPACT OF THIS PHENOTYPE

Bárbara Marques Ferreira, Filipa Ferreira, Sofia Alegria, Alexandra Briosa,
Ana Rita Pereira, Débora Repolho, João Grade Santos, Mariana Martinho,
Diogo Cunha, Maria José Loureiro, Hélder Pereira

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Introduction: Pulmonary hypertension (PH) is a serious complication of connective tissue disease (CTD) and remains one of the leading causes of mortality in this subset of patients (pts). Pulmonary veno-occlusive disease

	Functional class		p	NTproBNP		p
	I and II	III and IV		< 650	≥ 650	
RV axial area	23.7 ± 7.4	27.9 ± 4	0.043	23.4 ± 7.6	26.7 ± 5.3	0.042
RA axial area	22.6 ± 11	32.4 ± 9	0.010	20.1 ± 9.5	32.01 ± 10.1	<0.001
Septal angle	149.69 ± 17.51	166.72 ± 18.26	0.013	150 ± 17	159 ± 21	0.070
RV free wall thickness	5.66 ± 1.07	6.74 ± 1.50	0.037	5.75 ± 1.22	6.25 ± 1.24	0.422

Table 1 – AngioCT parameters, NTproBNP and functional class.
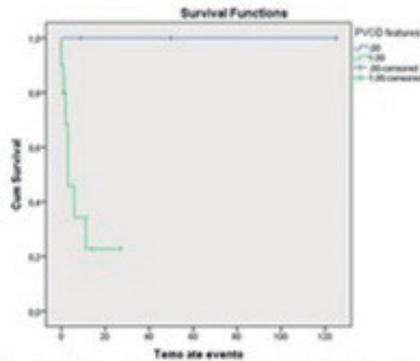
CO 18 Figure

Figure 1 Kaplan-Meier survival in patients with CTD-PAH without signs evocative of PVOD (blue) versus patients with at least 1 sign evocative of PVOD (green).

	CTD-PAH	All other PAH	p value
PaO2 (mmHg)	64.9 +/- 16.0	66.0 +/- 14.0	0.868
DLCO (%)	44.0 +/- 10.8	57.0 +/- 14.9	0.015
NT pro-BNP (ng/L)	1325 (461-3365)	602 (231-1927)	0.738
6MWT (m)	315.8 +/- 131.0	406.0 +/- 118.0	0.854
PVR (WU)	11.49 +/- 6.06	12.63 +/- 8.58	0.568
PAPm (mmHg)	43.81 +/- 9.59	52.68 +/- 15.38	0.025
SvO2 (%)	63.85 +/- 10.84	67.01 +/- 10.57	0.793
PADP (mmHg)	8.13 +/- 5.54	8.98 +/- 0.76	0.878
CI (L/min/m2)	2.14 +/- 0.59	2.27 +/- 0.68	0.402
Mean age (years)	60.53 +/- 14.90	44.35 +/- 16.76	0.001

Table 1 Characteristics of patients in the CTD-PAH group versus all other PAH groups.
* Continuous variables are expressed as mean ± standard deviation with exception of NT-proBNP expressed as median, Q1 and Q3.
Abbreviations: CTD-PAH – PAH associated with CTD; PAH – pulmonary arterial hypertension; PaO2 – arterial oxygen pressure; DLCO – diffusing capacity of the lung for carbon monoxide; NT proBNP – N-terminal pro-brain natriuretic peptide; 6MWT – 6-minute walking test; PVR – pulmonary vascular resistance; PAPm – mean pulmonary arterial pressure; SvO2 - mixed venous oxygen saturation; PADP – pulmonary artery diastolic pressure; CI – cardiac index

CO 19 Figure

(PVOD), recently reclassified as pulmonary arterial hypertension (PAH) with overt features of venous/capillaries involvement, is a subgroup of group 1 PH, which has been rarely reported in CTD pts. Due to clinical similarities between CTD-related PAH and PVOD, some pts are misdiagnosed and this could explain, in part, the worse prognosis associated with this clinical condition.

Objectives: To analyze signs evocative of venous and capillary (pulmonary veno-occlusive disease/pulmonary capillary haemangiomatosis) involvement in pts with PAH associated with CTD (CTD-PAH).

Methods: We retrospectively included all pts with diagnosis of CTD-PAH (group 1.4.1) followed in a pulmonary hypertension referral center. Clinical parameters, pulmonary function tests and high-resolution computed tomography were reviewed looking for signs evocative of PVOD involvement: decreased diffusing capacity of the lung for carbon monoxide (DLCO) (< 50%), severe hypoxemia (PaO2 < 60 mmHg without supplementary oxygen), presence of septal lines, centrilobular ground-glass opacities/nodules (CLGGO) and mediastinal lymph node enlargement (MLNE). Follow-up period was up to 10 years. Cox's proportional hazards analyses was used to determine predictors of event-free survival defined as initiation of parenteric prostanoid therapy, referral for pulmonary transplant or death.

Results: In a universe of 91 pts with PAH, we included 17 pts with the diagnosis of PAH associated with CTD. All were females, mean age 60.5 ± 14.8. 82.4% were in WHO functional class (FC)≥ III. Compared to all other PAH groups, CTD-PAH were older, presented higher NT proBNP, lower mean pulmonary

artery pressure and lower DLCO (Table). DLCO was < 50% in 71.4%, severe hypoxemia was present in 43.8%, MLNE in 38.5%, CLGGO in 35.7% and septal lines in 28.6% of the pts. Only 4 pts did not present any finding suggestive of PVOD. With a mean follow-up of 4,5 years, 8 pts had no adverse event and 3 died. WHO FC, DLCO and cardiac index were predictors of adverse events in this population. Kaplan-Meier survival analyses showed that the median survival time without events was 11 months and was significantly worst in pts with at least 1 sign evocative of PVOD (log rank p = 0,028; Fig.).

Conclusions: Signs evocative of PVOD involvement are frequent in PAH associated with CTD and their presence determine worse event-free survival.

CO 20. RIGHT HEART REMODELING AFTER BALLOON PULMONARY ANGIOPLASTY IN PATIENTS WITH CHRONIC THROMBOEMBOLIC PULMONARY HYPERTENSION

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Introduction: In chronic thromboembolic pulmonary hypertension (CTEPH) there is right chambers (RC) remodeling to compensate for the increased

Variables	Initial (Time of diagnosis)	Baseline (Before BPA)	6-month follow-up	Initial vs. Baseline p-valor	Baseline vs. 6-month follow-up p-valor	Initial vs 6-month follow-up p-valor
Echocardiographic						
RA volume (ml)	94.4±86.6	74.7±45.4	47.7±18.0	p=NS	p=0.050	p=0.014
RA volume/BSA (ml/m2)	52.5±28.4	41.6±27.4	25.7±7.6	p=NS	p=0.054	p=0.017
RV diastolic area (mm2)	32.6±9.2	26.0±10.0	21.5±6.5	p=0.061	p=NS	p=0.015
RV systolic area (mm2)	23.3±8.6	18.5±9.5	12.5±4.3	p=NS	p=0.057	p=0.006
RVFAC (%)	25.8±9.2	31.9±11.8	41.5±7.5	p=NS	p=0.009	p=0.002
TAPSE (mm)	17.9±5.5	18.5±5.2	21.0±5.2	p=NS	p=0.076	p=0.063
RV S′ (cm/s)	10.4±3.2	11.0±3.8	12.0±3.2	p=NS	p=NS	p=0.006
LV diastolic EI	1.4±0.4	1.2±0.3	1.0±0.0	p=NS	p=0.071	p=0.012
LV systolic EI	1.6±0.8	1.3±0.4	1.0±0.1	p=NS	p=0.016	p=0.031
Haemodynamic						
Mean PAP (mmHg)	45.1±11.4	35.9±12.7	25.9±6.3	p<0.001	p=0.015	p<0.001
PVR (uWood)	10.2±4.5	5.4±3.2	3.1± 1.3	p<0.001	p=0.013	p<0.001
Cardiac Index (L/min/m²)	2.4±0.6	2.8±0.6	3.0±0.9	p=0.052	p=NS	p=0.056

TABLE 1. Haemodynamic and Echocardiographic parameters (N=13 patients)

CO 20 Figure

resistance in the lung circulation. Furthermore, right ventricular (RV) function is a prognostic marker in these patients (pts). The aim of this study was to evaluate the effects on RC remodeling of a hybrid therapeutic approach with pulmonary vasodilators and balloon pulmonary angioplasty (BPA) in CTEPH.

Methods: Prospective single-centre study that included consecutive CTEPH pts submitted to BPA from 2017 to 2020. All patients underwent two-dimensional transthoracic echocardiography and right-heart catheterization at the time of diagnosis before starting vasodilator therapy, before and 6 months after BPA. RC remodeling was assessed as RV area and right atrial (RA) volume. For RV function the following parameters were measured: tricuspid annular plane systolic excursion (TAPSE), tricuspid lateral annular peak systolic velocity by pulsed tissue Doppler imaging (RV S´) and RV fractional area change (RVFAC). LV geometry was assessed by calculation of LV eccentricity index (EI).

Results: 70 BPA sessions were performed in 13 CTEPH pts (69.2% inoperable disease). Eleven pts (84.6%) were treated with specific vasodilator therapy (guanylate cyclase stimulators in 9; endothelin receptor antagonists in 6; phosphodiesterase type 5 inhibitors in 2, prostacyclin analogues in 4 and selexipag in 1). Mean number of BPA sessions was 5.4 ± 1.9 per pt (min 2-max 8) and mean number of total vascular segments treated 9.9 ± 2.3 per pt (min 6-max 15). We observed the reduction of the diastolic RV dimensions after starting vasodilator therapy, but a significant reverse remodeling of the RA and RV in systole was only observed after a BPA strategy on top of pulmonary vasodilator therapy. There was also an increased RVFAC and an improved LV eccentricity index after BPA, in proportion to the decrease in mean pulmonary artery pressure (mPAP) and pulmonary vascular resistance (PVR) induced by the treatment (Table).

Conclusions: BPA on top of pulmonary vasodilator therapy is associated with significant hemodynamic improvement and consequently right chambers remodeling and normalization of LV geometry.

Sexta-feira, 22 Abril de 2022 | 10:30-11:30

Sala Vega | Comunicações Orais (Sessão 5) - Risco CV, Prevenção e Reabilitação Cardíaca 1 - Foco nos *Scores* de Risco

CO 21. POTENTIAL IMPACT OF REPLACING SCORE WITH SCORE-2 ON RISK CLASSIFICATION AND STATIN ELIGIBILITY - A CORONARY CALCIUM SCORE CORRELATION STUDY

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

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Introduction: Recently, the European Society of Cardiology issued new algorithms to estimate the 10-year risk of atherosclerotic cardiovascular disease (ASCVD), along with new age-specific thresholds to classify individuals as low-to-moderate, high, or very-high risk. The aim of this study was to compare the latest SCORE-2 model with the older SCORE (Systematic COronary Risk Evaluation) in their ability to identify individuals with high coronary artery calcium score (CACS), and assess the relationship between potential eligibility for statin therapy and CACS.

Methods: Individuals 40-69 years old without diabetes or known ASCVD were identified in a single center registry of patients undergoing CACS and
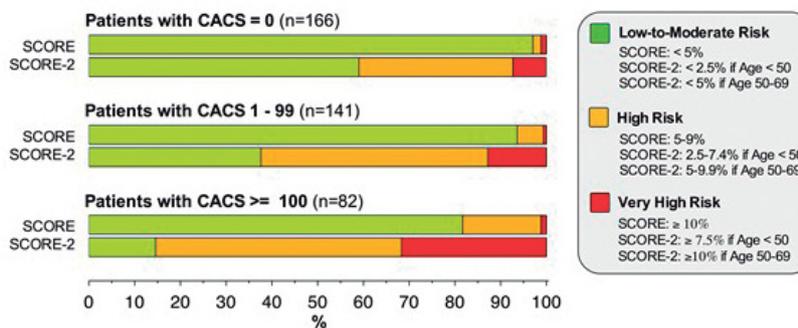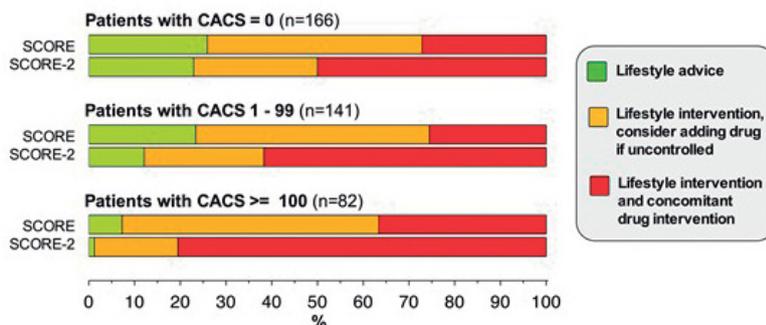
CO 21 Figure

coronary CT angiography for suspected coronary artery disease. SCORE and SCORE-2 were calculated and used with each patient's untreated LDL-C values to assess eligibility for statin therapy. High CACS was defined as an Agatston score ≥ 100.

Results: A total of 389 pts (46% men, mean age 58 ± 8 years) were included, of which 15% (n = 60) were active smokers. The mean systolic blood pressure and untreated LDL-C values were 136 ± 17 mmHg and 155 ± 65 mg/dL, respectively. The proportion of patients classified as low-to-moderate risk, high risk, and very high risk was 93%, 6% and 1% using the SCORE algorithm, and 42%, 44%, and 14% using SCORE-2, respectively. Overall, 218 patients (56%) would have their risk category revised upwards, while no patients would be downgraded. The median CACS was 5 (IQR 0-71 AU), with 166 patients (43%) having CACS = 0, and 81 (21%) presenting CACS values ≥ 100. SCORE and SCORE-2 showed similar discriminative power to identify patients with CACS ≥ 100 (C-statistic 0.77, 95%CI 0.71-0.82, *vs.* 0.75, 95%CI 0.69-0.80, p = 0.109 for comparison]. The up-reclassification of risk conveyed by SCORE-2 affected patients across all categories of CACS (Fig. 1A). The proportion of patients in whom statin therapy would generally be indicated was higher with the SCORE-2 criteria *vs.* the SCORE algorithm (61 *vs.* 29%, respectively, p < 0.001). The broadening of potential indication for statin therapy spanned all categories of CACS, including patients with CACS = 0 (Fig. 1B).

Conclusions: Even though the discriminative power of SCORE-2 is similar to the older SCORE, the introduction of age-specific thresholds results in the up-reclassification of risk in roughly half of the patients. The application of SCORE-2 will broaden statin eligibility overall, not only in patients with high atherosclerotic burden, but also in those with CACS = 0. These findings support the use of risk modifiers in selected patients to improve the effectiveness of statin therapy.

CO 22. THE EVALUATION OF THE EUROPEAN SCORE2 IN A PORTUGUESE POPULATION

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

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

Introduction: In 2021, the European Society of Cardiology updated the Cardiovascular Disease (CVD) risk stratification in asymptomatic individuals with the validation of European SCORE2. This new score was developed to estimate 10-year fatal and non-fatal CVD risk in European individuals aged 40-69 years without previous CVD or diabetes. However, the Portuguese population was not included in SCORE2 project.

Objectives: Analyse the new European SCORE2 and its influence on MACE prediction in a Portuguese population.

Methods: A cohort of 1,100 individuals (mean age of 53.3 ± 6.9 and 74.1% male) was prospectively surveyed during an extended follow-up (mean of 4.9 ± 3.4 years). Population was stratified into three SCORE2 risk categories (low, moderate and high) and MACE were analysed in each group. Kaplan-Meier estimated the differences in the three survival curves of SCORE2 for MACE occurrence. A multivariate Cox regression analysis with hypertension, smoking, dyslipidemia, kidney failure was performed to calculate the hazard risk of SCORE2 for MACE.

Results: The higher percentage of our population (58.9%) was assigned to the moderate risk. In the higher risk category of SCORE2, 40% presented MACE and 15.3% had no-MACE (p < 0.0001). At ten-year follow-up for MACE occurrence, the probability of survival was 98.3%, 89.6% and 78.1 in the low, moderate and high risk categories, respectively (p < 0.0001). After multivariate Cox regression, SCORE2 remained in the model with an HR = 8.90 (p = 0.001) in the highest category. SCORE2 compared with the others risk factors, showed a better discrimination capacity for MACE (C-index = 0.707) relatively to risk factors only (C-index = 0.633), with statistical significance (p = 0.001).

Conclusions: The new SCORE2 enhanced the identification of individuals at higher risk of developing MACE and also performed a good risk discrimination for MACE in this Portuguese population.

CO 23. PROGNOSTIC IMPACT OF ADDING CORONARY CALCIUM SCORE TO EUROPEAN SCORE2 IN AN ASYMPTOMATIC PORTUGUESE POPULATION

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

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

Introduction: The new European SCORE2 estimates the combined risk of fatal and non-fatal cardiovascular (CV) events, in contrast with SCORE's use for CV mortality only. Although controversial, several studies point out that Coronary Artery Calcification (CAC) scoring could improve CV risk stratification in primary prevention.
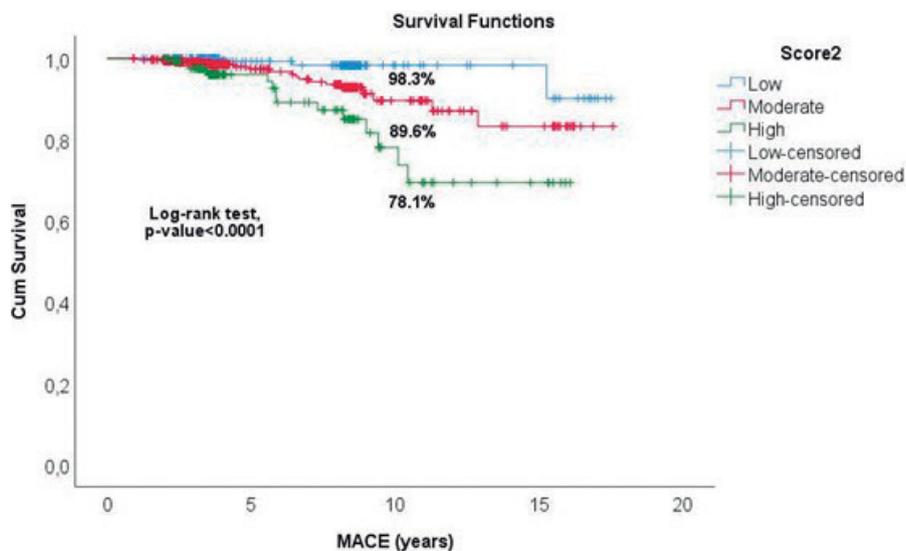
CO 22 Figure

Objectives: Assess the impact of including CAC scoring to the new SCORE2 in MACE prediction and cardiovascular risk stratification.

Methods: We calculate the new SCORE2 in a population-based cohort of 1,014 individuals without known CV disease and diabetes (mean age 58.6 ± 8.5 years). Population was stratified into three SCORE2 risk categories (low, moderate and high). According to the Hoff's nomogram, 3 categories were created for CAC score: low CAC (0≤ CAC ≤ 100 or p < 50); moderate CAC (100 ≤ CAC< 400 or P50-75) and high or severe CAC (CAC ≥ 400 or P> 75). Kaplan-Meier survival curves were estimated and a multivariate regression analysed the MACE risk for both scores. C-statistic methodology evaluated the improved capacity of adding CAC to the SCORE2 model.

Results: Cox regression analysis showed that the highest categories of CAC and SCORE2 remained in the equation with an HR of 3.7 (p = 0.008) and HR of 9.8 (p = 0.005), respectively, when compared with the lowest categories. C-statistic demonstrated that the predictive value for MACE was 0.668 for SCORE2 and 0.681 for CAC score. When CAC was added to the SCORE2 model, C-statistic increased to 0.787 (p = 0.007) showing a better discrimination capacity for MACE.

Cox regression* analysis for development of MACE

Variables	Hazard ratio (95% CI)	P-value
CAC score	----	0.010
Moderate	0.855 (0.218 – 3.349)	0.822
High	3.699 (1.397 – 9.793)	0.008
SCORE2	----	0.012
Moderate	3.820 (0.839 – 17.934)	0.083
High	9.871 (1.998 – 48.776)	0.005

*Forward wald method (SPSS vs. 25.0). MACE – Major adverse cardiovascular events; CAC – Calcium artery calcification; CI – Confidence interval. Statistically significant for p<0.05.

Comparison between different models using C-statistic methodology

Models	C-index (95% CI)	P-value
SCORE2	0.668 (0.582 – 0.754)	
CAC	0.681 (0.540 – 0.822)	
SCORE2 + CAC	0.787 (0.689 – 0.885)	0.007[a]

a) CAC score + SCORE2 vs SCORE2

Conclusions: Our results highlight the importance of adding CAC score 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 24. PROGNOSTIC ROLE OF ADDING A GENETIC RISK SCORE TO THE NEW EUROPEAN SCORE2 IN CARDIOVASCULAR EVENTS PREDICTION, IN A MODERATE-RISK REGION

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

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

Introduction: The new SCORE2 provides risk estimates for the combined outcome of fatal and non-fatal cardiovascular disease (CVD) events, in contrast with SCORE's use for CVD mortality only. Genetic predisposition to CVD is not considered in SCORE2 for prevention and treatment.

Objectives: Evaluate the impact of adding a Genetic Risk Score (GRS) to the new European SCORE2 in MACE prediction and estimate the additional value in cardiovascular risk stratification in our asymptomatic population.

Methods: We calculated the new SCORE2 prospectively in a population-based cohort of 1,100 individuals without known cardiovascular disease (CAD) and diabetes (mean age 53.3 ± 6.9). Three risk categories were considered for SCORE2: low, moderate and high-risk. For all included participants, a GRS was created, with 33 genetic variants previously associated with CAD, and two groups were analyzed: lower and higher

than the GRS median. Kaplan-Meier survival curves were created and a Cox regression model was performed including the two scores to assess the risk of major cardiovascular events (MACE). Using C-statistic methodology we compared the models SCORE2 and SCORE2 plus GRS.

Results: Kaplan-Meier curves showed that the highest category had a worst survival for each score. Cox regression presented an HR of 7.597 (p = 0.001) for SCORE2 for the high-risk category. The GRS as a continuous value displayed an HR of 1.005 (p < 0.0001). C-statistic demonstrated that the SCORE2 predictive value was 0.678, increasing to 0.792 with the GRS incorporation (p = 0.0005). After Kaplan-Meier analysis for MACE occurrence, the group with low SCORE2 category showed better survival when compared to the other categories (p < 0.0001). When evaluating GRS, the group higher than median showed worst survival with statistical significance (p < 0.0001).

Cox regression* analysis for development of MACE

Variables	Hazard ratio (95% CI)	P-value
SCORE2	----	0.003
Moderate	3.609 (1.072 – 12.149)	0.038
High	7.597 (2.187 – 26.380)	0.001
GRS	1.005 (1.003 – 1.006)	<0.0001

*Forward wald method (SPSS vs. 25.0). MACE – Major adverse cardiovascular events; GRS – Genetic risk score; CI – Confidence interval. Statistically significant for p<0.05.

Comparison between different models using C-statistic methodology

Models	C-index (95% CI)	P-value
SCORE2	0.678 (0.604 – 0.752)	0.0005[b]
SCORE2 + GRS	0.792 (0.719 – 0.865)	

b) SCORE2 + GRS vs SCORE2

Conclusions: In this work, combining SCORE2 with multiple genetic loci gathered into a GRS, improved the identification of patients with the worst prognosis. This new tool may be of great utility in risk stratification in primary prevention. Larger prospective multicenter cohorts with longer follow-up should reproduce and validate these findings.

CO 25. A NEW SCORE MODEL FOR MORTALITY PREDICTION IN TREADMILL TEST

Inês Pereira Oliveira, Bruno Bragança, Isabel Cruz, Rafaela Lopes, Joel Monteiro, João Azevedo, Paula Pinto, Aurora Andrade

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

Introduction: Exercise stress testing is a established diagnostic and prognostic tool in cardiovascular (CV) disease patients (pts). Although functional capacity and heart rate (HR) response to exercise are known prognostic factors, its role to stratify high-risk pts is not well defined.

Objectives: To assess the association between functional capacity, HR response to exercise and CV outcomes in pts with coronary artery disease (CAD), in order to develop a score for risk stratification in this population.

Methods: We performed a retrospective analysis of a cohort of 497 consecutive patients with known CAD, who underwent Bruce protocol treadmill testing (TT) between 2009-2010, followed during 9.7 ± 2.7 years. We analyzed known cardiovascular risk factors and the available parameters of TT, and their correlation with the occurrence of all-cause mortality during the follow-up. A multivariate binary logistic regression analysis was performed according to Backward Wald method, selecting the clinical variables with highest mortality predictive power. A multiplicative score was developed as the following: Age = Metabolic Equivalent of Task (MET) × DHR. The predictive performance of this model was evaluated using ROC curve analysis.

Results: The variables associated with all-cause mortality during the follow up were age (p < 0.001), peak heart rate (p < 0.001), metabolic equivalent of task (p < 0.001), double product (p = 0.003) and heart rate variance between peak and rest (p < 0.001). The backwards-Wald logist regression identified Age, heart rate variance and MET as independent risk predictors. The multiplicative model showed association with all cause mortality (p < 0.001)

and a moderate-high risk prediction capacity using ROC curve analysis (AUC = 0.73). Optimal bining identified 24 and 12 as cutoffs for the model. The categorized score retained its prognostic capacity with an AUC of 0.72.
Conclusions: This simple model based on physiological variables drawn from the stress test, predicts long term all-cause mortality in a cohort of high-risk CAD patients. Its simple categorization retains the prognostic value of the model and allows for immediate risk assessment.

Sexta-feira, 22 Abril de 2022 | 11:30-12:30

Sala Vega | Comunicações Orais (Sessão 6) - DAC e Cuidados Intensivos 2 - Vários Tópicos

CO 26. PATIENT DELAY IN ACUTE MYOCARDIAL INFARCTION – A LONG JOURNEY STILL AHEAD

Catarina Amaral Marques, André Cabrita, Paulo Maia Araújo, Tânia Proença, Ricardo Alves Pinto, Miguel Martins de Carvalho, Catarina Martins da Costa, Ana Filipa Amador, João Calvão, Ana Isabel Pinho, Cátia Oliveira, Luís Daniel Santos, Cristina Cruz, Filipe Macedo

Centro Hospitalar Universitário de S. João, EPE.

Introduction: It is overly known that time delays in acute myocardial infarction (AMI) strongly influence its outcomes. Patient delay (PD) is repeatedly pointed out as the longer one in this context, as well as it is the less modifiable one by organizational measures. Therefore, it is crucial to understand the reasons for longer PD in our population, to define proper strategies to improve PD and, ultimately, AMI-outcomes.
Methods: In this 6-month prospective study of patients (pts) admitted in a tertiary hospital due to type-1 AMI, 196 pts were consecutively enrolled between May and October 2021. Data was based on a pts well-structured interview within 48h after admission and review of medical records.
Results: Our work spotted several aspects significantly influencing PD in AMI context (Fig.). Concerning pts cardiovascular background, a trend towards a shorter PD was found in pts with at least 1 cardiovascular risk factor (CVRF) (p = 0.08) and with a previous history of AMI (p = 0.08). Regarding clinical presentation, a significantly shorter PD was found in pts presenting with associated symptoms (p = 0.02), higher chest pain intensity (chest pain intensity ≥ 7 *vs.* < 7 in a 0-10 scale; p = 0.03) and symptoms onset on weekdays rather than weekends (p = 0,003). Regarding pts knowledge, significant differences were found when pts recognized their symptoms as AMI, presenting a shorter PD in this context

(p = 0,006). Curiously, pts ability to correctly identify AMI symptoms, when asked, or to acknowledge their CVRF (when present), did not influence PD. Considering sociodemographic factors, higher incomes (p = 0.03) and non-rural residence (p = 0.03) significantly translated into shorter PD. No differences were found in PD according to pts age, gender or educational level.
Conclusions: Our study clearly points to the need for increasing public awareness and educational measures, mainly in pts with lower socioeconomic status, in order to: 1) Improve pts knowledge about CVRF; 2) Improve pts knowledge about AMI symptoms, clarifying that atypical symptoms can happen; 3) Reinforce the importance of shortening AMI time delays, clearly explaining the concept "time is muscle".

CO 27. CORONARY SINUS REDUCER DEVICE FOR THE TREATMENT OF REFRACTORY ANGINA THERAPY. A MULTICENTRIC INITIAL EXPERIENCE

João Pedro Reis[1], Catarina Brizido[2], Sérgio Madeira[2], Rúben Ramos[1], Manuel Almeida[2], Duarte Cacela[1]

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

Introduction: The coronary sinus Reducer device (CSRD) emerged as a complementary therapy in patients with severe angina refractory to optimal medical therapy and not amenable to revascularization. Our aim was to assess the safety and efficacy of the CSRD in a real-world setting.
Methods: Twenty-six patients with refractory angina (RA), evidence of myocardial ischemia attributable to the left coronary artery unsuitable for revascularization were treated with the CSRD at two centres between May 2017 and July 2019. Safety endpoints were procedural success and complications. Efficacy endpoints, assessed at 6-month follow-up, were a reduction in CCS class, improvement in quality of life (QoL) assessed using the short version of the Seattle Angina Questionnaire (SAQ-7) and reduction in anti-anginal therapy.
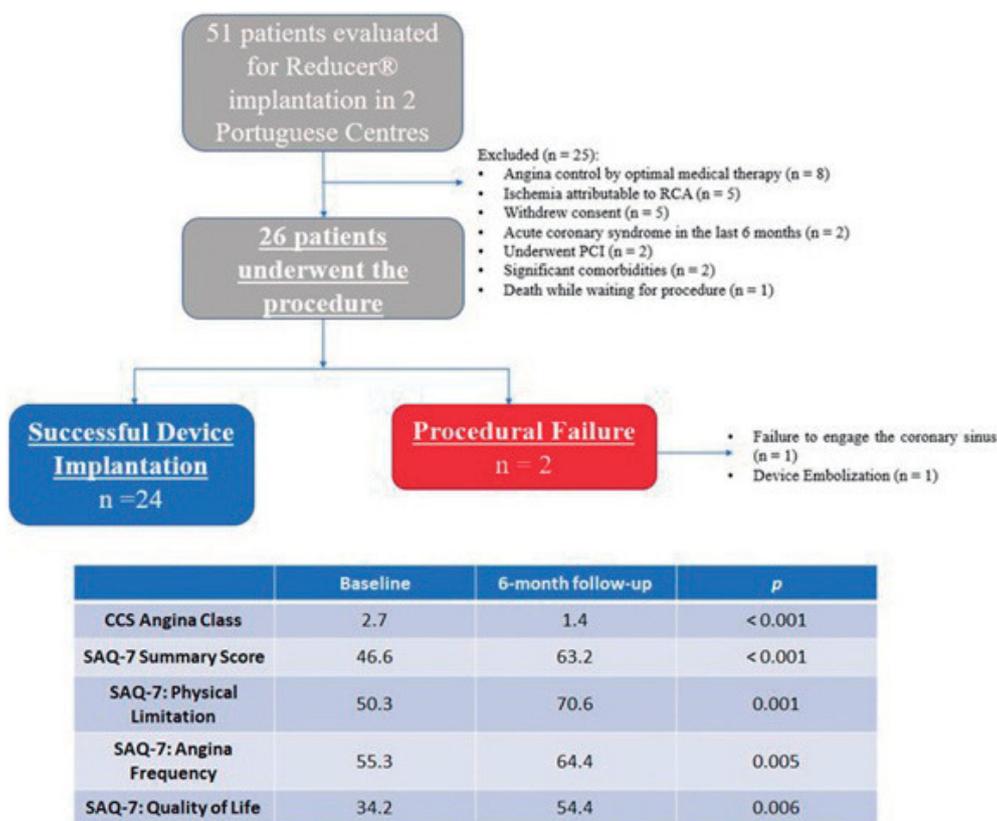**Results:** Twenty-three patients had end-stage CAD without revascularization targets and 3 patients had microvascular disease without epicardial stenosis. Procedural success was achieved 23 patients, with 2 device/procedural-related complications and one anatomically-related failure to deliver the device. Ultimately 25 patients implanted the device and entered the efficacy analysis. Eighteen patients (75.0%) had at least 1 reduction in CCS class, 41.7% had at least 2 class reductions, and 16.7% became asymptomatic, with a mean reduction of CCS class of 1.3 ± 0.2 (p = 0.001) at 6-month follow-up. All SAQ-7 domains improved, namely physical limitation (p = 0.001), angina frequency (p = 0.005) and QoL (p = 0.006). There was a mean reduction of anti-ischemic drugs from 3.4 ± 1.1 to 2.9 ± 1.2 (p = 0.010).
Conclusions: In this real-world, multicentric experience, implantation of the CSRD was associated with improvement of angina and QoL in patients with RA.

	CARDIOVASCULAR BACKGROUND		CLINICAL PRESENTATION			PATIENT KNOWLEDGE	SOCIODEMOGRAPHIC FACTORS	
	≥ 1 CVRF*[1]	Previous AMI history*[2]	Associated symptoms*[3]	Chest pain intensity ≥7*[4]	Symptoms on weekdays*[5]	Recognizing symptoms as AMI*[6]	Higher income*[7]	Non-rural residence*[8]
YES	95±245	65±190	77±205	90±233	73±215	73±125	30±88	Urban: 69±243 Suburban: 110±210
NO	356±645	120±293	168±400	192±439	170±382	150±368	110±253	192±605
TOTAL PD	105±248							

Figure 1 = Factors influencing patient delay (PD) in the acute myocardial infarction (AMI) context in our study.
All times are expressed in minutes and as median ± Interquartile Range (IQR). Non-parametric tests were used for statistical analysis.
Higher incomes were defined as gross income equal or superior to 2000€. Total PD corresponds to global PD identified in our study (n=196).
CVRF: Cardiovascular Risk Factors
*[1] p=0,08, *[2] p=0,08, *[3] p=0,02, *[4] p=0,03, *[5] p=0,003, *[6] p=0,006, *[7] p=0,03, *[8] p=0,03

CO 26 Figure

	Baseline	6-month follow-up	p
CCS Angina Class	2.7	1.4	< 0.001
SAQ-7 Summary Score	46.6	63.2	< 0.001
SAQ-7: Physical Limitation	50.3	70.6	0.001
SAQ-7: Angina Frequency	55.3	64.4	0.005
SAQ-7: Quality of Life	34.2	54.4	0.006

CO 27 Figure

CO 28. PERIPHERAL VENOARTERIAL EXTRACORPOREAL MEMBRANE OXYGENATION FOR REFRACTORY CARDIOGENIC SHOCK: SINGLE-CENTER EXPERIENCE

Daniel A. Gomes, Francisco Albuquerque, Christopher Strong, Pedro M. Lopes, Catarina Brízido, Sara Ranchordàs, Miguel Sousa Uva, Miguel Abecassis, Jorge Ferreira, António Tralhão, José Pedro Neves

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

Introduction: Venoarterial extracorporeal membrane oxygenation (VA-ECMO) provides short-term circulatory and respiratory support to patients with or at risk of refractory cardiogenic shock. Although reports are heterogeneous, complication and mortality rates remain high even in the most experienced centers. The aim of this study was to describe our experience using peripheral VA-ECMO for refractory cardiogenic shock.

Methods: All patients undergoing peripheral VA-ECMO implantation from January 2015 to November 2021 for refractory cardiogenic shock were retrospectively identified at a single-center. Indications, VA-ECMO-related complications, in-hospital and 30-day mortality were assessed. Predictors of in-hospital mortality were identified on multivariable analysis.

Results: A total of 46 patients (median age 55 years [IQR 40-63]; 73.9% male) were included, most with a femoro-femoral VA-ECMO configuration (n = 43; 93.5%). The most common clinical indications were cardiogenic shock due to acute myocardial infarction (n = 17; 40.0%), post-cardiotomy (n = 9; 19.6%) and acute decompensated heart failure (n = 7; 15.2%) (Table). Overall, 40.0% suffered pre-implantation cardiac arrest, most patients were at SCAI class D (n = 37; 80.4%) and median SAVE score was 0 (IQR -6 to 2). VA-ECMO-related complications were frequent, with at least one occurring in 33 patients (71.7%). The most common complications were access-site related (limb bleeding or ischemia in 24 patients [52.2%]) (Table). 66.7% had a distal perfusion cannula and left ventricular (LV) venting strategies were applied in 3 cases (6.5%). A total of 21 patients (45.6%) were successfully weaned, of which 8 (38.1%) ultimately received a heart transplant or a durable LV assist device. 30-day and in-hospital mortality were 56.5% and 65.2%, respectively, with non-cardiovascular mortality accounting for more than one third of all deaths. On multivariate analysis, SAVE score (HR 1.17 per each 1-point decrease; 95%CI: 1.03-1.32; p = 0.015) and the presence of any VA-ECMO-related complication (HR 4.94; 95%CI: 1.05-23.3; p = 0.04) were independent predictors of in-hospital mortality.

VA-ECMO indications	n (%)
Acute myocardial infarction	17 (40.0)
Post-cardiotomy	9 (19.6)
Acute decompensated heart failure	7 (15.2)
Myocarditis	6 (13.0)
Refractory ventricular tachycardia/ fibrillation	4 (8.7)
Pulmonary embolism	2 (4.3)
Valvular heart disease	1 (2.2)
Pre-VA-ECMO cardiac arrest	17 (40.0)
Intra-CPR VA-ECMO implantation	6 (13.0)

VA-ECMO-related complications	n (%)
Any complication	33 (71.7)
Access bleeding (BARC type 3 and 5)	19 (41.3)
Limb ischemia	10 (21.7)
Coagulopathy (including hemolysis)	16 (34.8)
Inadequate LV decompression	5 (10.9)
Thrombosis	3 (6.5)
Stroke	3 (6.5)
Access-site infection	3 (6.5)
Harlequin syndrome	2 (4.3)

Table 1– VA-ECMO clinical indications and complications. CPR – cardiopulmonary resuscitation; BARC – Bleeding Academic Research Consortium

Conclusions: In our small series, mortality in patients undergoing peripheral VA-ECMO implantation was high but similar to large-volume centers. Despite improved cannulation strategies, vascular complications remain frequent.

Specialized post-implantation management should reduce the impact of device related morbidity and mortality.

CO 29. CIRCADIAN RHYTHM IMPACT IN REMOTE ISCHEMIC CONDITIONING IN MYOCARDIAL INFARCTION

Carla Marques Pires, Diana Lamas, António Gaspar, Nuno Antunes, Jorge Marques, Adelino F. Leite-Moreira

Hospital de Braga, EPE.

Introduction: Remote ischemic conditioning (RIC) as an adjuvant to primary percutaneous coronary intervention (PPCI) have been promising in ischemia-reperfusion injury (IRI) reduction in ST-elevation myocardial infarction (STEMI) patients. However, there are some controversial results regarding the improvement of clinical outcomes. Daytime variation seems to affect the tolerance of cardiomyocyte to IRI, and consequently, recovery of contraction and clinical outcomes.
Objectives: To assess the daytime variation impact on clinical outcomes of RIC as an adjuvant to PPCI in STEMI patients.
Methods: A post-hoc analysis of a prospective, single-center, open-label, randomized controlled trial was performed. This analysis included 448 STEMI patients, randomized in 2 groups: PPCI alone (n = 217) and RIC as an adjuvant to PPCI (n = 231). The sample was, additionally, divided according to the time of the PPCI: night-morning (22:00-11:59) (n = 216) and afternoon (12:00-21:59) (n = 232) periods. Clinical characteristics and follow-up clinical outcomes were analyzed and compared between groups. The factors that contribute to our primary follow-up endpoint (cardiac death and hospitalization due to heart failure) were identified through a survival analysis.
Results: There were no significant differences in clinical characteristics and follow-up clinical outcomes between both periods of the day. Afternoon period (HR = 0.474; p = 0.043) and RIC (HR = 0.423; p = 0.029) were independent predictors of primary follow-up endpoint. Univariate analysis showed a lower frequency of primary follow-up endpoint in RIC group compared to alone PPCI group just in the afternoon period (10.3 *vs.* 0.9%; p = 0.002). For these reason, a multivariate analysis was performed and revealed that RIC is an independent predictor of primary follow-up endpoint in the afternoon group ((HR = 0.98; p = 0.029), but not in the night-morning group.
Conclusions: Previous published literature already suggested that the impact of RIC could be restricted to a subgroup of higher risk patients. This study proposes that afternoon period improves cardioprotection induced by RIC. However, further studies with larger samples are needed to explore this topic.

CO 30. EFFECTIVENESS AND SAFETY OF P2Y12 INHIBITOR PRETREATMENT FOR PRIMARY PCI IN STEMI: SYSTEMATIC REVIEW AND META-ANALYSIS

João Presume, Daniel Gomes, Francisco Albuquerque, Carlos Aguiar, Manuel Almeida, Regina Ribeiras, Miguel Sousa Uva, Jorge Ferreira

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

Introduction: Dual antiplatelet therapy (DAPT) with aspirin and a P2Y12 inhibitor is the cornerstone of antithrombotic therapy in patients with ST-segment elevation myocardial infarction (STEMI). Yet, there is uncertainty surrounding the optimal timing for the initiation of the P2Y12 inhibitor. This study aims to evaluate the effectiveness and safety of P2Y12 pretreatment by means of a systematic review and meta-analysis of studies in primary percutaneous coronary intervention (PCI) in STEMI.
Methods:: We performed a systematic search of electronic databases Pubmed, CENTRAL and Scopus until March of 2021. Studies were considered eligible if they were: a) comparing P2Y12 inhibitor upstream administration *vs.* treatment during PCI; b) patients enrolled for STEMI and submitted to primary PCI. Studies with patients treated with fibrinolysis or medical therapy only were excluded. Major clinical outcomes included 30-day occurrence of all-cause death, definite stent thrombosis and re-infarction. Thrombolysis in myocardial infarction (TIMI) flow-grade pre-PCI and post-PCI, in-hospital cardiogenic shock and major bleeding events were analysed.
Results: Out of 2,193 articles, 18 studies were included (1 randomized clinical trial [RCT] and 17 observational studies [non-RCT]), with a total of 76,836 patients, 52,181 in the pretreatment arm. At 30 days, pretreatment was associated with a reduction in definite stent thrombosis (1 RCT & 4 Non-RCT: OR 0.40; 95%CI 0.18-0.90), but no significant reduction in all-cause death (1 RCT & 7 Non-RCT: OR 0.77; 95%CI 0.56-1.04) or re-infarction (1 RCT & 4 Non-RCT: OR 0.73; 95%CI 0.49-1.09). Regarding in-hospital outcomes, pretreatment showed a significant reduction in the occurrence of cardiogenic shock (5 Non-RCT: 0.62; 95%CI 0.51-0.79), major bleeding events (1 RCT & 14 Non-RCT: 0.83; 95%CI 0.75-0.92) and in the number of patients with TIMI flow < 3 post-PCI (1 RCT & 8 Non-RCT: 0.82; 95%CI 0.73-0.93). Pretreatment was not associated with lower number of patients with TIMI flow < 3 pre-PCI (1 RCT & 5 Non-RCT: 0.85; 95%CI 0.66-1.09).
Conclusions: Pretreatment with DAPT, including a P2Y12 inhibitor, was associated with lower risk for definite stent thrombosis and cardiogenic shock, but was not associated with lower all-cause death or re-infarction.
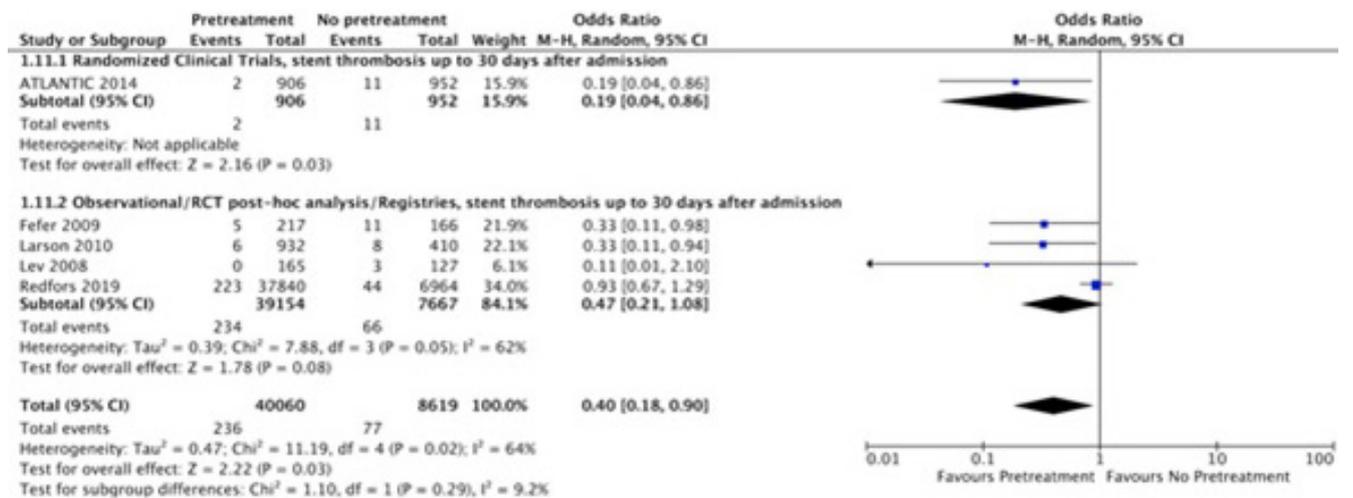
CO 30 Figure

Sexta-feira, 22 Abril de 2022 | 12:30-13:30

Sala Vega | Comunicações Orais (Sessão 7) - Intervenção Cardíaca Coronária e Estrutural 1 - Válvula Aórtica

CO 31. VALVE-IN-VALVE TAVI FOR FAILING SURGICAL AORTIC BIOPROSTHETIC VALVES: A SINGLE-CENTRE EXPERIENCE

Mariana Ribeiro Silva, Alberto Rodrigues, Cláudio Guerreiro, Gualter Santos Silva, Pedro Ribeiro Queirós, Mariana Brandão, Diogo Ferreira, Gustavo Pires Morais, Bruno Melica, Lino Santos, Pedro Braga, Ricardo Fontes-Carvalho

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

Introduction: Valve-in-valve (ViV) transcatheter aortic valve implantation (TAVI) is an alternative to redo surgery for surgical bioprosthetic (BP) valve deterioration. The clinical experience with this approach is gradually increasing.
Objectives: To assess periprocedural and short-term outcomes in patients (pts) undergoing ViV TAVI for degenerated surgical aortic BP valves.
Methods: Single-centre retrospective study of consecutive pts undergoing ViV TAVI for failed surgical aortic BP valves between 2007 and 2019. Data were analysed regarding periprocedural events according to the Valve Academic Research Consortium 2 criteria and 30-day and 1-year outcomes.
Results: TAVI was implanted in 705 pts, of which 43 (6.1%) were ViV TAVI procedures. Most pts were female (51.2%), with a mean age of 75.7 ± 11.2 years, median EuroSCORE II of 8.8% (IQR 4.7-10.5%). Prior surgical aortic BP were implanted for a mean 8.0 ± 3.2 years with a label size ≤ 21 mm in 66% pts. Surgical BP dysfunction was due to regurgitation (AR), stenosis or a combination of both in 21 (48.8%), 18 (41.9%) or 4 pts (9.3%), respectively. At the time of the intervention, the majority of pts were in NYHA-class ≥ III (70%), with 47% treated as urgent interventions. All pts were treated via transfemoral approach, the majority (84%; n = 36) with self-expandable TAVI.

ViV TAVI procedural success rate was 98%. Intraprocedural coronary artery obstruction occurred in one pt. Periprocedural adverse events included major vascular complication (7%), major bleeding (7%), stroke (7%), acute kidney injury (19%) and permanent pacemaker implantation (PPI) (2.5%). There was 1 in-hospital death due to cardiogenic shock because of left main coronary artery obstruction. At discharge, mean aortic gradient (MAVG) was 20,4 ± 10 mmHg, with 45% of the pts presenting MAVG ≥ 20 mmHg and 12% AR grade ≥ II. At 30-day follow-up, no death or heart failure hospital admission was reported. One-year after the procedure, 89% of the pts were in NYHA class I-II; MAVG remained unchanged at 1-year in the majority of pts and 19% had AR grade ≥ II. One pt needed PPI and 3 pts were hospitalized due to acute heart failure in this follow-up period. One-year mortality was 7.1%.
Conclusions: In our population, ViV TAVI in degenerated surgical aortic BP was a safe procedure with persistence of favorable clinical results at 30-day and 1-year follow-up in this high-risk population.

CO 32. TRANSCATHETER AORTIC VALVE DESIGN AND MORTALITY: TRUTH OR REALITY?

Margarida Martins, Pedro Silvério António, Sara Couto Pereira, Pedro Alves da Silva, Beatriz Valente Silva, Joana Brito, Ana Beatriz Garcia, Catarina Oliveira, Fernando Ribeiro, Miguel Nobre Menezes, João Silva Marques, Cláudia Jorge, Pedro Carrilho Ferreira, Fausto J. Pinto, Pedro Cardoso

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

Introduction: Third generation transcatheter heart valves have been developed to improve safety of transcatheter aortic valve replacement (TAVR). This study aimed to compare mid-term outcomes after TAVR with Sapien 3 (S3), Sapien 3 Ultra (S3U), Evolut R (EvR) and Evolut Pro (EvP).
Methods: Patients (pts) who underwent TAVR between 2016 and 2020 at a single centre were retrospectively analysed. Primary endpoint was all-cause mortality. Secondary endpoint included peri-procedural results, clinical and echo findings.
Results: A total of 545 pts (S3 = 181; S3U = 83; EvR = 103; Evp = 155) were included: 55% female, mean age 82 ± 6 years, 91% had hypertension, 74%
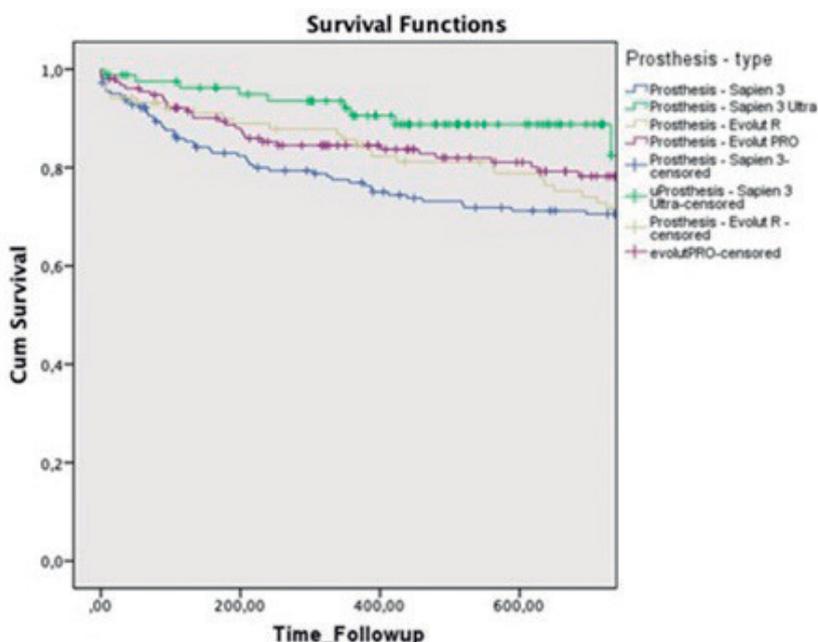

Figure 1: Cumulative survival comparison between 3rd generation transcatheter aortic prosthesis

CO 32 Figure

dyslipidemia, 37% diabetes mellitus, 14% coronary artery disease, 31% chronic kidney disease. Mean follow-up (FUP) was 768 ± 565 days. Mean EUROSCORE II was 4.2 ± 3.6. Pts who implanted 3rd generation prosthesis (S3U and EvP) had significantly lower EUROSCORE II compared to those who implanted 2nd generation prothesis (S3 and EvR): S3U 3.4 ± 1.9, S3 4.4 ± 3.9, EvoR 4.8 ± 3.6 and EvP 3.1 ± 3.4, p = 0.033. Pre-procedure NYHA was significantly higher in pts with S3 and EvR prosthesis (NYHA III-IV: 70% and 78%) than in pts with S3U and EvP (NYHA III-IV 48% and 54%), p < 0.001. Complication rates were similar in all prosthesis, namely major bleeding (3% for S3, EvR, EvP vs. 4% for S3U; p = 0.992) and ischemic stroke (1% in S3, 3% in S3U and EvP, and 2% in EvR; p = 0.592). Conduction disturbances leading to permanent pacemaker implantation after TAVR was of 20%, 22%, 27% and 26% for S3U, S3, EvR and EvP, with no significant differences (p = 0.10). As for hemodynamic profile, aortic mean gradient at 24 hours after TAVR compared with 1-year FUP was only significantly increased for S3U (10 vs. 14 mmHg, p = 0.005), although without clinical impact. No difference was found for ejection fraction for all prosthesis. Mortality rate was significantly different between groups (p < 0.001): 38%, 12%, 44% and 24% for S3, S3U, EvR and EvP, respectively. Survival analysis is shown in the figure (Log Rank 11.5, p = 0.009).

Conclusions: Although last generation prosthesis were associated with less mortality in our cohort, we found no differences regarding complication rates between different prosthesis. These findings may suggest that pts' comorbidities and functional class may be the main determinants of mortality among them.

CO 33. VASCULAR CLOSURE DEVICE IN TAVI WITH A DEDICATED ENDOVASCULAR PLUG-BASED DEVICE. EXPERIENCE FROM A HIGH-VOLUME TERTIARY CENTER

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

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

Introduction: Vascular complications at the access site are important adverse events during transcatheter aortic valve implantation (TAVI). Effective, reproducible, and safe closure of large-bore arteriotomies remains challenging as management strategies vary among centers and operators. MANTA™ is a dedicated plug-based vascular closure device (VCD) recently approved for percutaneous access site closure. This study aimed to describe our experience and to determine the safety and effectiveness of MANTA™ for large bore arteriotomies during transfemoral TAVI.

Methods: Single-center retrospective analysis on prospectively collected data of all consecutive patients who underwent transfemoral TAVI from 2018 to 2020. The primary safety outcomes were access-related vascular injury and bleeding complications according to VARC-3 criteria. Technical success was defined as puncture closure obtained with MANTA™ without the use of unplanned endovascular or surgical intervention. A secondary analysis according to center experience was performed.

Results: Of the 535 patients that underwent transfemoral TAVI during the study period (median age = 84 [IQR 80-87], 39.4% male; median EuroSCORE II of 3.89% [IQR 2.62 – 5.39]), MANTA® VCD was deployed in 320 (59.8%). Overall, 32 (10.0%) patients suffered an access-related vascular injury and 22 (6.6%) had a bleeding complication (Figure 1-A). Technical success was achieved in most cases (n = 298; 93.1%). 30-day mortality rate was 1.6% (n = 5). Since the first deployment in mid-2018, the rates of MANTA-related complications decreased with increasing experience and a steep learning curve effect was noted (Figure 1-B).

Conclusions: MANTA™ was rapidly adopted as the default strategy for vascular access site closure after TAVI at our center. A relatively steep learning was observed, suggesting that few procedures are required to acquire device proficiency. In addition, our results suggest that MANTA ™ can effectively close large bore arteriotomies with a low risk of severe complications.

CO 34. EARLY AORTIC VALVE REPLACEMENT *VERSUS* CONSERVATIVE MANAGEMENT IN ASYMPTOMATIC SEVERE AORTIC STENOSIS

Gonçalo Ferraz Costa[1], João Lopes Cardoso[1], Lino Gonçalves[2], Rogério Teixeira[1]

[1]Centro Hospitalar e Universitário de Coimbra, EPE/Hospitais da Universidade de Coimbra. [2]Faculdade de Medicina da Universidade de Coimbra.

Introduction: Aortic stenosis (AS) is the most common valvular disease in developed countries. Specific timing of intervention for asymptomatic patients with severe aortic stenosis.

Objectives: To compare the outcomes of early aortic valve replacement (AVR) *versus* watchful waiting (WW) in asymptomatic AS patients.

Methods: We systematically searched PubMed, Embase and Cochrane databases, in November 2021, for both interventional or observational studies comparing early-AVR with WW in the treatment of asymptomatic severe AS. Random-effects meta-analysis was performed.

Results: Thirteen studies were included in which two were randomized clinical trials. A total of 4,679 patients were included, providing a 1,268 pooled death events (327 in early-AVR and 941 in watchful waiting). Our meta-analysis showed a significantly lower all-cause mortality for the
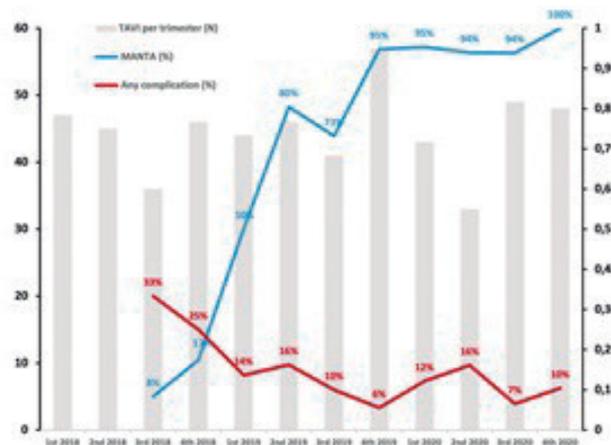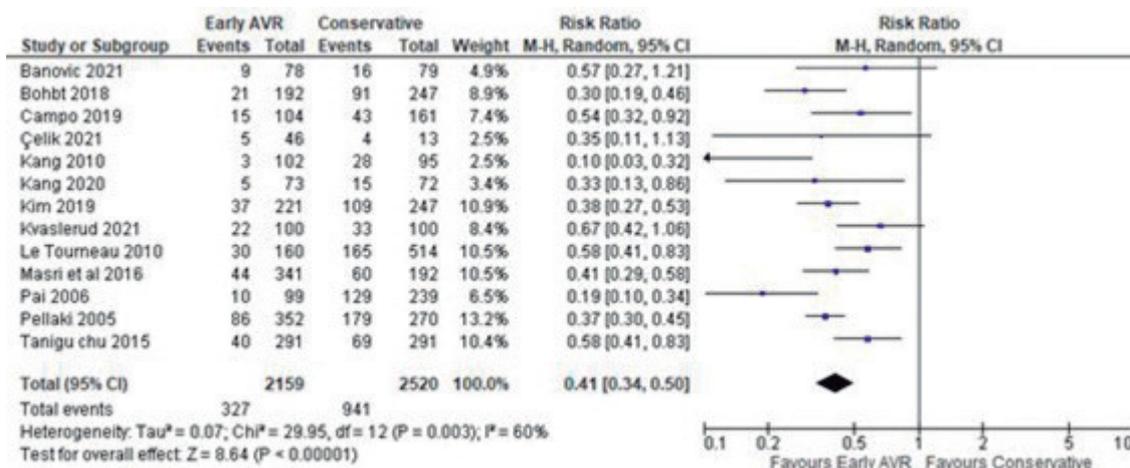

Figure 1 A

Figure 1 B

CO 33 Figure

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early-AVR compared with WW group, although with a moderate amount of heterogeneity between studies in the magnitude of effect (pooled OR, 0.41; 95%CI [0.34, 0.50], p < 0.01; I^2 = 60%). early surgery strategy displayed a significant lower cardiovascular mortality (pooled OR, 0.33; 95%CI [0.19, 0.56], p < 0.01; I^2 = 64%) and heart failure hospitalizations (pooled OR 0.19; 95%CI [0.10, 0.39], p < 0.01, I^2 = 7%). However, both groups had similar rates of stroke (pooled OR 1.30; 95%CI [0.73, 2.29], p = 0.36, I^2 = 0%) and myocardial infarction (pooled OR 0.49; 95%CI [0.19, 1.27], p = 0.14, I^2 = 0%). In terms of Major Adverse Cardiac Events, early AVR presented a lower rate of events (pooled OR 0.43; 95%CI [0.21, 0.87], p = 0.02, I^2 = 50%).

Conclusions: Our pooled data suggests that early-AVR strategy is preferable for asymptomatic severe AS patients.

CO 35. META-ANALYSIS COMPARING OUTCOMES IN PATIENTS UNDERGOING TRANSCATHETER AORTIC VALVE IMPLANTATION WITH *VERSUS* WITHOUT PERCUTANEOUS CORONARY INTERVENTION

Gonçalo Ferraz Costa[1], Vera Marinho[1], Diogo Fernandes[1], Joana Guimarães[1], Eric Monteiro[1], Marco Costa[1], Lino Gonçalves[2], Rogério Teixeira[1]

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**Introduction:** Patients having transcatheter aortic valve implantation (TAVI) routinely undergo coronary angiography before the procedure to define the coronary anatomy and to evaluate the extend of coronary artery disease (CAD). Whether percutaneous coronary intervention (PCI) prior/concomitant with TAVI confers any additional clinical benefit in patients with CAD remains unclear.

Objectives: To compare the outcomes of PCI prior to TAVI in patients with significant coronary artery disease and severe aortic stenosis.

Methods: We systematically searched PubMed, Embase and Cochrane databases, in November 2021, for both retrospective and prospective studies comparing TAVI with PCI *versus* TAVI alone. Random-effects meta-analysis was performed.

Results: Eleven studies were included in which one was a randomized clinical trial. A total of 2530 patients were included, providing a 145 pooled death events (64 in TAVI with PCI and 81 in TAVI only). In terms of 30-day clinical outcomes, our pooled analysis revealed a similar all-cause mortality (pooled OR, 1.24; 95%CI [0.80, 1.93], p = 0.34; I^2 = 27%), cardiovascular mortality (pooled OR, 1.44; 95%CI [0.56, 3.75], p = 0.45; I^2 = 57%) and stroke (pooled OR, 1.07; 95%CI [0.53, 2.13], p = 0.86; I^2 = 0%). However, our analysis revealed a higher rate of myocardial infarction (pooled OR, 4.28; 95%CI [1.56, 11.69], p < 0.01; I^2 = 0%) and major bleeding events (pooled OR, 1.40; 95%CI [1.02, 1.93], p = 0.04; I^2 = 0%) in the TAVI with PCI group. A 1-year clinical outcomes analysis revealed a trend for lower all-cause mortality in TAVI only group (pooled OR, 1.37; 95%CI [0.98, 1.91], p = 0.06; I^2 = 0%), similar cardiovascular death rate (pooled OR, 1.15; 95%CI [0.70, 1.89], p = 0.59; I^2 = 6%) and major bleeding events (pooled OR, 1.62; 95%CI [0.95, 2.76], p = 0.07; I^2 = 0%).

Conclusions: Our pooled data suggests that PCI with TAVI in patients with severe aortic stenosis and concomitant CAD grants no additional clinical advantage.
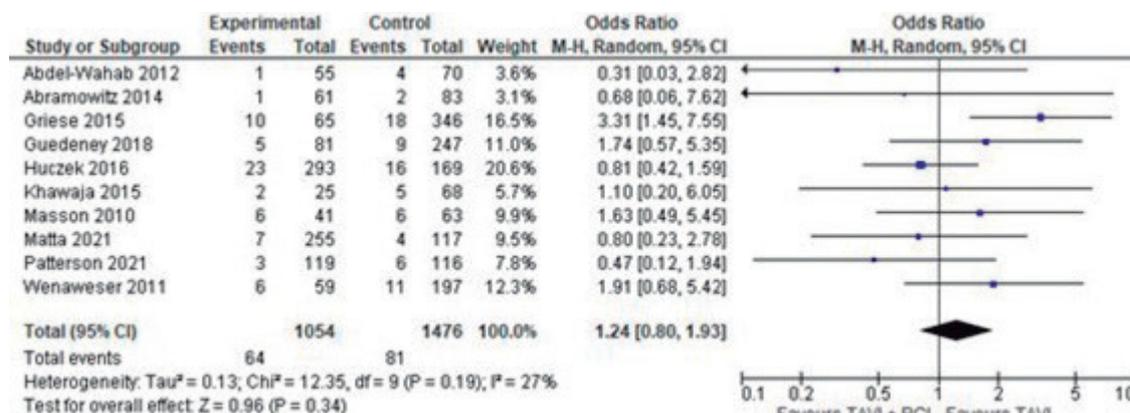
CO 35 Figure

Sexta-feira, 22 Abril de 2022 | 13:30-14:30

Sala Vega | Comunicações Orais (Sessão 8) - Arritmias 2 - *Pacing* e dispositivos cardíacos

CO 36. PROGNOSTIC IMPACT OF PERCENTAGE OF VENTRICULAR PACING IN PATIENTS REQUIRING PACEMAKER IMPLANTATION AFTER TRANSCATHETER AORTIC VALVE REPLACEMENT

João Pedro Reis, Tiago Mendonça, Alexandra Castelo, Inês Rodrigues, António Fiarresga, Ruben Ramos, Mário Oliveira, Duarte Cacela, Rui Ferreira

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Introduction: Despite the continuous developments of Transcatheter aortic valve implantation (TAVI), around 15% of the patients who undergo this procedure require permanent pacemaker (PPM). Right ventricular pacing (RVP), namely a cumulative percentage of ventricular pacing (CVp) above 40%, has been associated with detrimental effects on ventricular function and an increased risk of events in non-TAVI patients.

Objectives: To evaluate the long-term prognostic significance of RVP regarding overall mortality and the combined endpoint of overall mortality/heart failure hospitalization.

Methods: We retrospectively examined 517 patients who underwent TAVI with a self-expanding valve from 2009 to 2020 at our institution. All patients had pre-procedural clinical evaluation, cardiac computed tomographic angiography, transthoracic echocardiography and electrocardiography performed. CVp was determined from stored pacemaker data. Patients with previous PPM were excluded. Post-TAVI PPM implantation was defined as a device implantation during hospital stay or during the first month after discharge.

Wilcoxon chi-square = 1.41, p = 0.236
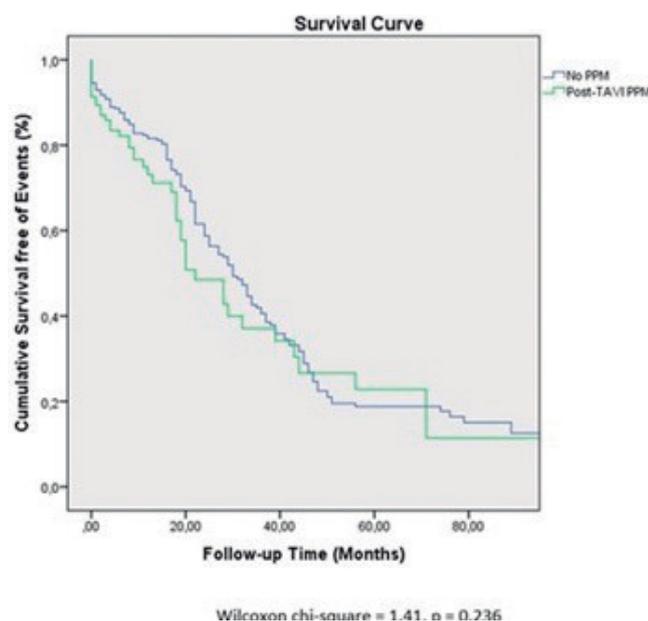
Results: 474 patients, 57% male, mean age 81.7 ± 6.5 years and a mean left ventricular ejection fraction of 51.5 ± 14.6% were analysed. Mean follow-up was 18.7 months. Mean STS score and mean Euroscore II were, respectively,

6.89% and 5.76%. Mean gradient was 51.67 mmHg and mean aortic valve area 0.71 cm². 104 patients (21.9%) required PPM implantation after TAVI, with a mean CVp of 65.3 ± 43.4. Post-TAVR PPM was not associated with a worse outcome - overall mortality: HR 1.13, 95%CI 0.72-1.78, p 0.57; overall mortality/heart failure hospitalization: HR 1.22, 95%CI 0.87-1.70, p 0.24. The follow-up Kaplan-Meier curves according to the need for PPM post-TAVI were similar: log rank p 0.24. A CVp cut-off of 40% was not associated with any of the study endpoints - overall mortality: HR 1.72, 95%CI 0.38-7.86, p 0.48; overall mortality/heart failure hospitalization: HR 1.32, 95%CI 0.45-3.91, p 0.61. Also, a CVp cut-off of 40% did not provide an accurate risk stratification as survival free of events was similar between these patients and patients below this cut-off (log rank p 0.11) and in comparison, with patients without PPM (log rank p 0.65).

Conclusions: In patients submitted to TAVI with a self-expanding valve the need for PPM implantation was not associated with increased risk of total mortality or heart failure hospitalization. A CVp cut-off of 40% showed poor discriminative ability regarding long-term events in this population.

CO 37. HEART RATE SCORE: A SIMPLE AND USEFUL PREDICTOR FOR CLINICAL OUTCOMES IN HEART FAILURE

M. Inês Barradas, Fabiana Duarte, Luís Resendes de Oliveira, Cátia Serena, António Xavier Fontes, André Viveiros Monteiro, Carina Machado, Raquel Dourado, Emília Santos, Nuno Pelicano, Miguel Pacheco, Anabela Tavares, Dinis Martins

Hospital do Divino Espírito Santo, Ponta Delgada.

Introduction: Heart rate score (HRS) is a simple index obtained from implantable cardioverter defibrillator (ICD) and cardiac resynchronization therapy defibrillator (CRT-D) and is defined as the percentage of all atrial-paced and sensed events in the single tallest 10 beats/min device histogram bin. It serves as a measure of impaired heart rate variability and HRS ≥ 70% may be associated with arrhythmic events and mortality in heart failure (HF) patients.

Objectives: We hypothesized that HRS ≥ 70% is associated not only with arrhythmic events and mortality, but also with HF decompensations and hospitalizations in HF patients.

Methods: HRS was calculated from remote monitoring in 103 HF patients with ICD or CRT-D. Two groups of patients were defined: HRS ≥ 70% (group 1) and HRS < 70% (group 2). Primary outcome was defined as HF hospitalizations and related admissions to emergency department (ED) and secondary outcome as device total and appropriate number of shocks, ventricular fibrillation (VF) episodes and cardiovascular (CV) death.

Results: Mean age was 64.39 ± 13.04 years, 69.9% were males and mean follow-up period was 61.65 ± 38.87 months. HF aetiology was idiopathic in 33.0% and ischemic in 30.1%. 61 (59.2%) patients had CRT-D and 42 (40.8%) ICD. Mean left ventricular ejection fraction was 33.62 ± 11.964% and mean HRS 51.07 ± 23.27%. Each patient had 1.23 ± 2.06 HF hospitalizations or related admissions to the ED, 3.04 ± 14.90 episodes of VF and 2.39 ± 8.936 device shocks. HRS was ≥ 70% in 55 (53.4%) patients (group 1) and < 70% in 48 (46.6%). Group 1 patients were more frequently males (p = 0.017) and had more frequently coronary artery disease (p = 0.035). HF hospitalizations and admissions to the ED were more common in group 1 (1.83 ± 2.35 *vs.* 0.60 ± 1.52, p = 0.002). Patients from group 1 had more episodes of non-sustained ventricular tachycardia (337.07 ± 755.90 *vs.* 23.70 ± 58.82, p = 0.001), VF episodes (9.15 ± 27.33 *vs.* 0.52 ± 1.65, p = 0.044) and appropriate (4.69 ± 9.594 *vs.* 0.13 ± 0.344, p = 0.004) and total device shocks (7.59 ± 15.945 *vs.* 0.26 ± 0.541, p = 0.004). CV death was higher in group 1 but without significance (2 patients in group 1 *vs.* 0, p = 0,177). HRS also correlated with composite outcome of number HF hospitalizations, HF related admissions to the ED, FV episodes and device shocks (r = 0.495, p = 0.001).

Conclusions: HRS is a simple and easily obtained indexthat correlates with HF hospitalizations and related admissions to the ED, VF episodes and total and appropriate device shocks and may be used as a predictor for clinical outcomes.

CO 38. WHAT IS THERE TO EARN WITH A CRT IMPLANTATION? PREDICTIVE FACTORS OF MORTALITY OR CLINICAL DETERIORATION IN PATIENTS RECEIVING CARDIAC RESYNCHRONIZATION THERAPY BASED ON PRE-IMPLANT FACTORS

João Grade Santos, Alexandra Briosa, Bárbara Ferreira, Mariana Martinho, Diogo Cunha, Khrystyna Budzak, João Simões, Carlos Alvarenga, Rita Miranda, Sofia Almeida, Luís Brandão, Hélder Pereira

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Introduction: Cardiac resynchronization therapy (CRT) in heart failure patients with reduced ejection fraction (HFrEF) and wide QRS complexes has been shown to improve both functional capacity and quality of life, and to decrease hospital admissions and mortality. Mortality in CRT patients has been associated with several pre-implant risk factors and some risk scores, like the EAARN score, have been developed to try and predict mortality and morbidity in this population.

Objectives: Our aim was to assess risk factors for a compositive end-point of admissions for heart failure or cardiovascular death at 5 years, particularly the EAARN SCORE (EF, Age, Atrial Fibrillation (AF), Renal dysfunction, New York Heart Association (NYHA) class IV), in patients with EF < 35% and QRS > 130 ms submitted to CRT implantation.

Methods: We performed a retrospective analysis between 2012 and May of 2019 of all patients admitted for CRT implantation due to HFrEF with EF < 35% and QRS > 130 ms in a single expert centre. Medical records were analysed for clinical, procedural data and outcomes. The predictive accuracy of the score was assessed using the area under curve (AUC) of receiver operating characteristics (ROC) curve. The association between EAARN and the composite end-point at 5-years was analyzed using a Cox regression model.

Results: Of the 134 patients assessed, 101 patients fulfilled all inclusion criteria. The mean age at implantation was 70.2 ± 10 years with a male preponderance (67.2%). This population was significantly symptomatic, with 35% in NYHA class II, 58% in NYHA class III and 5% in NYHA class IV. Most had an ischemic etiology (74.2%). 75% of patients were considered responders after implantation (NYHA improvement of at least 1 class and/or increase in 10% in EF). A primary composite end-point occurred in 17.8% of patients. The pre-procedure characteristics associated with an event were an ischemic etiology (OR 4.66; 95%CI 1.52-14.24, p < 0.05) and pre-procedure EF (OR 0.81; 95%CI 0.81-0.97, p < 0.05). The age, sex, NYHA class, presence of AF, renal function, bundle branch block morphology and responder status were non significant. The EAARN Score showed predictive power for the occurrence of an event (OR 1.95; 95%CI 1.13-3.36, p < 0.05) and a reasonable discriminative capacity with the ROC curve analysis (Fig. 1A) demonstrating an AUC of 0.70. The survival analysis (Fig. 1B) a Hazard Ratio of 1.88 (95%CI 1.158-3.058, p < 0.05) signifying an increased risk of an event of 88% per EAARN class increase, with the Kaplan Meier curves widening significantly in the different categories of the score.

Conclusions: In patients who implanted a CRT due to HFrEF with EF < 35% and QRS > 130 ms the EAARN score demonstrated a good predictive power and discriminative capacity for admission for heart failure or cardiovascular death at 5 years although it does not account for the etiology which was also a significant factor.
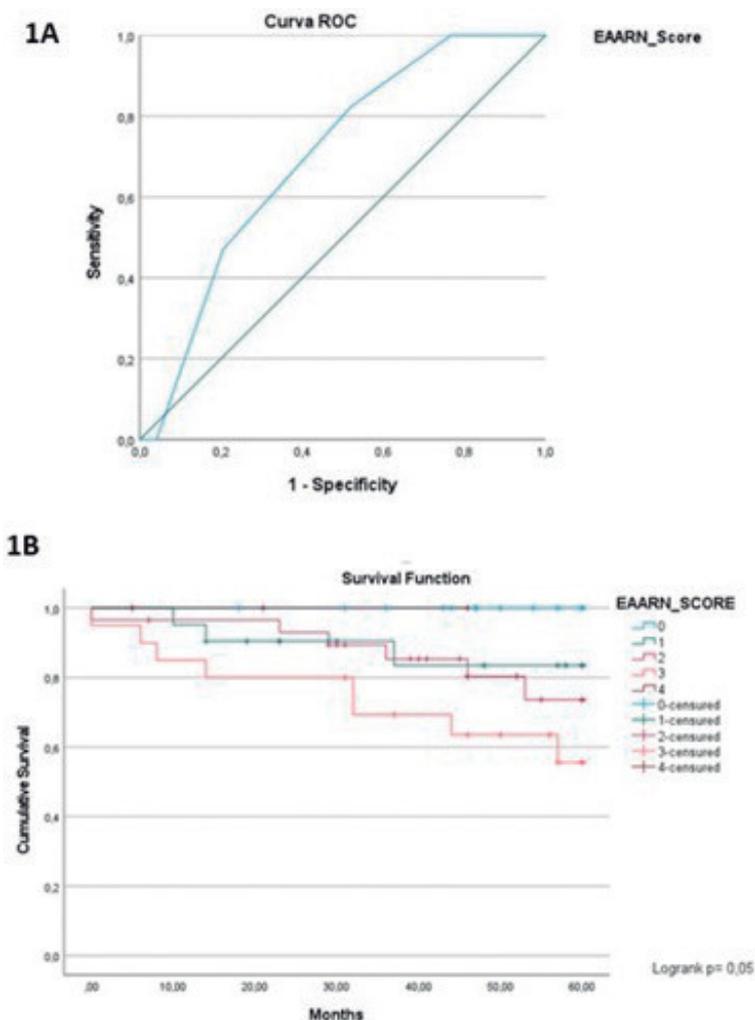
CO 39. PACING VENTRICULAR NA REGIÃO DO RAMO ESQUERDO – EXPERIÊNCIA INICIAL

Francisco Moscoso Costa, Pedro Carmo, Francisco Morgado, Gabriela Bem, Eduardo Varandas, Elisabete Vaz, Daniel Matos, Gustavo Rodrigues, João Carmo, Salomé Carvalho, Pedro Galvão Santos, Diogo Cavaco, Pedro Adragão, Miguel Mendes

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Introdução: A estimulação cardíaca através do feixe de his (*pacing* hisiano) tem a vantagem de preservar a sincronia e mecânica ventricular, contudo, os limiares elevados e o desafio técnico para a implantação, limitam a sua aplicabilidade. Recentemente a estimulação da região do ramo esquerdo do feixe de His surgiu como uma potencial alternativa. O objetivo deste trabalho é descrever as características técnicas da implantação e a experiência inicial de um centro.

Métodos e resultados: Incluíram-se os primeiros 13 doentes consecutivos (82 ± 8 anos), desde 27 de Outubro a 10 de Dezembro de 2021, referenciados para implantação de *pacemaker* convencional. Descreveram-se as características da implantação e os parâmetros pré alta. A indicação para implantação foi bradifibrilhação auricular em 3 doentes (23%) e doença do nodulo áurico-ventricular nos restantes 10 doentes (77%) incluindo dois doentes com bloqueio aurículo ventricular completo. O acesso vascular foi axilar esquerdo guiado por eco em todos os doentes. Foi utilizada a bainha pré formada C315 (Medtronic®) e o elétrodo de fixação ativa 3830 SelectSecure (Medtronic®). A região de interesse para entrega do elétrodo foi identificada utilizando a região do feixe de His como marco anatómico, seguida de *pacemapping* na região septal para melhor aferição do local (morfologia de *pacing* positiva em I e II e negativa em III). O elétrodo foi depois enroscado em posição perpendicular ao septo até atingir a região septal esquerda, monitorizando a impedância e morfologia do QRS sob *pacing* unipolar até obter padrão de bloqueio de ramo direito e um tempo estimulo-onda R (LVAT) em V6 < 100 ms. Foi possível atingir as características descritas em todos os doentes, com um tempo médio de procedimento de

75 ± 24 minutos e um tempo de fluoroscopia de 4 ± 2,5 minutos. O tempo médio de LVAT em V6 foi de 85 ± 10,8 ms, o limiar médio na implantação 0,6 ± 0,3 mv a 0,4 ms e a impedância 633,5 ± 149,9W. A onda R média foi de 12,3 ± 5,4 mv em bipolar. No final a largura do QRS foi de 90 ± 32 ms (Fig.). À data de alta não se verificou nenhum caso de deslocamento do elétrodo ou perfuração. Observou-se um caso de dor pleurítica pós procedimento e um acidente vascular cerebral em relação com a suspensão da hipocoagulação oral peri procedimento num doente com fibrilhação auricular.

Conclusões: A estimulação da região do ramo esquerdo do feixe de His é exequível e permite obter *pacing* permanente com bons limiares e preservando a sincronia ventricular esquerda. O acumular de experiência e o seguimento alargado serão fundamentais para o consolidar da técnica e para estabelecer as suas principais indicações e limitações.

CO 40. APICAL *VERSUS* SEPTAL PACING AND UPGRADE TO CARDIAC RESYNCHRONIZATION THERAPY: WHAT ARE THE ODDS?

Sara Couto Pereira, Nuno Cortez-Dias, Pedro Silvério António, Afonso Nunes-Ferreira, Gustavo Lima da Silva, Ana Bernardes, Helena Cristina Costa, Luís Carpinteiro, Andreia Magalhães, Pedro Marques, Fausto J. Pinto, João de Sousa

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Introduction: Right ventricular apical pacing (RVAp) may be deleterious to ventricular function and hemodynamics due to pacing induced dyssynchrony. In the last decades, some studies showed that RVAp has been associated with heart failure, deterioration of left ventricular function and high mortality. Some patients (pts) may need, during the follow up (FUP), an upgrade to cardiac resynchronization therapy (CRT). New techniques have emerged such as RV lead implantation in the high septum or outflow RV tract (RVOT) and, more recently, His bundle/LB pacing.

Objectives: To compare the need for upgrade to CRT in patients with RVAp *versus* septal/RVOT pacing.
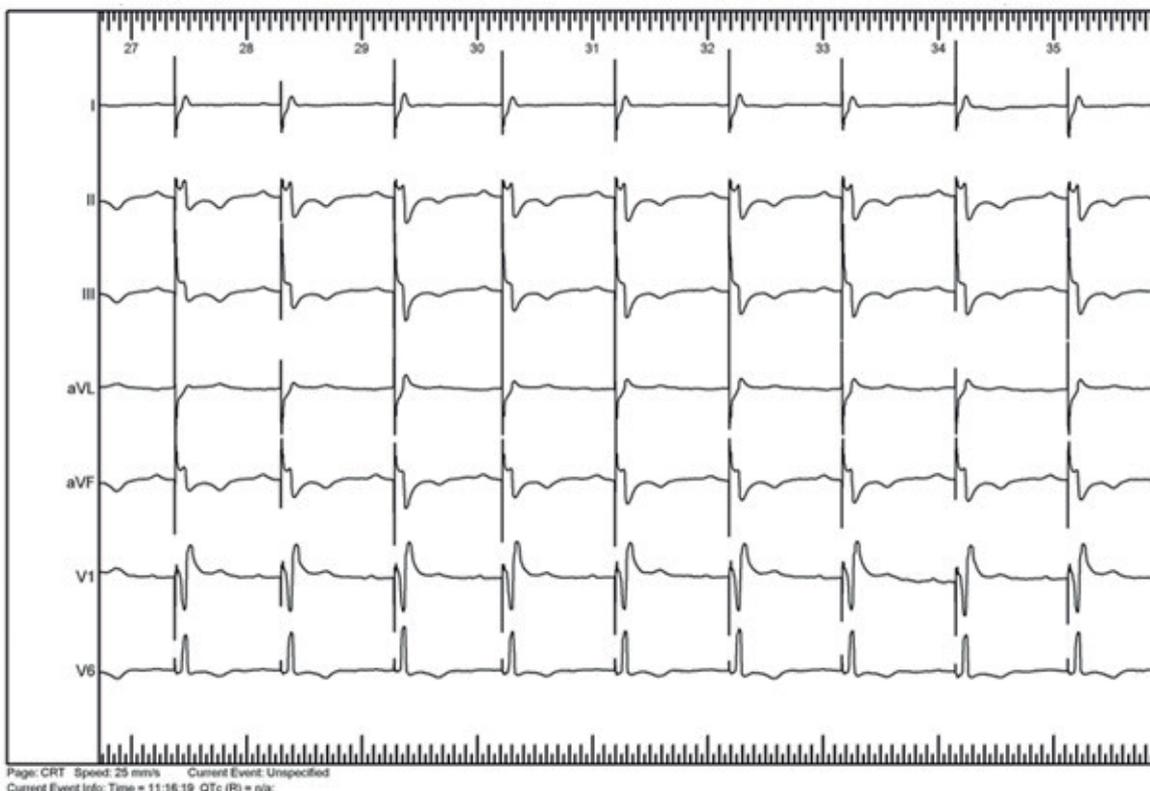
CO 39 Figura

Methods: Retrospective single-center study of consecutive pts that implanted pacemakers in a tertiary center between January 1995 and December 2020. We collected data regarding pacing indication, RV pacing site (apex *versus* septum/RVOT) and need for an upgrade to CRT during follow up (FUP). Our primary endpoint was upgrade to CRT during the FU period. In the model, the impact of localization of the implanted lead on the survival free from upgrade was estimated assuming a neutral effect on mortality. Statistical analysis was performed using t-Student test and logistic regression.

Results: We included 8,761 pts, 60.2% (n = 5,275) were male, with a mean age of 76.5 ± 10.7 years. The main indications for pacemaker implantation were (1) complete atrioventricular (AV) block (2,239, 25.6%), (2) sick sinus syndrome (2211, 25.2%), (3) atrial fibrillation with AV block or bradycardia with significant pauses (17.4%) and (4) Mobitz II 2nd degree AV block (1,467, 16.7%). RVAp was performed in 1,746 (20%) patients and RVOT/septal pacing in 6,933 patients (80%; RVOT in 657 (9.5%)). During FUP, 26 (1.5%) RVAp pts and 52 (0.8%) RVOT/septal pacing pts underwent upgrade to CRT, in a total of 78 pts (CRT-P in 54 patients and CRT-D in 24 patients). We observed that patients with RVAp had twice the risk of CRT upgrade during FUP (OR: 2.0 (95%CI1.25-3.21), p = 0,004) when compared to patients with RVOT/septal pacing (Fig.).
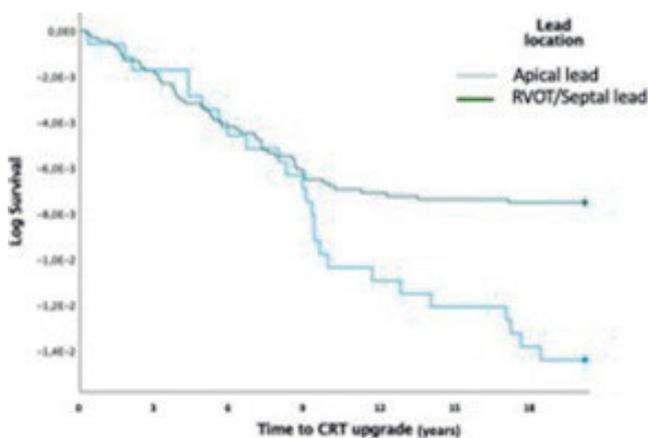
Conclusions: Patients with RVAp presented a 2-fold higher risk for upgrade to CRT when compared to patients with RVOT/septal pacing in our center. This retrospective analysis shows that lead implantation in the septum/RVOT should be preferred instead of the apex to reduce pacing induced dyssynchrony and need for CRT upgrade.

Sala Aquarius | Comunicações Orais (Sessão 9) - Intervenção Cardíaca Coronária e Estrutural 2 - Vários Tópicos

CO 41. A DECADE OF EXPERIENCE WITH ROTATIONAL ATHERECTOMY: A SINGLE-CENTRE STUDY

João Borges Rosa[1], Mafalda Griné[2], Manuel Oliveira-Santos[1], Joana Delgado Silva[1], Vítor Matos[1], Marco Costa[1], Lino Gonçalves[1]

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Introduction: Rotational atherectomy (RA) enables percutaneous coronary intervention (PCI) for complex and calcified coronary lesions, despite limited data regarding long-term outcomes. We aimed to characterize success rate, safety, and long-term outcomes with this technique in a single-centre with over a decade of experience.

Methods: We retrospectively analysed all cases of RA performed in a single-centre between January 2009 and December 2020. Angiographic success was defined as the presence of less than 30% residual stenosis and grade 3 TIMI (thrombolysis in myocardial infarction) flow. Complications included coronary perforation or dissection, burr entrapment, wire fracture, slow flow/no-reflow, side branch occlusion, peri-procedural myocardial infarction (MI), or death. Long-term major adverse cardiovascular (CV) events (MACE) included CV and all-cause death, MI, and target vessel revascularization.

Results: Of the total of 14,527 PCI performed, 410 procedures (2.8%) included RA. Most patients were male (74.0%) with mean age of 72.3 ± 9.3 years. There was a high prevalence of hypertension (85.65%) and dyslipidaemia (74.2%) which increased significantly over time (p trend = 0.008 and p trend< 0.001, respectively). One-third presented with acute coronary syndrome, most patients had multivessel disease (38.4% two-vessel, 32.7% three-vessel), and 12.2% had significant left main disease. Over time there was an increase in disease complexity, reflected by the proportion of type B2/C lesions (p trend = 0.003) and median SYNTAX score (p trend = 0.003). The utilization of transradial access increased over time (p trend = 0.003) and the maximum burr size was ≤ 1.50 mm in most cases (88.0%), with smaller sizes over time. The overall angiographic success
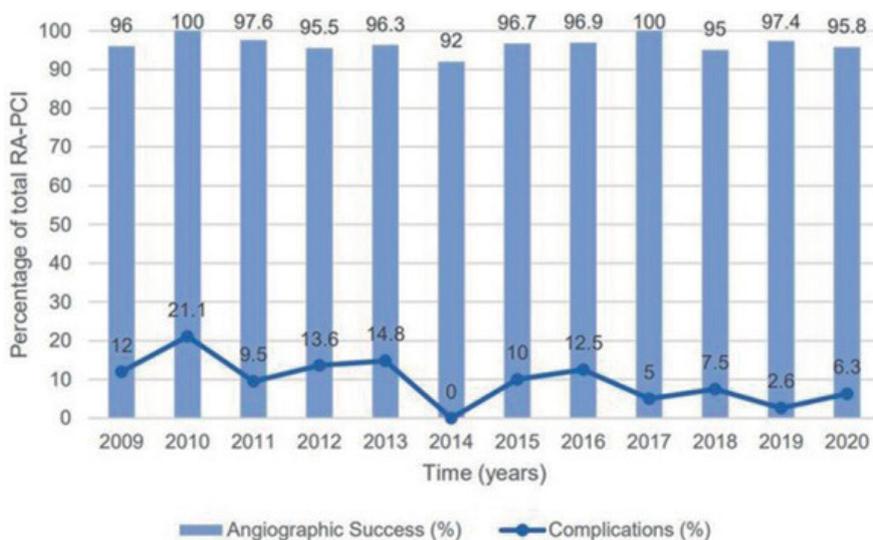

Figure 1. Tends in peri-procedural outcomes. Angiographic success rate (light blue bars) remained unchanged over time (p trend=0.938), while the incidence of peri-procedural complications (dark blue line) declined (p trend=0.029).

CO 41 Figure

rate was 96.6% without significant variation over time while complications (9.0%) showed a temporal decline (p trend = 0.029) (Figure 1). Most frequent complications were coronary dissection (n = 17) and burr entrapment (n = 6). After a median follow-up of 40 (16-76) months, MACE occurred in 27.7% of patients, mainly due to CV death. At one year of follow-up, MACE, all-cause mortality and, target vessel revascularization occurred in 12.1%, 6.4%, and 5.6%, respectively, without variation over time.

Conclusions: RA is an effective and safe technique, with a declining rate of peri-procedural complications along with technical developments. The rate of long-term events is concordant with the CV risk profile and coronary lesion complexity.

CO 42. RESIDUAL SHUNT AFTER PATENT FORAMEN OVALE CLOSURE: PREDICTORS' AND ITS IMPACT ON LONG-TERM OUTCOMES

Carolina Saleiro, Sara Matos, Telma Alves, Diana de Campos, Manuel Oliveira-Santos, Gustavo Santo, Fernando Silva, João Sargento Freitas, Luís Paiva, Marco Costa, Lino Gonçalves

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Introduction: Percutaneous closure is the standard therapy when a high-risk patent foramen ovale (PFO) is considered to have an important pathogenic role in stroke. Residual shunt after closure represents a problem in some patients.
Objectives: To assess the predictors of residual shunt at three-six months after PFO closure. To assess the impact of residual shunt on stroke/transitory ischemic attack (TIA) recurrence, headache symptoms relief or need for re-intervention.
Methods: 336 consecutive patients who underwent PFO closure between 09/2003 and 11/2021 were included in the analysis. Demographic, imagological, and procedural data were collected. Median follow-up time was 12 [6-29] months.
Results: Mean age was 47 ± 11years old, with 58% female patients. Comorbidity with CV risk factors was low, but almost a quarter reported headache. The main indication for closure was previous stroke/TIA (91%). Mean number of PFO risk characteristics was 4 ± 2 (aneurismatic septum 41.8%, moderate shunt 14.5%; severe shunt 68.5%; septum hypermobility 41.1%; long tunnel 73.6%; Chiari web 0.9%; large PFO 62.3%). Amplatzer device was used more frequently (71.4%) followed by Premere (15.2%), Figulla (4.2%), Solysafe (1.5%), Gore Cardioform (0.3%) and CeraFlex (0.3%). Remaining shunt after the procedure was confirmed by colour doppler in 0.6% of the patients 24 hours after the procedure and in 3.6% one-month after. Evaluation with agitated saline echocardiography at three to six

months was performed in 251 patients and residual shunt was confirmed in 7.7%. Grade 1 shunt was present in 43.5% of the cases, grade 2 in 21.7% and grade 3 in 34.8%. At one-year, the rate of residual shunt decreased to 3.6%. The anatomical characteristics of the PFO were not predictors of residual shunt, either when analysed in isolation or as cumulative number of risk characteristics (p = 0.51). However, despite the small sample size, there is an association between the Occluder device and residual shunt (p = 0.001, Table 1). Stroke/TIA recurrence rate was 1.5% and residual shunt was not a predictor of recurrence (p = 0.48). In a subgroup of patients with headache, residual shunt was not related to the absence of symptoms relief (p = 0.24). Reintervention rate was 0%.

Occluder Device	No shunt (N=224)	Residual shunt (N=26)
Amplatzer, n (%)	169 (88.5%)	22 (11.5%)
Premere, n (%)	38 (97.4%)	1 (2.6%)
Figulla, n (%)	13 (92.9%)	1 (7.1%)
Solysafe, n (%)	4 (100%)	0 (0%)
Gore Cardioform, n (%)	0 (0%)	1 (100%)
CeraFlex, n (%)	0 (0%)	1 (100%)

Table 1- Incidence of residual shunt at six-months stratified by Occluder device used.

Conclusions: Incidence of residual shunt after PFO closure at three to six months was 7.7%. There is an association between the Occluder device and risk of residual shunt. Residual shunt did not affect stroke recurrence, headache symptom relief or the need for re-intervention.

CO 43. PERCUTANEOUS LEFT ATRIAL APPENDAGE CLOSURE: A SINGLE CENTER EXPERIENCE

Ana Rita M. Gomes[1], Carolina Saleiro[2], Natália António[2], Manuel Oliveira-Santos[2], Luís Paiva[2], Marco Costa[2], Lino Gonçalves[2]

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Introduction: In patients with atrial fibrillation and high thromboembolic risk, percutaneous closure of left atrial appendage (LAA) is an alternative treatment in case of contraindication to oral anticoagulants (OAC) or an additional strategy for therapeutic failure.
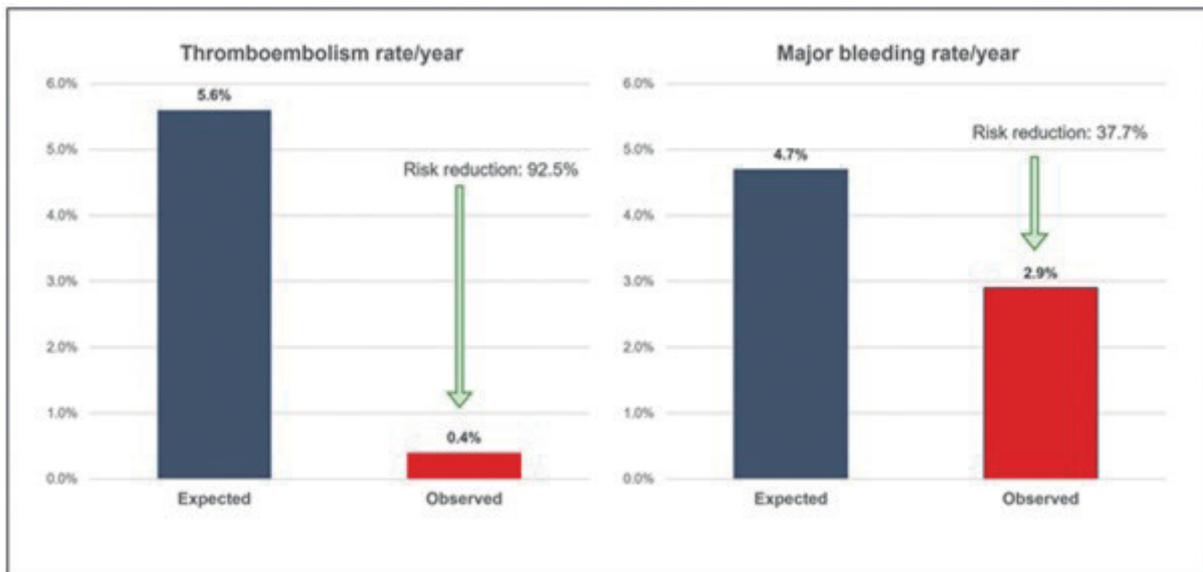
CO 43 Figure

Objectives: This study aims to assess the feasibility and efficacy of LAA percutaneous closure in the prevention of thromboembolic events.

Methods: Retrospective analysis of patients consecutively admitted for percutaneous LAA closure in a single Cardiology Department between May 2010 and December 2021. The procedure was guided by transesophageal echocardiogram (TEE) or intracardiac echocardiography (ICE) and device options included first generation Amplatzer Cardiac Plug (ACP), second generation ACP (Amulet) and Watchmann. A short-term follow-up was conducted with echocardiographic control at 1 month. Long-term follow-up included screening for thromboembolic and hemorrhagic events.

Results: A total of 179 patients were included. The median age was 75 (68-80) years old, 65.4% were male and 30.2% had paroxysmal atrial fibrillation. About a third (36.3%) had previous history of stroke or transitory ischemic attack and 14.0% had coronary artery disease. The prevalence of arterial hypertension was 82.1%, 59.2% had dyslipidemia, 35.8% had diabetes mellitus and 30.2% chronic kidney disease. The mean CHA_2DS_2-VASc risk score was 4.3 ± 1.5 and mean HAS-BLED score was 3.1 ± 1.1 (≥ 3 in 72.7%). The main indications for LAA closure were previous major hemorrhage (57.0%), high bleeding risk (23.5%), embolic events while on OAC therapy (13.4%) or recurrent minor bleeding (12.8%). The procedural success rate was 95.5%. It was guided by TEE (59.8%) and/or ICE (46.9%). The most used device was Amulet (68.0%), followed by ACP (18.3%) and Watchmann (13.7%). Median follow-up time was 12.0 (5.0-21.0) months. In long-term follow-up, we registered a mortality rate of 10.1%, being 22.2% due to cardiovascular causes. Thromboembolic and bleeding events incidence was lower than expected from CHA_2DS_2-VASc (expected stroke rate/year 5.6 *vs.* observed stroke rate/year 0.4; 92.5% risk reduction) and HAS-BLED (expected major bleeding rate/year 4.7 *vs.* observed major bleeding rate/year 2.9%; 37.7% risk reduction) scores, respectively.

Conclusions: According to our study, percutaneous left atrial appendage closure is feasible and seems to offer significant protection against thromboembolic and hemorrhagic events in high-risk patients.

CO 44. 3D PRINTING FOR LEFT ATRIAL APPENDAGE CLOSURE: A META-ANALYSIS OF COHORT STUDIES

Diana Decampos, Rogério Teixeira, Carolina Saleiro, Manuel Oliveira-Santos, Luís Paiva, Marco Costa, Ana Botelho, Lino Gonçalves

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

The most recent data on peridevice leaks (PDL) show that moderate to severe PDL are present at 12 months in 10% - 27.5% of patients following left atrial appendage closure (LAAC). Accurately sizing the occluder device is pivotal in LAAC to avoid PDL and procedural complications. Three dimension printing (3DP) has emerged as an alternative to imaging to guide LAAC device sizing. We assessed the usefulness of a 3DP based compared to a standard only-imaging approach for LAAC. A fixed-effects meta-analysis was performed targeting a co-primary endpoint of disagreement in device sizing and PDL. The quality of individual studies was assessed using the Newcastle-Ottawa scale. Subgroup analyses were performed to explore possible sources of heterogeneity. Eight studies met our inclusion criteria with a total of 307 patients (144 underwent 3DP). Mean ages ranged from 69 to 79 years. Baseline mean CHA2DS2-VASc and HAS-BLED scores ranged from 3.0 to 4.9 and 3.1 to 4.8 points, respectively. Stroke or transient ischemic accident and previous bleeding were prevalent conditions. The Amplatzer device was used in two studies and the Watchman device was the choice in the remaining series. Overall, 84 patients had a disagreement in device sizing and/or a PDL. 3DP significantly reduced the risk of the co-primary endpoint (RR = 0.19; 95%CI 0.09-0.37) with consistency across the studies (I2 = 0%). Individually, both size disagreements and leaks were reduced under a 3DP modeling strategy compared to an imaging-only strategy. Sensitivity analysis showed that the magnitude of the pooled estimates did not significantly change under a fixed-effects model. This meta-analysis of cohort studies shows that 3DP disagreement in device sizing and PDL when compared to
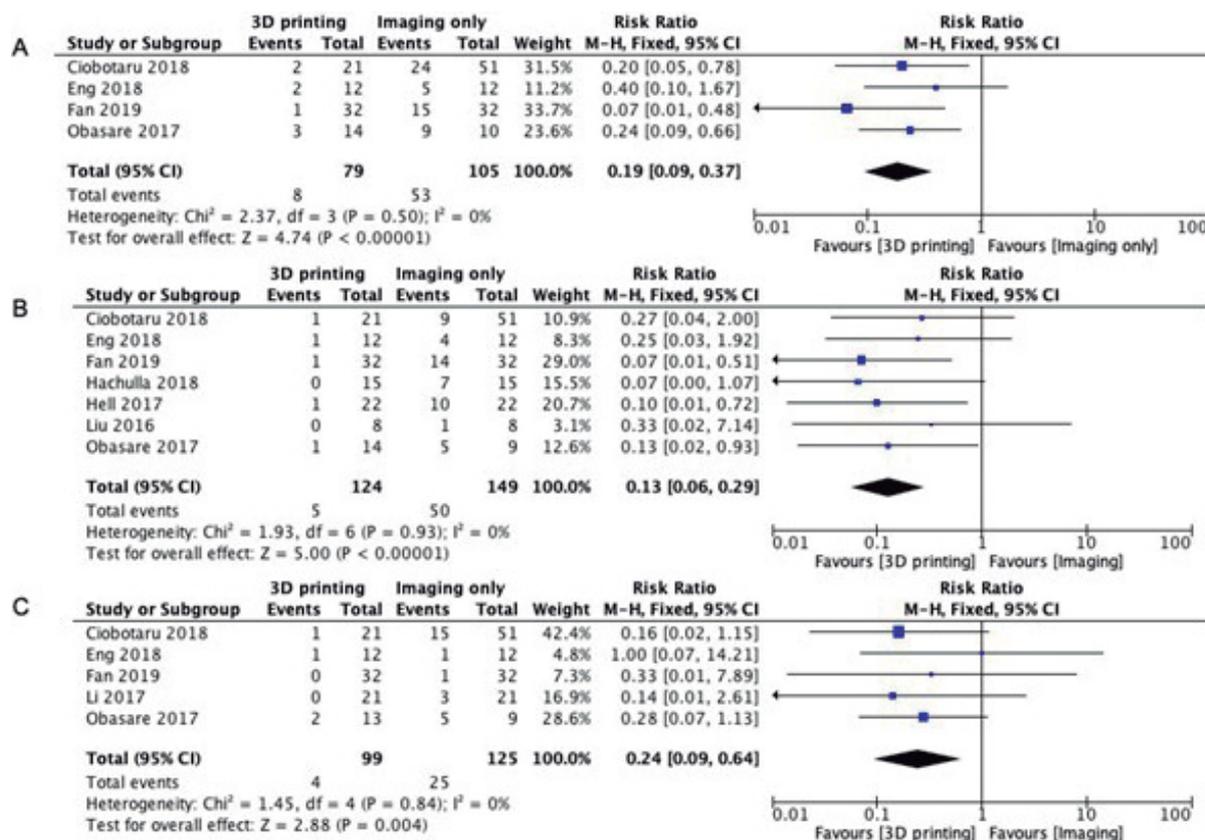
CO 44 Figure. (A) Fixed-effects model comparing the composite endpoint of disagreement in landing zone size estimation and peridevice leaks between procedures guided by 3D printing and procedures guided by imaging only. (B) Fixed-effects model comparing over and underestimation of the LAA occluder between 3D printing model and imaging. (C) Fixed-effects model comparing post-procedural peridevice leaks between 3D printing model and imaging.

an imaging-only approach. Larger randomized controlled trials with an imaging core laboratory are needed. Nevertheless, our analysis identified key experimental features required for future studies.

CO 45. ISCHEMIC HEART DISEASE: LOOKING BEYOND CORONARY STENOSIS

Vera Ferreira, Ruben Ramos, Tiago Mendonça, Luís Almeida Morais, Tiago Pereira-da-Silva, Eunice Oliveira, Cristina Fondinho, Alexandra Castelo, José Viegas, Duarte Cacela, Rui Cruz Ferreira

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Introduction: About 50% of patients referred for invasive coronary angiography (ICA) because of angina and/or myocardial ischemia are found to have non-obstructive coronary artery disease (NOCAD). The role of coronary vasomotion disorders (CVD), namely microvascular angina (MVA) and vasospastic angina (VSA), as mechanisms of ischemic heart disease are becoming increasingly recognized.

Objectives: Our aim was to describe coronary physiology and microvascular function in patients with angina and NOCAD referred to ICA applying a pre-approved, multi-parametric and sequential protocol covering the coronary functional testing whole spectrum.

Methods: Patients with persistent angina referred for ICA and found to have NOCAD, were included in this single centre prospective study and underwent our protocol for coronary function test (CFT) in last 10 months. Our protocol comprises assessment of coronary circulation vasorelaxation using invasive coronary physiology at rest and with hyperaemia and assessment of the propensity of the coronary circulation to excessive vasoconstriction using intra-coronary acetylcholine (Ach). Fractional flow reserve, coronary flow reserve (CFR) and index of myocardial resistance
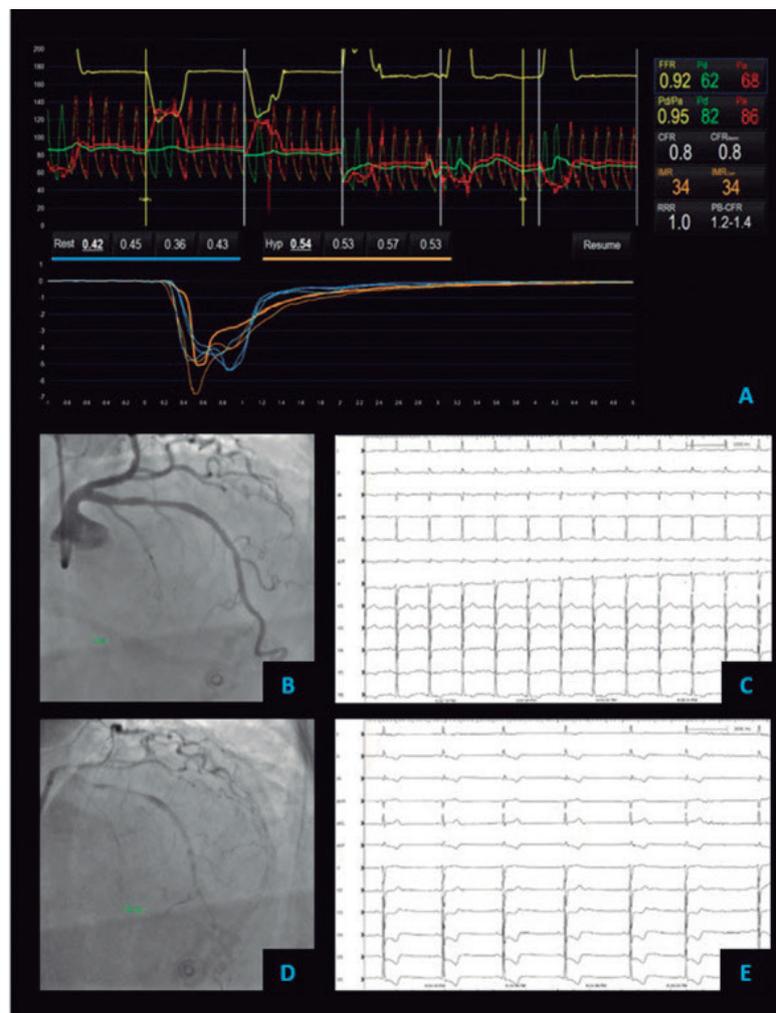
Figure 1 Microvascular and vasospastic angina – Coronary angiography revealed tortuous coronary arteries. LAD had no obstructive lesions - FFR 0.92 (A). Coronary vascular function testing was performed in the LAD using the thermodilution technique. Coronary flow reserve was low at 0.8 and index of microvascular resistance was high at 34 (A). On acetylcholine provocation testing, there was a diffuse vasospasm in the LAD (D), accompanied by inferior and lateral ST depression (E), which were not present at baseline (C) and complaints of precordial pain.

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(IMR) were recorded, using last generation software devices. CVD were diagnosed based on the criteria proposed by the Coronary Vasomotor Disorders International Study Group.

Results: A total of 20 patients were included, mean age was 63 ± 13 years and half were females. Hypertension and dyslipidemia were the most frequent cardiovascular risk factors (75% and 65%, respectively), and 20% had known ischemic heart disease with a previous percutaneous coronary intervention. Most patients (75%) had typical angina with median duration of 16 months before CFT. At baseline, 59% of patients had CCS class II angina and 55% had previous ICA/computed tomography due to typical anginal symptoms. Of patients who underwent non-invasive stress testing (80%), the majority had evidence of ischemia (75%). Our protocol was successfully and totally completed in all subjects without serious complications. Isolated MVA was found in 5 (25%), isolated VSA in 8 (40%), both conditions in 2 (10%), and noncardiac chest pain in 5 (25%) patients. Four patients had CFR < 2.0 and six had IMR ≥ 25. According to the diagnosis obtained in our protocol, antianginal therapy was modified in 70% of patients.

Conclusions: In patients with persistent angina and NOCAD, coronary functional abnormalities, including coronary spasm, impaired microvascular vasodilatation and resistance, are prevalent and frequently coexist. A predefined, standardized, multi-parametric protocol is feasible and safe in clinical practice, providing us definitive diagnosis for the underlying cause of angina, and more importantly, allowing a stratified treatment of the distinct CVD entities.

## Sexta-feira, 22 Abril de 2022 | 17:00-18:00

Sala Aquarius | Comunicações Orais (Sessão 10) - Insuficiência Cardíaca 1 - Parâmetros de Avaliação e Prognóstico

CO 46. REMOTE INVASIVE MONITORING OF PULMONARY ARTERY PRESSURE IN PATIENTS WITH HEART FAILURE: INITIAL EXPERIENCE OF A TERTIARY CARE CENTER

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Introduction: Decompensated heart failure (HF) is associated with poor short- and long-term prognosis. Remote invasive monitoring of pulmonary artery pressure (PAP) enables an early detection of HF decompensations,
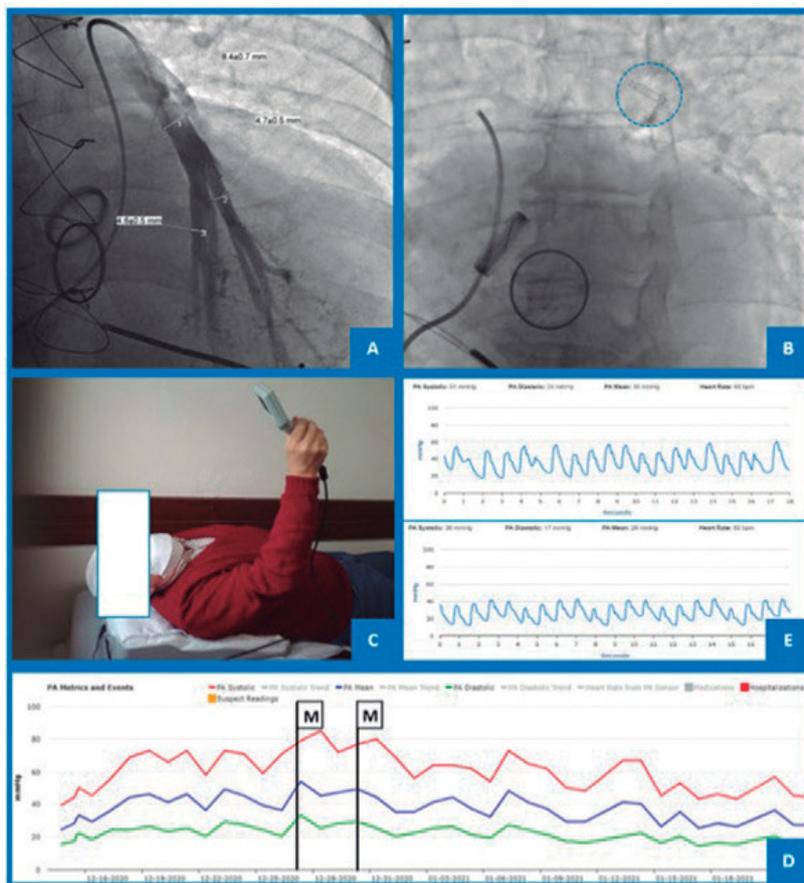
Selective pulmonary angiography to identify and measure an appropriate-sized pulmonary artery branch (**A**). Sensor (dotted circle) was released in the desired location (**B**). Patient transmits daily pressure readings using the home electronics (**C**). A marked increase in PAP was noted, requiring contact by HF team for dietary and diuretic dose adjustment leading to PAP reduction (**D**). Patient single-beat pulmonary artery pressure tracings before and after dose-adjustment of diuretics (**E**). The notification M signals the treatment changes.

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before symptoms occur, and may improve clinical outcomes. We aimed to describe our initial experience with the use of the CardioMEMS™ remote monitoring system in patients with HF, including its safety and effectiveness.

Methods and results: Ten patients with HF in New York Heart Association class III and at least one hospitalization due to decompensated HF in the last 12 months, who underwent invasive remote monitoring of PAP, were included in this prospective registry. The mean age was 65 ± 13 years, nine were men and the mean LVEF was 30 ± 8%. The median of HF admissions in the previous 12 months was 2 (IQR 1-3). All patients were receiving a β-blocker, an ACE inhibitor/ARB/ARNI and an aldosterone antagonist. Mean glomerular filtration rate was 52.3 ± 12.5 mL/min per 1.73 m², mean NT-proBNP was 4,365 ± 3,628 pg/mL and mean baseline furosemide daily dosage was 64 ± 35 mg. The pulmonary artery (PA) sensor was placed in a left PA branch in all patients and no major procedural complications occurred. In a mean follow-up of 257 ± 111 days, a total of 2314 pressure readings were transmitted, with a patient reading compliance of 97.8%. There was one (late) sensor failure due to device migration to a segmentary PA branch. During follow-up, PAP remained inside the optimal range (which was individualized per patient) in 86.4% of readings. Of the 13.6% readings outside the optimal range, patients were asymptomatic in 87%. There was a need for 286 telephone contacts (about one per week) by the HF team with patients. Each patient had a median of 6 (IQR 3-7) medical adjustments due to increases in PAP to values above the targets, regardless of symptoms worsening. These required dietary and diuretic dose adjustments, leading to PAP reductions. One patient required an outpatient clinic visit for intravenous diuretic due to persisting PAP elevation. Only one hospitalization due to a non-cardiac cause was registered. No hospitalizations for HF or deaths occurred during follow-up.

Conclusions: A haemodynamic-guided HF monitoring was safe and effective and may be a useful adjunctive tool to the standard-of-care management in selected HF patients, particularly in the context of COVID-19 pandemics, where a reduction in the number of health-care visits may be desirable.

CO 47. BNP *VERSUS* NT-PROBNP FOR ECHOCARDIOGRAPHIC AND HEMODYNAMIC PARAMETERS PREDICTION IN HEART TRANSPLANTED PATIENTS

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Introduction: Invasive right-heart (RH) catheterization for hemodynamic assessment and transthoracic echocardiography (TTE) for functional and structural evaluation are used on heart transplanted (HT) patients clinical approach. In this population, it is still unclear whether brain natriuretic peptide (BNP) and N-terminal-pro-hormone BNP (NT-proBNP) plasma levels predict unfavorable hemodynamic and TTE parameters.

Objectives: To assess whether BNP and NT-proBNP can predict hemodynamic and TTE parameters in the HT population.

Methods: Retrospective analysis of consecutive HT patients submitted to RH catheterization and TTE between February 2016 and November 2021. Plasma BNP and NT-proBNP, measured at the same day, were used to determine whether unfavorable hemodynamic and TTE characteristics might be predicted using the area under the curve (AUC) analysis of Receiver Operating Characteristic curve (SPSS®).

Results: A total of 127 RH catheterization and TTE were performed in the study period. Mean age was 49.5 years, mean left ventricular ejection fraction was 57.7 ± 10.2%, BNP 808 ± 984 pg/mL and NT-pro BNP 4,221 ± 8,418 pg/mL. AUC results of BNP and NT-proBNP values for TTE and RH hemodynamic parameters prediction are described in the table. BNP, but not NT-proBNP, was significantly increased in patients with pulmonary capillary wedge pressure (PCWP) ≥ 15 mmHg (p < 0.001), central venous pressure (CVP) ≥ 8 mmHg (p = 0.012), cardiac index < 2.5 L/min/m² (p < 0.001), cardiac power output < 0.6 (p = 0.003) on RH catheterization and left ventricular ejection fraction (LVEF) < 50% (p = 0.013) on TTE. Both BNP and NT-proBNP were significantly associated with mean pulmonary arterial pressure (mPAP) ≥ 20 mmHg (p = 0.001 and p = 0.003, respectively) on RH catheterization and systolic PAP > 30 mmHg as estimated by TTE (p = 0.031 and p = 0.012, respectively). BNP > 680 pg/mL had a sensitivity (S) of 81% and specificity (Sp) of 70% to predict PCWP ≥ 15 mmHg, a S of 79% and a Sp of 73% for mPAP ≥ 20 mmHg and a S of 70% and Sp of 50% for CVP ≥ 8 mmHg.

Conclusions: In the HT population, BNP was significantly associated with several hemodynamic parameters while NT-proBNP was not. In an era where many hospitals are replacing the use of BNP for NT-proBNP to follow Heart Failure patients using Sacubitril-Valsartan, physicians might consider these findings important to their clinical practice assessing HT patients.

CO 48. NT-PROBNP FOR FUNCTIONAL CAPACITY ASSESSMENT IN PATIENTS WITH HEART FAILURE WITH REDUCED EJECTION FRACTION

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Table 1.		Predictors of right-side cathetherization and transthoracic echocardiographic parameters					
Parameters		**BNP**			**NT-pro BNP**		
		AUC	p value	95% CI	AUC	p value	95% CI
Hemodynamic	PCWP > 15 mmHg	.806	< .001	.707 - .905	.513	.890	.334 - .690
	CVP > 8 mmHg	.686	.012	.565 - .807	.673	.140	.495 - .852
	CI < 2.5 L/min/m2	.811	< .001	.706 - .917	.357	.255	.130 - .583
	PAPi < 2	.645	.092	.706 - .917	.490	.931	.325 - .655
	CPO < 0.6	.723	.003	.594 - .852	.477	.128	.215 - .735
	mPAP > 20 mmHg	.767	.001	.660 - .874	.789	.003	.610 - .887
Echocardiographic	E/e' > 15	.574	.599	.348 - .800	.426	.673	0 - .875
	E/a > 2	.482	.851	.313 - .800	.625	.673	.458 - .875
	LVEF < 50%	.708	.013	.313 - .651	.536	.796	.254 - .817
	TAPSE < 16	.636	.135	.482 - .790	.428	.430	.268 - .589
	DT < 150 ms	.601	.180	.455 - .790	.450	.651	.237 - .662
	SPAP > 30 mmHg	.668	.031	.525 - .810	.741	.012	.577 - .662
	LA index volume > 34 ml/m2	.652	.067	.492 - .813	.657	.250	.303 - .932

Table 1. BNP versus NT-pro BNP as predictors of right-side hemodynamics and transthoracic echocardiographic parameters in heart transplanted patients.

CI=cardiac index, CVP=central venous pressure, CPO=cardiac power output, DT=desaceleration time, LA=left atrial, LVEF=left ventricular ejection fraction, mPAP=mean pulmonary artery pressure, PAPi=pulmonary artery pulsatility index, PCWP=pulmonary capillary wedge pressure, SPAP=systolic pulmonary artery pressure, TAPSE=tricuspid annular plane systolic excursion
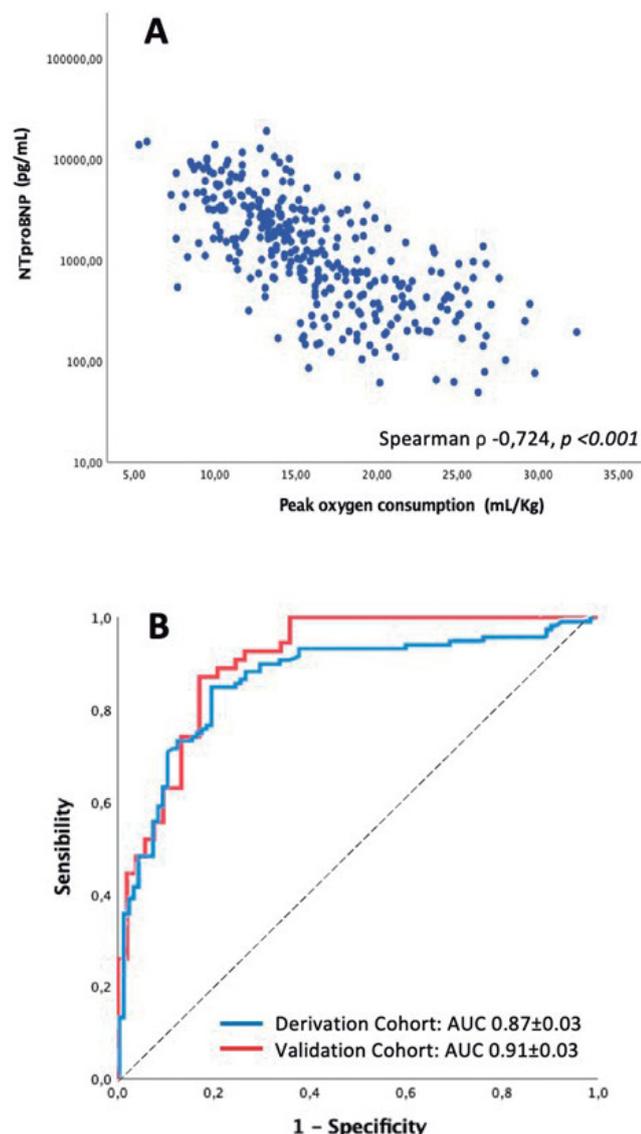
CO 47 Figure

Introduction: Cardiopulmonary respiratory exercise testing (CPET) is the gold-standard for the assessment of functional capacity, even though it is not widely available. NT-proBNP is an easily obtainable measurement, that correlates with left ventricular (LV) filling pressures in patients with heart failure with reduced ejection fraction (HFrEF). The aim of this study was to evaluate the performance of NT-proBNP in predicting functional capacity.

Methods: Stable ambulatory patients with chronic HFrEF (LV ejection fraction [LVEF] < 40%) who underwent CPET from 2004 to 2021 were retrospectively identified at a single center. Those without serum NT-proBNP within 3 months from CPET were excluded (n = 42). Significant functional limitation was defined as peak oxygen consumption (pVO2) < 16 mL/Kg (Weber class C and D). Patients were randomized to a derivation or validation cohort in a 2:1 fashion, and, using c-statistic, further divided according to NT-proBNP levels in three groups: high, intermediate, and low probability of significant functional limitation.

Figure. 1 – A: NT-proBNP and pVO2 correlation. B: ROC curves exhibiting NT-proBNP discriminative power for pVO2 < 16mL/Kg (significance at p<0.001)

Results: A total of 325 patients (mean age 57 ± 12 years, 80% male, 58% with ischemic HF and median LVEF of 30% [IQR 24-35]) were analyzed. Median NT-proBNP was 1,185 pg/mL (IQR 449-3,110), median pVO2 was 15.5 mL/Kg (IQR 12.8-19.4) and median respiratory exchange ratio was 1.11 (IQR 1.00-1.18). There was a strong correlation between log NT-proBNP and pVO2 (Spearman ρ -0,724, p < 0.001) (Fig. 1A). In the derivation cohort (n = 218), NT-proBNp < 650 and > 2,600 pg/mL were the best thresholds to identify patients with a low- or high-probability of significant functional limitation, respectively, with a negative predictive value of 88% and a positive predictive value of 93%. These cutoffs maintained similar performance in the the validation group (n = 107). NT-proBNP showed good discriminative power in both cohorts (respectively, AUC 0.87 ± 0.03 and 0.91 ± 0.03, p < 0.001) (Fig. 1B), and median pVO2 for patients with NT-proBNp < 650 or > 2,600 pg/mL were 20.4 mL/Kg (IQR 17.5-23.7) and 11.6 mL/Kg (IQR 10.4-14.2). A subgroup analysis of patients with atrial fibrillation (n = 59) showed similar thresholds, whereas, in obese patients (n = 81), lower cutoffs were identified (< 200 and > 2,000 pg/mL, respectively).

Conclusions: In our population of HFrEF patients, NT-proBNP accurately stratified functional capacity. In selected cases, this simple measurement may preclude the need for a CPET for the sole purpose of exercise capacity evaluation.

CO 49. CAN ECHOCARDIOGRAPHIC PARAMETERS EFFECTIVELY PREDICT ELEVATED PCWP IN HEART TRANSPLANT PATIENTS?

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Introduction: PCWP measurement remains the gold standard for the diagnosis of Heart Failure with preserved ejection fraction. Nevertheless, right heart catheterization (RHC) is a last step procedure nowadays, with most of the patients diagnosed solely by transthoracic echocardiography (TTE) parameters, as it is widely available and not associated with the risks of the invasive procedures. Heart transplant (HT) patients, on the other hand, routinely perform RHC as follow-up for rejection surveillance, allowing frequent invasive hemodynamic assessment.

Objectives: Evaluate the association between TTE parameters and the invasively measured pulmonary capillary wedge pressure (PCWP) by RHC in HT patients.

Methods: A retrospective analysis of consecutive HT patients submitted to RHC between February 2016 and November 2021, who previously performed TTE, was made. The area under the curve (AUC) was performed to evaluate the association between several TTE parameters (left ventricular (LV) end-diastolic diameter (LVEDD), LV end-systolic diameter (LVESD), LV ejection fraction (LVEF), interventricular septum wall thickness (ST), LV global longitudinal strain (GLS), left atrium volume index (LAVi), transmitral E/A ratio (E/A), LV E/e' ratio (E/e'), E velocity deceleration time (DT), isovolumetric relaxation time (IVRT), tricuspid annular plane systolic excursion (TAPSE) and systolic pulmonary artery pressure (sPAP)) and elevated PCWP (defined as > 15 mmHg). Statistical differences with a p-value < 0.05 were considered significant.

Results: A total of 127 RHC were performed during the study period. Mean age was 50 years, 79% (n = 100) were male, mean LVEF 58 ± 10% and mean BNP 808 ± 984 pg/mL. Mean PCWP was 12 ± 6 mmHg, with 28% (n = 35) with a value higher than 15 mmHg. AUC results of several TTE parameters for the prediction of elevated PCWP are depicted in the table. LVEF (AUC 0.702, p = 0.001) and GLS (AUC 0.768, p = 0.07) were significantly correlated with elevated PCWP, while the remaining parameters failed to do so.

Conclusions: In this HT group, several TTE indices commonly employed for non-invasive estimation of increased intraventricular pressures, including E/e', E/A ratio, LAVi, and sPAP, showed a poor correlation with elevated PCWP. GLS, a TTE parameter widely used to assess subclinical dysfunction were the parameter with the most robust association with elevated PCWP in this population, demonstrating that it has the potential to be used in routine clinical practice.

Table 1: Association between PCWP and echocardiographic parameters of cardiac transplar
patients analyzed by receiver operating characteristic curve

PARAMETERS	AUC	p	95% CI
Left ventricular end-diastolic diameter	0.556	0.344	0.448-0.664
Left ventricular end-systolic diameter	0.659	0.007	0.550-0.767
Left ventricular ejection fraction	**0.702**	**0.001**	**0.594-0.811**
Septal diameter	0.562	0.302	0.448-0.676
Left ventricular global longitudinal strain	**0.768**	**0.07**	**0.522-1.000**
Left atrium volume index	0.570	0.271	0.437-0.704
Transmitral E/A ratio	0.601	0.132	0.485-0.716
Left ventricular E/e ratio	0.670	0.029	0.535-0.805
E velocity deceleration time	0.313	0.006	0.185-0.441
Tricuspid annular plane systolic excursion	0.549	0.448	0.396-0.701
Systolic pulmonary artery pressure	0.644	0.028	0.517-0.771
Isovolumetric relaxation time	0.459	0.555	0.325-0.593

CO 49 Figure

CO 50. LONG-TERM BENEFITS OF NON-INVASIVE TELEMONITORING IN PATIENTS WITH CHRONIC HEART FAILURE

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Introduction: The impact on prognosis and quality of life of non-invasive remote monitoring (TM) of patients with heart failure (HF) is controversial. In addition, studies evaluating the results of TM in long-term follow-up are scarce.

Objectives: To assess in chronic HF patients the 36-month efficacy of a TM program *vs.* usual care (UC) *vs.* a protocol-based follow-up program (PFP) but with no TM facilities.

Methods: Prospective and single center study of propensity score matched patients discharged from hospital after an episode of decompensated HF. Patients were matched according to age, NYHA at discharge and ejection fraction (EF), and three groups were considered: 50 integrated a PFP after hospital discharge; 50 were followed according to UC; and 25 integrated a TM program. This last group included only patients ≥ 1 HF hospitalization in the previous year included in the program. These patients were evaluated remotely 24/7. The 36-month TM program efficacy was assessed by composite endpoint of death or HF hospitalization (Kaplan-Meier analysis). Secondary endpoints included the number of days lost due to unplanned hospital admission, evaluated by hospital emergency department admission, days of hospitalization or death -analysed by t-Student test.

Results: Mean age of patients was 66.8 ± 10.6 years, 28% female. Dilated cardiomyopathy was the main aetiology (53.3%). All patients had a reduced EF (HFrEF), median EF baseline was 26% and NTproBNP was 3,293 ± 3,542 pg/mL. There were no significant differences in the baseline clinical and laboratory characteristics of patients. In the 36-month efficacy evaluation, there was a reduction in the composite endpoint of death or HF hospitalization between TM and UC (28 *vs.* 66%; HR 0.54, 95%CI 0.36-0.82, p < 0.01); TM was similar to PFP (HR 0.63, p = 0.28). These TM prognostic benefits were mainly driven by a reduction in all-cause death compared to UC (12 *vs.* 34%, log rank 3.98, p = 0.046). TM was similar to PFP regarding all-cause death (12 *vs.* 20%, HR 0.58, p = 0.41) and HF hospitalization (28 *vs.* 32%, HR 0.85, p = 0.72). There was a reduction in the average number of days lost due to unplanned hospital admissions or all-cause death in the TM group compared to UC (61.9 *vs.* 186.4 days, p < 0.01) and PFP (61.9 *vs.* 112.2 days, p < 0.01).

Conclusions: In the long-term follow-up of severe HFrEF patients, non-invasive TM facilities may have prognostic benefit when compared to UC, and significantly reduces unplanned hospital admission compared to both UC and PFP.
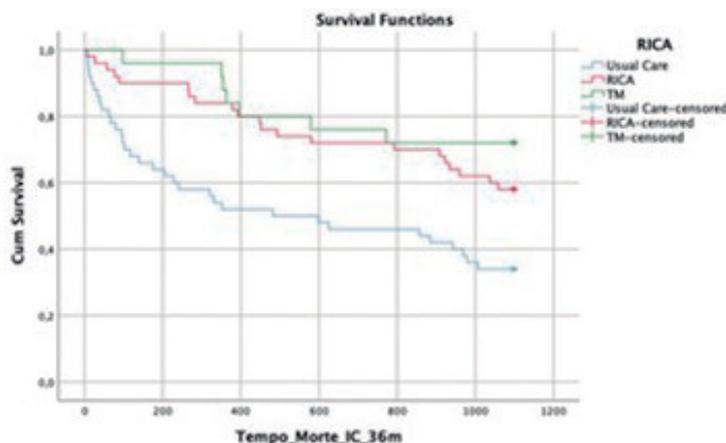

Figure 1: Diferences between UC, PFP and TM in the composed endpoint

CO 50 Figure

Sala Aquarius | Comunicações Orais (Sessão 11) – Imagem 1 - TC e RM Cardíaca e Cardiologia Nuclear

CO 51. USE OF CORONARY CALCIUM SCORE TO REFINE THE CARDIOVASCULAR RISK CLASSIFICATION OF THE NEW SCORE-2 AND SCORE-2 OP ALGORITHMS IN PATIENTS UNDERGOING CORONARY CT ANGIOGRAPHY

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Introduction: Recently, the European Society of Cardiology issued new algorithms (SCORE-2 and SCORE-2 OP) to estimate the 10-year risk of atherosclerotic cardiovascular disease (ASCVD). CACS has been shown to reclassify a significant proportion of patients when applied on top of several scores, but data on its use with these new algorithms are lacking. The aim of this study was to assess the risk reassignment that can be attained by using CACS as a risk modifier of the SCORE-2/SCORE-2 OP classification, in patients referred for coronary CT angiography (CCTA).

Methods: Individuals without diabetes or known ASCVD were included in a single center registry of patients undergoing CCTA for suspected coronary artery disease (CAD). The 10-year risk of cardiovascular disease was calculated for each patient using SCORE-2 (ages 40-69) or SCORE-2 OP (ages 70-89), and categorized as low-to-moderate, high, or very-high risk, according to guideline-recommended age-specific thresholds. CACS was considered to reclassify risk one level downward if = 0 in high or very-high risk patients, and reclassify risk upward if > 100 (or > 75th percentile) in those with low-to-moderate risk, or > 1,000 in those with high-risk.

Results: A total of 529 patients (43% men, mean age 63 ± 10 years) were included, of which 13% (n = 69) were active smokers. The mean systolic blood pressure and non-HDL-C values were 137 ± 18 mmHg and 140 ± 37 mg/dL, respectively. A total of 47 patients (9%) had obstructive CAD on CCTA, classifying them as very-high risk. In the remainder 482 patients without obstructive CAD, the median CACS was 8 (IQR 0-80 AU), with 194 patients (40%) having CACS = 0, and 111 (23%) presenting CACS values ≥ 100. The proportion of patients classified as low-to-moderate risk,

high risk, and very high risk was 36%, 46% and 19% using the SCORE-2/SCORE-2 OP algorithm. Using CACS would reclassify 150 patients (31%): 107 patients (22%) downward, and 43 patients (9%) upward. The extent of risk reclassification conveyed by CACS was 33% in patients assessed with SCORE-2, and 25% with SCORE-2 OP (p = 0.082). Overall, most of the risk reassignment (42%, n = 93) would occur in patients originally classified as high-risk – Fig. 1. At the time of testing, 32% (n = 61) of patients with CACS = 0 were being treated with statins, whereas 52% (n = 58) of those with CACS ≥ 100 were not.

Conclusions: Even when the most recent SCORE-2/SCORE-2 OP algorithms are used, risk refinement with CACS leads to the reclassification of nearly one third of the patients undergoing CCTA, mostly from downgrading risk. This opportunistic use of CACS may be employed to improve the allocation of primary prevention therapies.

CO 52. INDEXING CALCIUM SCORE OF THE AORTIC VALVE TO THE ANNULUS AREA IMPROVES THE GRADING OF AORTIC STENOSIS SEVERITY IN PATIENTS WITHIN THE "GREY ZONE" OF AORTIC VALVE CALCIFICATION

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Introduction: Calcium score of the aortic valve (CaScAoV) is recommended as a supporting tool to assist in the grading of aortic stenosis (AS) severity when echocardiographic assessment is inconclusive. However, a significant proportion of patients have CaScAoV values within a "grey zone" between the "unlikely" and "likely" thresholds. The purpose of this study was to assess the potential usefulness of indexing CaScAoV to the area of the aortic annulus, in order to improve the discriminative power of CaScAoV in this subset of patients.

Methods: Consecutive patients evaluated at a single center transcatheter aortic valve implantation (TAVI) program were retrospectively identified and included in the analysis if cardiac CT and echocardiography were performed within a 6-month timeframe. Those with left ventricular ejection fraction (LVEF) < 50%, indexed stroke volume < 35 ml/m², rheumatic heart disease, or bicuspid aortic valves were excluded. Severe AS was defined as mean transvalvular gradient ≥ 40 mmHg. The likelihood of severe AS assessed by CT was categorized according to the guideline-recommended sex-specific CaScAoV thresholds. Patients were considered to be in the "grey zone" if their CaScAoV values were between 800-1,200 for women, and between 1,600-2,000 for men.
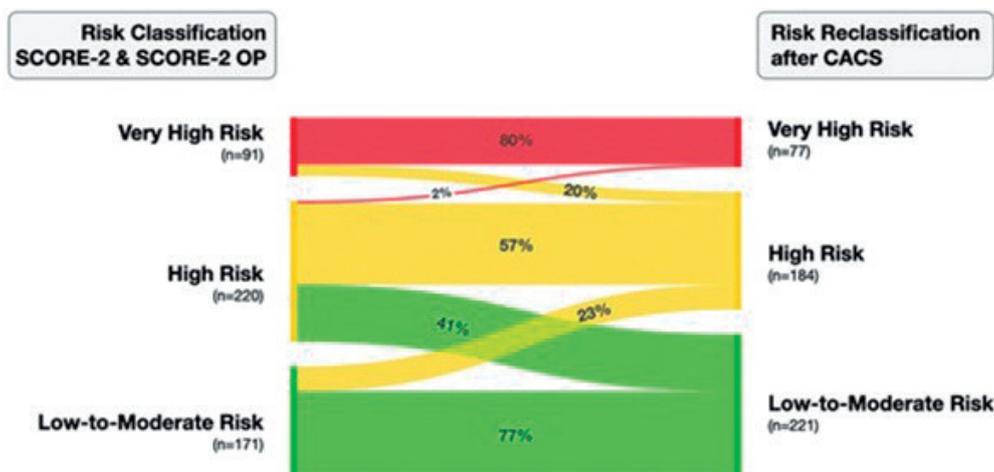
CO 51 Figure
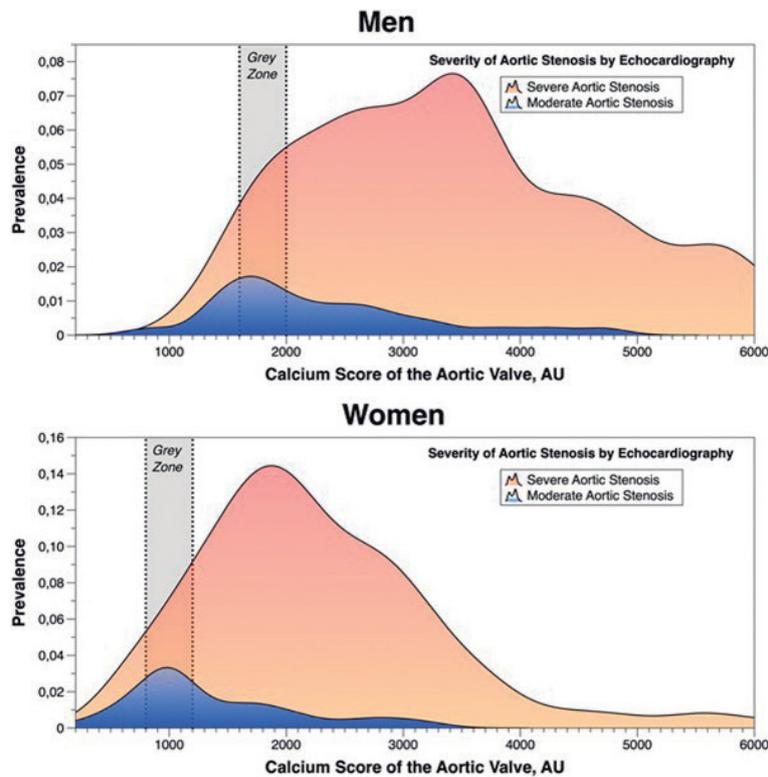
CO 52 Figure

Results: A total of 655 patients were included (282 men (43.1%), median age 83 years [IQR 79-86]). AS was considered severe by echocardiographic criteria in 587 patients (89.6%), and moderate in the remaining ones. Median transvalvular gradient was 49 mmHg (IQR 43-59), and median CaScAoV values were 3,329 (IQR 2,356-4,500) for men, and 1995 (IQR 1,462-2,781) for women. Overall, 77 patients (11.7%) had CaScAoV values in the "grey zone", of which 24 (31.2%) had moderate AS (Fig.). Patients within this region of uncertainty were no different form the others in terms of age, sex, annulus size and body surface area. In this subset of patients, indexing CaScAoV to aortic annulus area showed good discriminative power to identify severe AS (AUC 0.69, 95%CI 0.56-0.81, p = 0.008). Using previously established thresholds (> 300 AU/cm² for women and > 500 AU/cm² for men), 48 patients (62.3%) were correctly reclassified (net reclassification index of 0.45, p = 0.03). These findings were similar for both sexes.

Conclusions: In patients undergoing cardiac CT for known or suspected severe AS with CaScAoV values within the "grey zone", indexing CaScAoV to the area of the aortic annulus improves the classification of AS severity and may decrease diagnostic uncertainty.

CO 53. LATE GADOLINIUM ENHANCEMENT PATTERNS IN SEVERE SYMPTOMATIC HIGH-GRADIENT AORTIC STENOSIS

Sérgio Maltês[1], João Abecasis[1], Rita Reis Santos[1], Luís Oliveira[2], Gustavo Sá Mendes[1], Sara Guerreiro[1], Telma Lima[1], Pedro Freitas[1], António Ferreira[1], Nuno Cardim[3], Vitor Gil[3], Miguel Mendes[1]

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Introduction: Left ventricular (LV) remodeling in patients with severe aortic valve stenosis (AS) is a complex process that goes beyond hypertrophic response and may involve reparative/replacement fibrosis. Currently, cardiac magnetic resonance (CMR) is the gold-standard imaging technique for detecting focal myocardial fibrosis through late gadolinium enhancement (LGE). However, myocardial fibrosis prevalence and distribution is quite variable among series. Our goal was to assess LGE prevalence and distribution pattern in severe symptomatic high-gradient AS.

Methods: Single-center prospective cohort of 132 patients with severe symptomatic high-gradient AS (mean age 73 ± 11 years; 48% male, mean valvular transaortic gradient 60 ± 20 mmHg; mean aortic valve area 0.7 ± 0.2 cm²/m²; mean LV ejection fraction by 2D echocardiogram 58 ± 9%), all with normal flow (except one) undergoing surgical aortic valve replacement. Those with previous history of myocardial infarction or other cardiomyopathy were excluded. All patients performed 1.5T CMR assessment with LV myocardium tissue characterization prior to surgery. Segmental LGE presence was assessed by two independent operators and classified according to the AHA 16 segment model, using 5-standard deviations from remote myocardium as the signal intensity cut-off for LGE identification and quantification.

Fig.1 — LGE patterns (per segment) among those with non-ischemic LGE (n = 96)
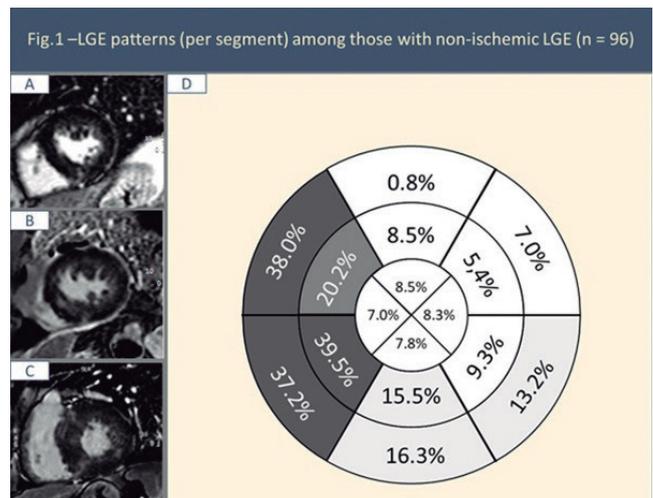
Results: Overall, 96 patients (74%) had non-ischemic LGE (median LGE mass 3.2 g [IQR 0.2-8.3] g; median percentage of LGE myocardial mass 2.5% [IQR 0.1-6.1]%); 22 patients [17%] with exclusively junctional LGE); in one patient an incidental ischemic scar (subendocardial distribution) was identified. No cases of subepicardial distribution were found. Intramyocardial LGE was most frequently observed in basal and mid-anterior and inferior interventricular septum (Fig.). In these segments, LGE was most often junctional at right-ventricular insertion points (54%), followed by mid-wall LGE (32%) or both sites involvement (14%).

Conclusions: LGE is frequent in symptomatic high-gradient AS patients with preserved left ventricular ejection fraction, most often presenting as junctional enhancement in basal/mid-anterior and inferior interventricular septum. Future studies may address whether distinct LGE patterns may impact patient prognosis.

CO 54. 99MTC-DPD SCINTIGRAPHY IN THE DIAGNOSIS AND PROGNOSIS OF TRANSTHYRETIN V30M CARDIAC AMYLOIDOSIS

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Introduction: Early diagnosis and prognostic stratification of transthyretin amyloid cardiomyopathy (ATTR-CM) are crucial. Previous findings suggested that ^{99m}Tc-3.3-diphosphono-1.2-propanodicarboxylic acid (DPD) scintigraphy has the potential to provide an earlier diagnosis of ATTR-CM but it seems to present suboptimal accuracy to detect ATTR-CM caused by V30M mutation, particularly in patients with onset of symptoms bellow 50 years of age. Furthermore, its prognostic value has never been evaluated in this mutation.

Objectives: To assess the diagnostic value of DPD scintigraphy to detect cardiomyopathy in a large cohort of patients with ATTR-V30M mutation and to explore its association with mortality.

Methods: Of the 305 ATTRV30M mutation carriers followed prospectively and who underwent DPD scintigraphy, 288 individuals [median age 46 (39-56); 49% male] without myocardial thickening attributable to other causes were enrolled in the study. ATTR-CM was defined by septal thickness ≥ 13 mm plus at least one of the following criteria: (1) late heart-to-mediastinum (H/M) ^{123}I-metaiodobenzylguanidine (MIBG) ratio < 1.60; (2) electrical heart disease (arrhythmia or cardiac conduction defect); or (3) amyloid infiltration documented in biopsy.

Results: ATTR-CM was identified in 41 (14.2%) patients and 34 (11.8%) individuals presented abnormal cardiac DPD uptake. A strong association was noted between cardiac DPD retention and the presence of amyloid cardiomyopathy. Cardiac DPD retention was associated with a 27-fold higher likelihood of having ATTR-CM (OR: 27.4; 95%CI 11.6-65.0; p < 0.001). During a mean follow-up of 33.6 ± 1.2 months, 16 patients died (5.6%). Mortality was 14 times higher in patients with amyloid cardiomyopathy (HR: 14.1; 95%CI 4.9-40.7; p < 0.001), 13 times higher in those with abnormal cardiac DPD uptake (HR: 12.59; 95%CI% 4.56-34.72; p < 0.001) and 10 times higher in those with H/M MIBG ratio < 1.60 (HR: 10.40; 95%CI 2.95-36.69; p < 0.001). The prognostic value of ventricular thickness and cardiac DPD uptake was additive: patients without septal thickening and no cardiac DPD retention had excellent prognosis (5-year mortality of 0.75%), while those with septal thickening and/or abnormal DPD retention presented 5-year mortality rates ranging from 39.9 to 53.3%.

Conclusions: DPD scintigraphy is valuable in the evaluation of V30M mutation carriers, particularly for prognostic stratification purposes, identifying patients at higher risk of death.

CO 55. LEFT VENTRICULAR REMODELING IN AORTIC STENOSIS PATIENTS REFERRED FOR SURGICAL AORTIC VALVE REPLACEMENT

Rita Reis Santos[1], João Abecasis[1], Sérgio Maltês[1], Gustavo Sá Mendes[1], Luís Oliveira[2], Eduarda Horta[1], Sara Guerreiro[1], Pedro Freitas[1], António Ferreira[1], Regina Ribeiras[1], Maria João Andrade[1], Nuno Cardim[3], Victor Gil[4], Miguel Mendes[1], José Pedro Neves[1]

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Introduction: Left ventricular (LV) hypertrophy is a common expected finding in aortic stenosis (AS) patients. Cardiac magnetic resonance
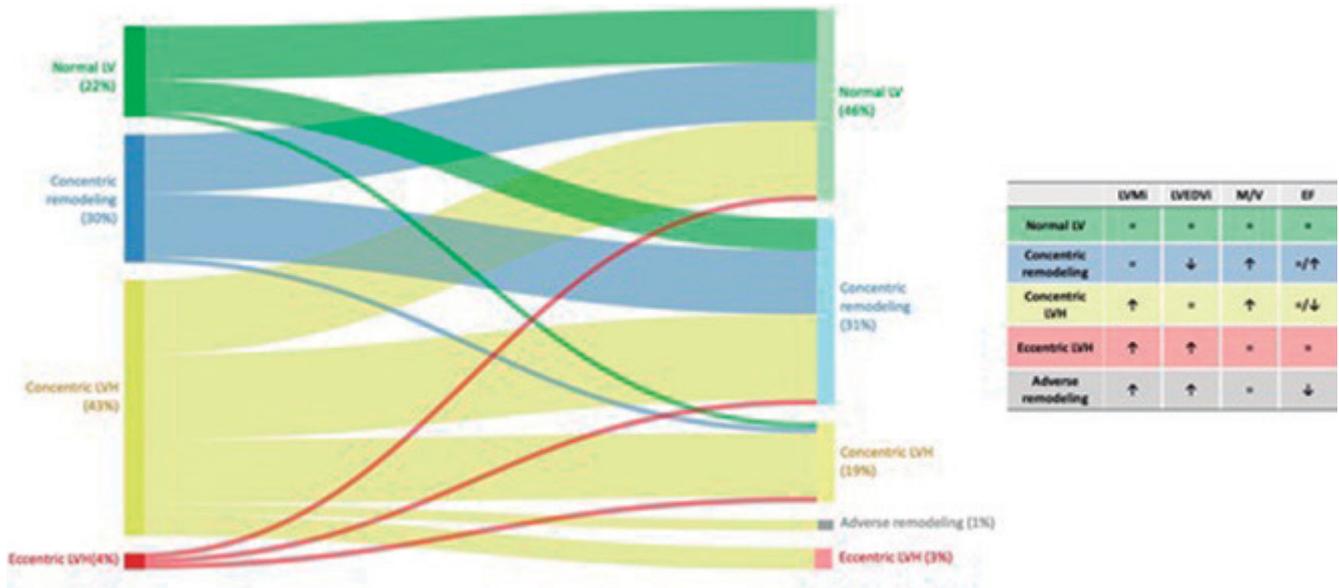

Figure 1 – Sankey diagram of Cardiac Magnetic Resonance patterns (pre and post-surgical aortic valve replacement) of left ventricular hypertrophy in aortic stenosis patients.

CO 55 Figure

(CMR) plays an important role as a non-invasive method for determining LV mass and volume, and to characterize the LV remodeling response in AS.

Objectives: To assess the prevalence, to describe the patterns and evolution of LV remodeling (by CMR) in AS patients referred for surgical aortic valve replacement (AVR).

Methods: Single-center prospective cohort of 134 consecutive patients (73years [68-77years], 49% men] with severe AS: mean transaortic pressure gradient (AVmean): 61 ± 1.5 mmHg; aortic valve area (AVA): 0.7 ± 0.1 cm², referred for surgical AVR, with no previous history of ischemic cardiomyopathy. Before surgery, all patients underwent electrocardiogram, complete transthoracic echocardiogram (TTE) and CMR for LV assessment and tissue characterization (mean LV indexed mass [LVMi]: 80.3 ± 26.5 g/m²; mean end-diastolic LV indexed volume [LVEDVi]: 84.4 ± 24.5 mL/m² and median geometric remodeling ratio [M/V]: 0.95 g/mL [IQR 0. 81-1.08 g/mL]). Patterns of LV remodeling were investigated before and after AVR by CMR measurements of LVMi, LVEDVi and M/V. Besides normal LV ventricular structure, four other patterns were considered: concentric remodeling, concentric hypertrophy, eccentric hypertrophy, and adverse remodeling (Fig.).

Results: Overall, 43% (n = 58) of the patients had concentric hypertrophy, 30% (n = 40) concentric remodeling, 22% (n = 29) normal ventricular geometry, 4% (n = 5) eccentric hypertrophy and in two patients we observed an adverse remodeling pattern. AVR was performed in 80 patients. At the 3rd to 6th month post-AVR assessment, LV remodeling changed to: normal ventricular geometry in 46%, concentric remodeling in 31%, concentric hypertrophy in 19%, eccentric hypertrophy in 3% and adverse remodeling in only one patient (Fig.).

Conclusions: in this group of patients with severe aortic stenosis, concentric hypertrophy was not the sole pattern of LV remodeling and one out of every five still presented a normal ventricular geometry and mass as assessed by CMR. LV response was dynamic after AVR which stands for complex and multifactorial interaction in this group of patients despite similar valvular pathophysiology and therapeutic intervention.

Sábado, 23 Abril de 2022 | 08:30-09:30

Sala Vega | Comunicações Orais (Sessão 12) - Insuficiência Cardíaca 2 - Tratamento

CO 56. CARDIAC RESYNCHRONIZATION THERAPY IN ATRIAL FIBRILLATION: RESPONSE AND LONG-TERM OUTCOMES

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Introduction: Patients (pts) with atrial fibrillation (AF) were excluded from major resynchronization therapy (CRT) trials. Studies suggest AF pts derive less benefit from CRT.

Objectives: To compare response and clinical outcomes after CRT in pts in AF or in sinus rhythm (SR).

Methods: Single-center retrospective study of consecutive pts submitted to CRT implantation (2007-2018). Major adverse cardiac events (MACE) included heart failure (HF) hospitalization or all-cause mortality (ACM). Clinical response was defined as NYHA class improvement without MACE in the 1st year of follow-up (FU). Left ventricle end-systolic volume reduction of > 15% at 1-year defined echocardiographic (echo) response. Survival analysis with Kaplan-Meier method and *Log-rank* test was performed.

Results: 295 CRT pts (70.5% male, 68 ± 16 years, 54.6% CRT-D) were included. 95 (32.6%) pts presented in AF; these were older (72 *vs.* 67, p = 0.007), with higher prevalence of coronary disease (40.2 *vs.* 24.2%, p = 0.008), significant tricuspid regurgitation (21.7 *vs.* 8.8%, p = 0.011) and kidney disease (33.0 *vs.* 16.5%, p = 0.003). AF pts had larger left atrial diameters (50.5 *vs.* 44.6 mm, p < 0.001) and higher baseline N-terminal pro B-type natriuretic peptide values
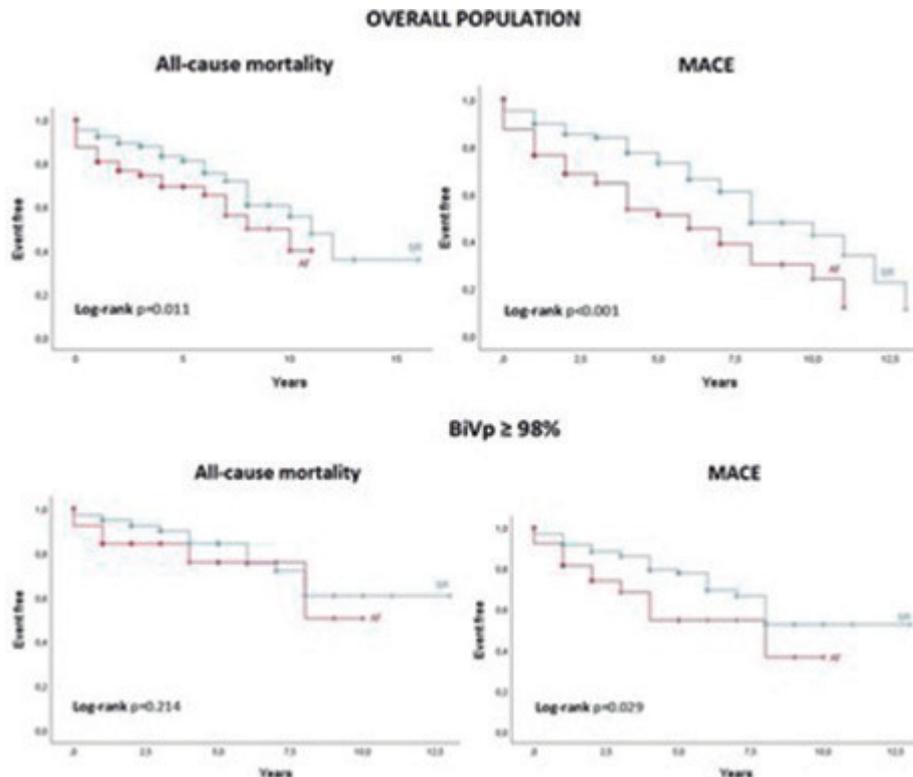
CO 56 Figure

(6,738.6 *vs.* 3,179.4 pg/ml, p = 0.044). HF etiology (p = 0.242) and type of device (p = 0.127) did not differ. Secondary prevention indications for CRT-D were more common in AF pts (45.0 *vs.* 15.7%, p < 0.001). Atrioventricular junction ablation was performed in 14.0% of AF pts. Median percentage of biventricular pacing (BiVp) was significantly lower in AF pts (97 *vs.* 99, p < 0.001). NYHA class improvement (79.3 *vs.* 78.9%, p = 0.930) and echo response (65.4 *vs.* 75.2%, p = 0.269) were similar between AF and SR pts. Clinical response was lower in AF pts (52.7 *vs.* 66.5%, p = 0.036). During a median FU of 3 ± 5 years, occurrence of MACE (log-rank test, p < 0.001) and all-cause mortality (log-rank test, p = 0.011) were higher in AF. Among pts achieving BiVp ≥ 98% (67.8%), clinical response did not differ between AF and SR pts (68.4 *vs.* 70.5%, p = 0.968). Mortality was also similar between groups (log-rank test, p = 0.214). MACE remained more frequent in AF group (log-rank test, p = 0.029).

Conclusions: In this cohort, despite having a higher comorbidity burden, AF pts showed similar NYHA class improvement and echo response to SR pts. Among pts with BiVp ≥ 98%, clinical response and all-cause mortality were also comparable between groups. Strategies to optimize response and outcomes in AF pts are warranted.

CO 57. ONLY RIGHT VENTRICULAR FUNCTION PARAMETERS CAN PREDICT ACUTE CELLULAR REJECTION IN HEART TRANSPLANT PATIENTS?

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

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Introduction: In heart transplanted (HT) patients, endomyocardial biopsy (EMB) remains the gold-standard for acute cellular rejection (ACR) detection. Non-invasive measures to detect ACR remain a clinical challenge. Whether non-invasive analytical and transthoracic echocardiography (TTE) parameters and invasive right heart catheterization (RHC) parameters can confidently predict ACR is still not stablished.

Objectives: To determine whether analytical, TTE, and RHC parameters can predict ACR in a HT population.

Methods: Retrospective analysis of consecutive HT patients submitted to EMB between February 2016 and November 2021, who performed at the same day blood analysis, TTE and RHC. Significant ACR was defined as ≥ 2R on EMB, according to the International Society of Heart and Lung Transplantation 2004 grading. Analytical, TTE and RHC parameters were assessed by the area under curve (AUC) of Receiver Operating Characteristic curve (SPSS®) for the prediction of ACR. Statistical differences with a p-value < 0.05 were considered significant.

Results: A total of 127 EMB were performed during the study period with the following histological results (0: 33%; 1R: 59%; 2R: 8%)**.** Mean age was 50 years, 79% were male, mean left ventricular ejection fraction was 58 ± 10% and mean BNP 808 ± 984 pg/mL. AUC results of analytical, TTE and RHC parameters for the prediction of ACR are depicted in the table. Neither analytical nor TTE parameters were able to predict ACR. Central venous pressure (CVP) (p = 0.002) and pulmonary artery pulsatility index (PAPi) (p = 0.009) were significantly associated with ACR. CVP > 8 mmHg had a sensitivity (S) of 60% and a specificity (Sp) of 80% for ACR ≥ 2R. ACR did not occur for CVP values < 6 mmHg (S 100% and Sp 57%). PAPi < 2 had a S of 60% and a Sp of 85% for predicting ACR.

Conclusions: Detecting ACR in HT patients without invasive measures remains a clinical challenge. However, two important messages can be taken

Table 1.	Acute celular rejection predictors			
	Parameters	**AUC**	**p value**	**95% CI**
Analytic	NT-pro BNP	0.62	0.426	0.359-0.881
	BNP	0.659	0.145	0.461-0.856
	Troponin I	0.456	0.645	0.234-0.768
	Glomerular Filtration Rate	0.54	0.674	0.339-0.741
Echocardiographic	Left Ventricular Ejection Fraction	0.447	0.582	0.293-0.601
	Tricuspid Annular Plane Systolic Excursion	0.563	0.579	0.282-0.844
	Global Longitudinal Strain	0.583	0.587	0.280-0.886
	E/A	0.55	0.682	0.302-0.798
	E/e'	0.732	0.084	0.587-0.876
	Desaceleration time	0.545	0.696	0.319-0.770
	Pulmonary Artery Systolic Pressure	0.557	0.619	0.410-0.703
	Left Atrial Volume	0.543	0.668	0.324-0.763
Hemodynamic	Cardiac Index	0.609	0.254	0.238-0.44
	Central venous pressure (CVP)	0.793	0.002	0.685-0.900
	Pulmonary capillary wedge pressure (PCWP)	0.66	0.092	0.530-0.808
	Right ventricular end-diastolic pressure	0.766	0.008	0.656-0.876
	Right ventricular end-systolic pressure	0.583	0.411	0.411-0.754
	Systolic Pulmonary artery pressure	0.674	0.068	0.515-0.833
	Diastolic Pulmonary artery pressure	0.663	0.088	0.512-0.814
	Mean pulmonary artery pressure	0.674	0.069	0.525-0.822
	Pulmonary artery pulse pressure	0.586	0.369	0.369-0.803
	Pulmonary artery resistance	0.463	0.712	0.279-0.647
	Systemic vascular resistance	0.412	0.36	0.272-0.553
	Pulmonary Artery Pulsatility Index	0.749	0.009	0.111-0.391
	PVC/PCWP	0.704	0.042	0.549-0.859
	Cardiac Power Output	0.441	0.535	0.279-0.603
	Mean Arterial Pressure	0.414	0.368	0.246-0.582

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from this study to our clinical practice. First, this study demonstrates that right heart function parameters, such as CVP and PAPi, are the most reliable predictors of ACR, whereas left ventricular function parameters should only be influenced later in the rejection process. Secondly, low CVP levels can rule out ACR. Because venous jugular pressure can be used to estimate CVP during a physical examination, clinicians may still have a non-invasive way to rule out ACR in HT patients.

CO 58. THE EFFECT OF HEART FAILURE THERAPY IN PATIENTS WITH MILDLY REDUCED EJECTION FRACTION: A NETWORK META-ANALYSIS

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Introduction: Recent 2021 heart failure (HF) guidelines have renamed patients with left ventricular ejection fraction (LVEF) between 41-49% as heart failure with mildly reduced ejection fraction (HFmrEF). HFmrEF treatment is often considered a gray zone as there are no RCTs conducted exclusively in these patients. Network meta-analysis is a new statistical technique that compares several interventions simultaneously in a single analysis by combining both direct and indirect evidence across a network of studies.
Objectives: To evaluate and compare the relative efficacy of spironolactone (MRA), candesartan (ARB), sacubitril-valsartan (ARNI), and beta-blockers (BB) in HFmrEF.
Methods: RCTs evaluating the efficacy of pharmacological treatments in HF that included patients with LVEF between 40%-50% were searched. Hazard ratio (HR) was extracted from each subanalysis for intervention *versus* placebo. A fixed and random-effects network meta-analysis was performed using *R* statistical software. The three outcomes analyzed were a composite of cardiovascular death and HF hospitalizations, cardiovascular death, and HF hospitalizations.
Results: From the literature, we found four RCTs with subgroup analysis according to participants' ejection fraction (TOPCAT, CHARM, PARADIGM/PARAGON), and an individual patient-level analysis of double-blind randomized trials of BB (BB-HCFG). A total of 3,844 patients were included. There is a significant reduction of events with pharmacological treatment compared with placebo in the composite endpoint (ARNI *vs.* placebo: HR 0.62, 95%CI 0.45-0.85; ARB *vs.* placebo: HR 0.76, 95%CI 0.61-0.94) and in HF hospitalizations (BB *vs.* placebo: HR 0.48, 95%CI 0.24-0.95). We did not observe a statistically significant difference in any comparisons between treatments (indirect comparisons), which suggests a similar magnitude of effect. Nevertheless, there was a sound reduction of the composite endpoint with ARNI (HR *vs.* BB: 0.74, 95%CI 0.47-1.16; HR *vs.* MRA 0.86, 95%CI 0.53-1.38). Although BB were globally less beneficial in the composite endpoint and cardiovascular death, they seemed to be more effective in reducing HF hospitalizations (HR *vs.* ARB: 0.59, 95%CI 0.28-1.25; HR *vs.* MRA: 0.70, 95%CI 0.30-1.60; HR *vs.* ARNI: 0.62, 95%CI 0.28-1.40).
Conclusions: Pharmacological treatment recommended for reduced LVEF can also be effective in HFmrEF. This network meta-analysis did not show significant superiority of any pharmacological class compared to the others.

CO 59. HEART FAILURE WITH REDUCED EJECTION FRACTION FOUNDATIONAL THERAPY: WHY SHOULD WE FOLLOW THE 2021 EUROPEAN SOCIETY OF CARDIOLOGY HEART FAILURE GUIDELINES AND FORGET THE PREVIOUS THERAPEUTIC ALGORITHM?

Joana Brito, João Agostinho, Pedro Silva, Beatriz Silva, Ana Margarida Martins, Ana Beatriz Garcia, Catarina Simões de Oliveira, Sara Couto Pereira, Pedro Silvério António, Rafael Santos, Doroteia Silva, Fausto J. Pinto, Dulce Brito
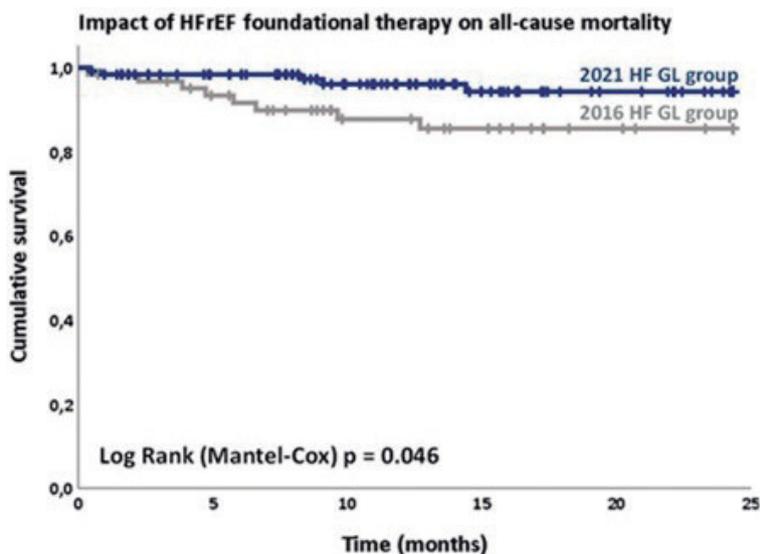
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Introduction: Recently published European Society of Cardiology Heart Failure Guidelines (2021 HF GL) recommend early introduction of 4 pharmacological classes considered the foundational therapy (FT) for heart failure with reduced ejection fraction (HFrEF): sacubitril/valsartan (ARNi), beta-blocker (BB), mineralocorticoid receptor antagonist (MRA) and SLGT2 inhibitor. This approach contrasts with the sequential therapy suggested by previous guidelines (2016 HF GL).
Objectives: To compare in the real-world practice the effect on 2-year all-cause mortality of the simultaneous use of every HFrEF FT class *versus* sequential therapy initiation and up-titration.
Methods: A population of patients (pts) included in a HF follow-up program was split in two groups: 1) pts started on all pharmacological classes of the HFrEF FT – "2021 HF GL"; 2) pts started on ACEi/ARB/ARNI, BB and MRA-"2016 HF GL group". Chi-square and Mann-Whitney tests were used. Impact on all-cause mortality was established with Kaplan-Meier survival analysis and multivariate Cox regression.
Results: A total of 276 pts with HFrEF were included and followed for 14.6 ± 7.9 months. One hundred twenty-five patients were included in the FT group and 63 in the 2016 HF GL. The study population (71.3% males, 65.7

Impact of HFrEF foundational therapy on all-cause mortality

2021 HF GL group

2016 HF GL group

Log Rank (Mantel-Cox) p = 0.046

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± 13.2 years) were mainly in NYHA class II (60.1%) and III (32.4%). The most common HF etiologies were ischemic heart disease (48.4%) and dilated cardiomyopathy (40.4%); mean left ventricular ejection fraction was 27.9 ± 7.7%; 17% of the patients had a CRT and 29.3% an ICD. All-cause mortality rate during follow up was significantly different: 4% in the FT group and 12.7% in the 2016 HF GL group (p = 0.046) (Fig.). The implementation of all foundational therapy classes was an independent protective factor for all-cause mortality (HR 0.29; IQR 0.086-0.948; p = 0.041). Statistical significance for mortality reduction was observed since month 6 (p = 0.037).

Conclusions: This real-world study suggests that simultaneous initiation of all pharmacological classes that nowadays are considered the foundational therapy as recommend by the 2021 HF GL may be more effective on reducing all-cause mortality in HFrEF than sequential therapy initiation as suggested by the 2016 HF GL. Considering the small size of the studied sample, demonstration of significant effect on mortality reduction since month 6 of follow-up supports the need for early introduction of all foundational therapy classes followed by a tailored titration.

CO 60. MAIN LIMITING FACTORS OF FOUNDATIONAL THERAPY INTRODUCTION IN PATIENTS WITH HEART FAILURE WITH REDUCED EJECTION FRACTION

Catarina Simões de Oliveira, João Agostinho, Pedro Silvério António, Sara Couto Pereira, Joana Brito, Pedro Alves da Silva, Beatriz Valente Silva, Ana Beatriz Garcia, Ana Margarida Martins, Rafael Santos, Joana Rigueira, Doroteia Silva, Nuno Lousada, Fausto J. Pinto, Dulce Brito

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

Introduction: ESC Heart failure (HF) guidelines recommend the introduction of 4 different pharmacological classes – foundation therapy (FT) – in all patients (pts) with HFrEF as all these classes have a significant impact in mortality and HF hospitalizations. However, due to these drugs side effects and the complexity of HFrEF pts, pharmacologic initiation and uptitration may become a challenge.

Objectives: To identify the main limiting factors that conducted to non-initiation of foundational therapy in a cohort of pts with HFrEF.

Methods: Retrospective single-center study of HFrEF pts followed in a multidisciplinary HF unit. Clinical characteristics and pharmacological therapy data, mainly the reasons for therapy non-initiation were collected. Statistical analysis was performed using Chi-square and Mann-Whitney tests and the impact of the main FT initiation limiting factors was assessed using Cox regression and Kaplan-Meier survival analysis.

Results: A total of 275 pts (mean age: 66 ± 14 years; 70.7% males) were included. Ischemic heart disease (45.7%) and dilated cardiomyopathy (41.7%) were the main HFrEF etiologies. At follow-up 58.3% patients were at NYHA functional class II and 7.2% at III. The mean left ventricular ejection fraction (LVEF) was 36 ± 12%, NT-proBNP, 3,385 ± 8,701 pg/mL, eGFR, 61 ± 27 and potassium, 4.7 ± 0.58 mmol/L. At the end of follow-up, a reason that inhibited therapy initiating was present in 148 (54%) pts and 127 (46%) were treated with all the 4 FT classes; 271 (98.2%) pts were treated with a B-blocker, 178 (64.5%) with ARNI, 86 (31.1%) with ACEi/ARB, 236 (85.5%) with MRA and 176 (63.8%) with iSGLT2. The highest rate of therapy non-initiation was observed in ARNI (64 pts) and the main reasons were symptomatic hypotension (22 pts) and economic insufficiency (23 pts). Most pts that did not started on MRA had prohibitive hyperkaliemia (18 pts) or worsening renal function (7 pts). Pts that were not started on SGLT2 had symptomatic hypotension (14 pts) or worsening renal function (7 pts). The most well tolerated drug were B-blockers, with a very low rate of non-initiation (10 pts) mainly because of lower heart rate (Fig.). During a mean follow-up of 1.43 ± 1.15 years, 33 (12%) pts died and 40 (14.5%) pts were hospitalized due to HF. Globally symptomatic hypotension was the main reason of FT non-initiation. On multivariate analysis symptomatic hypotension was a predictor of HF events independently of its impact on FT initiation (HR 2.37, 95%CI 1.2-4.8; p = 0.016) (Fig.).

Conclusions: This real-world cohort showed a high rate of FT non-initiation in HFrEF pts. The main FT initiation limiting factor was symptomatic hypotension that had a significant impact on prognosis partially related with its repercussion in HFrEF medical therapy.

Sábado, 23 Abril de 2022 | 09:30-10:30

Sala Aquarius | Comunicações Orais (Sessão 13) – Arritmias 3 – Fibrilhação auricular

CO 61. ATRIAL GANGLIONATED PLEXI MODIFICATION COMBINED WITH PULMONARY VEIN ISOLATION IN ATHLETES WITH HIGHLY SYMPTOMATIC ATRIAL FIBRILLATION AND BASELINE BRADYCARDIA

Mário Martins Oliveira[1], Pedro S. Cunha[1], Sérgio Laranjo[1], Mauricio Scanavacca[2], Guilherme Portugal[1], Bruno Valente[1], Ana Lousinha[1], André Grazina[1], Hipólito Reis[3], Ana S. Trindade[4], Cláudia Mendes[3], Margarida Paulo[1], Rui C. Ferreira[1]

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Introduction: Experimental and clinical studies have established an important influence of autonomic nervous system activity on the initiation
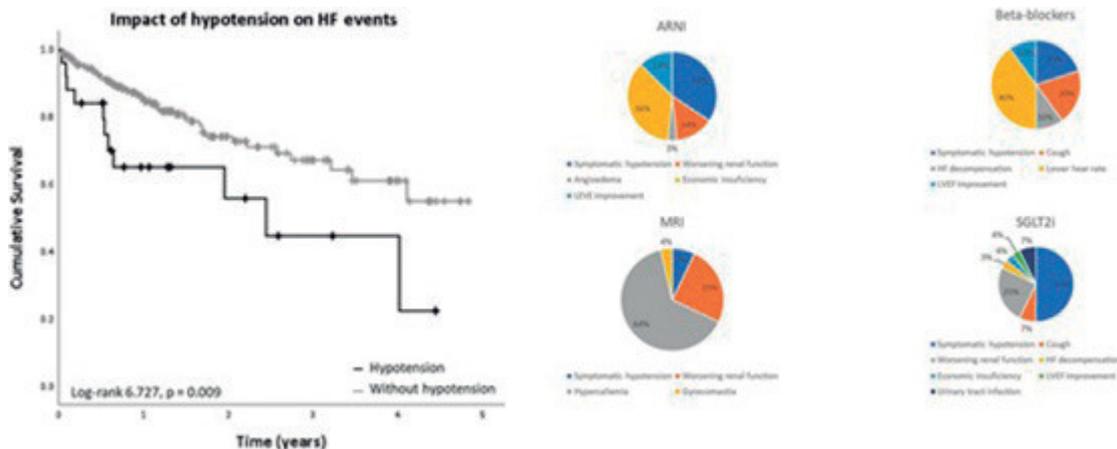
CO 60 Figure

and maintenance of atrial fibrillation (AF). Long-term endurance sports training is associated with a higher risk of developing AF, due to increased vagal tone, acting synergistically with sympathetic hyperactivity during intense exercise, creating the electrophysiological conditions for the occurrence of AF episodes. In this population, the use of antiarrhythmic drugs (AAD) contributes to more pronounced bradycardia and a decrease in exercise performance.

Objectives: Evaluate the safety and success rates of combining pulmonary vein isolation (PVI) and anatomic modification of the major left atrial ganglionated plexi (GP) in athletes with AF and sinus bradycardia.

Methods: 22 consecutive patients (46 ± 11 years; 17 male; left atrial volume 32-56 mL/m²; left ventricular ejection fraction > 50%; CHADSVASc 0-2; AAD used as "pill in the pocket") undergoing PVI + atrial GP ablation with radiofrequency (RF) due to AF (paroxysmal AF – 77.3%) and pronounced rest bradycardia (< 50 bpm). The primary outcome was the freedom from AF or sustained atrial tachycardia during 12-months follow-up verified by ECG (every 3 months or if symptoms), external event recorder (blanking period), and 24h-Holter (at 3 and 12 months).

Results: Patients underwent successful PVI (4-5 PV) and RF modification of the four GP in the vicinity of the PV. All but one had extreme bradycardia or pauses during RF application in GP locations. The average procedure time was 150 min and fluoroscopy time 15 min. The duration of RF (20-35W) was 40 ± 10 min. There was a pericardial effusion drained in the laboratory, with no other acute complications. The mean heart rate (24h-Holter recording) changed from 53 bpm to 67 bpm, before and 3 months after ablation, respectively (p = 0.03). At 12-month follow-up, maintenance of sinus rhythm was 86.3%, with an EHRA score for AF-related symptoms of I-II.

Conclusions: Left atrial neuromodulation as an adjunctive procedure to PVI may provide benefits in AF suppression for the treatment of athletes suffering from AF and sinus bradycardia.

CO 62. NOT SUCH A BLANKING PERIOD AFTER ALL: EARLY RECURRENCE PREDICTS LATE RECURRENCE AFTER AF ABLATION

Mariana Ribeiro Silva[1], Pedro Ribeiro Queirós[1], Gualter Santos Silva[1], Rafael Teixeira[1], Sara Fernandes[2], João Almeida[1], Paulo Fonseca[1], Marco Oliveira[1], Helena Gonçalves[1], Alberto Rodrigues[1], Sílvia O. Diaz[3], Francisca Saraiva[3], António S. Barros[3], João Primo[1], Ricardo Fontes-Carvalho[1]

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Introduction: AF recurrence after catheter ablation (CA) within the blanking period is generally classified as benign, but recently has been associated with later recurrence. The prediction of early recurrence (ERAF) and late recurrence (LRAF) AF after CA remains challenging as well as the predictive value of ERAF.

Objectives: To determine the clinical and procedural predictors of ERAF and LRAF after CA.

Methods: Single-centre retrospective study that included all patients (pts) who underwent AF CA between January 2017 and October 2019. Ablation procedures included radiofrequency and second-generation cryoballoon CA. ERAF was defined as any recurrence of AF, atrial flutter or atrial tachycardia > 30 seconds within 90 days after CA and LRAF was defined as any recurrence after 90 days of CA. The independent association between clinical and procedural variables and AF recurrence was evaluated with logistic regression analysis for ERAF and Cox regression analysis for LRAF.

Results: We included 395 pts, 64.6% male and with a mean age of 56.8 ± 11.6 years; most of them had paroxysmal AF (76.7%) with a CHADSVASC score ≥ 2 points in 41.8%; mean pericardial adipose tissue volume was 149.0 ± 73.2 cm³ and 19.4% of the pts had coronary calcium scoring > 100. Overall, median follow-up was 33.0 months (IQR 25-42). ERAF occurred in 57 pts (14.4%), on average 29.1 ± 25.3 days after CA. After multivariate logistic regression, we identify left atrium (LA) enlargement (defined as LA indexed volume > 34 mL/m² or LA diameter > 38 mm for female or > 40 mm for male) [odds ratio (OR) 4.29 95% confidence interval (CI) 1.38-13.33; p = 0.012], persistent AF (OR 2.33, 95%CI 1.01-5.33; p = 0.046) and pericardial adipose tissue volume

(OR 1.01, 95%CI 1.001-1.01; p = 0.020) as independent predictors associated with ERAF. LRAF was observed in 129 pts (32.7%), on average, 15.1 ± 10.9 months after CA. Cox regression analysis identified ERAF as the only independent predictor of late recurrence of AF (OR 3.64, 95%CI 2.32-5.71; p < 0.001). Regarding patients with ERAF, most of them also had LRAF (84.2%). In pts with LRAF, it is important to emphasize that 37.2% of them also had ERAF whereas in patients without LRAF only 3.4% had ERAF (p < 0.001) (Fig.).
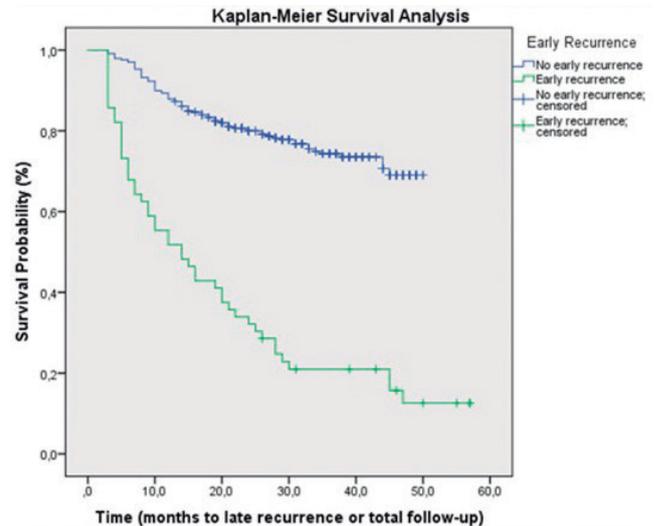
Conclusions: In our cohort, LRAF was significantly higher in pts with recurrence within the blanking period, which was the only independent predictor of AF late recurrence. These results support the urgent need for more studies to redefine the blanking period.

CO 63. FLUOROLESS CAVOTRICUSPID ISTHMUS ABLATION SUCCESSFULLY ACHIEVES ATRIAL FLUTTER CONTROL

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

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

Introduction: Cavotricuspid isthmus (CTI) ablation in patients with typical atrial flutter (AFL) has improved in the past years, especially by the use of three-dimensional (3D) electroanatomic mapping systems. These mapping tools contributed to reduce radiation exposure, but most ablation procedures still require varying amounts of fluoroscopy.

Objectives: We aim to examine whether fluoroless CTI ablation is effective and safe in reducing AFL recurrence, compared with CTI ablation using fluoroscopy and a 3D mapping system.

Methods: A retrospective analysis of CTI ablation procedures performed at a tertiary center between December 2008 and December 2020 was conducted. Cases were divided in two groups: fluoroless and fluoroscopic, according to the use of radiation. Procedural duration, fluoroscopy time (FT), use of 3D mapping system, complications and recurrence rates at one year were analyzed.

Results: A total of 324 CTI ablations performed on patients with documented typical AFL were included. Mean age was 62.3 ± 14.0, with 78.1% male patients. Fluoroless ablations were performed based on a 3D mapping system, and all fluoroscopic procedures also used 3D electroanatomic mapping. The FT was zero in the fluoroless group - 31 cases (9.6%), and 7.0 ± 4.4 minutes in the fluoroscopic group - 291 cases (90.4%) (p < 0.001). There was no statistically significant difference between the two groups, regarding AFL recurrence at one year (21.7% in the fluoroless group vs. 13% in the fluoroscopic group; odds ratio [OD] 0.54; 95% confidence interval [CI]

0.18-1.62; p = 0.27). Total procedure duration was significantly shorter in the fluoroless group (1h07m *vs.* 1h40m; t-test 4.261, p < 0.001, CI 0h16m-0h50m). There were no acute complications for both groups.

Conclusions: Fluoroless CTI ablation, avoiding any radiation exposure to the patient and operator, can be performed in patients with typical AFL, without compromising duration, safety or efficacy of the procedure.

CO 64. CRYO-3D - A THREE-DIMENSIONAL MAPPING-GUIDED CRYOBALLOON-BASED ATRIAL FIBRILLATION ABLATION: FEASIBILITY AND PRELIMINARY RESULTS

André Paulo Ferreira, Pedro Silva Cunha, Bruno Tereno Valente, Guilherme Portugal, Sérgio Laranjo, Ana Lousinha, Ana S. Delgado, Margarida Paulo, Manuel Brás, Rui Cruz Ferreira

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

Introduction: Cryoballoon-based ablation (CBA) has become widely used as a "single-shot" approach in the treatment of paroxysmal atrial fibrillation (AF) and persistent AF, being an unquestionable alternative approach to point-by-point radiofrequency (RF) ablation for circumferential pulmonary veins isolation (PVI). The CBA as the drawback of longer fluoroscopy times when compared with the RF.

Objectives: To demonstrate the potential benefits of a CBA procedural technique, utilizing the Achieve Advance Mapping Catheter and the Ensite Precision system to reduce the fluoroscopy times, maintaining procedure duration, safety and efficacy.

Methods: Consecutive patients submitted to AF ablation, with CBA and a 3D mapping system (Crio 3D group) between March 2021 and October 2021, were compared with a historical cohort of CBA (ConV group) from the previous 2 years. The circular mapping catheter was used to create electroanatomic maps with an open mapping system (EnSite Precision (Abbott, Inc.)) in all patients in the Crio 3D group.

Results: A total of 37 CBA of AF using a 3D mapping system were performed during the study period and included in the Crio 3D group. Patient mean age was 61.1 ± 10.9 years, 51.4% were male (n = 19) and paroxysmal AF was present in 70.3% (n = 26) of cases. A total of 160 conventional CBA of AF were performed during the cohort period and included in the ConV group. There were no significant differences between group's demographics. Mean left atrium (LA) size was similar between groups (35.6 ± 9.7 ml/mm^2 in the Crio 3D group *vs.* 38.0 ± 13.9 ml/mm^2 in the ConV group, p = 0.592) and mean number of isolated pulmonary veins on each procedure was also similar (3.8 ± 0.7 in the Crio 3D group *vs.* 3.9 ± 0.7 in the ConV group, p = 0.609). In the Crio 3D group procedure time was significantly lower (79.2 ± 20.9 *vs.* 122.7 ± 38.4 minutes, p < 0.01) and so was fluoroscopy time (8.7 ± 4.0 *vs.* 21.1 ± 9.2 minutes, p < 0.01), when compared to the ConV group. Only one 1 (2.7%) acute complication was observed in the Crio 3D group, compared to 4 (2.5%) acute complications in the Conv group.

Conclusions: CBA with the aid of a 3D mapping system is feasible in a subset of patients referred to AF ablation and leads to a significant sustained decrease in both procedure and fluoroscopy times, when compared with the conventional approach.
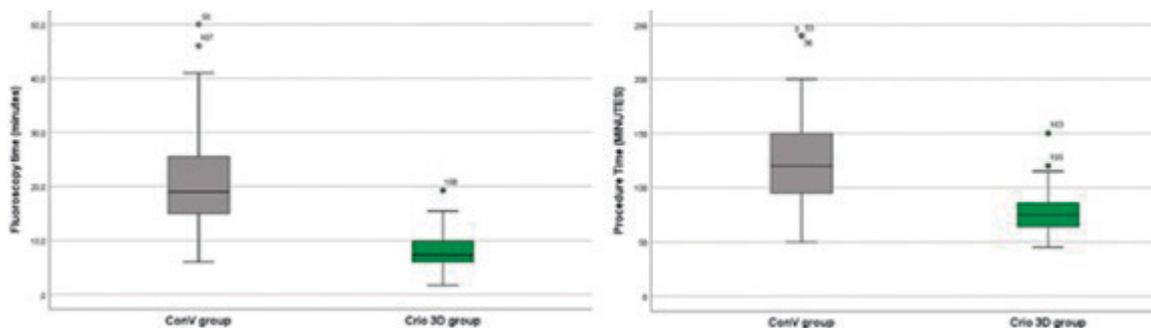
CO 65. ISOLATION OF PULMONARY VEINS WITH DUTY-CYCLED CIRCULAR MULTI-POLAR CATHETER

Ana Lobato de Faria Abrantes, Sara Couto Pereira, Pedro Silvério António, Joana Brito, Beatriz Valente Silva, Pedro Alves da Silva, Ana Margarida Martins, Ana Beatriz Garcia, Catarina Simões de Oliveira, Afonso Nunes-Ferreira, Gustavo Lima da Silva, Luís Carpinteiro, Nuno Cortez-Dias, Fausto J. Pinto, João de Sousa

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

Introduction: The isolation of pulmonary veins (IPV) is the central element in the ablation of atrial fibrillation (AF) and can be obtained with different ablation modalities. The duty-cycled circular multi-pole catheter PVAC allows linear application of radiofrequency energy with the production of circumferential lesions. Conceptually, it can make ablation simpler and faster in patients with favorable anatomy.

Objectives: To evaluate the safety and efficacy of ablation with a PVAC catheter and to compare it with the conventional point-to-point, with irrigated catheter technique (TCv).
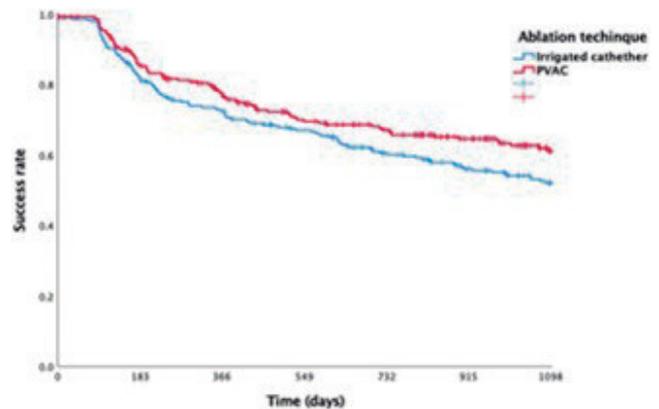

Figure 1: Long-term sucess rate of atrial fibrillation ablation according to the employed technique

Methods: Single-center retrospective study of consecutive AF patients (pts) refractory to antiarrhythmic therapy and submitted to ablation with PVAC or TCv. The ablation strategy consisted of IPV, complemented with ablation of the cavo-tricuspid isthmus in pts with a history of concomitant flutter. Monitoring was performed with a 7-day event recorder at 3, 6 and 12 months and annually from the 2nd year. Success was defined by AF-free survival or any maintained supraventricular tachycardia. Kaplan-Meier survival curves were used to estimate the risk of events. The groups were compared using Chi-square and Mann-Whitney analysis.

Results: We included 629 patients (67.2% males, 60 ± 12 years, TCv: 319, PVAC: 310), 56.9% with paroxysmal AF, 23.7% with short duration persistent AF and 13.5% with long-standing persistent AF. There were no differences

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between the two groups. The mean follow-up period was 1,224 ± 1,567 days. Among the PVAC treated patients, acute success rate of IPV was similar to that of the TCv group (99.7 *vs.* 97.8%, p = 0.092). PVAC patients presented lower complication rate (PVAC: 4.1 *vs.* TCv: 9.9%, p = 0.006) and lower hemopericardium risk (0 *vs.* 3.4%; p = 0.01). Three patients treated with PVAC developed stroke (1 *vs.* 0.9%; p = 0.972). Procedure time was lower among the patients treated with PVAC [120 (90-155) *vs.* 225 (180-250) min; p < 0.001], as well as the fluoroscopy time [20 (12-29) *vs.* 25.5 (14.0-35.6) min; p < 0.001]. PVAC presented a trend for superior success rate after first intention ablation at 36 months (66.4 *vs.* 56.7%; p = 0.56; Fig.). In the PVAC group, when considering multiple ablations, the success rate increased 22.9%, however without statistical difference between groups (p = 0.49).
Conclusions: The multipolar PVAC catheter can represent an added value in AF ablation, making the procedure simpler and faster, ensuring similar efficacy to the TCv and with a lower risk of complications.

Sábado, 23 Abril de 2022 | 09:30-10:30

Sala Vega | Comunicações Orais (Sessão 14) - DAC e Cuidados Intensivos 3 - Foco na Oclusão do Tronco Comum

CO 66. CARDIOGENIC SHOCK COMPLICATING ACUTE MYOCARDIAL INFARCTION DUE TO LEFT MAIN CORONARY ARTERY OCCLUSION: A MULTICENTRE STUDY

Marta Braga[1], João Calvão[1], João Carlos Silva[1], Andreia Campinas[2], André Alexandre[2], Bruno Brochado[2], Mariana Brandão[3], Marisa Passos Silva[3], Gustavo Pires Morais[3], Filipe Macedo[1]

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Introduction: Cardiogenic shock (CS) complicating acute myocardial infarction (MI) occurs in about 8% of patients and carries a high in-hospital mortality if untreated. Revascularization has improved survival in these patients. Reported data concerning outcomes of CS in setting of MI due left main coronary artery (LMCA) occlusion are scarce. In this study we describe patients with CS due to acute LMCA occlusion and evaluate their in-hospital and 1-year mortality.
Methods: We performed a retrospective multicentre study of patients with ST-segment elevation MI (STEMI) or high-risk non-ST segment elevation MI who underwent emergent coronary angiography (eCA) between January 2008 and December 2020 in 3-hospital centres. Among this cohort, 128 patients presented with unprotected LMCA occlusion (Thrombolysis In Myocardial Infarction – TIMI ≤ 2) and were categorized according to the presence/absence of signs of CS at admission: CS and no-CS.
Results: Of 128 patients with acute MI due to LMCA occlusion, 78 patients presented with CS (60.9%). Mean age was 62.4 ± 10.8 years in CS patients and 65.1 ± 12.2 years in no-CS patients, p = 0.203. In both groups, most patients were male and have at least 1 cardiovascular risk factor. Previous angina/positive ischemic test were found in only 9.0% of CS patients (*vs.* 24.0% in no-CS patients, p = 0.02). STEMI presentation was more frequent in CS group (81.6 *vs.* 46.9%, p < 0.001). TIMI = 0 (55.1 *vs.* 32.0%, p = 0.01) and slow/no-reflow phenomenon (28.8 *vs.* 5.3%, p = 0.004) in eCA were also more prevalent in CS group. Primary percutaneous coronary intervention was performed in 92.3% of CS patients and in 76.0% of no-CS patients (p < 0.001). Invasive mechanical ventilation (71.8 *vs.* 22.0%, p < 0.001), haemodialysis (18.8 *vs.* 2.0%, p = 0.010) and mechanical circulatory support ([MCS] 65.4 *vs.* 36.0%, p = 0.002) were more frequent in CS group. Haemorrhagic complications were higher in CS patients (14.7 *vs.* 2.1%,

p = 0.022). In-hospital mortality in CS group was 73.1%, compared to 18.0% in no-CS group (p < 0.001). Almost 80% of CS patients had died at 1-year after index-event, in contrast to 32.7% in no-CS group (p < 0.001). MCS use in CS patients, pre/post-LMCA revascularization, was not a survival predictor.
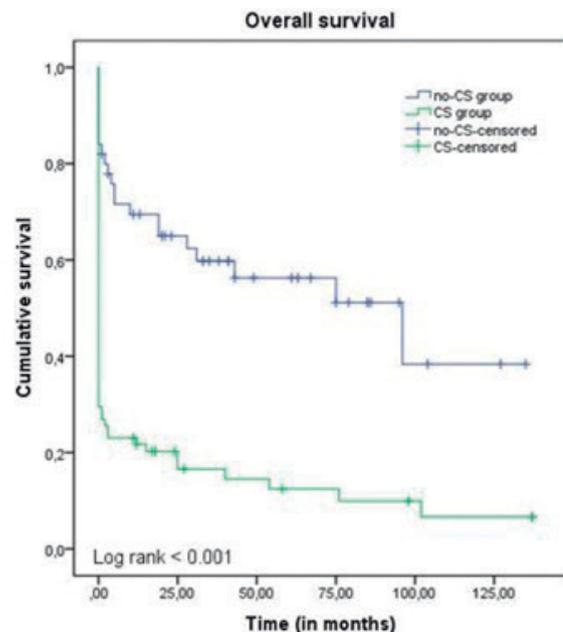
Conclusions: CS complicating acute MI due to LMCA occlusion is common and results in an extremely high mortality rate, mainly in the acute phase. Further studies are crucial in this population to refine initial medical treatment in order to improve their prognosis.

CO 67. CARDIAC ARREST IN PATIENTS WITH ACUTE LEFT MAIN STEM OCCLUSION: A REAL-WORLD MULTICENTER REGISTRY

André Alexandre[1], Marta Braga[2], Andreia Campinas[1], Ricardo Costa[1], Dias de Frias[1], João Calvão[2], Mariana Brandão[3], Marisa Passos Silva[3], Gustavo Pires de Morais[3], João Carlos Silva[2], Raquel Santos[1], Bruno Brochado[1], André Luz[1], João Silveira[1], Severo Torres[1]

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Introduction and objectivses: Patients presenting with acute coronary syndrome (ACS) with unprotected left main coronary artery (LMCA) occlusion are at higher risk for mortality. Most studies have shown an association between LMCA occlusion and cardiac arrest at admission. We aimed to evaluate clinical determinants and prognostic factors of cardiac arrest presentation in patients with ACS from unprotected LMCA occlusion.
Methods: We conducted a retrospective multicenter registry of patients with ACS with unprotected LMCA occlusion admitted in three central hospitals from Portugal between 2008 and 2020. Patients were divided according to cardiac arrest presentation.
Results: Of 128 patients with ACS from unprotected LMCA occlusion, 26% presented with cardiac arrest and they were younger (58 *vs.* 65 years; p = 0.001). Comorbidities such as hypertension, diabetes, dyslipidemia, previous ACS, left ventricular dysfunction, peripheral artery disease, or chronic kidney disease were not clinical determinants for cardiac arrest. There was no significant association between the site of LMCA lesion and cardiac arrest (p = 0.935). Similarly, there was no association with the number of other epicardial vessels with significant disease. Regarding interventional procedures, cardiac arrest at admission was associated with a shorter symptom-to-balloon time (150 *vs.* 195 minutes; p = 0.042).
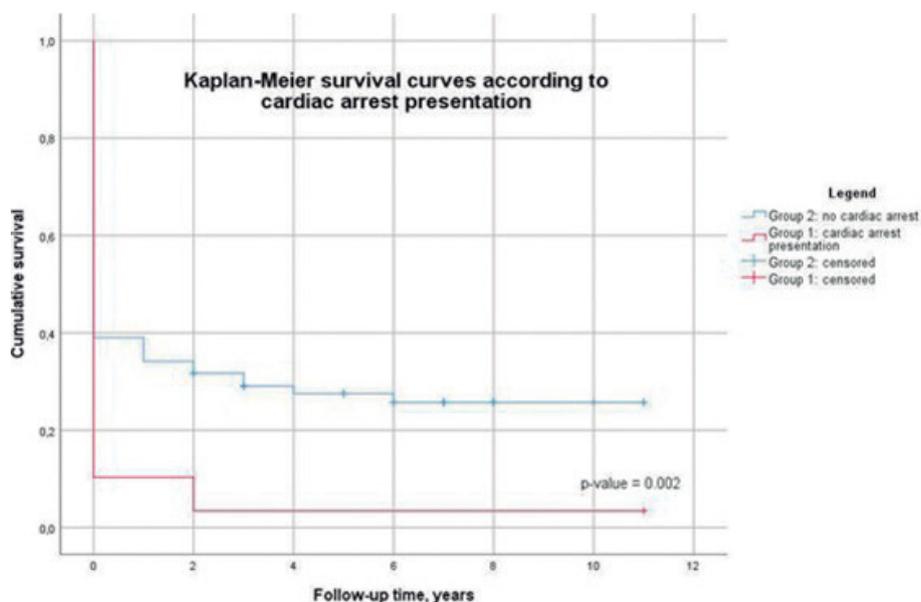
CO 67 Figure

In terms of outcomes, there was a significant association with cardiogenic shock (88 *vs.* 51%; p < 0.001) and with the need for aminergic support (91 *vs.* 64%; p = 0.004), but not with mechanical circulatory support (MCS) (58 *vs.* 53%; p = 0.624). Furthermore, cardiac arrest patients had significantly higher in-hospital (79 *vs.* 45%; p = 0.001) and 5-year (97 *vs.* 73%; p = 0.008) mortality, as anticipated by Kaplan-Meier survival curves (p = 0.002; log-rank test).

Conclusions: In our real-world population, more than one quarter of patients with ACS with LMCA occlusion present with cardiac arrest, which correlates with higher probability of cardiogenic shock and dictates higher short- and long-term mortality. Despite cardiac care improvements, technological evolution and better patient/system-delay times, this is still a subpopulation with poor prognosis. Further studies (namely with early use of MCS) are needed to find innovative strategies that can make a difference in this subgroup of patients.

72.9% of patients were in cardiogenic shock, and aborted cardiac arrest occurred in 27.1%. Right dominance was present in all patients except one, who had a balanced dominance. Primary percutaneous coronary intervention (PCI) was performed in 89.8% of the patients, with angiographic success being achieved in 55.6% of the procedures. Overall, the in-hospital mortality rate was 57.6%. Mortality was significantly higher in patients without angiographic criteria for PCI success (87.5 *vs.* 36.7%, p < 0.001). Among survivors, 91.7% were still alive at 1-year and 66.7% at 5 years of follow-up.

Conclusions: Patients with ATOLMCA have a dismal prognosis. Most patients present with cardiogenic shock, and a significant number develop cardiac arrest during the acute phase. Despite medical care, in-hospital mortality is high. Patients with left dominance may not even reach the hospital. Among survivors, long term outcomes are reasonable. Further studies are needed in order to improve the management and outcomes of patients with ATOLMCA.

CO 68. ACUTE TOTAL OCCLUSION OF THE UNPROTECTED LEFT MAIN CORONARY ARTERY - PATIENT CHARACTERISTICS AND OUTCOMES

João Calvão[1], Marta Braga[1], Mariana Brandão[2], Andreia Campinas[3], André Alexandre[3], Ana Filipa Amador[1], Catarina Martins da Costa[1], Miguel Martins de Carvalho[1], Ricardo Alves Pinto[1], Tânia Proença[1], João Carlos Silva[1], Gustavo Pires-Morais[2], Marisa Passos Silva[2], Bruno Brochado[3], Filipe Macedo[1]

[1]Centro Hospitalar Universitário de S. João, EPE. [2]Centro Hospitalar de Vila Nova de Gaia/Espinho, EPE. [3]Centro Hospitalar Universitário do Porto, EPE/Hospital Geral de Santo António.

Introduction: Acute total occlusion of the unprotected left main coronary artery (ATOLMCA) is a dramatic entity with very high mortality. Owing to its infrequency, there is limited and inconsistent data regarding this population.
Objectives: To describe the clinical presentation, short- and long-term outcomes of patients with ATOLMCA.
Methods: This retrospective multicentric cohort study included all patients presenting with acute (< 12h) myocardial infarction (MI) due to ATOLMCA (Thrombolysis In Myocardial Infarction - TIMI = 0) between January 2008 and December 2020 in three tertiary hospitals.
Results: In the period of the study, 11,036 emergent coronary angiographies were performed in the participating centers, 59 of which were ATOLMCA (0.5%). Mean age of patients at the time of the event was 61.2 (± 12.2) years. Seventy-three percent were male. At presentation,

CO 69. MECHANICAL CIRCULATORY SUPPORT DEVICES IN LEFT MAIN OCCLUSION: A MULTICENTER STUDY FROM 2008 TO 2020

Andreia Campinas[1], Marta Braga[2], André Alexandre[1], Ricardo Costa[1], André Frias[1], João Calvão[2], Mariana Brandão[3], João Carlos Silva[2], Marisa Passos Silva[3], Gustavo Pires de Morais[3], Bruno Brochado[1], André Luz[1], Catarina Gomes[1], João Silveira[1], Severo Torres[1]

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Introduction: Evidence of benefit in the use of mechanical circulatory support devices (MCS) in patients with acute myocardial infarction (AMI) is scarce. We aimed to evaluate the clinical characteristics, prognosis and factors associated with the use of MCS in patients with AMI due to left main (LM) occlusion.
Methods: We performed a retrospective multicenter study of 128 consecutive patients with AMI with ≤ 12h of presentation with LM occlusion submitted to immediate reperfusion between January 1, 2008, until December 31, 2020 in three terciary hospitals of Portugal. Among this cohort, we divided patients into two groups according to the use of MCS devices.
Results: Regarding the baseline characteristics no statistically significant differences were found, except for the presence of cerebrovascular disease (2.9% in group with *vs.* 16.9% in group without MCS, p = 0.007)
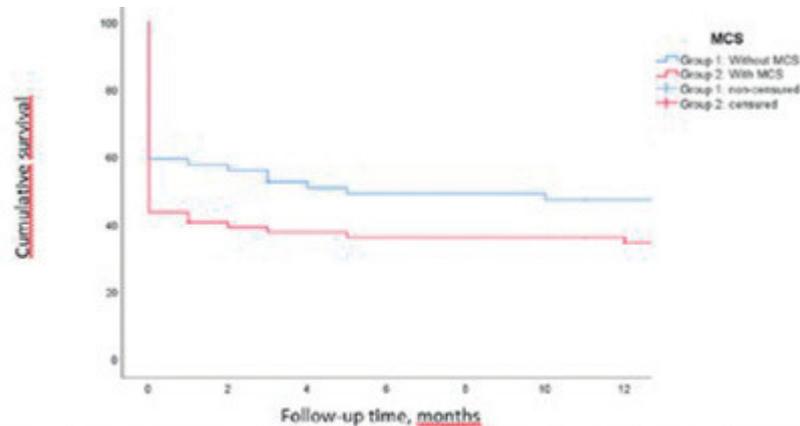
Figure 1: Kaplan-Meier survival curves for all-cause of death according to use of MCS in patients with AMI with left main culprit lesion

CO 69 Figure

and peripheral artery disease (8.8% in group with *vs.* 22% in group without MCS, p = 0.037). We observed that the use of MCS devices was statistically different between the three centers (47.8%, 42%, 8.7%, p < 0.001). No differences were found at presentation for ST-segment elevation *vs.* non-ST segment elevation AMI (p = NS). The presence of cardiogenic shock (72.4 *vs.* 45.8%, p = 0.002), cardiac arrest (27.5 *vs.* 23.7%,p = 0.034) and more severe thrombolysis in myocardial infarction (TIMI) flow at presentation (55.1 *vs.* 35.6%, p = 0.015) were more frequent in group with MCS. The rate of 1-year cumulative mortality was high in both groups (31/59 = 52.5% in the group without *vs.* 47/69 = 68.1%, p = NS). Also, no statistically significant differences were found in terms of survival, but we observed a trend to higher mortality in those who received MCS as Kaplan-Meier survival curves show (log rank = 0.062). Finally, in multivariable analysis, older age [odds ratio (OR), 0.935; 95%CI 0.87-0.99], the presence of diabetes (OR 0.223; 95%CI 0.056-0.88), peripheral artery disease (OR 0.070; 95%CI 0.009-0.566) and extra-hospitalar cardiac arrest (OR 0.06; 95%CI 0.007-0.543) were characteristics associated with lower odds of receiving MCS. Contrarily, male sex (OR 5; 95%CI, 1-20.4) and the presence of cardiogenic shock (OR 5.7, 95%CI 1.42-23) were factors associated with higher use of MCS.

Conclusions: The use of MCS does not seem to modify prognosis in patients admitted with AMI due to left main occlusion. Only cardiogenic shock and male gender were predictors of MCS use.

CO 70. AMI DUE TO LEFT MAIN CORONARY ARTERY OCCLUSION: A COMPARATIVE MULTICENTER STUDY FROM 2008 TO 2020

Andreia Campinas[1], Marta Braga[2], André Alexandre[1], Ricardo Costa[1], André Frias[1], João Calvão[2], Mariana Brandão[3], João Carlos Silva[2], Marisa Silva Passos[3], Gustavo Pires de Morais[3], Bruno Brochado[1], André Luz[1], Catarina Gomes[1], João Silveira[1], Severo Torres[1]

[1]Centro Hospitalar Universitário do Porto, EPE/Hospital Geral de Santo António. [2]Centro Hospitalar Universitário de S. João, EPE. [3]Centro Hospitalar de Vila Nova de Gaia/Espinho, EPE.

Introduction: Acute myocardial infarction (AMI) due to left main coronary artery (LMCA) occlusion is a potentially fatal condition. We aimed to study a cohort of patients admitted in three tertiary hospitals of Portugal with AMI due to LMCA occlusion.
Methods: We performed a retrospective multicenter study of 128 consecutive patients with AMI with LMCA occlusion submitted to immediate percutaneous coronary intervention (PCI) between January 1, 2008, until December 31, 2020. We sought to compare clinical characteristics, interventions and prognosis between an older group (from January 2008 to December 2012, N = 28) and a contemporary group (from January 2017 and December 2020, N = 48).

Results: No statistically significant differences were found in baseline risk factors between the two groups, except for hypertension (50% in group 1 *vs.* 75% in group 2, p = 0.027). There was no difference regarding presentation with cardiogenic shock (57.1 *vs.* 64.6%, p = NS). The median time of symptoms to balloon was high but similar in both groups [180 min (120-300) *vs.* 210 min (120-420),p = NS]. Group 1 had a lower pre-PCI thrombolysis in myocardial infarction (TIMI) flow (64.3% of the patients were classified as TIMI = 0, while in group 2 only 33.3% presented TIMI = 0, p = 0.009). Radial access was more frequent in the contemporary group (33 *vs.* 10.7%, p = 0.028) as well as the administration of glycoprotein IIb/IIIa inhibitors (14.6 *vs.* 12%, p = 0.004) and the rate of implantation of drug eluting stents (100 *vs.* 63.2%, p = 0.01). The use of mechanical cardiac support was higher in group 1 (82 *vs.* 46%, p = 0.002) but the intra-aortic pump balloon (IABP) was the only device available. In group 2, utilization of IABP, Impella pump, and extracorporeal membrane oxygenation was 37.5%, 20.8%, and 2.1%, respectively. The second *antiplatelet* agent used was also different between groups (ASA/ticagrelor 75.6% preferred in group 2, p < 0.001). In-hospital mortality (46.4 *vs.* 54.2%,p = NS) and 1-year cumulative mortality (17/28 = 60.7 *vs.* 29/48 = 60.4%, p = NS) were high in both groups and no statistically significant differences in mortality rate at 12 months were found (log rank = 0.572).
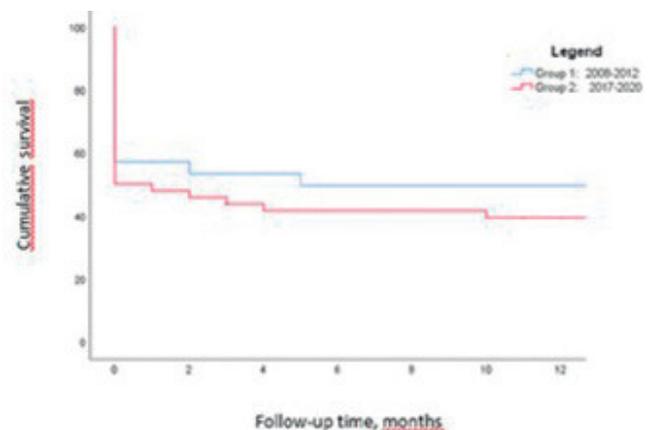

Figure 1: Kaplan-Meier survival curves for all-cause of death by subgroups of time to admission in patients with AMI with left main occlusion.

Conclusions: The use of new drugs and more advanced devices was more common in the contemporary group but the median time to reperfusion remained unchanged. The last may explain why the prognosis of this condition remained dismal in this Portuguese cohort.

Sábado, 23 Abril de 2022 | 10:30-11:30

Sala Aquarius | Comunicações Orais (Sessão 15) - Enfermagem e Técnicos de Cardiopneumologia

CO 71. PERCEPTION OF NOISE IN A CICU: IMPLICATIONS ON THE WELL-BEING OF PERSON IN CRITICAL SITUATION

Helena Viana[1], Amâncio António de Sousa Carvalho[2], Francisco Firmino dos Reis[2]

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Introduction: The relevance of noise in Intensive Care Units (ICUs) has been recognized as a determining factor in the well-being and comfort of patients, having become an uncomfortable and ubiquitous factor. Thus, a study was carried out on this theme, which we consider relevant and follows the very genesis of nursing since Florence Nightingale, revealing itself to be of crucial importance due to the implications it has for people in critical situations.
Objectives: To analyze the relation between social demographic variables, previous hospitalization experience, clinical variables, noise (perceived) and the subjective well-being (SWB) of people in critical situations admitted to a Cardiac Intensive Care Unit (CICU).
Methods: Descriptive, correlational, cross-sectional study with a quantitative approach, with a sample of 131 patients admitted to a CICU, in the northern region of the country. For data collection, a form was used and the sound pressure level was measured using a sound level meter. The data was treated using the SPSS software, using descriptive and inferential statistics. The level of significance considered was 5%.
Results: Of the total patients in the sample, all reported noise and 63.4% considered it bearable. We observed that there is a highly significant negative correlation (Pearson: $p < 0.000$) of low intensity (correlation coefficient = -0.309), between the Global Environmental Comfort Score and the SWE Global Score. When we analyze the relationship between the Environmental Comfort Scale recoded in three categories and the BES Global Score, there is a statistically very significant relationship ($p < 0.003$). We conclude that the patients in our study report High Environmental Comfort. However, the average continuous sound pressure level (LAeq) to which patients were subjected was 53,440 dB (A), exceeding the guidelines of the World Health Organization (WHO). Thus, from the analysis of the results, an intervention proposal was made, with the primary purpose of sensitizing health professionals to this problem. We consider contributing to a better well-being of the person in a critical situation and contributing to excellent care.

CO 72. TÉCNICOS DE CARDIOPNEUMOLOGIA NO SERVIÇO DE URGÊNCIA NA PRESTAÇÃO DE CUIDADOS AOS DOENTES COM SÍNDROME CORONÁRIA AGUDA

Filipa Castro[1], Nazaré Rego[2], Olga Azevedo[1], Isabel Oliveira[1], António Lourenço[1]

[1]Hospital da Senhora da Oliveira, EPE-Guimarães. [2]Universidade do Minho.

Introdução: A doença arterial coronária é responsável por 4000 mortes anuais em Portugal. Para uma orientação e tratamento precoces das situações agudas, é fundamental o cumprimento dos tempos preconizados pelas orientações da Sociedade Europeia de Cardiologia, registando-se ainda atrasos que importa auditar e corrigir.
Objetivos: Caracterizar doentes com enfarte agudo do miocárdio admitidos no serviço de urgência hospitalar; avaliar o impacto da presença dos Técnicos de Cardiopneumologia no cumprimento de tempos preconizados pelas orientações da Sociedade Europeia de Cardiologia.
Métodos: Foram analisados os processos clínicos dos doentes admitidos no Serviço de Urgência, com enfarte agudo do miocárdio, entre 2015 e 2019, com supradesnivelamento de ST ou bloqueio completo de ramo esquerdo de novo, procedendo-se ao levantamento dos seus dados sociodemográficos, de triagem e tempos até à realização do eletrocardiograma, intervenção coronária percutânea e alta hospitalar e tendo-se analisado estes dados usando técnicas estatísticas.
Resultados: Os 79 doentes estudados apresentavam uma idade média de 60,4 anos ± 11,04 anos. Na presença dos técnicos, com 95% de confiança a média do tempo porta-ECG situa-se entre 1,0 e 40,5 minutos, enquanto, na sua ausência, se situa entre 49,7 e 126,6 minutos. O mesmo se passa com o tempo porta-balão: com 95% de confiança, a média deste tempo situa-se entre 88,3 e 146,9 minutos com presença de técnico e entre 168,7 e 282,7 minutos sem presença de técnico. Na presença de técnico, o atendimento aos pacientes com dor precordial (sintomatologia típica) respeitou, em média, os tempos preconizados a nível europeu, com uma média de tempo porta-ECG, na amostra analisada, de 5,1 minutos e de porta-balão de 88,6 minutos. Na sua ausência, as médias foram superiores aos tempos recomendados. Enfartes que apresentaram sintomatologia atípica resultaram em triagens menos acertadas e, consequentemente, tempos mais longos até ao eletrocardiograma e diagnóstico; porém, sempre com atendimento mais precoce na presença de técnico de Cardiopneumologia.
Conclusões: A presença de Técnicos de Cardiopneumologia diminuiu significativamente os tempos porta-ECG e porta-balão. Investir na integração permanente destes profissionais num serviço de urgência poderá constituir um importante vetor estratégico, promovendo uma melhoria na prestação de cuidados de saúde.

CO 73. VASCULAR REMODELLING DURING PREGNANCY AND POSTPARTUM

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

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Introduction: Pregnancy is a physiological condition of hemodynamic overload, characterized by a progressive reduction of peripheral vascular resistance, which normalizes postpartum.
Objectives: To characterize longitudinal changes in maternal arterial stiffness, endothelial function and ventricular-arterial coupling during pregnancy and postpartum.
Methods: Prospective cohort study including volunteer pregnant women (healthy, obese and/or hypertensive and/or diabetic) recruited in two tertiary centres between 2019 and 2020, at their 1st or 3rd trimester of pregnancy. Women were evaluated at the first trimester [1T, 10-15 weeks, baseline], third trimester of pregnancy [3T, 30-35 weeks, peak of cardiac remodelling] as well as at the 1st month and 6th month after delivery [during reverse remodelling, RR]. Systemic vascular resistance (SVR), arterial elastance, left ventricular (LV) end-systolic elastance, arterial stiffness and endothelial function were assessed using echocardiography and blood pressure, pulse wave velocity (PWV) and EndoPAT, respectively. Friedman tests were used to compare four evaluation moments.
Results: We included 77 pregnant women with a median age of 34 [26;44] years-old, 69% being healthy. As shown in the table, PWV decreased significantly from the 1st to the 3rd trimester (6.3 [5.3;7.8] m/s to 5.7 [4.6;7.3] m/s, $p < 0.001$) and normalized as soon as 1 month after delivery (6.4 [5.3;8.6] m/s, $p < 0.001$). The SVR rose significantly 1 month after delivery (1,336 [1,015;2,049] dyn·s·cm^{-5} to 2,087 [1,283;2,699] dyn·s·cm^{-5}, $p < 0.001$). Despite the absence of significant variation of arterial elastance during follow-up period, the ventricular-arterial coupling increased significantly from 1st to 3rd trimester (0.49 [0.34;0.85] to 0.60 [0.37;1.49], $p < 0.001$) due to a significant reduction of the net arterial load on the left ventricular between the 1st and the 3rd trimester, as assessed by LV end-systolic elastance (3.34 [2.31;4.76] mmHg/mL to 2.56 [1.09;4.93] mmHg/mL, $p = 0.009$). This value normalized only 6 months after delivery (2.56 [1.09;4.93] mmHg/mL to 3.19 [1.94;7.42], $p = 0.002$). A significant deterioration of endothelial function became evident from 1st to 3rd trimester, as assessed by the logarithm of reactive hyperemia index [lnRHI, 0.78 [0.05;1.36] *vs.* 0.44 [-0.20;0.85], $p = 0.014$],

Table 1: Hemodynamic assessment in total cohort sample.

	1st Trimester	3rd Trimester	1 month after delivery	6 month after delivery	p-value
Mean arterial pressure [mmHg]	83.3 [56.7;95.3]	80.0 [70.0;100.0]	86.7 [70.0;106.7]	87.7 [70.0;113.3]	<0.001
Pulse wave velocity [m/s]	6.3 [5.3;7.8]	5.7 [4.6;7.3]	6.4 [5.3;8.6]	6.4 [5.3;8.6]	<0.001
Systemic vascular resistance [dyn·s·cm⁻⁵]	1337 [1030;2589]	1336 [1015;2049]	2087 [1283;2700]	1848 [1226;3296]	<0.001
Arterial elastance [mmHg/mL]	1.61 [1.18;2.71]	1.62 [1.30;2.40]	1.76 [1.15;2.45]	1.69 [1.13;2.83]	0.093
Left ventricular end-systolic elastance [mmHg/mL]	3.34 [2.31;4.76]	2.56 [1.09;4.93]	3.11 [1.01;4.82]	3.19 [1.94;7.42]	0.002
Ventricular-arterial coupling	0.49 [0.34;0.85]	0.60 [0.37;1.49]	0.56 [0.37;1.14]	0.52 [0.33;1.17]	<0.001
Stroke volume (mL)	60 [37;78]	61 [44;76]	56 [40;81]	61 [38;82]	0.062
Cardiac output (mL/min)	4.6 [2.8;6.7]	4.8 [3.1;6.0]	3.4 [2.6;4.6]	3.7 [2.6;5.5]	<0.001
Logarithm of reactive hyperaemia index	0.78 [0.05;1.36]	0.44 [-0.20;0.85]	0.45 [0.17;1.11]	0.43 [0.10;1.01]	0.004

Values expressed by median [min; max].

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followed by slight amelioration 1 month postpartum (0.44 [-0.20;0.85] *vs.* 0.45 [0.17;1.11], p > 0.999).

Conclusions: Our cohort presented a significant decrease in arterial stiffness during pregnancy and normalization at 1st month after delivery. The SVR revealed a similar pattern, which recovered as soon as one month after delivery. In addition, an increased ventricular-arterial coupling was documented at peak of vascular remodelling, inherent to volume overload present in pregnancy context.

CO 74. + CORAÇÃO + VIDA: MAIOR ARTICULAÇÃO E VIGILÂNCIA DO UTENTE COM PATOLOGIA CARDIOVASCULAR E SUAS FAMÍLIAS

Filipa Homem[1], Ana Caetano[1], Anaísa Reveles[2], Helena Martins[1], Joana Sousa[3], Luís Miguel Rodrigues[4], Tânia Azevedo[1]

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As doenças cardiovasculares (DCV) são a principal causa de morte em Portugal (30,2%), e uma das mais importantes causas de morbilidade, de incapacidade e invalidez e de anos potenciais de vida precocemente perdidos. Vários são os estudos que têm demonstrado a eficácia de diferentes estratégias para evitar as readmissões hospitalares do utente com DCV, nomeadamente na qualidade de vida e redução dos internamentos hospitalares. Existem ainda estudos que demonstram a importância da articulação dos CSP com os CSD em Cardiologia, tornando-se fulcral para melhorar o acesso, eficiência e qualidade dos cuidados de saúde, reduzindo os encaminhamentos para cuidados hospitalares. O *Global Burden of Disease Study* (2019) reforça que as doenças crónicas e a falha na prevenção das doenças evitáveis, torna a população vulnerável a emergências agudas como foi a COVID-19. Neste sentido, torna-se urgente garantir sistemas de saúde mais robustos que assegurem uma melhor vigilância das doenças crónicas. Neste contexto, surge o projeto «+ coração + vida» que tem como finalidade melhorar o desempenho e a articulação dos serviços de saúde no atendimento de pessoas com DCV e suas famílias, assim como melhorar a gestão da DCV nos CSP. Para tal, foram definidos os seguintes objetivos: 1) Implementação de consulta de enfermagem especializada no acompanhamento de pessoas com DCV nos CSP (Elaboração de manual e formação dos enfermeiros do ACeS BM); 2) Implementação de protocolo de colaboração entre Médico de Família e Cardiologista, através de telemedicina; 3) Referenciação de todos os utentes da área de residência do ACeS Baixo Mondego, com alta dos serviços de Cardiologia e Cirurgia Cardiotorácica, para consulta de enfermagem especializada no acompanhamento de pessoas com DCV nos CSP; 4) Convocatória para consulta de todos os utentes com DCV por parte dos CSP. Este projeto assenta num processo de melhoria contínua da qualidade dos cuidados prestados nos serviços de saúde que exige mudanças no processo assistencial do utente com DCV, no sentido de aumentar a qualidade e satisfação não só dos utentes como dos profissionais de saúde envolvidos. Contudo é um enorme desafio gerir e liderar a mudança. Para Kotter (2017), a condução da mudança nas organizações compreende oito fases: estabelecer um sentido de urgência, criar uma coligação liderante, desenvolver uma visão e estratégia, comunicar a visão da mudança, dar poder a um amplo conjunto de pessoas para tomar iniciativas, gerar vitórias de curto prazo, consolidar os ganhos e produzir mais mudanças, e institucionalizar as novas abordagens na cultura da organização. Consideramos que a fase 1 (estabelecer um sentido de urgência) já foi alcançado, uma vez que tanto o CHUC, como o ACeS BM abordam esta temática nos respetivos planos estratégicos. Agora é tempo de criar uma coligação liderante que consiga sucesso na mudança (CHUC e ACeS BM), que consiga transmitir esta visão estratégica.

CO 75. IMPACTO DA INTERVENÇÃO DO ENFERMEIRO DE REABILITAÇÃO NA REDUÇÃO DOS REINTERNAMENTOS POR INSUFICIÊNCIA CARDÍACA AOS 30 DIAS

Patrícia Silva, Inês Oliveira, Sónia Cátia Apolinário Ferreira, Ana Carina Dias Ferreira, Lícinia Aguiar, Raul Pinto, Cristiana Teles, Joana Antunes, Bruno Bragança, Isabel Cruz, Rafaela Lopes, Magda Soares, Aurora Andrade

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

Introdução: A Insuficiência Cardíaca (IC) é uma síndrome com elevada incidência e prevalência em Portugal associadas a elevados custos na saúde, essencialmente devido ao elevado número de internamentos, com alto impacto na qualidade de vida dos doentes. Atualmente, estima-se que a taxa de readmissão aos 30 dias após internamentos por IC seja de cerca de 20 a 25% em adultos com mais de 65 anos. (Leavitt, et al., 2020). Por este motivo, é urgente a estruturação de melhores estratégias de transição dos cuidados com o objetivo de diminuir os reinternamentos, através da consciencialização para a síndrome e focando na maior capacidade para o autocuidado: na gestão da medicação, da dieta e do exercício físico; no controlo de fatores de risco cardiovascular; na monitorização do peso; e no reconhecimento precoce dos sinais e sintomas de descompensação, promovendo o contacto atempado com a equipa de saúde. Vários estudos demostram que uma hora de educação para a saúde durante o internamento melhora o conhecimento do doente acerca da sua patologia, contribuindo para a redução das readmissões hospitalares.

Objetivos: Avaliar a taxa de reinternamentos dos doentes admitidos por IC num serviço de Cardiologia, após a realização do plano de educação para a saúde pela equipa de Enfermagem de Reabilitação (EER).

Métodos: Estudo retrospetivo, unicêntrico, descritivo. Avaliada a taxa de readmissões, aos 30 dias dos doentes internados por IC num serviço de Cardiologia, no período de 1 de janeiro a 31 de outubro de 2021, seguidos pela equipa de ER. Consideraram-se como readmissões os episódios no serviço de urgência, os reinternamentos por IC e os episódios não

programados em hospital de dia. Todos os doentes participaram em pelo menos 1 sessão de educação para a saúde com a EER.

Resultados: Foram seguidos 110 doentes internados com diagnóstico de IC, dos quais 72 (65,4%) apresentava IC com fração de ejeção reduzida, e 19 (17,3%) com fração de ejeção preservada e ligeiramente reduzida. 58,1% (n 64) eram do género masculino, e a idade média foi de 66,8 anos. Recorreram ao serviço de Urgência ou ao hospital de dia de forma não programada nos 30 dias após a alta7 doentes (6.36%) e foram readmitidos 2 (1,82%).

Conclusões: À semelhança de outros estudos, na nossa *coorte* a taxa de reinternamentos dos doentes admitidos por IC após realização do plano de educação para a saúde foi inferior às reportadas nos estudos sem esta estrutura implementada.

Sábado, 23 Abril de 2022 | 11:30-12:30

Sala Vega | Comunicações Orais (Sessão 16) - Doença CV em Populações Especiais

CO 76. PREVALENCE OF RV DYSFUNCTION IN PATIENTS UNDER CARDIOTOXIC CHEMOTERAPY: A PRELIMINARY ANALYSIS

Sérgio Maltês[1], Bruno M. l. Rocha[1], Gonçalo J. I. Cunha[1], Mariana Paiva[1], Ana Carolina Vasques[2], Pedro Freitas[1], Sara Guerreiro[1], Liliana Marta[1], João Abecasis[1], Regina Ribeiras[1], Maria João Andrade[1], Carlos Aguiar[1], Ana Martins[2], Miguel Mendes[1]

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Introduction: Chemotherapy-induced cardiotoxicity is a serious complication often leading to symptomatic heart failure. While the left ventricle (LV) has been thoroughly implicated in this process, data is scarce on right ventricular (RV) function following cardiotoxic chemotherapies. Our goal was to determine the prevalence and clinical significance of RV dysfunction in a cohort of patients who had received these drugs.

Methods: Single-center retrospective study of cancer patients performing 2D transthoracic echocardiogram between January 2020 and December 2021. Those previously exposed to anthracyclines and/or anti-HER2 agents (≥ 6 months prior to echocardiogram) were included. Patients with known coronary artery disease or cardiomyopathy were excluded, as were those with prior pulmonary embolism. LV function was assessed through LV ejection fraction (LVEF) and global longitudinal strain (GLS). LV cardiotoxicity was defined as per 2020 ESMO guidelines. RV function was considered abnormal if any of the following criteria were met: tricuspid annular systolic plane excursion (TAPSE) < 17 mm, lateral tricuspid annulus systolic velocity by pulsed wave Doppler tissue imaging (S'VD) < 12 cm/s, fraction area change (FAC) < 35% and mean free wall longitudinal strain (FWLS) > -20%.

Results: Forty patients were included (mean age 58 ± 13 years; 95% female; 93% with breast cancer; 30%, 20% and 50% previously treated with anthracyclines, anti-HER2 or both, respectively). Mean LVEF and GLS were 56 ± 7% and -17 ± 3%, respectively. Overall, 13 patients had current LV cardiotoxicity. RV dysfunction was documented in 15 (38%) patients, most often through FWLS (Fig.). Seven patients (18%) and one patient (3%) had ≥ 2 and ≥ 3 abnormal RV parameters, respectively. Those with RV dysfunction were more often symptomatic (NYHA class ≥ 2: 53 *vs*. 16%; p = 0.013), had higher NT-proBNP levels (516 [204-2,400] *vs*. 66 [46-191] pg/mL; p = 0.003) and most often had LV cardiotoxicity (62 *vs*. 26%, p = 0.029). Isolated RV dysfunction was observed in 7 (18%) patients.

Conclusions: In our cohort of patients treated with cardiotoxic anti-neoplastic drugs, RV dysfunction was frequent (approximately one in every five patients with isolated RV dysfunction), most often detected by RV 2D strain and associated with worse symptoms and higher NT-proBNP levels.
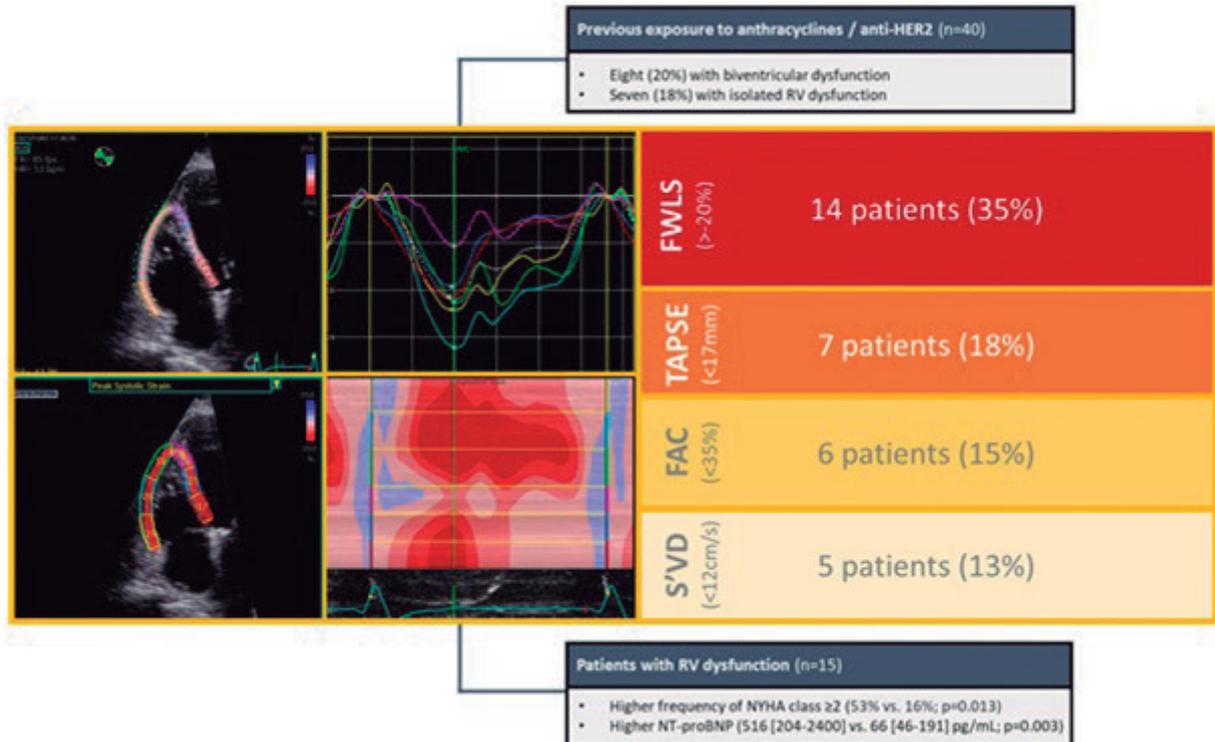

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CO 77. CARDIOTOXICITY IN BREAST CANCER PATIENTS – RISK FACTORS AND ROLE OF CARDIOPROTECTIVE DRUGS

Miguel Martins de Carvalho, Ricardo Alves Pinto, Tânia Proença, Inês Costa, Sofia Cardoso Torres, Carlos Xavier Resende, Pedro Grilo Diogo, Ana Filipa Amador, Catarina Martins da Costa, João Calvão, Carla de Sousa, Mariana Paiva, Filipe Macedo

Centro Hospitalar Universitário de S. João, EPE.

Introduction: Recent advances in cancer treatment have led to improved survival, albeit with cardiovascular adverse effects being some of the most frequent and feared consequences. Patient's risk stratification, prevention and treatment are still to be fully elucidated. Our aim was to evaluate the risk and therapy of cardiotoxicity (CT) secondary to cancer treatment in a subset of patients with breast cancer (BC).
Methods: We collected a retrospective cohort of female with BC treated with conventional chemotherapy (CHT) and/or anti-HER2-targeted therapies (AHT) referred to Cardio-oncology consultation from January 2017 to November 2019. All patients were evaluated before CHT and at least at 3, 6 and 12-months with echocardiogram and cardiac biomarkers, namely high sensitivity troponin I (hs-cTnI) and brain natriuretic peptide (BNP). CT was defined as left ventricle ejection fraction (LVEF) under 50% or decline of at least 10% in LVEF during follow-up. As cardioprotective drugs (CPD) were considered renin-angiotensin-aldosterone system inhibitors and beta-blockers.
Results: A total of 174 women were enrolled with mean age 51.4 ± 11.1 year-old. As for the cardiovascular risk factors (CVRF) 24.7% had hypertension, 32.2% dyslipidaemia, 9.8% diabetes and 24.1% were smokers or previous smokers. 36.4% of patients were already on CPD before CHT. The majority of patients had a high or very-high CT risk score (98.3% with score ≥ 5). All patients were submitted to CHT, whether adjuvant (43.5%), neoadjuvant (54.3%) or palliative (2.2%) and 15.8% were submitted to radiotherapy (RT). Anthracyclines (AC) and AHT were applied to 81.5% and 41.8% of patients, respectively, with 26.6% of patients taking both. At presentation, 99.4% had normal cardiac function with mean LVEF of 62.9%; mean hs-cTnI and BNP were 3.3 ng/L and 35.9 pg/mL, respectively. During a median follow-up of 16 months, 10.4% of patients developed CT, leading to initiation or titration of CPD in 83.3% and treatment interruption in 22.2%; most of them recovered (94.1%). During treatment there was a significantly increase of hs-cTnI (mean - 18.6 ng/L at 3 months, p < 0.001) and a decrease of LVEF during follow-up (decrease of 2.2% at 12 months, p < 0.001). Both AHT and AHT plus AC were significantly associated with CT (p = 0.002 and p = 0.002, respectively), with an extremely high prevalence in the latter group (24.5%). Nor CVRF neither RT raised the risk of CT. Although patients on CPD didn't had lower prevalence of CT (7.9 *vs.* 11.8%, p = 0.421), they presented a non-significative higher rate of cardiac function recovery (100 *vs.* 66.7%, p = 0.084).
Conclusions: Patients submitted to AHT or AHT plus AC were at higher risk of developing CT. This and the significant LVEF decline during follow-up highlighted the importance of long-term-monitoring of these patients. Although needing further validation CPD seemed to be associated with cardiac recovery.

CO 78. THE IMPACT OF COMORBIDITIES IN CARDIAC REMODELLING AND REVERSE REMODELLING INDUCED BY PREGNANCY

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

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Introduction: Hemodynamic overload during pregnancy induces cardiac remodelling which is characterized by non-pathological left ventricle (LV) eccentric hypertrophy and left-atrium enlargement. After delivery, the woman's heart undergoes reverse remodelling (RR) and myocardial performance normalize to their pre-gravid state. Currently, the impact of comorbidities in cardiac remodelling and RR is variable and remains to clarify.
Objectives: To characterize cardiac remodelling and RR during pregnancy and postpartum, as well as to investigate the impact of comorbidities in these processes.
Methods: This prospective cohort study included volunteer pregnant women recruited in two tertiary centres between 2019 and 2021. Women were evaluated by echocardiography at the 1st [1T, 10-15 weeks] and 3rd trimesters [3T, 30-35 weeks] of pregnancy as well as at the 1st and 6th month after delivery. Kruskal-Wallis test and Friedman test were used as appropriate to between and within groups comparisons.
Results: We included 77 pregnant women with a median age of 34 [26;44] y ears, 31% being hypertensive and/or obese and/or diabetic. As shown in the table, pregnant women tended to develop from 1T to 3T eccentric hypertrophy, characterized by a significant increase of LV mass index (LVMi, p = 0.001), accompanied by atrial (p = 0.012) and ventricular enlargement (p < 0.001). A significant rise in filling pressures was also documented

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]	58 [32;81]	71 [43;101]	62 [44;88]	59 [42;93]	<0.001
Relative Wall Thickness	0.31 [0.22;0.40]	0.34 [0.24;0.45]	0.31 [0.22;0.44]	0.30 [0.22;0.43]	0.004
Left Atrial Volume Index [mL/m²]	26 [18;34]	28 [20;46]	23 [15;32]	22 [16;32]	<0.001
Left Ventricular Diastolic Volume Index [mL/m²]	47 [34;59]	54 [35; 75]	49 [30;63]	48 [31;62]	<0.001
Left Ventricular Systolic Volume Index [mL/m²]	18 [13;23]	22 [13;57]	19 [14;47]	19 [11;29]	<0.001
Heart Rate [bpm]	71 [55;97]	81 [59;102]	58 [45;80]	64 [44;79]	<0.001
Ejection Fraction (%)	62 [51;70]	59 [51;72]	62 [56;67]	61 [53;73]	0.029
Global Longitudinal Strain (%)	-24.8 [-30.7;-21.1]	-24.5 [-28.0;-18.0]	-22.9 [-25.3;-20.4]	-22.5 [-27.4;-21.1]	0.801
Global Circumferential Strain (%)	-27.9 [-33.8;-26.2]	-30.3 [-37.1;-26.0]	-28.9 [-31.6;-21.2]	-26.6 [-33.1;-25.9]	0.319
E/e'	6.1 [4.0;8.7]	6.5 [4.3;8.6]	5.3 [4.1;9.3]	5.7 [3.7;8.2]	<0.001
Right Atrial Volume [mL/m²]	31 [18;52]	33 [21;50]	34 [21;50]	34 [19;50]	0.027
TAPSE [mm]	25 [18;32]	26 [16;31]	23 [16;29]	23 [16;32]	<0.001
S' tricuspid wave [cm/s]	14.3 [9.8;18.3]	14.2 [9.9;19.6]	12.5 [10.0;16.6]	12.6 [8.9;16.7]	<0.001

Values expressed by median [min; max]. Legend: TAPSE - tricuspid lateral annular systolic velocity wave

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during gestation (E/e',p = 0.011). During postpartum, while indexed left atrial (p = 0.001) and ventricular volumes (p = 0.002) normalized as soon as 1 month after delivery, regression of hypertrophy decreased significantly only 6 months after delivery (p < 0.001). Ventricular filling pressures also normalized 1 month after delivery (p < 0.001). Systolic function was preserved with a significant increase of ejection fraction after delivery (3T to 6 months postpartum, p = 0.025), while global longitudinal (p = 0.801) and circumferential strains (p = 0.319) were similar between all time-points. Regarding right ventricle, a significant reduction of TAPSE (p = 0.035) and S' (p < 0.001) were documented after delivery. Compared to the healthy pregnant women, the group with comorbidities showed higher relative wall thickness (RWT) for all time points, except 6 months after delivery (p = 0.53), with similar values of LVMi and indexed cardiac volumes. Pregnant women with comorbidities revealed higher values of E/e' from the 3rd trimester (p = 0.046) until the 6th month of postpartum (p = 0.009).

Conclusions: Right ventricle seems to be more sensitive to pregnancy-induced volume overload, as evident by increased systolic function in the 3rd trimester. While most cardiac parameters recover as soon as one month after delivery others, such as hypertrophy, only normalize 6 months after delivery. Pregnant women with comorbidities showed higher RWT and diastolic dysfunction when compared with healthy women.

CO 79. CARDIOPULMONARY EXERCISE TESTING IN FONTAN PATIENTS: UNMASKING THE SECRET OF "SUPER-FONTANS"

Mariana Sousa Paiva, João Rato, Rita Reis Santos, Gonçalo l Cunha, Daniel A. Gomes, Rita Lima, Rita Amador, Rita Bello, Susana Cordeiro, Sara Guerreiro, Sérgio Madeira, Luís Moreno, Anaí Durazzo, Miguel Mendes, Rui Anjos

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

Introduction: Exercise capacity is usually reduced in Fontan patients, however there is a subset of patients who have normal exercise capacity and better outcomes, the "Super-Fontans". The aim of this study was to characterize a cohort of Fontan patients undergoing cardiopulmonary exercise testing (CPET) and identify predictors of better functional capacity.

Methods: Single center retrospective analysis of consecutive Fontan patients aged > 10 years old who underwent CPET, between March 2018 and May 2021. Peak respiratory exchange ratio > 1.05 defined maximal CPET. Peak VO2 (pVO2) as a percentage of its predicted value was used as reference value to stratify patients in tertiles. Patients in 3rd tertile, with a percentage of predicted pVO2 superior to 75%, were considered good-performers. Blood

tests and transthoracic echocardiogram (TTE) were performed on the same day. Additional data were collected from electronic charts.

Results: In total, 49 patients were included (mean age 19±7 years old, 67% male) with intra or extracardiac conduit implanted in mean 12±7 years prior to the CPET. The most common primary diagnoses were tricuspid/pulmonary atresia (43%), followed by unbalanced complete AV septal defect (14%) and double inlet left ventricle (14%). 12 patients had a systemic right ventricle. All, except 5 patients, had preserved systolic ventricular function and 37% had moderate to severe AV regurgitation. The majority had normal hemoglobin levels (median 15.6 g/dL), hepatic enzymes (median total bilirubin 0.8 mg/dL), renal function (median creatinine 0.8 mg/dL) and low NT-proBNP (median 122 pg/mL). All patients had maximal CPET, median %VO2 at VT1 was 57% of peak and mean pVO2 was 66 ± 14% of the predicted. Most patients (69%) showed exercise limitation due to cardiovascular cause, followed by O2 desaturation, present in 22% of CPETs. The age of Fontan completion was not associated with functional capacity (p=0.6). The good-performer group comprised 13 patients (27%), all in sinus rhythm, of which 10 were physically active. Compared with the remainder, this group had higher VO2 at VT1 (18.7 *vs.* 14.6, p = 0.011) and VO2 at VT2 (25.9 *vs.* 22.1, p = 0.019), both in mL/kg/min. Also, peak heart rate (% predicted) (90 vs. 80.5, p=0.028) was higher in this subgroup (Fig.). Conversely, differences on TTE parameters (GLS and AV valve regurgitation) and blood biomarkers were not statistically significant. On multivariable analysis, no single variable predicted better functional capacity.

Conclusions: In our Fontan cohort, most patients had reduced exercise capacity, largely due to cardiovascular dysfunction. However, "Super-Fontans" stood out as they had a higher anaerobic threshold illustrating their better physical condition. These findings highlight the role of regular physical activity in Fontan patients as a cornerstone for better functional capacity.

CO 80. COMPARISON OF DIFFERENT CLINICAL PROGNOSTIC SCORES IN PATIENTS WITH PULMONARY EMBOLISM AND ACTIVE CANCER

Beatriz Valente Silva, Pedro Silvério António, Sara Couto Pereira, Pedro Alves da Silva, Joana Brito, Ana Beatriz Garcia, Catarina Simões de Oliveira, Ana Margarida Martins, Miguel Azaredo Raposo, Rui Plácido, Miguel Nobre Menezes, Fausto J. Pinto

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

Introduction and objectives: Several prognostic models have been validated for risk-stratification in patients with pulmonary embolism (PE), but current

Figure 1- Box plots representing VO2 at VT1, VO2 at VT2 and peak heart rate (% predicted) in the good-performer group and in the remainder
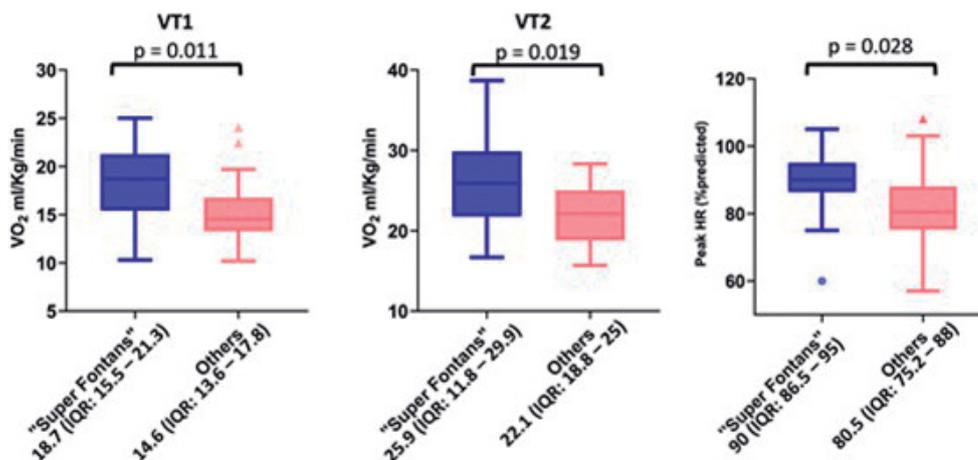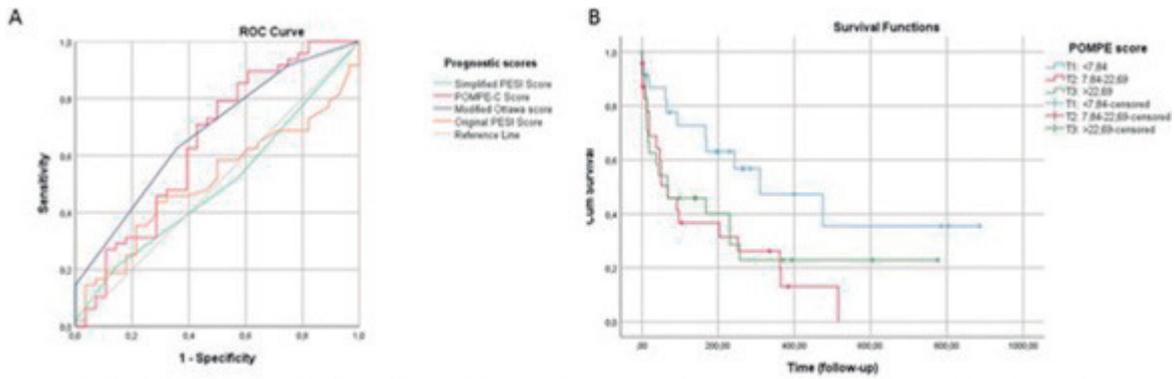
CO 79 Figure

Figure 1: A - Prognostic accuracy of diferent prognostic scores; B – Cumulative survival analysis stratified according to POMPE-score.

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literature lacks a consensus tool to quantify short-term prognosis among cancer patients. This study aimed to compare the prognostic performance of generic (original and simplified PESI) and cancer-specific prognostic scores (POMPE-C and modified Ottawa) to estimate 30-day mortality after PE.

Methods: Retrospective study of patients with PE and active cancer. The primary outcome was 30-day overall mortality. The prognostic accuracy of the clinical scores was determined using receiver operating characteristic (ROC) curve analysis.

Results: Seventy-six patients were evaluated (50% female, mean age 71 ± 14 years). Mortality at 30 days occurred in 21 patients (27.6%). The figure 1 shows the ROC curves for 30-day overall mortality. Original and simplified PESI scores did not predict mortality in PE patients with cancer. Indeed, sPESI score categorized all cancer patients as high risk, limiting its discriminatory power. Only the cancer-specific POMPE-C and modified Ottawa scores predicted PE-related mortality in this population (AUC 0.65 and 0.68, respectively). Compared to patients with POMPE-C score < 7.7 (1st tertile), 30-days mortality was four times higher in the ones presenting higher scores (OR: 4.0; 95%CI: 1.05-15.22; p < 0.042). The Kaplan-Meier individual survival analysis for mortality stratified by POMPE-C score is represented in figure 2 (log rank 6.27, p = 0.043).

Conclusions: Clinical course of cancer patients differs from those without cancer, and malignancy itself may contribute to a substantial proportion of the risk of death. Thus, cancer-specific PE prognostic scores (POMPE-C and Ottawa) performed better than generic scales (original PESI and sPESI).

Sábado, 23 Abril de 2022 | 12:30-13:30

Sala Vega | Comunicações Orais (Sessão 17) - Ciência Básica e Saúde Digital

CO 81. HISTOLOGY-VERIFIED MYOCARDIAL FIBROSIS IN SEVERE AS PATIENTS: PREVALENCE AND CORRELATION WITH NON-INVASIVE LV MYOCARDIAL TISSUE ASSESSMENT

Sérgio Maltês[1], João Abecasis[1], Daniel Gomes Pinto[1], Rita Reis Santos[1], Pedro M. D. Lopes[2], Gustavo Sá Mendes[1], Sara Guerreiro[1], Telma Lima[1], Pedro Freitas[1], António Ferreira[1], Sância Ramos[1], Ana Félix[1], Nuno Cardim[3], Victor Gil[3], Miguel Mendes[1]

[1]Centro Hospitalar Universitário de Lisboa Ocidental, EPE/Hospital de Santa Cruz. [2]Centro Hospitalar de Lisboa Ocidental, EPE/Hospital de Santa Cruz. [3]Hospital da Luz Lisboa.

Introduction: Myocardial fibrosis (MF) is a common finding and a potential adverse prognostic marker in several cardiac diseases, including in severe aortic stenosis (AS). While histological analysis obtained through endomyocardial biopsy remains the gold-standard for MF assessment, non-
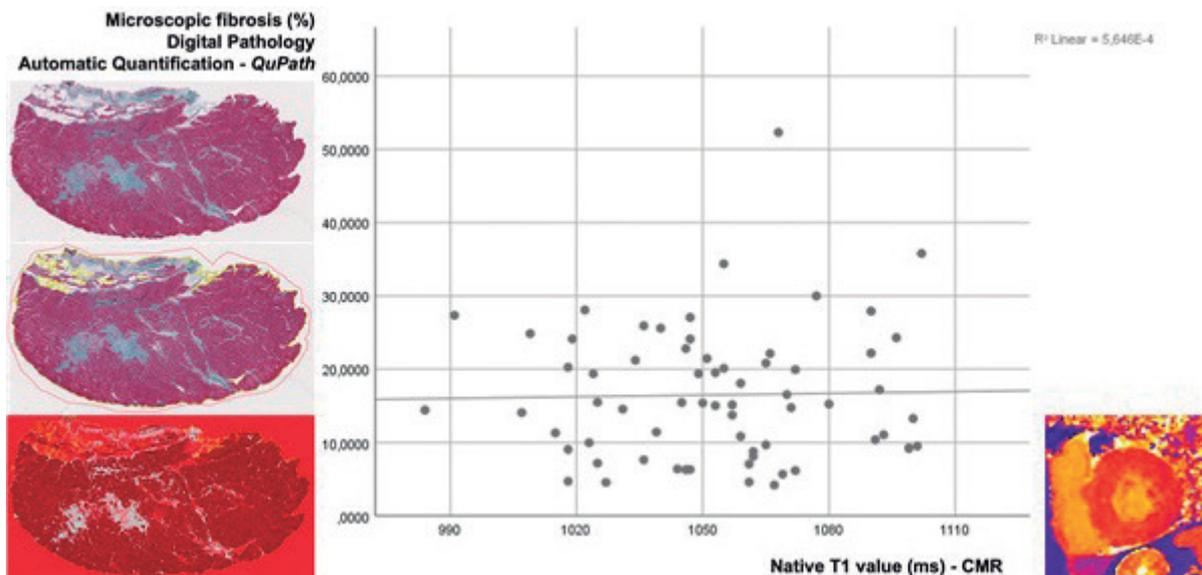
CO 81 Figure

invasive cardiac imaging may offer surrogate biomarkers for fibrosis. We tried to assess the correlation between MF quantification at histopathology and cardiac magnetic resonance (CMR)-derived tissue characterization data in patients with severe AS.

Methods: Single-center prospective cohort enrolling 71 patients with severe symptomatic high-gradient AS undergoing surgical aortic valve replacement (SAVR) (mean age 71 ± 9 years; 49% male, mean valvular transaortic gradient 60 ± 20 mmHg; mean left ventricle [LV] ejection fraction by CMR 58 ± 9%). Those with past history of myocardial infarction or other cardiomyopathy were excluded. All patients underwent pre-operative CMR study with LV tissue characterization and quantification. Elevated T1 mapping was defined as a value > 1,021 ms as per center protocol. Myocardial tissue was obtained during SAVR either through biopsy at basal LV septum or harvested from surgical myectomy specimens. Masson´s trichrome stain was used for collagen/fibrosis assessment. Automatic quantification was obtained at *QuPath*™ digital pathology software after applying a dedicated artificial intelligence algorithm on ultra-high-resolution digital slide scanning images (*Aperio AT2 brightfield scanner*™).

Results: Histology-confirmed MF was observed in all patients (median percentage of fibrotic myocardial tissue 15% [IQR 9-22%]). Median global T1 mapping and extracellular volume (ECV) percentage was 1,048 ms (IQR 1,027-1,078) and 24% (IQR 20-30%), respectively. Late gadolinium enhancement (LGE) with a non-ischemic pattern was present in 42 patients (59%) with a median LGE mass of 5.8 g [IQR 1.0-10.2]; median percentage of LV mass with LGE 3.7% [IQR 0.6-10.4]. While neither T1 mapping (global or basal LV septum), ECV nor LGE had any significant correlation with histology-confirmed MF (Fig.), the vast majority of patients had significantly elevated global and basal LV septum T1 mapping – 81% and 92%, respectively.

Conclusions: In this single-center prospective study, microscopic MF was present in all patients with severe symptomatic high-gradient AS, was accompanied by elevated T1 mapping values but no correlation was found between myocardial fibrosis at histopathology analysis and CMR-derived LV tissue characterization parameters. This may not only stem from sampling (single point biopsy *vs.* whole myocardial tissue assessment) but also from distinct evaluation of different types of fibrosis by different methods.

CO 82. TRANSCRIPTION FACTOR 21 AND PROGNOSIS IN A CAD POPULATION

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

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

Introduction: TCF21 is a member of the basic- helix-loop-helix (bHLH) transcriptor factor family, being critical for embryogenesis of the heart. It regulates epicardium-derived cells differentiation into smooth muscle (SMC) and fibroblast lineages. The biological roles of TCF21 in epicardial fate determination and the progression of atherosclerosis remained a controversial issue.

Objectives: Investigate the impact of the TCF21 rs12190287 gene variant on the prognosis of a coronary artery disease (CAD) cohort.

Methods: 1,713 CAD patients mean age 53.3 ± 7.8; 78.7% male sex were surveyed in terms of MACE occurrence in an extended follow of 5.0 ± 4.3 (range 1 to 20 years). After considering all the genetic models, we used the dominant (GC+CC) as the best model. This model was compared with the wild type of GG with Kaplan Meier methodology to evaluate the survival probability. A Cox regression analysis with all the risk factors and genetic models was performed to assess the independent variables associated with the prognosis.

Results: GG wild genotype presented 9.5% of the whole population, GC 43.2% and the risk genotype CC 47.3%. After Kaplan Meier estimated GC+CC showed a worse survival throughout the follow-up period. After multivariate Cox regression analysis, this dominant model remained in the equation as an independent risk factor to MACE occurrence with an HR of 1.41; p = 0.033, together with multivessel disease, physical inactivity, chronic kidney disease (CKD) and diabetes.

Conclusions: TCF21 rs12190287 is a risk factor for prognosis in our population. The role of this gene may influence fundamental SMC processes in response to vascular stress, accelerating atherosclerosis progression and may represent a target for future therapies.

## CO 83. PLASMA LIPIDOMICS IN PATIENTS WITH HEART FAILURE WITH PRESERVED EJECTION FRACTION

Sílvia O. Diaz[1], António S. Barros[1], José M.G. Alvarenga[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, NOVA Medical School|Faculdade de Ciências Médicas da Universidade NOVA de Lisboa.

Introduction: The importance of plasma lipids is well established in the context of cardiovascular diseases (CVD). Still, a comprehensive and detailed evaluation of plasma lipidome in HFpEF patients is missing and may provide important mechanistic clues with potential therapeutic impact.

Objectives: To study the lipidomic profile in patients with stable HFpEF compared to comorbidity-matched controls.

Methods: Single-center and prospective cohort study including stable HFpEF patients (n = 60) and comorbidity-matched controls (n = 13). Plasma samples were analyzed using top-down shotgun lipidomics. The acquired MS shotgun signals were explored through orthogonal partial least squares discriminant analysis (OPLS-DA) to untangle and then identify lipid profiles distinctive of each group. Due to the unbalanced number of patients in both groups, which impacted the model's accuracy, specificity, sensitivity, and robustness, the SMOTE technique was previously applied. *SMOTE - Synthetic Minority Over-sampling Technique* – a kNN-nearest neighbour–based algorithm was used to generate partially synthetic data of the minority class, in this case, the controls samples. The OPLS-DA model was internally validated using bootstrapping (resampling with 15% repetitions, recomputed 300 times).

Survival Functions

Log-rank test, p=0.015
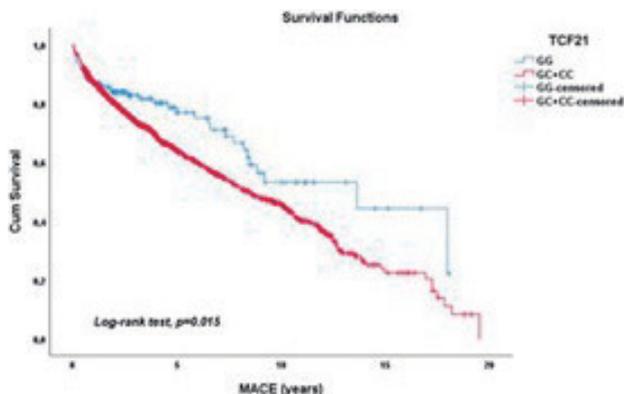
Independent risk factors for MACE occurrence (Cox regression*)

Variables	Hazard ratios (95% CI)	P-value
Multivessel disease	1.809 (1.525 – 2.146)	<0.0001
TCF21 (GC+CC)	1.408 (1.027 – 1.930)	0.033
Physical inactivity	1.402 (1.168 – 1.682)	<0.0001
Clearance<60	1.357 (1.047 – 1.760)	0.021
Diabetes	1.237 (1.046 – 1.464)	0.013

*Forward wald method (SPSS vs 25.0). Hypertension, smoking status and diabetes did not remain in the equation. MACE = Major adverse cardiovascular events; CI = Confidence interval. Statistically significant for p<0.05.
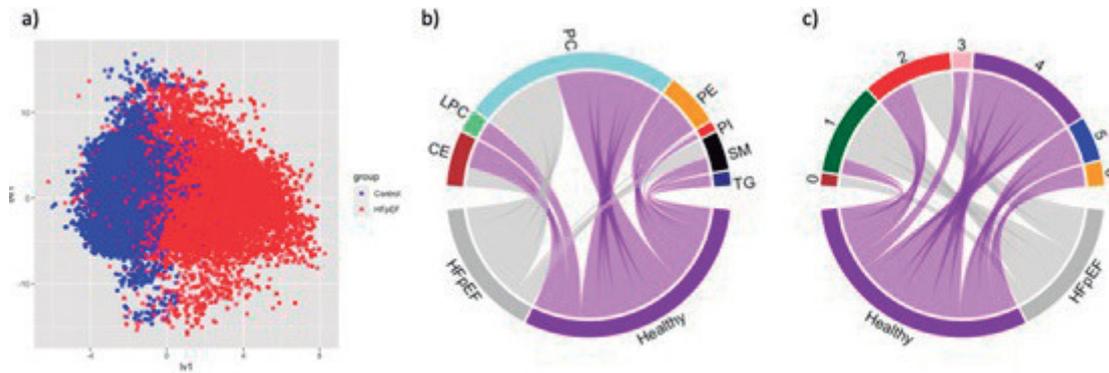
CO 82 Figure

Figure 1: a) OPLS-DA scores plot obtained after class balancing and bootstrapping for internal validation and robustness purposes. Control cases are shown in blue and HFpEF in red. b and c) representation of the 29 lipids that explain the separation between HFpEF and controls visible in a), and their characterization in terms of b) family and c) number of unsaturations, linked to the group where they are increased, i.e. grey connectors indicate lipids increased in HFpEF, and purple connectors indicate lipids increased in controls.

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Results: The resulting model showed a group separation trend, as shown in the score plot (Fig. 1a, controls shown in blue and HFpEF in red). Loading plots and Variable Importance to the Projection (VIP) revealed that 29 lipids (Fig. 1 b-c) were harbouring this separation. Out of this panel, lipids increased in HFpEF predominantly belong to the family of phosphocholines, cholesterol esters and sphingomyelins (Fig. 1b, grey connectors) and have, on average, a low number of unsaturations (Fig. 1c, grey). On the other hand, lipids increased in controls mainly belong to the triacylglycerols, phosphoinositols, phosphoethanolamines, lyso-phosphocholines, some sphingomyelins, and cholesterol esters (Fig. 1b, purple connectors) and have a higher number of unsaturations (Fig. 1c, purple). These findings are widely consistent with previous work and support that polyunsaturated lipids are inversely associated with CVD. In contrast, sphingolipids and low unsaturated PC are directly associated with CVD.

Conclusions: Despite the low and unbalanced sample numbers available, the use of appropriate data-analysis procedures, namely over-sampling and bootstrapping, enabled the development of robust multivariate models with interpretative value. These preliminary results showed that the lipidomic screening might help unravel the molecular mechanisms involved in HFpEF.

Histological analysis of the left ventricle (LV) was performed as well as quantitative RT-PCR analysis for relevant molecular markers.

Results: mRNA expression of Ucn-2 and CRHR2 was decreased in the LV of ZSF1-Obese rats compared to ZSF1-Lean and correlated with LV structure and diastolic function. In both morphometric and echocardiographic analysis we found that ZSF1-Obese rats presented significantly higher cardiac and LV weight, compared to Lean counterparts. Cardiomyocyte cross-sectional area and fibrosis were found to be increased in Obese rats, corroborating morphometric and echocardiographic measurements. Chronic Ucn-2 treatment showed beneficial effects in both cardiac hypertrophy and fibrosis. Furthermore, ZSF1-Obese rats displayed increased BNP and TNF-α LV mRNA expression, both of which were decreased with chronic treatment. Interestingly, Col3A1 LV mRNA expression was found to be decreased in ZSF1-Obese rats compared to ZSF1-Lean, and Ucn-2 chronic treatment resulted in a faint further decrease of Col3A1 expression, compared to non-treated animals.

Conclusions: This work suggests that Ucn-2/CRHR2 system is altered in experimental HFpEF and that chronic administration of Ucn-2 attenuates LV remodeling, in particular the hypertrophic changes of the cardiac muscle, a beneficial effect for patients with HFpEF.

CO 84. THERAPEUTIC EFFECT OF UROCORTIN-2 IN HEART FAILURE WITH PRESERVED EJECTION FRACTION

Inês Vasconcelos[1], Rui Adão[1], Pedro Vaz-Salvador[1], Glória Conceição[1], Daniela Miranda-Silva[1], Joana Santos-Gomes[1], Beatriz Rego[1], Carolina Maia-Rocha[1], Inês Gandra[1], Pedro Mendes-Ferreira[1], Adelino Leite-Moreira[1], Ana Patrícia Fontes-Sousa[2], Carmen Brás-Silva[1]

[1]Faculdade de Medicina da Universidade do Porto. [2]Instituto de Ciências Biomédicas Abel Salazar.

Introduction: Although initially believed to be less severe than heart failure with reduced ejection fraction (HFrEF), heart failure with preserved ejection fraction (HFpEF) prevalence has increased and accounts for as much as 50% of heart failure cases. Treatment options remain limited and aim primarily for symptom relief and improvement of patients' quality of life. Urocortin-2 (Ucn-2) belongs to the corticotrophin-releasing hormone family and has been found to have significant beneficial hemodynamic, hormonal and renoprotective effects in both animal models and humans with HFrEF.

Objectives: In this work we studied the role of the Ucn-2/CRHR2 system in the pathophysiology of HFpEF and evaluated the efficacy of Ucn-2 as a novel therapeutic strategy in this clinical syndrome.

Methods: 18-week-old male ZSF1-Lean (n = 26) and ZSF1-Obese (n = 28) rats randomly received either Ucn-2 (15 µg/kg/day, subcutaneously) or vehicle (0.9% NaCl), for 12 weeks. During the treatment period evolution of cardiac (dys)function was assessed by echocardiography. After treatment, invasive hemodynamic analysis was performed, with subsequent sample collection.

CO 85. APPLICATION OF ARTIFICIAL INTELLIGENCE IN CORONARY CT ANGIOGRAPHY: A POTENTIAL GATEKEEPER STRATEGY?

José Miguel Viegas, João Ferreira Reis, Rita Teixeira, Sofia Jacinto, Tiago Mendonça, Ruben Ramos, Hugo Marques, Luísa Figueiredo, Rui Cruz Ferreira

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

Introduction: Coronary computed tomography angiography (CCTA) analysis plays a critical role in the diagnosis of coronary artery disease (CAD), however it can be time consuming and subject to significant inter-reader variability. Medical artificial intelligence (AI) is rapidly developing and moving from the research field to daily clinical practice. AI algorithms have demonstrated high performance and computational efficiency, reducing the degree of manual input and processing time. For its widespread clinical implementation, validation of these algorithms are highly necessary.

Objectives: This study aimed to determine the impact of an AI-enabled CCTA analysis for comprehensive coronary artery evaluation in patients (P) with suspected CAD.

Methods: We analysed 100 CCTA exams from a cohort of symptomatic patients (P) with mild-to-moderately abnormal non-invasive ischemia test. Stenosis severity was assessed by level III experts (manual evaluation, MEv). A novel AI-based software tool (automatic evaluation, AEv) was also used to quantify coronary stenosis and characterize plaque phenotype. In P later referred for invasive coronary angiography (ICA), diagnostic and revascularization yields of MEv and AEv were compared.
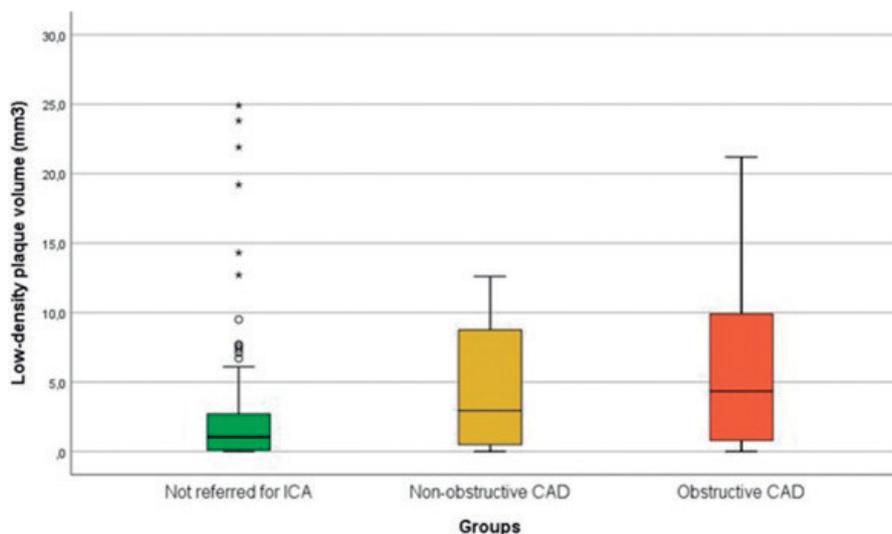
CO 85 Figure

Results: 100P, 52% male, mean age 68 ± 10 years. One-third had persistent typical angina, of which 67% had a Canadian Cardiovascular Society angina grade ≥ 2. Overall prevalence of obstructive CAD determined by MEv and AEv was 25% and 21%, respectively, with a significant association between both assessments (p < 0.001). Framingham risk score was significantly higher in P with obstructive stenosis (12 (22) *vs*. 24 (15)%, p = 0.042). Based upon MEv, referring physician decided to proceed to ICA in 22P (21P with significant and 1P with minimal non-obstructive stenosis). For those undergoing ICA, 13P also had obstructive CAD established by AEv. Diagnostic yields for MEv and AEv-guided ICA was 82 and 60%, and revascularization yields 73 and 60%, respectively. AEv atherosclerosis quantification revealed significant differences between P who did not undergo ICA, P referred for ICA without significant stenosis and P with obstructive CAD on ICA: median total plaque volume (126 *vs*. 312 *vs*. 518 mm³, p < 0.001), calcified plaque volume (23 *vs*. 197 *vs*. 222 mm³, p < 0.001), non-calcified plaque volume (71 *vs*. 112 *vs*. 252 mm³, p < 0.001) and low-density plaque volume (1.1 *vs*. 3.0 *vs*. 4.4 mm³, p = 0.042) (Fig.).

Conclusions: A diagnostic strategy using AI-based analysis of coronary stenosis severity on CCTA had a similar performance compared to MEv. In addition, risk prediction can be enhanced by AI assessment of plaque composition. This study is an example of the potential role of AI in the CCTA workflow. Further validation of these algorithms are needed.

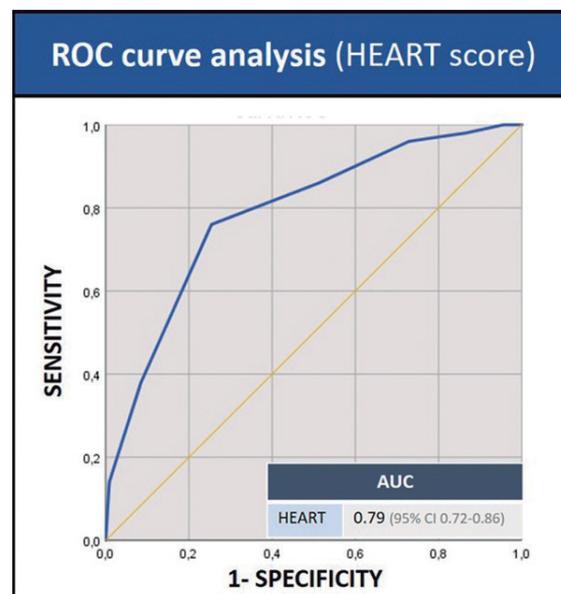## Sábado, 23 Abril de 2022 | 13:30-14:30

Sala Vega | Comunicações Orais (Sessão 18) - DAC e Cuidados Intensivos 4 - Risco e Prognóstico

CO 86. CORRELATION BETWEEN NSTE-ACS RISK SCORES WITH SYNTAX: CAN WE PREDICT CORONARY LESION COMPLEXITY BEFORE ANGIOGRAPHY?

Sérgio Maltês, Mariana Paiva, Gustavo Sá Mendes, Sérgio Madeira, Rui Campante Teles, Manuel Almeida, Jorge Ferreira, Miguel Mendes

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

Introduction and objectives: Standard single antiplatelet regimen (SAPT) is currently recommended before invasive risk stratification in non-ST elevation acute coronary syndromes (NSTE-ACS). However, there are subsets in whom dual antiplatelet therapy (DAPT) may be more protective according to the coronary anatomy and revascularization strategy. We aimed to identify pre-procedural predictors of coronary artery complexity that may be helpful in selecting an individualized antiplatelet regimen.

Methods: Retrospective single-center study including patients with NSTE-ACS performing coronary angiography between January 2020 and July 2021. Clinical variables and classic NSTE-ACS risk scores (TIMI, GRACE and HEART) were captured and SYNTAX 1 score was calculated. Patients were divided into low (0-22), moderate (23-32) and high (≥ 33) SYNTAX score. Multivariate logistic regression analysis was performed to determine predictors of anatomical complexity (defined as significant left main disease [stenosis ≥ 50%] or SYNTAX ≥ 33).

Results: A total of 448 patients were included (mean age 67 ± 13 years; 74% males; 85% with NSTE-myocardial infarction). Overall, 350 (78%), 63 (14%) and 35 (8%) patients had a low, moderate or high-SYNTAX score, respectively. Thirty-one (7%) patients had significant left main disease. At multivariate analysis (adjusted for age, diabetes, renal function, GRACE and TIMI scores), the HEART score (odds ratio 2.3, 95% confidence interval 1.5-3.3, p < 0.001) predicted a high coronary anatomical complexity. When performing ROC curve analysis, the HEART score had a significant discriminative ability in identifying those with complex coronary anatomy (area under the curve

0.79, 95%CI 0.72-0.86, p < 0.001) (Fig.) – a score > 7 showed a sensitivity of 76% and specificity of 75% in identifying such patients.

Conclusions: In this cohort of NSTE-ACS patients, the HEART score was an independent predictors of complex coronary anatomies. These results suggest that those with high (> 7) HEART score benefit from SAPT as opposed to DAPT, given the high probability of complex lesions amenable to CABG.

CO 87. NEW-ONSET OF ATRIAL FIBRILLATION IN ST-ELEVATION MYOCARDIAL INFARCTION

Hélder Santos, Mariana Santos, Sofia B. Paula, Inês Almeida, Samuel Almeida, Lurdes Almeida

Centro Hospitalar Barreiro/Montijo, EPE/Hospital do Montijo.

Introduction: ST-Elevation Myocardial Infarction (STEMI) is a major health problem, that without an emergency reperfusion therapy is associated with a worse prognosis. Nevertheless, in some cases, this pathology can be accompanied by other diseases, for example, atrial fibrillation (AF). AF presence at admission can be interpreted as an early and hemodynamic response to STEMI, yet after 48 hours its significance is not completed clarified.

Objectives: Evaluate differences between early and late new-onset AF in STEMI patients.

Methods: Multicenter retrospective study, based on the Portuguese Registry of ACS between 1/10/2010-4/09/2019. New-onset AF was defined as the first episode of AF in patients without a history of AF and if occurred during the hospitalization for ACS. Patients were divided into two groups: A) early new onset of AF (first 48h after the initial electrocardiogram); B) late new onset of AF, more than 48 hours after the electrocardiogram.

Results: A total of 29,851 patients was analyze and 501 patients presented new-onset of AF during the hospitalization for STEMI, 332 in group A (66.3%) and 169 in group B (33.7%). Both groups were similar regarding gender, body mass index, arterial hypertension, dyslipidemia, diabetes mellitus, coronary artery disease, stroke history, peripheral artery disease, chronic kidney disease, Killip-Kimball class > I, creatinine at admission, glycemia levels at admission, HbA1c, platelet count, cholesterol levels, re-infarction as complication, STEMI mechanical complication, stroke as a STEMI complication and hospitalization death. Group A was directly admitted more frequent in the Cat lab (36.6 *vs.* 26.2%, p = 0.020), had more smokers (29.3 *vs.* 18.0%, p = 0.006), hemoglobin at admission (13.7 ± 1.8 *vs.* 13.3 ± 2.2, p = 0.016), left ventricular ejection fraction (46 ± 13 *vs.* 43 ± 13, p = 0.016), heart failure complication (30.3 *vs.* 17.3%, p = 0.002), cardiogenic shock complication (15.0 *vs.* 6.6%, p = 0.007), atrioventricular block complication (7.9 *vs.* 1.8%, p = 0.006), sustained ventricular tachycardia (10.9 *vs.* 4.7%, p = 0.022) and cardiac arrest (12.7 *vs.* 2.4%, p < 0.001). On the other hand,

group B was elderly (70 ± 14 *vs.* 75 ± 11, p < 0.001), was higher time from the first symptoms until medical assistance (p < 0.001) and brain natriuretic peptide (720 ± 1,212 *vs.* 1,051 ± 1,239, p = 0.006). Curiously, late AF group had higher rates of amiodarone prescription (22.8 *vs.* 38.3%, p < 0.001), and the early group had more frequent beta blocker prescription (73.7 *vs.* 63.4%, p < 0.001).

Conclusions: Late new-onset of AF in STEMI patients was elderly, had higher time since the first symptom until medical assistance and had higher levels of brain natriuretic peptide. On the other hand, early new-onset of AF in STEMI had higher rates of major cardiac adverse events.

CO 88. FUNCTIONAL IRON DEFICIENCY IN ACUTE CORONARY SYNDROMES: PREVALENCE AND PROGNOSTIC IMPACT

Ana Fátima Esteves, Sara Gonçalves, Tatiana Duarte, José Maria Farinha, António Pinheiro, Joana Ferreira, Rui Coelho, Jéni Quintal, Nuno Fonseca, Rui Caria

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

Introduction: Functional iron deficiency (ID) is a well-known prognostic marker in heart failure (HF), independent of the presence of anemia. However, its impact in acute coronary syndromes (ACS) is not well established. Recent studies show that ID could have prognostic value in this setting but don't discriminate between absolute and functional ID.

Objectives: To evaluate the prevalence of functional ID in patients with ACS and its prognostic impact during follow-up.

Methods: Retrospective analysis of consecutive patients admitted with ACS from January to December 2019. The population was evaluated according to basal characteristics. We divided the population in two groups: with or without functional ID (defined as transferrin saturation < 20% and ferritin between 100 and 299ng/mL), which were compared according to demographic and index-hospitalization variables, co-morbidities, analytical and echocardiographic data and adverse events. We determined the predictive value of functional ID on occurrence of HF, urgent care admissions, HF and total re-hospitalizations, reinfarction, hemorrhage and death.

Results: We included 297 patients, mean age 65.67 (± 13.5) years, 72% male. From these, 167 (56%) presented with ST-segment elevation myocardial infarction (MI), 48 (16%) with a Killip class equal or above 2. Previously known HF was present in 4 (1.3%) patients; on admission, 110 (37%) had a left ventricle ejection fraction (LVEF) < 50%. Functional ID was identified in 70 (24%), absolute ID in 69 (23%) and anemia in 92 (31%). Of note, 70% patients with functional ID had no anemia. During a mean follow-up of 25 (± 9.2) months, 61 (21%) patients were hospitalized (7% with HF) and 52 (18%) died. There were no significant differences between the two groups in terms

	Univariate analysis OR (95% CI), p-value	Multivariate analysis OR (95% CI), p-value
Functional iron deficiency	2.828 (1.117-7.159), 0.028	3.019 (1.015-8.981), 0.047
Age in years	1.095 (1.047-1.146), <0.001	1.081 (1.026-1.139), 0.004
Anemia	5.162 (1.977-13.477), 0.001	2.998 (1.018-8.832), 0.046
LVEF	0.948 (0.917-0.981), 0.002	0.955 (0.916-0.996), 0.030
De novo AF	3.950 (1.301-1.989), 0.015	1.968 (0.523-7.403), 0.317
AKI	3.673 (1.455-9.270), 0.006	0.948 (0.282-3.270), 0.948
Infection treated with antibiotics	3.617 (1.390-9.408), 0.008	1.068 (0.335-3.403), 0.911

Table: Predictors of HF hospitalizations

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of basal characteristics, LVEF, NT-proBNP levels or Killip class. In univariate analysis, patients with functional ID had a significantly higher rate of HF urgent care admissions and hospitalizations. In multivariate analysis, the presence of functional ID was an independent predictor of HF hospitalizations during follow-up with OR 3.019, 95%CI 1.015-8.981, p-value 0.047 (Table). There was no independent impact of functional ID regarding other adverse events.

Conclusions: In this population of patients with ACS, the presence of functional ID is associated with adverse outcomes, with a higher risk of HF hospitalizations. A larger number of patients is required for more definite conclusions.

CO 89. WORKLOAD-INDEXED BLOOD PRESSURE RESPONSE PREDICTS CARDIOVASCULAR EVENTS IN CORONARY ARTERY DISEASE

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Introduction: Abnormal blood arterial pressure response to exercise (BPR) is a cardiovascular (CV) risk factor (CVRF). The concept of pathological BPR, believed to be an excessive raise or decrease, has been challenged. The workload-indexed blood pressure response (WBPR) recently emerged in an attempt to normalize hypertensive responses to exercise. However, it remains to be explored its value in high-risk CV subjects.

Methods: A cohort of 318 patients with known coronary artery disease (CAD), who underwent Bruce protocol treadmill testing between 2009-2010, were retrospectively followed to 11/2021 (9.9 ± 2.3 years) to assess the predictive value of WBPR for the occurrence of death and CV events. The WBPR is the ratio between systolic blood pressure variation from rest to peak exercise (?SBP) and metabolic equivalent of task (MET-1). High and low ?SBP/MET groups were created based on median value for this sample (5.2 mmHg/MET). Data presented: mean ± standard deviation; 95% confidence interval (CI) for hazard ratios (HR); significance between groups p < 0.05.

Results: Low *vs.* high ?SBP/MET groups were similar at baseline for sex (88% male, p = 0.67), hypertension (63%, p = 0.18), diabetes (32%, p = 0.34); dyslipidemia (72%, p = 0.62), myocardial infarction (75%, p = 0.39) and heart failure (HF) (9.9%, p = 0.07), with exception for overweight/obesity (90 *vs.* 82%, p = 0.009) and age (57 ± 11 *vs.* 61 ± 8 years, p = 0.009) that were higher in the ?SBP/MET^high. No significant differences were detected between groups for medication at baseline, including anti-hypertensive/-thrombotic/-ischemic drugs. In the follow-up period occurred 43 deaths (12 CV deaths), 58 reinfarctions, 94 worsening/*de novo* HF and 29 strokes. A non-linear J-shaped relationship was observed between ?SBP/MET and most events. In survival analyses using Cox regression, ?SBP/MET^high was associated with all death (HR 2.0 (CI 1.0-3.9, p = 0.042), reinfarction (HR 2.3 (CI 1.2-4.1, p = 0.008), and worsening/*de novo* HF (HR 1.7 (CI 1.0-2.9, p = 0.043) after adjusting for age, CVRFs and medication. In receiver operating characteristic curves, adding ?SBP/MET to a model with other cardiac stress variables (double product, ST-T changes, symptoms, and test positivity) significantly improved the power to predict all death, with an area under curve of 0.73 (CI 0.66-0.80, p = 0.037).

Conclusions: Data shows, for the first time, that ?SBP/MET is a powerful independent predictor of future cardiovascular events and deaths in the high-risk CAD population.

CO 90. LONG-TERM PROGNOSIS OF MYOCARDIAL INFARCTION WITH NON-OBSTRUCTIVE CORONARY ARTERIES *VERSUS* MYOCARDIAL INFARCTION WITH OBSTRUCTIVE CORONARY ARTERY DISEASE

Eric Alberto Monteiro[1], José Barbosa[2], Joana Guimarães[1], Diogo Fernandes[1], Gonçalo Costa[1], Rita Gomes[1], João Rosa[1], Gustavo Campos[1], Sofia Martinho[1], Carolina Saleiro[1], José Almeida[1], Diana Campos[1], João Gameiro[1], André Azul[1], José Sousa[1], Cátia Ferreira[1], Rui Baptista[1], Pedro Monteiro[1], Sílvia Monteiro[1], Francisco Gonçalves[1], Marta Madeira[1], Lino Gonçalves[1]

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Introduction: The long-term survival rates of myocardial infarction with non-obstructive coronary arteries (MINOCA) patients is lower than in the general population. Nevertheless, there are conflicting results regarding the prognosis of MINOCA patients in comparison to myocardial infarction with obstructive coronary artery disease (MI-CAD) patients. The aim of this study was to assess the long-term all-cause mortality of MINOCA patients and compare it to MI-CAD patients.

Methods: Retrospective analysis of 2443 consecutively admitted patients for acute myocardial infarction (AMI), in a single coronary intensive care unit. Only patients with 5 years of follow-up and those who died before the 5-year mark were considered. Patients were divided into two groups according to the presence or absence of obstructive coronary artery disease on angiography (≥ 50% stenosis). Demographic characteristics, symptoms at presentation, past medical history, laboratory characteristics and medication at discharge were compared using the Mann-Whitney U or χ^2 test (according to variable type) to ensure comparability between groups. Five-year all-cause mortality was the target endpoint. Five-year survival was modelled through the Cox proportional hazard regression model. The variable of interest (MINOCA *vs.* MI-CAD) and possible confounders that displayed statistically significant differences in the initial demographic analysis were included in univariable Cox regressions, and those with statistically significant associations were included in a multivariable model. Those that displayed non-significant associations in the multivariable model

	MINOCA n=428	AMI-CAD n=2015	P value
Age - years	64 (IQR 55-72)	66 (IQR 56-74)	<0.001
Males - %	55	76.7	<0.001
BMI - kg/m²	27.3 (IQR 24.6-30.1)	27.3 (IQR 24.9-29.6)	0.381
Hypertension - %	76.5	76	0.759
Dyslipidemia - %	77.8	80	0.242
Current smoking - %	12.6	20.6	<0.001
Diabetes mellitus - %	37.4	49.7	<0.001
Previous history of angina - %	59.3	63.2	0.06
Previous history of MI - %	16.2	23.8	<0.001
Killip - %			<0.001
1	94.8	89.5	
2	3.8	7.3	
3	1	1.7	
4	0.4	1.5	
Troponin I - ng/mL	0.2 (IQR 0.04-3.32)	1.81 (IQR 0.16-13.81)	<0.001
Creatinine - mg/dL	0.85 (IQR 0.73-1.0)	0.9 (IQR 0.8-1.1)	<0.001
LDL-C - mg/dL	121.5 (IQR 97.5-146)	127 (IQR 100-154)	0.019
Haemoglobin - g/dL	13.6 (IQR 12.5-14.6)	13.75 (IQR 12.5-14.9)	0.115
LVEF - %	58 (IQR 50-61)	52 (IQR 44-60)	<0.001
BB at discharge - %	74.2	87.3	<0.001
RAS blocker at discharge - %	88.4	88.3	0.929
Aspirin at discharge - %	76.5	88.3	<0.001
Statin at discharge - %	98.2	98.7	0.258

Table 1: Comparison between groups.
MINOCA = myocardial infarction with non-obstructive coronary arteries; AMI-CAD = myocardial infarction with obstructive coronary artery disease; BMI = body mass index; MI = myocardial infarction; LDL-C = low density lipoprotein cholesterol; LVEF = left ventricular ejection fraction; BB = beta-blocker; RAS = renin-angiotensin system.
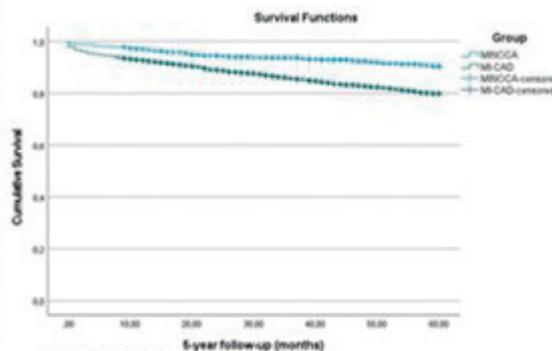

Figure 1: Kaplan-Meier survival curves.
MINOCA = myocardial infarction with non-obstructive coronary arteries; MI-CAD = myocardial infarction with obstructive coronary artery disease

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were subsequently removed until we were left with significant associations only, giving us an adjusted hazard ratio.

Results: Comparison between groups is presented in table 1. MINOCA patients were younger and more often women. They were less likely to have smoking habits, diabetes, or a previous history of AMI. They had a lower Killip class, as well as lower troponin I, serum creatinine and low-density lipoprotein cholesterol at admission. On the other hand, they had higher left ventricular ejection fractions. They were also less likely to have beta-blockers or aspirin prescribed at discharge. All-cause mortality at 5 years was 13.1% among MINOCA patients and 28.3% among MI-CAD patients (Kaplan-Meier survival curves in the figure), with an unadjusted hazard ratio (HR) of 0.421 (95%CI 0.322-0.550), p < 0.001. Adjusting for known confounders, the HR was 0.461 (95%CI 0.261-0.816), p = 0.008.

Conclusions: Compared with MI-CAD patients, those with MINOCA were slightly younger and had fewer comorbidities. In spite of having a worse long-term prognosis when compared to the general population, MINOCA patients have a significantly higher 5-year survival rate than MI-CAD patients, even after adjustment of confounding factors.

Sábado, 23 Abril de 2022 | 14:30-16:00

Sala Vega | Comunicações Orais (Sessão 19) - Prémio Jovem Investigador - Investigação Clínica

CO 91. SEGMENTAL ANALYSIS OF MICROVASCULAR DYSFUNCTION AND TISSUE CHARACTERIZATION IN HYPERTROPHIC CARDIOMYOPATHY BY MAGNETIC RESONANCE IMAGING

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Introduction: While left ventricular hypertrophy (LVH) and myocardial fibrosis are frequently evaluated in hypertrophic cardiomyopathy (HCM), microvascular dysfunction is often overlooked. The aim of this study was to assess the association between wall thickness, microvascular dysfunction and tissue characteristics in HCM patients (P), comparing individual myocardial segments.

Methods: Prospective evaluation of HCM P (P with "end-stage" HCM, prior septal reduction therapy or epicardial coronary artery disease were excluded). All underwent a cardiac magnetic resonance (CMR) protocol (1.5-T), from which the following parameters were analysed: maximal LV wall thickness (MLVWT), T1 and T2 mapping, extracellular volume (ECV), late gadolinium enhancement (LGE) and stress perfusion. Results were stratified according to the 16 American Heart Association segments. Multivariate regression analyses for perfusion defects and tissue characteristics were performed.

Results: 75 P (total of 1,200 myocardial segments analysed), 63% male, mean age 55 ± 15 years, MLVWT of 20 ± 4.5 mm (61% asymmetric septal LVH, 29% apical LVH and 8% concentric LVH). 28% presented LV outflow tract obstruction. Among the 424 segments (35.3%) with a perfusion defect, 286 (23.8%) had a defect only in the endocardial layer and 138 (11.5%) in both endocardial and epicardial layers with defects more often detected in hypertrophied segments. This association was verified in segments with MLVWT 12-14 mm and MLVWT ≥ 15 mm (OR 7.83, 95%CI 5.75-10.67, p < 0.001) (Table 1). Among the 660 segments with normal MLVWT (≤ 11 mm), 123 (19%) presented perfusion defects. A perfusion defect was more frequent in segments of obstructive HCM P (OR 1.48, 95%CI 1.13-1.92, p = 0.004). Microvascular dysfunction was associated with changes in tissue characteristics. For the same thickness, segments with perfusion defects had a higher T1 mapping (β-estimate 37.71, 95%CI 31.20-44.21, p < 0.001) and T2 mapping values than those without.

Furthermore, regardless of MLVWT, segments with perfusion defects had LGE more often (OR 4.16, 95%CI 3.19-5.41, p < 0.001) and a higher ECV. On the other hand, among the 424 segments with a perfusion defect, 115 (27%) did not present LGE. MLVWT was associated with tissue characteristics. Comparing to non-hypertrophied segments, T1 mapping was higher in segments with MLVWT 12-14 mm and with ≥ 15 mm (β-estimate 37.71, 95%CI 31.2-44.21, p < 0.001). Segments with MLVWT ≥ 15 mm showed a significantly superior ECV comparing to non-hypertrophied segments. LGE was more frequent in the more hypertrophied segments: MLVWT 12-14mm and ≥ 15 mm (OR 9.02, 95%CI 6.42-12.67, p < 0.001) (Table 2).

Table 1. Multivariable logistic and linear regression for perfusion defect and tissue characteristics

Perfusion defect			
Model	Odds ratio estimate	95% confidence interval	p-value
Thickness 12-14mm	3.54	2.50 to 5.01	<0.001
Thickness ≥15 mm	7.83	5.75 to 10.67	<0.001
Obstructive HCM	1.48	1.13 to 1.92	0.004
Native T1 mapping			
Model	β-estimate	95% confidence interval	p-value
Thickness 12-14mm	15.32	7.82 to 22.81	<0.001
Thickness ≥15 mm	37.71	31.20 to 44.21	<0.001
Perfusion defect	30.90	25.18 to 36.62	<0.001
LGE	31.23	25.76 to 36.70	<0.001
Diabetes	11.02	3.24 to 18.79	0.006
Male gender	-15.2	-9.34 to -21.04	<0.001
Native T2 mapping			
Model	β-estimate	95% confidence interval	p-value
Perfusion defect	0.72	0.31 to 1.23	0.001
LGE	1.05	0.66 to 1.44	<0.001
Obstructive HCM	1.23	0.79 to 1.66	<0.001
Male gender	-0.61	-1.10 to -0.20	0.004
Late gadolinium enhancement			
Model	Odds Ratio estimate	95% confidence interval	p-value
Thickness 12-14mm	2.66	1.92 to 3.68	<0.001
Thickness ≥15 mm	9.02	6.42 to 12.67	<0.001
Perfusion defect	4.16	3.19 to 5.41	<0.001
Obstructive HCM	0.52	0.40 to 0.68	<0.001
Extracellular volume			
Model	β-estimate	95% confidence interval	p-value
Thickness ≥15 mm	2.51	1.79 to 3.24	<0.001
Perfusion defect	1.57	0.92 to 2.22	<0.001
LGE	3.00	2.40 to 3.60	<0.001
Diabetes	2.60	1.70 to 3.40	<0.001

Reference categories: Wall thickness ≤11mm, non-obstructive HCM, absence of perfusion defect. p-values were obtained by mixed effects regression models.

HCM: Hypertrophic cardiomyopathy, LGE: Late gadolinium enhancement

Conclusions: Microvascular dysfunction is more prevalent in obstructive HCM, particularly in the more hypertrophied segments. The presence of microvascular dysfunction is associated with diffuse tissue abnormalities and replacement fibrosis.

CO 92. TRANSCATHETER AORTIC VALVE IMPLANTATION OUTCOMES IN PATIENTS WITH LOW FLOW – LOW GRADIENT AORTIC STENOSIS

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Introduction: There are limited data about the outcomes of transcatheter aortic valve implantation (TAVI) in patients with low flow – low gradient (LF-LG) aortic stenosis (AS), but some studies suggest that these patients may have worse results.

Objectives: To compare outcomes between LF-LG AS and high gradient AS patients submitted to TAVI.

Methods: Retrospective analysis of consecutive patients (P) submitted to TAVI between 2009 and 2020 in a tertiary center. Baseline characteristics and outcomes after the procedure were collected. LF-LG AS was considered in patients with mean gradient < 40 mmHg, valve area < 1 mm², stroke volume index < 35 mL/m² and at least one other criteria of contractile reserve confirmed by stress echocardiography, with elevation of mean gradient to > 40 mmHg, or high aortic calcium score in angio-CT.
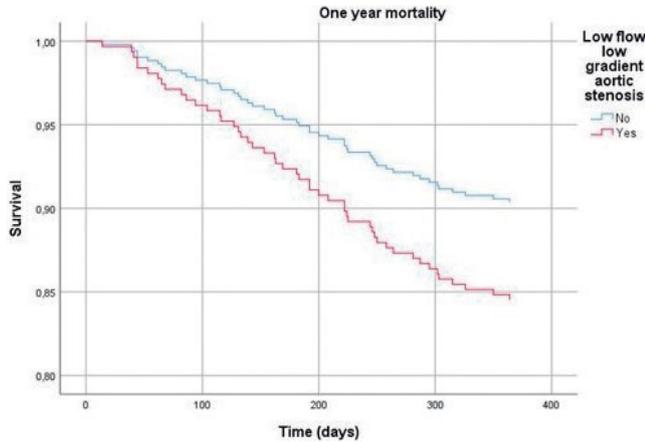
Results: A total of 517P (56.3% female) were included, with a mean age of 82 ± 6years. Patients with LF-LG AS (99P, 19.1%) had worse baseline characteristics, with higher STS score (7.4 *vs.* 5.6%, p < 0.0001), and natriuretic peptide B (9,585 *vs.* 2,903 pg/mL, p = 0.001), more frequent left ventricular ejection fraction (LVEF) < 40% (27.3 *vs.* 8.8%, p < 0.0001), more coronary artery disease (54.5 *vs.* 37.1%, p = 0.002), including previous myocardial infarction (25.3 *vs.* 14.1%, p = 0.008) and coronary artery bypass graft (27.3 *vs.* 12.3%, p < 0.0001), more frequent previous valvular surgery (12.1 *vs.* 5.5%, p = 0.02) and more atrial fibrillation (44.4 *vs.* 32.2%, p = 0.022) and pacemaker implantation (13.1 *vs.* 7.1%, p = 0.049). In univariable analysis, LF-LG AS was associated with worse 30-day, 1 year and long-term functional class (NYHA 3-4 - 11.5 *vs.* 2.9%, p = 0.001; 16.5 *vs.* 3.6% p < 0.0001 and 18.7 *vs.* 5.8%, p < 0.0001, respectively), 1 year mortality (17.2 *vs.* 9.8%, p = 0.045) and 1 year and long-term heart failure hospitalizations (16.3 *vs.* 3%, p < 0.0001 and 22.8 *vs.* 6.0%, p < 0.0001). When adjusted to the differences in baseline characteristics, in a multivariable analysis, LF-LG AS was still associated with worse functional class at 30 days (p = 0.011), 1 year (p = 0.021) and long-term (p = 0.021) and with heart failure hospitalizations at 1 year and long-term (p = 0.001 for both). In a sub-analysis considering only the patients with LF-LG AS, those with LVEF < 40% have the worst outcomes, with more global, intra-hospital and 30 days mortality (48.1 *vs.* 18.1%, p = 0.002; 14.8 *vs.* 1.4%, p = 0.019; 18.5 *vs.* 1.4%, p = 0.005), global and 30 days cardiovascular mortality (25.9 *vs.* 5.6%, p = 0.004 and 18.5 *vs.* 1.4%, p = 0.005), worse 1 year functional class (31.8 *vs.* 11.6%, p = 0.026) and more long-term heart failure hospitalizations (40.9 *vs.* 17.1%, p = 0.002).

Conclusions: Patients with LF-LG AS have worse short and long-term outcomes, even when adjusted for baseline characteristics differences. The sub-group of patients with LVEF < 40% have the worst global outcomes.

CO 93. IMPLICATIONS OF THE NORTH AMERICAN 2021 CHEST PAIN GUIDELINES IN THE DIAGNOSTIC APPROACH TO PATIENTS WITH STABLE CHEST PAIN AND LOW PRETEST PROBABILITY OF OBSTRUCTIVE CORONARY ARTERY DISEASE

Pedro M. Lopes[1], Francisco Albuquerque[1], Pedro de Araújo Gonçalves[2], João Presume[1], Pedro Freitas[1], Sara Guerreiro[1], João Abecasis[1], Ana Coutinho Santos[1], Carla Saraiva[1], Miguel Mendes[1], Hugo Marques[2], António M. Ferreira[1]

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Introduction: The North American 2021 Chest Pain Guidelines recommend not testing stable patients with low pretest likelihood of obstructive coronary artery disease (CAD), defined as pretest probability < 15% using contemporary models (Class I recommendation). In selected cases among this subset of patients, coronary artery calcium (CAC) score is considered a "reasonable first-line test" (Class IIa). Despite some supporting evidence, the clinical implications of a widespread adoption of these recommendations remain unclear. The purpose of this study was to assess the results of three different testing strategies for patients with pretest probability < 15%: A) defer testing; B) perform CAC score and withhold further testing if = 0, and proceed to coronary CT angiography (CCTA) if > 0; C) perform CCTA in all.

Methods: We conducted a two-center cross-sectional study assessing symptomatic patients with suspected CAD who underwent CAC score and CCTA. Patients with known CAD, suspected acute coronary syndrome, or symptoms other than chest pain or dyspnea were excluded. Pretest probability of obstructive CAD was calculated based on age, sex and symptom typicality. Obstructive CAD was defined as any luminal stenosis ≥ 50% on CCTA.

Results: A total of 2,259 patients were screened, of which 1,385 (61.3%) had pretest probability < 15% and were included in the analysis (mean age 57 ± 11 years, 79% women). Symptom characteristics were: 48% non-anginal chest
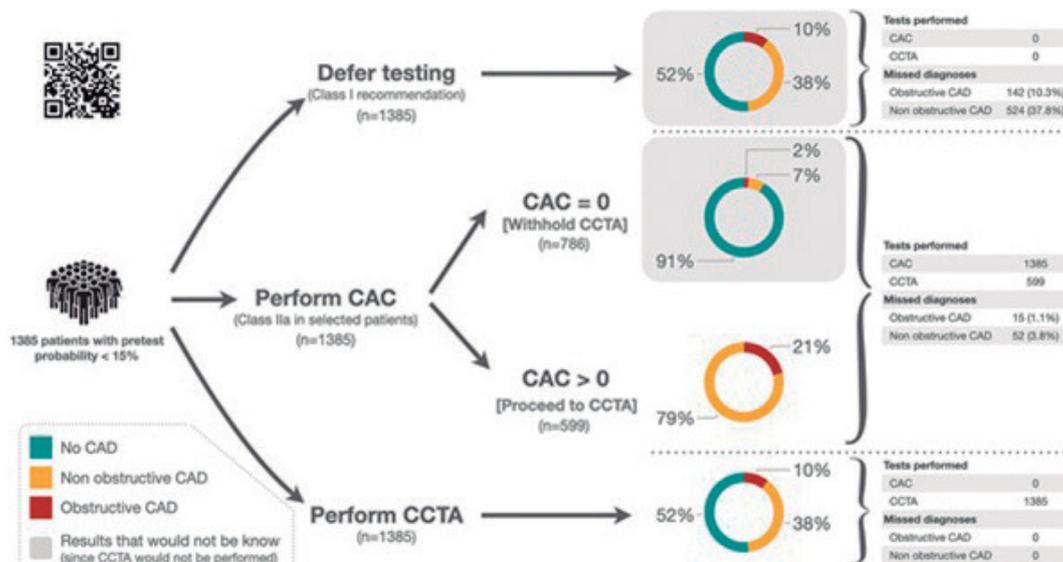
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pain, 26% atypical angina, 21% dyspnea, and 5% typical chest pain. Overall, the prevalence of obstructive CAD was 10.3% (n = 142). In the 786 patients (56.6%) with a CAC score of 0, 8.5% (n = 67) had some degree of CAD [1.9% (n = 15) obstructive, and 6.6% (n = 52) nonobstructive]. Among those with CAC > 0 (n = 599), 21.2% (n = 127) had obstructive CAD. The results that would be reached with each of the 3 diagnostic strategies are presented in the figure. The number of patients needed to scan with strategy B (CAC as gatekeeper) *vs.* A (no testing) to identify one patient with obstructive CAD was 11, whereas the number needed to scan with strategy C (CCTA for all) *vs.* strategy B was 91.

Conclusions: Not testing patients with suspected CAD and pretest likelihood < 15% would lead to missing obstructive CAD in 1 out of 10 patients. Using CAC as a gatekeeper in this subgroup would decrease the use of CCTA by more than 50%, at the cost of missing obstructive CAD in 1 out of 100 patients. These findings may be used to inform decisions on testing, which will ultimately depend on how much diagnostic uncertainty and missed diagnoses patients and their physicians are willing to accept.

CO 94. FUNCTIONAL MITRAL REGURGITATION: KEEPING COHERENCE WITH THE ASE GRADING GUIDELINES, WHICH PROPORTIONALITY CONCEPT BEST PREDICTS PROGNOSIS IN THE REAL WORLD?

João Presume, Pedro Lopes, Pedro Freitas, Francisco Albuquerque, Carla Reis, Eduarda Horta, Sara Guerreiro, Liliana Marta, Marisa Trabulo, João Abecasis, Maria João Andrade, Miguel Mendes, Regina Ribeiras

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

Introduction: While the proportionality concept of functional mitral regurgitation (fMR) has been proposed as a potential explanation for the different results of two landmark mitral edge-to-edge trials, it still remains to be established which is the best way to assess it. The aim of this study was to evaluate the prognostic value of two proportionality concepts and assess their ability to improve MR stratification proposed by the American Society of Echocardiography (ASE).

Methods: We conducted a single-centre retrospective analysis in patients with reduced LVEF (< 50%) and at least mild fMR under optimal medical therapy. Proportionality status was calculated using the formulas proposed by: a) Grayburn, *et al.* – disproportionate fMR defined as (*EROA/LVEDV*) ≥ 0.15; b) Lopes, *et al.* – disproportionate fMR is present when measured EROA > individualized EROA cut-off (determined as: (50% × LVEF × LVEDV)/ Mitral VTI). The primary endpoint was all-cause mortality.

Results: A total of 572 patients (mean age 69 ± 12 years; 76% male) were included. Mean LVEF was 33 ± 9%, with a median LVEDV of 174 mL [136;220], and a median EROA of 14 mm^2 [8;22]. During a mean follow-up of 4.1 ± 2.7 years, there were 254 (44%) deaths. FMR (ASE guidelines) was classified as grade I in 418 (73%) patients, grade II in 109 (19%), grade III in 33 (6%) and grade IV in 12 (2%). Considerable disagreement (p < 0.001) exists between the two formulas: 46 (48%) of the 96 patients with disproportionate fMR by Lopes' formula were proportionate by Grayburn's; and 12 (19%) of the 62 patients with disproportionate fMR by Grayburn's were proportionate by Lopes'. Two different models were created to test each formula's prognostic impact. Each model was adjusted for multiple variables with prognostic value. While Lopes' formula maintained independent prognostic impact (aHR 1.5 [95%CI 1.07-2.1], p = 0.018), Grayburn's formula was not associated with all-cause mortality in multivariate analysis (aHR 1.0 [95%CI 0.67-1.5], p = 0.998). The distribution and mortality of ASE fMR classification was
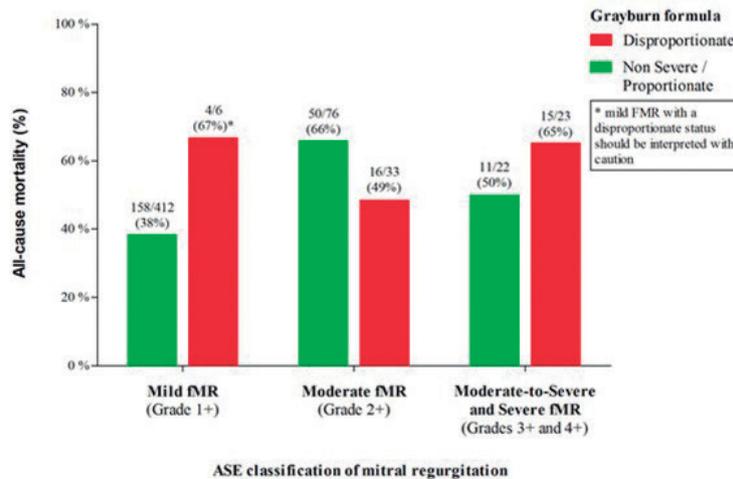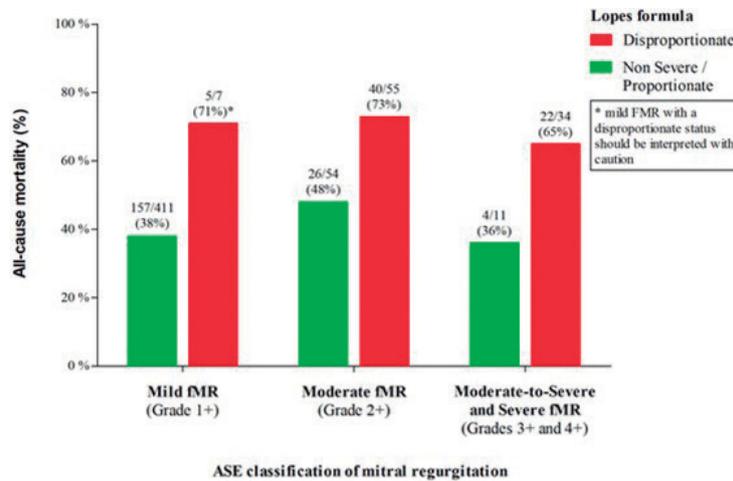
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restratified according to each disproportionate formula (Fig.). Only Lopes' formula was able to distinguish lower and higher risk subsets of patients.

Conclusions: While two formulas exist to define fMR proportionality status, only the formula integrating LVEF at its core (Lopes's formula) maintained independent prognostic impact and was able to improve risk stratification of fMR severity according to the ASE.

CO 95. DEVELOPMENT OF DEEP LEARNING SEGMENTATION MODELS FOR CORONARY X-RAY ANGIOGRAPHY: PERFORMANCE ASSESSMENT BY NEW CLINICAL CRITERIA SCORE AND COMPARISON WITH HUMAN PERFORMANCE

Beatriz Silva[1], Miguel Nobre Menezes[1], João Lourenço[2], Tiago Rodrigues[1], Ana Rita Francisco[1], Pedro Carrilho Ferreira[1], Arlindo Oliveira[2], Fausto J. Pinto[1]

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Introduction: Artificial intelligence applied to invasive coronary angiography is underexplored. Few publications explored automatic invasive coronary angiography segmentation, arguably the first step for future clinical application. None have provided an appreciation of the results using clinical experts' criteria. The purpose of this study was to develop artificial intelligence models for invasive coronary angiography segmentation and assess the results with a set of criteria clinically defined by a panel of Interventional Cardiologists.

Methods: Patients undergoing invasive coronary angiography and physiology assessment were randomly selected. Per incidence, an ideal frame was segmented by trained physicians, forming a baseline human dataset. A baseline artificial intelligence model was then trained. An enhanced human segmentation was created combining the best of baseline human model, baseline artificial intelligence model and additional human segmentation as needed. An enhanced artificial intelligence model was trained with the enhanced human model dataset (Figs. 1A and 1B). Results were assessed by three Interventional Cardiologists with eleven criteria, combined into a Global Segmentation Score (GSS: 0-100 points), where each criteria's relevance was weighted (Fig. 1C).

Results: We included 416 images from 69 patients. Global Segmentation Score for baseline human dataset, enhanced human segmentation, baseline artificial intelligence model and enhanced artificial intelligence model were 96,9 ± 5,7; 98,9 ± 3,1; 86,1 ± 10,1 and 90 ± 7,6, respectively (p < 0,001 for both paired and global differences) (Fig. 1D). The enhanced artificial intelligence model outperformed the baseline artificial intelligence model in coronary segmentation, catheter to coronary transition and catheter thickness, but performed less well in other catheter tasks.

Conclusions: The use of Global Segmentation Score and its criteria was feasible. Artificial intelligence models performed very well. Human models were superior to artificial intelligence models, but only enhanced human segmentation achieved a near perfect Global Segmentation Score.
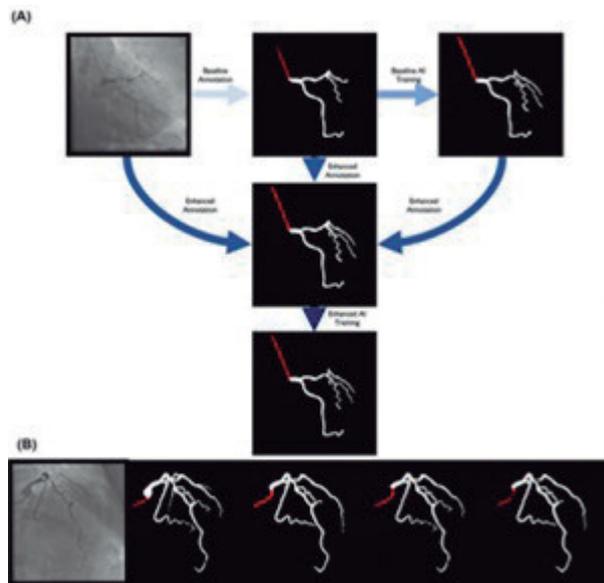
Sábado, 23 Abril de 2022 | 16:00-17:00

Sala Aquarius | Prémio Manuel Machado Macedo

CO 146. BIOLOGICAL OR MECHANICAL AORTIC PROSTHESES IN PATIENTS AGED 40-60 YEARS: A SINGLE CENTRE EXPERIENCE

Inês Alves

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

Introduction: The choice of prostheses type when performing surgical aortic valve replacement (SAVR) remains controversial in middle aged patients. Mechanical prostheses are associated with risks due to the need of anticoagulation therapy, while biological valves have a higher risk of deterioration. In recent guidelines, the ESC/EACTS recommends mechanical valves should be considered in patients < 60 and biological valves in patients > 65. US guidelines recommend either biologic or mechanical prostheses in patients aged 50 to 70 years. Baseline characteristics, life expectancy, contraindications for anticoagulation and patient preference are also considered in prostheses choice. Despite guidelines, biological valve use has increased over the last decades in all age groups We set out to study long-term outcomes of mechanical *versus*

Figure 1. (A) – Annotation and training process; (B) - (left to right): the first human segmentation incorrectly labels contrast backflow as coronary. The baseline artificial intelligence model improves on the human segmentation, but is still not perfect. The enhanced human model perfectly segments the transition. The enhanced artificial intelligence model is hampered by catheter gaps, but identifies the transition correctly; (C) - Global Segmentation Score (GSS: 1,5 to 100 points) taking into account the relevancy of each criteria, defined by the expert authors; (D) – Overall performance of different models according to GSS.

CO 95 Figure

biologic prostheses in patients aged 40-60 years and analyse the use of biological valves in this group.

Methods: We performed a single-centre retrospective observational study. Patients aged 40 to 60 that underwent SAVR in our centre from 2006 to 2016 were included (n = 383). The primary outcome was all-cause long-term mortality or aortic valve reoperation within the study time. Univariable analysis of relevant variables was performed comparing patients who underwent mechanical (n = 343) or biological (n = 40) prostheses. A propensity score nearest neighbour matching (1:1) for the biological valves group using the statistically different variables was used. Primary outcome was studied using Kaplan Meier Curves.

Results: Mean follow-up was 10.7 years. Mortality or reoperation was 19.8% in the mechanical and 35% in the biological prostheses. In the overall study group, mortality was significantly higher in the biological group, but when applied to the propensity matched sample, mortality was significantly higher in the mechanical group (figure 1 and 2). When comparing the population and propensity matched sample, the later showed higher pre-op chronic kidney disease (p = 0.024) and stroke (p = 0.002), lower left ventricle ejection fraction (p < 0.001) and more post-operative complications (p = 0.021). Overall survival was lower in the matched group.
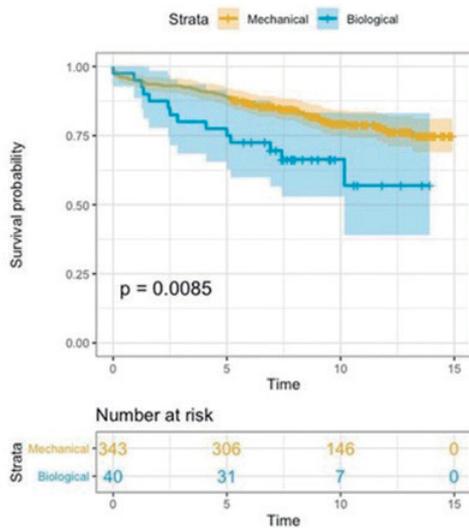

Figure 1 – Kaplan Meier Curve analysis of mortality in overall study population
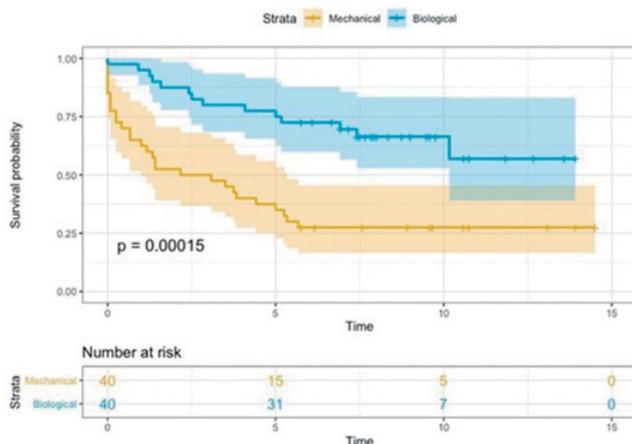

Figure 2 – Kaplan Meier Curve analysis of mortality in propensity matched sample

Conclusions: The present study has limitations, including the type of study and reduced number of patients, that can account for some of the results found. However, based on our centre's experience we hypothesize that in a select group of patients, even in younger ages, the use of biological prostheses may prove beneficial, highlighting the importance of the patient's comorbidities and characteristics in prostheses choice. Further studies to analyse these findings could be beneficial, since very few other studies focused on this age group were found.

CO 147. MIECTOMIA MORROW NA MIOCARDIOPATIA HIPETRÓFICA OBSTRUTIVA: RESULTADOS A CURTO E LONGO PRAZO DE UM CENTRO REFERÊNCIA

Rui Pedro Cerejo, Carolina Rodrigues, Manuela Silva, Tiago Silva, Sílvia Rosa, Pedro Coelho, Rui Rodrigues, José Fragata

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

Introdução: O tratamento cirúrgico com Miectomia *Morrow* é considerado o tratamento *gold standard* para desobstrução da câmara de saída do ventrículo esquerdo (CSVE) nos doentes sintomáticos com Miocardiopatia Hipertrófica Obstrutiva. Em centros de referência é uma cirurgia segura e com resultados comprovados. Neste estudo revemos os resultados a curto e longo prazo desta cirurgia num centro de média dimensão.

Métodos: Revisão dos resultados de todos os doentes submetidos a Miectomia de *Morrow* por Miocardiopatia Hipertrófica obstrutiva num período de 12 anos (2009-2021) num centro terciário. Analisaram-se as características dos doentes, variáveis intra-operatórias, variáveis ecocardiográficas pré e pós procedimento, e outros fatores relacionados com sucesso do procedimento a curto e longo prazo, tais como: necessidade de *pacemake*r ou cardiodesfibrilhador, melhoria da capacidade funcional, eventos arrítmicos e mortalidade.

Resultados: Foram realizadas 47 procedimentos: 30 sexo feminino (63,8%), idade média 54,2 anos (+-20,8 anos), gradiente na CSVE pre op em repouso médio 87 mmHg (+-53 mmHg) e provocado de 128 mmHg (+- 47 mmHg). Espessura média do septo de 21,5 mm (+-6,9 mm). Em 34 doentes (72,3%) correspondeu a ciurgia isolada e em 13 doentes existiram outros procedimentos concomitantes (valvular, coronário e/ou outro). Em 8 doentes (17%) interviu-se também no aparelho sub-valvular mitral (excisão de cordas anomalas e/ou sobre músculo papilar). Como complicações a destacar bloqueio auriculoventricular completo com necessidade de colocação *pacemaker* definitivo em 5 doentes (10,6%) e mortalidade em 3 doentes (6,4%). No ecocardiograma pos-op imediato o gradiente CSVE desceu para uma média de 21.5 mmHg (± 24,4 mmHg). Na avaliação ecocardiografica 1 ano pos-op gradientes intra-ventriculares mantiveram-se estáveis com uma média de 20 mmHg (± 15,5 mmHg). Na última avaliação *follow-up* maioria dos doentes encontrava-se pouco sintomática: 57% encontravam-se em NYHA I e 38% em NYHA II.

Conclusões: Miectomia cirúrgica é muito eficaz na remoção do obstáculo sub-aórtico que é responsável pelo mau prognóstico da MCHO, os seus resultados são duradouros com melhoria do prognóstico e qualidade de vida destes doentes. É um procedimento seguro e com baixa taxa de complicações quando realizado num centro de referência.

Domingo, 24 Abril de 2022 | 09:00-10:00

Sala Pégaso | Comunicações Orais (Sessão 20) - Insuficiência Cardíaca 3 - Terapêutica Farmacológica

CO 96. LEFT VENTRICULAR STRAIN IMAGING IN HEART FAILURE PATIENTS UNDER SACUBITRIL/VALSARTAN THERAPY

Ana Rita Teixeira, Pedro Garcia Brás, António Valentim Gonçalves, Luísa Moura Branco, Rita Ilhão Moreira, Tiago Pereira da Silva, Ana Teresa Timóteo, Pedro Rio, Rui Cruz Ferreira

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

Introduction: Sacubitril/valsartan (SV) is one of the cornerstones of heart failure with reduced ejection fraction (HFrEF) therapy, with results in reversing left ventricular (LV) remodelling. However, data is limited on myocardial LV strain imaging in different HFrEF etiologies in patients (P) under SV therapy. This study aimed to evaluate improvement in LV strain and strain rate parameters with SV therapy in nonischemic and ischemic HFrEF.
Methods: Prospective evaluation of HFrEF patients under guideline-directed medical therapy. LV mechanics were assessed by 2D speckle-tracking at baseline and after 6 months of SV therapy. LV longitudinal, radial, and circumferential (circ) strain and respective strain rates were compared and stratified according to nonischemic (group A) and ischemic (group B) etiology. Data analysis was performed with Student's t-test and Wilcoxon test.
Results: 35 patients were evaluated (83% male, mean age of 59 ± 11 years). 40% had atrial fibrillation and 43% ischemic etiology. Regarding longitudinal strain, there was a significant improvement in peak longitudinal strain in both groups (A: -5.13 *vs.* -9.66%, p < 0.001; B: -6.23 *vs.* -8.81%, p < 0.001). There was also an improved systolic strain rate (SRs) (-0.31 *vs.* -0.50s^{-1}, p < 0.001), early (SRe) (0.24 *vs.* 0.48s^{-1}, p = 0.001) and late diastolic strain rate (SRa) (0.28 *vs.* 0.45s^{-1}, p = 0.031) in group A, as well as in B: SRs (-0.34 *vs.* -0.44s^{-1}, p = 0.003), SRe (0.32 *vs.* 0.46s^{-1}, p = 0.029) and SRa (0.34 *vs.* 0.43s^{-1}, p = 0.029). Regarding radial strain, both had a significant peak radial strain improvement (A: 6.03 *vs.* 10.37%, p = 0.010; B: 5.65 *vs.* 12.2%, p = 0.001) and SRe (A: 0.44 *vs.* 0.89 s^{-1}, p = 0.014; B: 0.67 *vs.* 1.03s^{-1}, p = 0.031). SRs was improved in group A (0.63 *vs.* 0.95s^{-1}, p = 0.001) but the improvement was nonsignificant in B (0.71 *vs.* 0.83s^{-1}, p = 0.274). SRa did not show significant difference in both groups. In circ strain, both presented significant improvement of peak circ strain (A: -7.39 *vs.* -9.53%, p = 0.036; B: -7.99 *vs.* -10.48%, p = 0.008). While there was a significant improvement SRs in group A (-0.64 *vs.* -0.87s^{-1}, p = 0.021), it was nonsignificant in B (-0.85 *vs.* -0.87s^{-1}, p = 0.530). SRe and SRa wasn't significant in both groups.
Conclusions: After 6 months of SV therapy, there was significant improvement in LV peak longitudinal, radial, circ strain and longitudinal strain rate in nonischemic and ischemic HFrEF P. Radial SRs and circ SRs were significantly improved in nonischemic HFrEF P in contrast to ischemic HFrEF P.

CO 97. SAFETY AND EFFECTIVENESS OF SACUBITRIL-VALSARTAN IN A REAL-WORLD POPULATION

Mariana Tinoco, Ana Filipa Cardoso, Geraldo Dias, Tâmara Pereira, Bebiana Faria, Filipa Almeida, Sérgio Leite, António Lourenço

Hospital da Senhora da Oliveira, EPE – Guimarães.

Introduction: PARADIGM-HF demonstrated superiority of Sacubitril-Valsartan (SV) over enalapril in patients with heart failure with reduced ejection fraction (HFrEF). However, patients in clinical practice may differ in their characteristics compared with patients in clinical trials.
Objectives: To characterize a real-world population of patients with HFrEF under SV therapy, and evaluate its safety and effectiveness.
Methods: Retrospective study of patients with HFrEF under SV therapy followed in an HF clinic between Jan 2018 and Jun 2020, with a follow up period until Oct 2021.
Results: A total of 90 patients were included: 80% (72) male, 65 ± 12 years, mostly with dilated cardiomyopathy (46.7%, 42) and ischemic cardiomyopathy (42.2%; 38). In the evaluation before starting SV, mean LVEF was 26.35 ± 7.32%, 50% of patients were in NYHA class III-IV; 89% were on ACEI/ARB, 92% on beta-blocker (BB) and 92% on MRA; 43.3% had an ICD and 31.1% a CRT-D; Up-titration to target dose (TD) was achieved in 57.8%. During a median follow-up (FUP) of 31.5 months [IQR: 23-41] we observed: an improvement in functional class (p = 0.019); NT-PBNP did not significantly change (3,718 *vs.* 3,110 pg/ml); a statistically significant increase in percentage of BB TD (50.28 *vs.* 65.28%, p = 0.003) and a marked reduction in furosemide use (21.1 *vs.* 7.9%, p < 0.001) and dose (mg) (67.04 *vs.* 45.14, p < 0.001).On TTE we observed an increase in LVEF (26.59 *vs.* 35.64; p < 0.001), a decrease in LV end-diastolic volume index (LVEDVi) (142.2 *vs.* 86.2; p < 0.001), in LV end-systolic volume index (LVESVi) (108.75 *vs.* 59.86; p < 0.001) and in E/e' (13.49 *vs.* 11.21, p = 0.09). After starting SV, major adverse cardiovascular events (MACE) occurred in 18.9% (17) of patients of which 8.9% (8) died for CV causes and 18.9% (17) had hospitalizations for HF.SV discontinuation occurred in 7.8% (7) of patients, being symptomatic hypotension (43%) and economic insufficiency (29%) the most common reasons. Dose reduction was needed in 12.2% (11), being symptomatic hypotension (43%) and hyperkalaemia (27%) the most common reasons.
Conclusions: We observed the impact of SV in improving NYHA functional class and in reducing the needed of loop diuretic, as well as on cardiac remodelling. SV was well tolerated and uptitration to the maximal TD was possible in 57.8%. In our real-world cohort, with heterogeneous patients, with more comorbidities and many who did not tolerate TD, the overall outcomes rates were similar when compared to PARADIGM-HF.

CO 98. SACUBITRIL-VALSARTAN *VERSUS* ACEI IN LEFT VENTRICULAR REVERSE REMODELLING AND CARDIOVASCULAR OUTCOMES

Mariana Tinoco, Ana Filipa Cardoso, Geraldo Dias, Tâmara Pereira, Bebiana Faria, Filipa Almeida, Sérgio Leite, António Lourenço

Hospital da Senhora da Oliveira, EPE – Guimarães.

Introduction: PARADIGM-HF demonstrated superiority of Sacubitril-Valsartan (SV) over enalapril in patients with heart failure with reduced ejection fraction (HFrEF). However, the results of SV in hard endpoints in patients treated in routine clinical practice is missing evidence.
Objectives: The aim of this study was to assess comparative effectiveness of SV *vs.* ACEI on left ventricular reverse remodelling (LVRR) and in major adverse cardiovascular events (MACE).
Methods: We performed a retrospective study of patients with HFrEF observed at an HF clinic between Jan 2018 and Jun 2020, with a follow up period until Oct 2021. We defined LVRR as an absolute increase in LVEF≥ 10 and a relative decrease in indexed LV end-diastolic diameter of at least 10%. MACE was defined as composite of death from CV causes or hospitalization for HF. One-to-one propensity score matching was used.
Results; A total of 173 HFrEF patients were included, 90 (52%) and 83 (48%) adults treated with SV or ACEI, respectively. The final propensity-matched cohort included 72 pairs taking SV or ACEI: 78.5% (113) male, 64.19 ± 11.74 years, mean LVEF 26.01 ± 7.47% and median follow up (FUP) of 33 months (22.5-48.75). LVRR was observed more frequently in ACEI group than in SV group (38.9 *vs.* 19.4%; p = 0.017). The change in LVEF from baseline to FUP was greater in ACEI group than in SV group (15.05 *vs.* 8.61%, p = 0.016). ACEI increased the prevalence of LVEF ≥ 40% at FUP (56.9 *vs.* 33.3%; p = 0.014). The components of CV outcomes all showed trends toward lower numbers of events with SV *vs.* ACEI, but those were not statistically significant, possibly due to a low FUP. MACE occurred in 21 (29.2%) patients treated with SV and in 26 (36.1%) patients taking ACEI. During FUP, 11 (15.3%) patients treated with SV died, compared with 17 (23.6%) treated with ACEI. The proportion of CV mortality was 6 (8.3%) for SV patients and 10 (13.9%) for ACEI patients. HF hospitalization occurred in 18 (25%) patients taking SV *vs.* 20 (28.6%) patients taking ACEI, of which 10 (13.9%) and 7 (9.9%), respectively, were rehospitalised for HF.
Conclusions: We observed an increased benefit of using ACEI over SV on recovery of LVEF. Despite this, treatment effect on CV outcomes of SV *vs.* ACEI did not show a significant difference, however there is a trend for patients taking SV to have a reduction in MACE. Improvement in LVEF is an important marker, nonetheless it was not translated into an effective reduction in mortality or hospitalizations in this population.

CO 99. DOES DAPAGLIFLOZIN IMPROVE CARDIOPULMONARY PERFORMANCE OF NON-DIABETIC HEART FAILURE PATIENTS?

Ana Rita Teixeira, João Ferreira Reis, António Valentim Gonçalves, Rita Ilhão Moreira, Tiago Pereira da Silva, Ana Teresa Timóteo, Pedro Rio, Sofia Silva, Rui Cruz Ferreira

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

Introduction: Sodium-glucose co-transporter 2 inhibitors have shown to reduce events in Heart Failure (HF) with reduced Ejection Fraction patients – HFrEF. The cardiopulmonary exercise test (CPET) is a powerful predictor of mortality in this

setting. Our aim was to assess whether Dapagliflozin improves cardiopulmonary performance of non-diabetic HF patients (Ps) in a real-world setting.

Methods: Adult HF Ps were randomized 1:1 to receive dapagliflozin 10 mg or placebo. All Ps had a LVEF < 50%, were in NYHA class II-III and under guideline-recommended OMT for the previous 3 months, including a BB, ARNI/ACEi and MRA. They were excluded if they had a previous history of diabetes mellitus or a GFR ≤ 30 ml/min. Baseline and 6-month post-treatment measurements of CPET were evaluated.

Results: 40 Ps were included (82.5% male, mean age of 61 ± 13 years, mean LVEF 34 ± 5%, 70% with ischemic etiology). In the 20 Ps randomized to dapagliflozin, no major safety events were recorded, and the reported compliance was 100%. There were no significant differences between groups regarding baseline clinical and demographic characteristics. The mean respiratory exchange ratio (RER) was 1.10 ± 0.11 and the mean peak oxygen consumption (pVO$_2$) was 16.4 ± 4.5 ml/kg/min. Treatment with dapagliflozin led to a significant increased pVO$_2$: 3.09 ± 3.81 *vs.* 0.11 ± 3.29 mL/kg/min, p = 0.030. There was also a reduction in VE/VCO$_2$ slope (-0.81 ± 5.92 *vs.* 3.33 ± 4.02, p = 0.027). In both groups there was an increase in RER, which was more significant in Ps taking dapagliflozin (0.10 ± 0.09 *vs.* 0.02 ± 0.11, p = 0.027). No statistically significant difference was found in CPET duration (p = 0.225), heart rate recovery (p = 0.452), peak heart rate (p = 0.240), and peak systolic blood pressure (p = 0.094) or any other CPET parameter.

Conclusions: Dapagliflozin use led to a significant improvement of cardiorespiratory fitness at 6-months follow-up in non-diabetic HFrEF Ps, improving several CPET variables with established prognostic value in HFrEF.

CO 100. SGLT2 INHIBITOR INITIATION IN PATIENTS HOSPITALIZED FOR ACUTE HEART FAILURE: DOES IT STILL MATTER WHEN PATIENTS ARE STRICTLY FOLLOWED AFTER DISCHARGE?

Pedro Silvério António, Sara Couto Pereira, Joana Brito, Pedro Alves da Silva, Beatriz Valente Silva, Catarina Oliveira, Beatriz Garcia, Margarida Martins, Rafael Santos, Joana Rigueira, Doroteia Silva, Nuno Lousada, João Agostinho, Fausto J. Pinto, Dulce Brito

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

Introduction: The EMPULSE Trial recently showed that starting empagliflozin in patients (pts) admitted due to acute heart failure (HF) led to significant reduction in 3-month HF hospitalizations and all-cause mortality. However real-world data regarding initiation of SGLT2 inhibitors (SGLT2i) during an HF hospitalization are scarce.

Methods: Quasi-experimental study comparing 3 groups: a group of clinically stable pts started on iSGLT2 during an HF admission included in a post-discharge HF follow-up program (FUPP) – SGLT2i group; a group of pts discharged after HF admission included in the FUPP – control group 1 (FUPPCG); and a group of pts discharged from an HF admission not in FUPP – control group 2 (CG2). Pts were matched for clinical characteristics in a 1:1:1 ratio. The co-primary endpoints were 1-year HF major events (all-cause mortality and HF hospitalization) and 1-year HF events (all-cause mortality, HF hospitalization, outpatient treated HF decompensation). Between groups, differences were established using Chi-square, Mann-Whitney test, Cox Regression and Kaplan-Meier analysis.
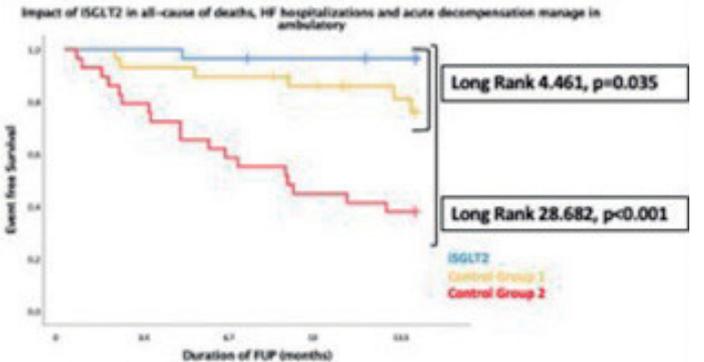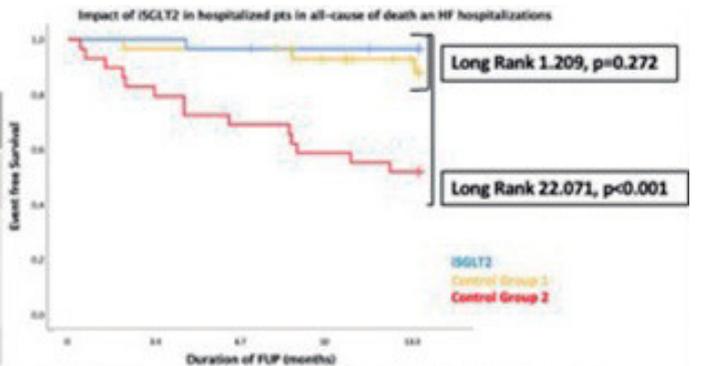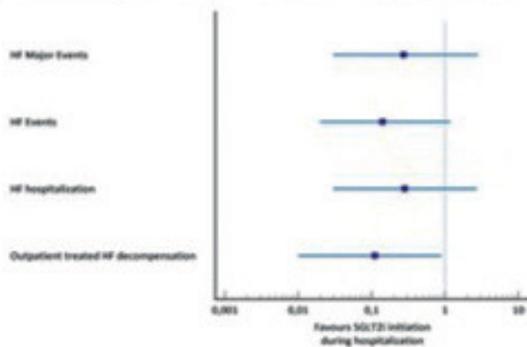
Results: From a total of 276 pts included in the FUPP, 29 pts met inclusion criteria in SGLT2i group. The 3 groups did not differ on baseline characteristics (Table). After a mean follow-up of 293 ± 111 days, there were no deaths in SGLT2i group and FUPPCG. Four (13.8%) pts died in the CG2. Major-HF events occurred in 3.4% in the SGLT2i group, 10.3% pts in FUPPCG and 48.3% pts in CG2, whereas HF events occurred in 3.4% in the SGLT2i group, 20.7% in FUPPCG and 62.1% in CG2. On survival analysis there was no difference on HF major events incidence between the 2 groups and both had a lower rate of HF major events than CG2 (HR 0.29; 95%CI 0.14-0.625; p = 0.002). Regarding HF events, there was a trend towards its reduction in SGLT2 group when comparing to FUPPCG (HR 0.14; 95%CI 0.02-1.17; p = 0.07) and a significant reduction when comparing to CG2 (HR 0.4; 95%CI 0.22-0.71; p = 0.001). Differences between SGLT2i group and FUPPCG were mainly driven by a reduction in outpatient treated HF decompensations (HR 0.11; 95%CI 0.01-0.9; p = 0.036).

Conclusions: This small study shows that starting SGLT2i in pts hospitalized due to acute HF may be beneficial in reducing HF events as seen on EMPULSE Trial. Despite the benefit hampering by the inclusion in an HF FUPP, there were still more outpatient treated HF decompensation when SGLT2i was not initiated, showing that, although FUPP is highly effective, there is still some prognostic benefit on inpatient SGLT2i initiation.

CO 100 Figure

Domingo, 24 Abril de 2022 | 09:00-10:00

Sala Vega | Comunicações Orais (Sessão 21) - Intervenção Cardíaca Coronária e Estrutural 3 - Vários Tópicos

CO 101. PERCUTANEOUS BALLOON MITRAL VALVULOPLASTY FOR MITRAL STENOSIS PATIENTS: AN OLD BUT RELIABLE WEAPON

Vera Ferreira, Inês Rodrigues, Luís Almeida-Morais, Luís Bernardes, Duarte Cacela, Lino Patrício, Alexandra Castelo, Pedro Garcia Brás, André Grazina, Luísa Moura Branco, Rui Cruz Ferreira

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

Introduction: In the era of transcatheter intervention, percutaneous balloon mitral valvuloplasty (PBMV) remains the primary treatment option in anatomic suitable patients.
Objectives: This study aimed to evaluate longterm follow-up (FU) of PBMV and to determine predictors of MACE.
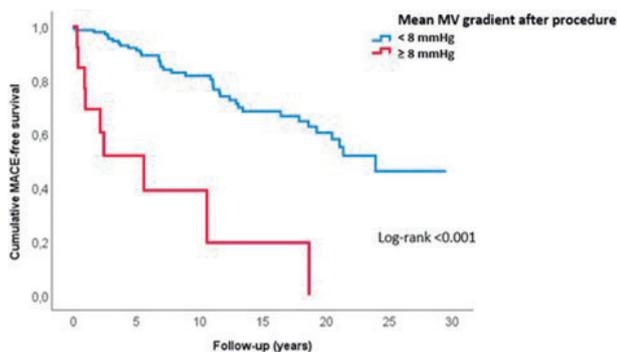
Figure 1 Kaplan–Meier curves for MACE-free survival in patients stratified according to the mean MV gradient after PBMV.
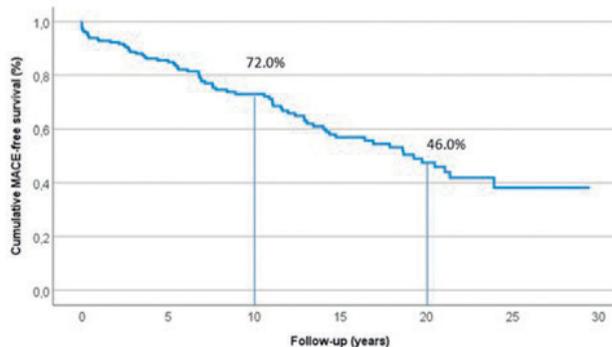
Figure 2 Kaplan–Meier curves for MACE-free survival after PBMV in long term follow-up.

Methods: Between 1991 and June 2021, 202 consecutive patients underwent PBMV in a single tertiary center. Clinical data, echocardiographic parameters, and MACE (cardiovascular mortality, need for percutaneous or surgical mitral reintervention and hospitalization for heart failure) were analysed. Predictors of MACE were determined by Cox regression analysis. Mean age was 47.3 ± 13.6 years, 89.6% female, 47.3% patients presenting atrial fibrillation. Mean Wilkins score was 7.6 ± 1.4, 51.5% had mild or moderate mitral regurgitation and mean pulmonary artery systolic pressure (PASP) of 46.7 ± 17.1 mmHg. Mean pre MVA and mean mitral valve (MV) gradient were 1.1 ± 0.2 cm2 and

10.8 ± 5.6 mmHg, respectively. Successful PMBV was achieved in 89.1% and 3.0% suffered procedural complications, including one cardiogenic shock, 3 urgent cardiac surgeries and 2 deaths (stroke and cardiac tamponade). During a mean FU of 12.0 ± 8.8 years, there were 25 deaths (12.4%) and 33.3% needed MV reintervention (6.5% underwent PBMV and 29.7% needed MV surgery). At univariate analysis, previous MV intervention [HR = 1.95 (1.02-3.72), p < 0.05], Wilkins score [HR = 1.22 (1.01-1.47), p < 0.05], pre mean MV gradient≥ 8 [HR = 0.62 (0.38-1.00), p < 0.05], mean MV gradient after procedure [HR = 1.37 (1.19-1.58), p < 0.05] and PASP > 45 mmHg [HR = 3.29 (1.13-9.55), p < 0.05] were predictors of MV reintervention. At multivariate analysis, pre mean MV gradient≥ 8 [HR = 0.17 (0.037-0.81), p < 0.05] and mean MV gradient after procedure were independent predictors of MV reintervention [HR = 1.74 (1.21-2.49), p < 0.05]. Wilkins score [HR = 1.29 (1.06-1.57), p < 0.05] and mean MV gradient after procedure [HR = 1.41 (1-21-1.63), p < 0.05] were independent predictors of MACE. Cumulative event-free survival at 10 and 20 years were 72.0 and 46.0%, respectively.
Conclusions: PBMV remains a reliable and efficient therapeutic option of mitral stenosis, warranting event-free survival at 10 years in most patients selected for the procedure. Mean MV gradient after procedure was independent predictors of MV reintervention and MACE during follow-up.

CO 102. PREDICTORS OF FUNCTIONAL RECOVERY AFTER MITRAL TRANSCATHETER-EDGE-TO-EDGE REPAIR

Diogo Santos Ferreira[1], Cláudio Guerreiro[1], Gualter Silva[1], Ana Rita Moura[2], Silvia Diaz[3], Eulália Pereira[1], Francisco Sampaio[1], Fábio Nunes[1], Rafael Teixeira[1], Lino Santos[1], Alberto Rodrigues[1], Pedro Braga[1], Gustavo Pires de Morais[1], Bruno Melica[1], Ricardo Fontes-Carvalho[1]

[1]Centro Hospitalar de Vila Nova de Gaia/Espinho, EPE. [2]Hospital Distrital de Santarém, EPE. [3]Faculdade de Medicina da Universidade do Porto.

Introduction: Mitral regurgitation (MR) is now the second-most frequent valvular heart disease in Europe, and can significantly impair functional performance, which can be easily assessed using New York Heart Association (NYHA) heart failure classification. Mitral transcatheter-edge-to-edge repair (TEER) is an increasingly attractive solution has a rather minimal-invasive approach to reduce MR, symptoms and, in some cases, prognostic, in eligible patients.
Methods: A single-centre retrospective database of all consecutive TEER procedures for primary and secondary MR performed between May 2014 and November 2020 was analyzed. The primary outcome was defined as a reduction of NYHA class of at least 1 point one month after treatment, and the secondary outcome considered a reduction of at least 2 classes. Clinical, echocardiographic and blood-analysis data previous to TEER were explored as potential predictors of good NYHA response, using Pearson's Chi-squared test, Wilcoxon rank sum test and Fisher's exact test, as appropriate. A p < 0.05 was considered statistically significant.
Results: A total of 86 cases had complete information regarding NYHA status both prior and 1 month after TEER (Fig.). 60% of the patients improved at least one NYHA class, and both age and sex seem not to have influenced this response. On the other hand, a higher body surface area was associated with functional recovery. Interestingly, a lower N-terminal pro-brain natriuretic peptide (NTproBNP) at baseline was linked to a higher response after intervention (2,048 vs. 5,676 pg/ml, p < 0.001). However, there were no differences regarding existing cardiovascular risk factors, atrial fibrillation and chronic obstructive pulmonary disease between NYHA responders and non-responders. The same scenario was found regarding echocardiographic data, namely for ejection fraction (EF), severity of mitral and tricuspid regurgitation, right ventricular function and left atrial size. There was a tendency for higher predicted surgical risk assessed through EuroSCORE II to be associated with a positive response after treatment, which did not reach statistical significance (p = 0.068). Only 13% cases exhibited a NYHA improvement of at least 2 functional classes, and these also had lower NTproBNP basal levels (p = 0.006) and tended to have lower inferior vena cava (IVC) diameter (10 vs. 23 mm, p = 0.039) and estimated systolic pulmonary artery pressure (sPAP, 39 vs. 56 mmHg, p = 0.041).
Conclusions: According to the present study, only three-fifths of cases improved their NYHA class after mitral TEER. These data suggest that patients

Table 1 – Predictors of NYHA recovery ≥1 class after Mitral TEER.

Table 2 – Predictors of NYHA recovery ≥2 classes after Mitral TEER.

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treated during earlier signs of disease – with lower NTproBNP levels, less severe pulmonary hypertension, and lower IVC diameters – are associated with a more clinical benefit from intervention, though these are merely exploratory deductions of a relatively low number, single-centre, patients.

CO 103. REFINING PATIENT SELECTION TO PERCUTANEOUS MITRAL VALVE REPAIR IN SECONDARY MITRAL REGURGITATION

Ana Abrantes, Sara Couto Pereira, Pedro Silvério António, Joana Brito, Beatriz Valente Silva, Pedro Alves da Silva, Ana Margarida Martins, Catarina Simões de Oliveira, Ana Beatriz Garcia, Catarina Gregório, Miguel Nobre Menezes, Cláudia Jorge, João Silva Marques, Fausto J. Pinto, Pedro Cardoso

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

Introduction: Secondary mitral regurgitation (SMR) may lead to functional limitation and carries a poor prognosis in heart failure (HF) patients (pts). These patients often have high or prohibitive surgical risk and the remodeling achieved with optimal medical therapy frequently fails to significantly reduce MR. Percutaneous mitral valve repair (PMVR) emerged as a valuable therapeutic modality despite conflicting evidence from clinical trials.
Objectives: To find predictors of MR improvement after PMVR that may help refine patient selection.
Methods: Twenty-five consecutive pts with grade 3 and 4 SMR submitted to PMVR with MitraClip between 2013 and 2021 were included in this single center study. Demographic, clinical and echocardiographic data (TTE, including left ventricle (LV) and right ventricle (RV) strain) before PMVR, immediately after the procedure and during follow up (FUP) were recorded. For statistical analysis, Student's t tests, Chi-square and non-parametric tests were performed when appropriate.
Results: Mean age of the 25 included pts was 65.6 ± 12.5 years, 76% males. Ischemic heart disease was the most frequent etiology (52%, 13 pts) and the remainder had non-ischemic dilated cardiomyopathy. A total of 9 (36%) patients had CRT and 15 (60%) had ICD implanted before PMVR. Acute success rate was 96% and complications occurred in one pt (procedure failure due to ruptured chordae). From baseline to FUP, NYHA functional class improved significantly (2.9 ± 0.7 *vs.* 1.8 ± 0.6 *vs.* 2.0 ± 0.6, p < 0.001), NT-proBNP decreased (5,662 ± 7,347 *vs.* 3,263 ± 2,543 *vs.* 2,947 ± 1,932 pg/mL, p = 0.239) and there was a tendency to reduce furosemide dosage (66 ± 31 mg *vs.* 56 ± 25 mg, p = 0.084). We also observed improvement of RV function (RV strain

-13.12 ± -5 *vs.* -13.4 ± 4, p = 0.043; TAPSE 17 ± 4 mm *vs.* 21 ± 16, p = 0.22). Additionally, there was a trend toward positive LV remodeling, with decreased LV end-diastolic volume (162 ± 72 ml *vs.* 158 ± 63 ml, p = 0.260), LV end-systolic volume (121 ± 61 ml *vs.* 115 ± 73 ml, p = 0.128) and improvement in LVEF (29 ± 9 *vs.* 34 ± 12%, p = 0.130). On univariate analysis, PMVR had higher RV strain (p = 0.047) and lower NYHA functional class at baseline (p = 0.013).
Conclusions: In this study, PMVR in SMR led to a positive impact on symptoms, RV function and LV remodelling. Better RV function and lower functional class at baseline were the only predictors of MR improvement in those pts. Our findings support the notion that early referral of SMR to PMVR may lead to better outcomes.

CO 104. IMPACT OF RESIDUAL SIGNIFICANT MITRAL REGURGITATION IN TAVR PATIENTS

Gualter Santos Silva, Mariana Silva, Pedro Queirós, Mariana Brandão, Diogo Ferreira, Cláudio Guerreiro, Gustavo Pires-Morais, Lino Santos, Bruno Melica, Alberto Rodrigues, Pedro Braga, Ricardo Fontes-Carvalho

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

Introduction: Significant mitral regurgitation (MR) is commonly encountered in patients with severe aortic stenosis undergoing transcatheter aortic valve replacement (TAVR). A decrease in MR severity after aortic valve replacement may be seen as a result of reverse left ventricle remodelling, including a reduction in LV end-diastolic volume and a decrease in mitral tethering forces. However, the impact of MR severity improvement in outcomes of patients undergoing TAVR has not been well established.
Objectives: The purpose of this study was to evaluate the improvement of significant MR and the impact of residual MR on mortality in patients undergoing TAVR.
Methods: Retrospective analysis of patients who underwent TAVR in a single centre between August 2007 and September 2020 and performed an echocardiogram before and at least 3 months after the procedure. MR severity was graded as no/mild (0/1), moderate (2), moderate-severe (3) or severe (4). Improvement in MR severity was defined as a decrease in at least one grade. Patients were stratified by existence of improvement in MR severity after TAVR (yes/no). The primary endpoint was all-cause mortality.
Results: A total of 684 patients (mean age 79.7 ± 7.6 years, 52% woman) were enrolled and 103 (15.1%) had significant MR (grade ≥ 3). Overall, there was an improvement in MR severity in 179 (26.2%) patients. In the group of preoperative significant MR, MR regressed in 66 (64.1%) patients and persisted

in 37 (35.9%) after TAVR. There is no difference in baseline characteristics between these two groups. One-year mortality was significantly lower in those with MR regression (1.5 *vs*. 17.1%, p = 0.003).

Conclusions: Concomitant significant baseline MR is relatively common in TAVR patients. In two-thirds of these patients, the degree of MR improves after the procedure with an associated positive impact on clinical outcomes. Risk stratification based on the improvement of MR after TAVR can help to identify patients at higher risk of mortality, who may need closer surveillance and possible transcatheter mitral valve intervention.

CO 105. CAROTID ANGIOPLASTY STENTING *VERSUS* ENDARTERECTOMY *VERSUS* BEST MEDICAL TREATMENT – WHAT IS THE BEST STRATEGY FOR THE TREATMENT OF CAROTID STENOSIS?

Rafaela Fernandes, Joana Delgado Silva, Joana Moura Ferreira, Lino Gonçalves

Centro Hospitalar de Coimbra, EPE/Maternidade Bissaya Barreto.

Introduction: Carotid stenosis causes 15% of strokes, which represent 10.8% of deaths in Portugal. Carotid angioplasty stenting (CAS), endarterectomy (CEA) and best medical treatment (BMT) are important in preventing *major* cardiovascular (CV) events.

Methods: We conducted a systematic review and metanalysis, with randomized controlled trials (RCT), to compare CAS with CEA and BMT regarding the short and long-term major periprocedural and follow-up CV events (stroke, myocardial infarction, and death) in symptomatic and asymptomatic carotid stenosis. We searched for RCT published from 2008 to 2021 in databases such as *Pubmed/ MEDLINE, B-On, Embase, Clinical Trials from U.S. National Library of medicine and International Clinical Trials Registry Platform*, between July of 2018 and January of 2019, and in October of 2021.

Results: Nine RCT were included, with a total of 9162 participants for CAS *versus* (*vs*.) CEA, and 513 participants for CAS *vs*. TMO. Compared with CEA, CAS is associated with periprocedural stroke and death in symptomatic patients (HR = 1.65, 95%CI 1.29-2.11, p = 0.05, I^2 = 62%), due to higher stroke events than deaths. That association does not occur in asymptomatic patients in which CAS is not associated with periprocedural stroke or

death (CAS = 8.55%, CEA = 7.05%, p = 0.09). During follow-up there were no significant differences between CAS and CEA in symptomatic patients regarding stroke (HR = 1.51, 95%CI 1.23-1.84, p = 0.57, I^2 = 0%) and death (HR = 1.10, 95%CI 0.93-1.30, p = 0.69, I^2 = 0%). Periprocedural MI incidence is higher in CEA (CAS = 1.1%; CEA = 2.3%; p = 0.03), without influence of symptomatic status. CAS is not inferior to CEA, in both symptomatic and asymptomatic patients with high surgery risk, as for periprocedural and one year CV *major* events (CAS = 12.2%, CEA = 20.1%, absolute difference = -7.9, 95%CI -16.4-0.7, p = 0.004). BMT had no significant findings *vs*. CAS in asymptomatic patients (HR = 3.5, 95%CI 0.42-29.11, p = 0.246).

Conclusions: CAS is not inferior to CEA as for the periprocedural and one-year *major* CV events in patients with normal surgery risk. However, there is a higher risk of periprocedural stroke in CAS for symptomatic patients, and of periprocedural MI in CEA with no influence of symptomatic status. CAS seams to prevent middle and long-term ipsilateral stroke in symptomatic patients. BMT has yet to prove not to be inferior to CAS in asymptomatic patients.

Domingo, 24 Abril de 2022 | 10:00-11:00

Sala Vega | Comunicações Orais (Sessão 22) - Arritmias 4 - Vários Tópicos

CO 106. ACCURACY OF NONINVASIVE ELECTROCARDIOGRAPHIC IMAGING USING ISOPOTENTIAL *VERSUS* ISOCHRONAL MAP FOR IDENTIFYING THE SITE OF ORIGIN OF VENTRICULAR ARRHYTHMIAS

Leonor Parreira[1], Rita Marinheiro[1], Pedro Carmo[2], Dinis Mesquita[1], Sofia Mancelos[2], Sílvia Nunes[2], Alexandra Goncalves[1], Pedro Amador[1], Antonio Ferreira[2], Pedro Goncalves[2], Hugo Marques[2], Pedro Adragão[2]

[1]*Centro Hospitalar de Setúbal, EPE/Hospital de São Bernardo.* [2]*Hospital da Luz Lisboa.*

	Overall sample N=20	RVOT PVCs N=10	Non-RVOT PVCs N=10	P value
Age in years	58 (47-71)	58 (47-67)	59 (45-72)	0.971
Male gender, n (%)	11 (55)	5 (50)	6 (60)	1.000
Nº of leads, n (%)	139 (117-159)	134 (117-162)	145 (115-159)	0.853
FND perfect match, n (%)	19 (95)	10 (100)	9 (90)	1.000
ADM perfect match, n (%)	13 (65)	8 (80)	5 (50)	0.350
FND near match, n (%)	19 (95)	10 (100)	9 (90)	1.000
ADM near match, n (%)	17 (85)	10 (100)	7 (70)	0.211
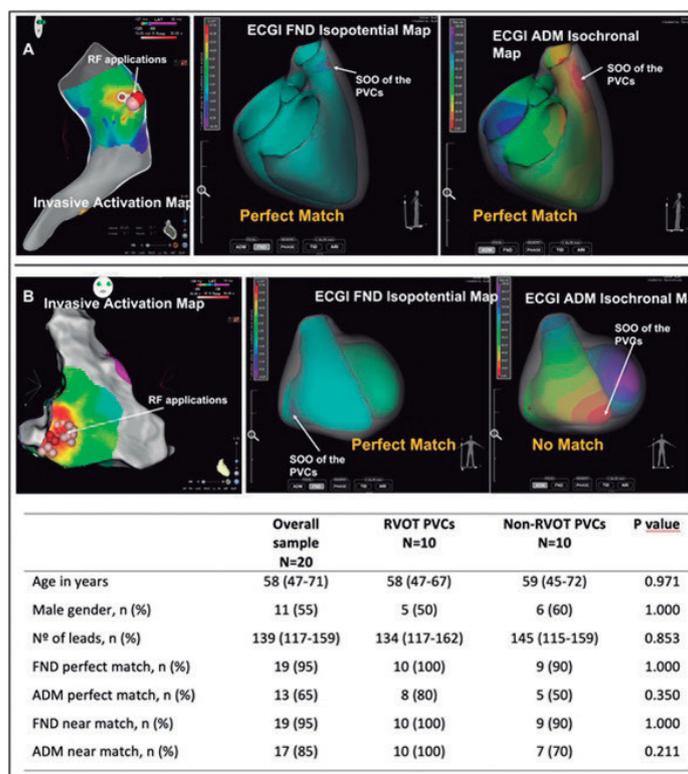
CO 106 Figure

Introduction and objectives: Previous studies reporting the results of noninvasive electrocardiographic imaging (ECGI) used both isopotential map and isochronal map to assess the site of origin (SOO) of premature ventricular contractions (PVCs). The aim of this study was to evaluate the accuracy of both methods globally, and according to the location of the arrhythmia: from the right ventricular outflow tract (RVOT) or other locations (non-RVOT).

Methods: We studied with ECGI 30 consecutive patients with frequent (> 10,000/24 h) PVCs. Patients were excluded if the ablation was not performed (3 patients) or was unsuccessful (7 patients). The study group consisted of 20 patients, 11 male, median age of 58 (47-71) years. The ECGI was performed with the epi-endocardial system Amycard. Two noninvasive maps were obtained per patient: isopotential map using the first negative deflection method (FND) and the isochronal map obtained using the activation direction method (ADM) (Figure). The invasive activation map was obtained with the Carto or the Ensite system and radiofrequency was applied at the earliest activation site with QS morphology on the unipolar electrogram and a pace match of at least 11/12. The SOO of the PVCs was considered the site where the PVCs were abolished. We assessed the accuracy of the ECGI to identify the SOO of the PVCs using both methods. A perfect match was defined as a predicted location by the ECGI within the same anatomic segment of the actual SOO of the PVCs and a near match as a predicted location within the same segment or a contiguous one. Values are presented as median (Q_1-Q_3)

Results: PVCs originated in the RVOT in 10 (50%) patients. The percentage of near matches was not significantly different between FND and ADM methods (95 *vs.* 85%, p = 0.50), however the percentage of perfect matches was significantly higher with the FND than with the ADM technique (95 *vs.* 65%, p = 0.031). We found no significant differences in accuracy according to the location of the PVCs: in the RVOT or outside (Table).

Conclusions: We found a good agreement between ECGI and invasive maps, however the FND technique showed a better accuracy regardless the site of the PVCs.

CO 107. HIGHER CORONARY CALCIUM SCORE IS ASSOCIATED WITH INCREASED RISK OF ATRIAL FIBRILLATION RECURRENCE

Sara Lopes Fernandes[1], Inês Cruz[2], Ricardo Ladeiras-Lopes[3], Mariana Silva[3], Sílvia O. Diaz[2], António S. Barros[2], Francisca Saraiva[2], Rita Faria[3], João Almeida[3], Paulo Fonseca[3], Marco Oliveira[3], Helena Gonçalves[3], Nuno Ferreira[3], João Primo[3], Ricardo Fontes-Carvalho[3]

[1]Centro Hospitalar de Leiria/Hospital de Santo André. [2]Faculdade de Medicina da Universidade do Porto. [3]Centro Hospitalar de Vila Nova de Gaia/Espinho, EPE.

Introduction: Patients with atrial fibrillation (AF) referred for catheter ablation routinely undergo cardiac computed tomography (CCT) for

procedure planning. An opportunistic evaluation of coronary artery calcium score (CACS) can be an important tool to improve clinical care. It is already known that CACS is associated with a high risk of AF development, particularly if values are above 100, but few data are available regarding the impact of CACS in AF recurrence after ablation.

Objectives: To assess the impact of CACS on atrial fibrillation recurrence following catheter ablation.

Methods: Retrospective, single-centre cohort study of consecutive patients with AF undergoing CCT for ablation procedure planning, from 2017 to 2019. Baseline clinical and demographical data were collected. Patients with known history of coronary artery disease (CAD) and moderate to severe valvular heart disease were excluded. CACS was assessed using the Agatston method. Recurrence was defined as any documented episode of AF, atrial flutter or atrial tachycardia after 3 months from procedure. Patients were stratified in CACS< 100 and CACS ≥ 100. Explorative analysis incorporated Kaplan-Meier survival curves and Cox regression.

Results: A total of 354 patients were included, with a mean age of 56 ± 12 years, 66% male and 21% with persistent AF. More than half of the patients had a CACS> 0 (n = 185, 52%) and 63 patients (18%) had a CACS ≥ 100. Patients with CACS ≥ 100 were older (63 ± 7 *vs.* 54 ± 12 years, p < 0.001), had higher prevalence of hypertension (68 *vs.* 43%, p < 0.001) and diabetes mellitus (21 *vs.* 10%, p = 0.012) and higher left atrial volume (39 ± 9 *vs.* 35 ± 9 ml/m², p = 0.018). After a median observation time of 34 months (IQR 24-43), 117 patients (33%) had AF recurrence. CACS ≥ 100 was associated with increased risk of AF recurrence (unadjusted Cox regression: hazard ratio [HR] 1.85; 95% confidence interval [CI], 1.23-2.79, p = 0.003). After covariate adjustment (age, gender, hypertension, diabetes mellitus, obesity, thyroid disease, AF type and left atria enlargement) CACS ≥ 100 remained an independent predictor of the risk of AF recurrence (HR, 1.68; 95%CI, 1.05-2.70, p = 0.03) as well as persistent AF (HR, 1.91; 95%CI, 1.23-3.00, p = 0.004).

Conclusions: In patients with AF undergoing catheter ablation, without previous history of CAD, a CACS ≥ 100 was independently associated with a 68% increase in the risk of AF recurrence.

CO 108. PREVALENCE AND IMPACT OF TACHYARRHYTHMIAS IN PATIENTS ADMITTED WITH COVID-19 PNEUMONIA

Diogo de Almeida Fernandes, Joana Guimarães, Eric Monteiro, Gonçalo Costa, Natália António, Lino Gonçalves

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

Introduction: The COVID-19 pandemic has shifted tremendously the paradigm of hospital care and treatment of cardiovascular (CV) patients. According to most recent evidence, due to its multisystemic impact, COVID-
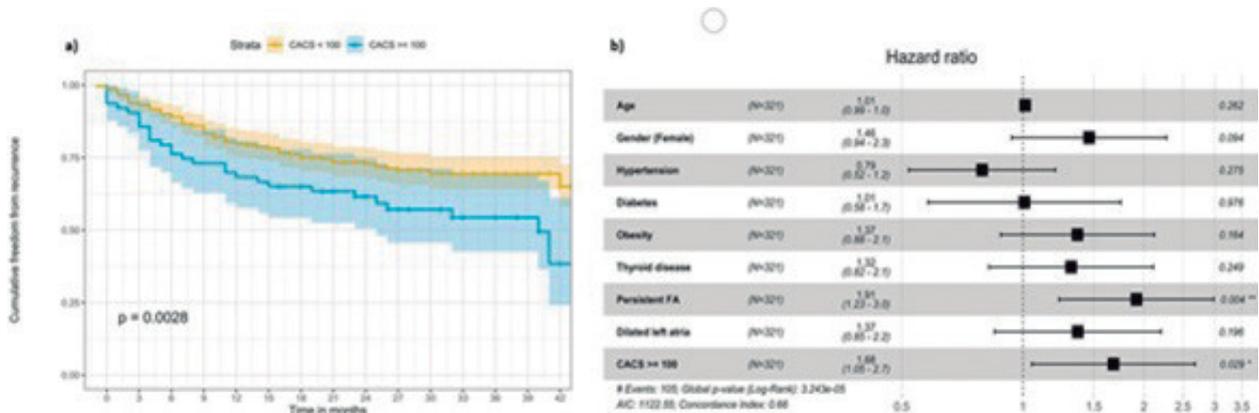
CO 107 Figure
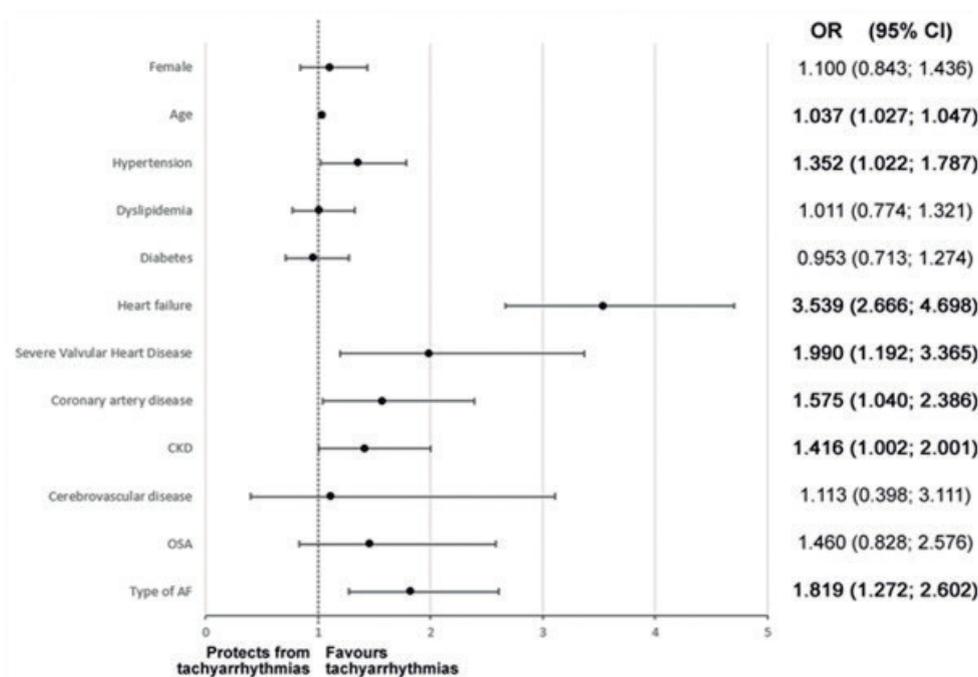
Fig. 1 - Forest plot of primary outcome according to the different variables

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19 may lead to an increased risk of cardiac arrhythmias with subsequently increased morbimortality.

Objectives: Determine the prevalence of tachyarrhythmias in patients admitted with COVID-19, possible predictors and impact on in-hospital mortality.

Methods: A retrospective study of 3,475 consecutive patients with COVID-19 pneumonia admitted to our hospital between February 2020 and November 2021 were included. The main outcome was tachyarrhythmias (high ventricular rate (HVR) or new-onset atrial fibrillation (AF), HVR or new-onset atrial flutter (AFL), other supraventricular tachycardias (SVT), ventricular tachycardia (VT) and ventricular fibrillation (VF)). Secondary outcome was in-hospital mortality. Sociodemographic variables and clinical data were recorded. Statistical comparison was made between groups, including logistic regression to determine odds ratios (OR).

Results: A total of 215 patients presented HVR AF (6.31%), 79 of which with new-onset AF (36.74%). 8 patients had HVR AFL (0.23%), 5 VT (0.15%), 4 VF (0.12%) and only 3 patients had a SVT identified (0.09%). Patients with tachyarrhythmias were significantly older (77. 74 ± 11.25 68.94 ± 17.51 years, p < 0.001) and had more hypertension (p 0.034), heart failure (HF) (p < 0.001), severe valvular heart disease (VHD) (p 0.007), coronary artery disease (CAD) (p 0.031), chronic kidney disease (CKD) (p 0.048) and paroxysmal AF (if previously diagnosed (p 0.001). There were no significant differences regarding gender, dyslipidemia, diabetes, cerebrovascular disease and obstructive sleep apnoea (OSA). Patients with HF had the highest risk of tachyarrhythmia (OR 3.539; 95%CI 2.666-4.698; p < 0.001), followed by severe VHD (OR 1.990; 95%CI 1.192-3.365; p 0.009) and CAD (OR 1.575; 95%CI 1.040-2.386; p 0.032). Older patients or patients with hypertension or CKD were also at an increased risk. Also of note, patients previously diagnosed with paroxysmal AF were more likely to have episodes of HVR AF than the ones with persistent or permanent AF (OR 1.460; 95%CI 0.828-2.576; p 0.001), Regarding the secondary outcome, patients with tachyarrhythmias during hospital stay had an odd almost 3 times higher of death (OR 2.820; 95%CI 2.151-3.695; p < 0.001).

Conclusions: Tachyarrhythmias is a common complication in COVID-19 patients during hospital stay that is significantly linked to higher in-hospital mortality. Patients presenting with high CV disease burden are at particularly significant risk and should be carefully managed.

CO 109. CARDIONEUROABLATION OF NEURALLY MEDIATED REFLEX SYNCOPE: THE EXPERIENCE OF TWO PORTUGUESE CENTRES

Gualter Santos Silva[1], Filipa Cardoso[2], João Almeida[1], Paulo Fonseca[1], Sílvia Ribeiro[2], Marco Oliveira[1], Victor Sanfins[2], Helena Gonçalves[1], João Primo[1], António Lourenço[2], Ricardo Fontes-Carvalho[1]

[1]Centro Hospitalar de Vila Nova de Gaia/Espinho, EPE. [2]Hospital da Senhora da Oliveira, EPE-Guimarães.

Introduction: Neurocardiogenic syncope (NCS) is the most frequent aetiology of syncope in young people. Cardioinhibition with asystole and/or transitory atrio-ventricular block induced by a massive vagal reflex is commonly observed in severe cases. According to the current guidelines, cardiac pacing is indicated in patients > 40 years old with severe, recurrent syncope and documented cardioinhibitory reflex. In younger patients there is no recommendation. Although pacing therapy could be effective, complications after pacemaker implantation are commonly seen. Recently, cardioneuroablation (CNA), a technique based on radiofrequency ablation of vagal ganglia, was developed to treat NCS as an alternative to pacemaker implantation in younger patients. However, this method is still evolving, and existing data refer to a small number of patients in a limited number of centres.

Objectives: The aim of our study was to evaluate the efficacy and safety of CNA in patients with highly symptomatic neurocardiogenic syncope.

Methods and results: A total of 15 patients (11 male; aged 40.0 ± 13.3 years) who underwent CNA in two Portuguese centres between January 2019 and September 2021 were included. All had recurrent syncope with documented pauses at head-up tilt test, Holter or implantable loop recorder. Radiofrequency energy was applied in ganglionated plexi (GP) 1 (between the right upper pulmonary vein and the right atrium) in 14 patients, GP2 (between the superior vena cava and aortic root just above the right upper pulmonary vein) in 9 patients, GP3 (between the inferior vena cava and the right and left atrium) in 5 patients and GP4 (at the insertion of the left pulmonary veins) in 9 patients. The end point of procedure was the inhibition of the vagal response at target sites. Ablation was successfully performed in all patients. One patient had a convulsive episode after the procedure, requiring admission to intensive care but without neurological sequelae. No other major complications occurred. At a mean follow-up

of 17.1 ± 12.6 months (range 3-35 months), 13 patients remained free of syncope. Other 2 patients had spontaneous recurrence of syncope (both 9 months after CNA) and underwent a new procedure. These 2 patients had a new symptomatic recurrence and a pacemaker was implanted.

Conclusions: CNA appears to be an effective and safe treatment option for patients with refractory neurocardiogenic syncope and provide a new potential approach without pacemaker implantation.

CO 110. USEFULNESS OF THE NON-INVASIVE ASSESSMENT OF LATE POTENTIALS FOR RISK STRATIFICATION IN BRUGADA SYNDROME

Pedro Silvério António, Joana Brito, Sara Couto Pereira, Beatriz Valente Silva, Pedro Alves da Silva, Beatriz Garcia, Catarina Oliveira, João Fonseca, Ana Abrantes, Irina Neves, Afonso Nunes-Ferreira, Gustavo Lima da Silva, Luís Carpinteiro, Nuno Cortez-Dias, Fausto J. Pinto, João de Sousa

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

Introduction: Brugada syndrome (BrS) is a relevant cause of sudden cardiac death (SCD) in young adults. Several risk factors have been identified, but clinical decision making remains extremely challenging, particularly in asymptomatic patients (pts).

Objectives: To explore the usefulness of the non-invasive assessment of late potentials (LPs) based signal-averaged ECG (SAECG) for risk stratification in BrS.

Methods: Prospective single-center study of pts with BrS included from 2003 to 2021. LPs were evaluated by SA-ECG with determination of the total filtered QRS duration (fQRS), root mean square voltage of the 40ms terminal portion of the QRS (RMS_{40}) and duration of the low amplitude electric potential component of the terminal portion of the QRS (LAS40) in conventional and modified right precordial leads. The primary endpoint was the occurrence of malignant arrhythmic events (MAEs), defined as a composite of SCD or appropriate shocks. Uni- and multivariate Cox regression survival analyses were used to identify significant prognostic predictors considering the clinical, genetic, and electrocardiographic characteristics as well as the tertile distribution of the SAECG parameters. A risk score was computed incorporating the significant LPs variables and its usefulness for prognostic stratification was explored using Kaplan Meier survival analysis.

Results: Our cohort consisted of 117 pts (mean age: 47 ± 13 years, 33% male), including 75 (65%) with type 1 spontaneous pattern and 92 (79%)

asymptomatic individuals. Symptoms at presentation included syncope in 16 pts (14%) and polymorphic VT/cardiac arrest in 4 (3.4%). During a median follow-up of 4.1 ± 0.3 years, 8 pts (6.8%) suffered MAEs: 3 (2.6%) with SCD and 5 (4.3%) with appropriate shocks. The risk of events differed in relation to the several SAECG parameters (Table), increasing linearly with the fQRS duration determined either in the conventional (HR 1.03, 95%CI 1.01-1.06, p = 0.008) or modified leads (HR: 1.03, 95%CI 1.01- 1.05, p = 0.003). The SAECG score incorporated as risk markers a fQRS ≥ 113 ms and a RMS_{40} < 13 μV. Pts with both risk markers presented a 7-fold increased risk (HR 7.17, 95%CI 1.29-40, p = 0.025), independently of the baseline symptomatic status and ECG pattern.

Conclusions: This study shows that the non-invasive assessment of LPs based on SAECG is useful for prognostic stratification of BrS. It was possible to identify a subset of pts presenting a high risk of events who may deserve individualized preventive strategies.

Domingo, 24 Abril de 2022 | 11:00-12:00

Sala Aquarius | Comunicações Orais (Sessão 23) - Doenças do Miocárdio e Pericárdio 1 - Miocardiopatia hipertrófica

CO 111. ECHOCARDIOGRAPHIC OUTCOMES OF OBSTRUCTIVE HYPERTROPHIC CARDIOMYOPATHY AFTER PERCUTANEOUS ASA: A SINGLE CENTRE EXPERIENCE

Vera Ferreira, Pedro Garcia Brás, Sílvia Aguiar Rosa, Isabel Cardoso, António Fiarresga, Ana Galrinho, Luísa Moura Branco, Ruben Ramos, Alexandra Castelo, Rui Cruz Ferreira

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

Introduction: Alcohol septal ablation (ASA) has been widely accepted as an alternative to surgical myectomy in patients with symptomatic obstructive hypertrophic cardiomyopathy (OHCM) despite optimal medical treatment.

	Arrhythmic events	No arrhythmic events	p-value
fQRS conventional leads	122 (116-153)	108 (97-114)	0.010
RMS40 conventional leads	9 (6-10)	17 (12-26)	0.009
LAS40 conventional leads	48 (46-51)	40 (32-48)	0.021
QRSf modified leads	127 (116-153)	107 (97-113)	0.002
RMS40 modified leads	9 (7-10)	18 (11-27)	0.001
LAS40 modified leads	53 (48-68)	40 (31-49)	0.006
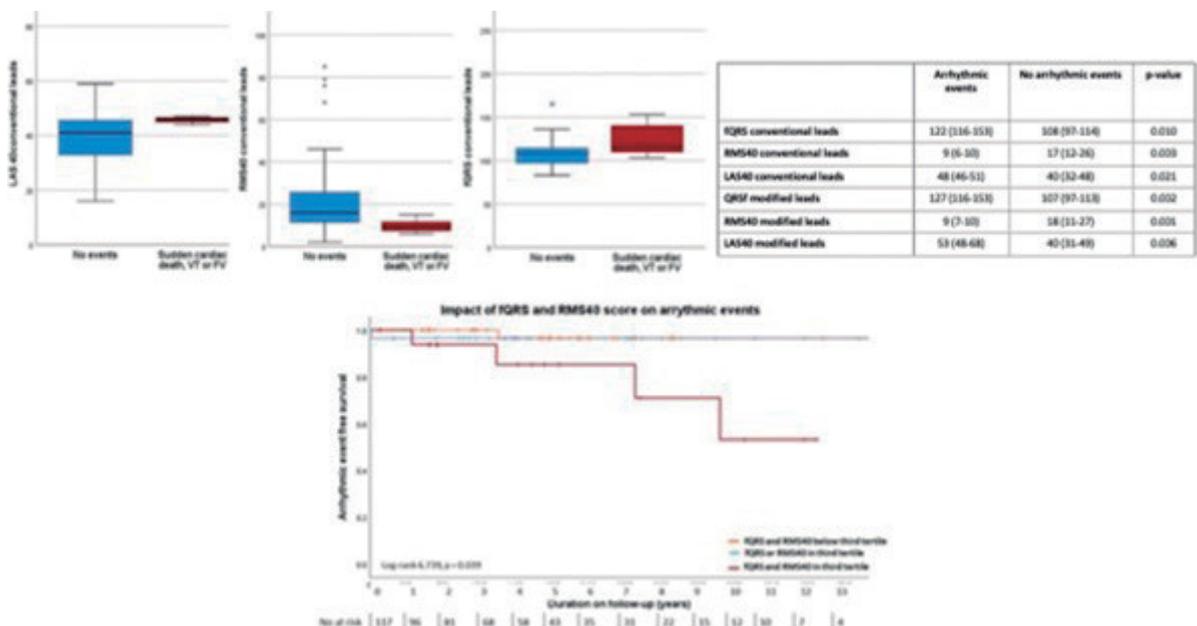
CO 110 Figure

	Total N=110	Successful ASA N=92	Unsuccessful ASA N=18	p-value
Clinical characteristics				
Age (years)	65±12.2	66.1±11.2	60.2±16.0	0.063
Female	73 (66.4%)	58 (63.0%)	15 (83.3%)	0.108
Hypertension	70 (64.8%)	60 (65.2%)	10 (55.6%)	0.234
Dyslipidemia	49 (45.4%)	43 (46.7%)	6 (33.3%)	0.177
Diabetes mellitus	11 (10.0%)	8 (8.7%)	3 (16.7%)	0.327
NHYA class > II	96 (87.3%)	80 (87.0%)	16 (88.9%)	0.822
Angina CCS class II/III	58 (52.7%)	50 (54.3%)	8 (44.4%)	0.417
Syncope	11 (10.0%)	8 (8.7%)	3 (16.7%)	0.319
Atrial fibrillation	23 (20.9%)	20 (21.7%)	3 (16.7%)	0.674
Paroxysmal	6 (5.5%)	5 (5.4%)	1 (5.6%)	
Permanent	17 (15.5%)	15 (16.3%)	2 (11.1%)	
Beta-blocker	88 (80.0%)	73 (79.3%)	15 (83.3%)	0.760
Calcium channel blocker	50 (45.5%)	45 (48.9%)	5 (27.8%)	0.099
Double therapy	33 (30.0%)	28 (30.4%)	5 (27.8%)	0.801
Previous pacemaker implantation	11 (10.0%)	10 (10.9%)	1 (5.6%)	0.563
Baseline echocardiographic data				
Maximum basal septal thickness (mm)	21.0±3.3	20.9±3.1	21.7±4.3	0.412
Rest LVOT gradient (mmHg)	93.6±39.8	94.0±40.6	91.9±36.8	0.837
Valsalva LVOT gradient (mmHg)	118.9±44.2	122.2±43.4	97.6±46.9	0.173
Moderate mitral regurgitation	27 (24.5%)	23 (35.0%)	4 (22.2%)	0.653
Systolic anterior motion of mitral valve	58 (52.7%)	52 (56.5%)	6 (33.3%)	0.669
Left atrial volume index (ml/m2)	48.9±11.2	48.9±11.7	49.4±5.9	0.917
Systolic pulmonary artery pressure (mmHg)	43.2±18.5	44.8±19.0	32.4±9.2	0.157
Post procedure data				
Maximum basal septal thickness (mm)	16.4±2.7	16.3±2.7	16.5±2.6	0.897
3-month LVOT gradient (mmHg)	33.3±31.5	24.6±23.9	82.0±28.7	**0.003**
6-month LVOT gradient (mmHg)	31.8±34.5	24.9±25.9	68.6±27.8	**0.027**
Moderate regurgitation	6 (5.5%)	4 (4.3%)	2 (11.1%)	0.132
Peak creatine kinase level (U/L)	1306.6±816.7	1307.7±861.9	1300.8±505.4	0.975
Alcohol injection (ml)	2.1±0.3	2.1±0.3	2.0±0.5	0.390
Events				
Atrioventricular block (transient or permanent) during ASA hospitalization	29 (26.4%)	26 (28.3%)	3 (16.7%)	0.770
Pacemaker implantation during ASA hospitalization	17 (17.1%)	17 (18.5%)	0	**<0.001**
Reintervention	14 (12.7%)	7 (7.6%)	7 (38.9%)	**0.001**
ASA redo	10 (9.1%)	4 (4.3%)	6 (33.3%)	
Surgical myectomy	4 (3.6%)	3 (3.3%)	1 (5.6%)	
Clinical endpoint	28 (25.5%)	19 (20.7%)	9 (50.0%)	**0.013**
Follow up (years)	3.4±2.1	3.4±2.6	3.2±1.5	0.880

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The aim of this study was to analyse the effect of ASA on anatomical and functional features analysed by echocardiography, as well as its clinical impact.

Methods and results: Retrospective analysis of consecutive patients submitted to ASA (2009-2019) in a single tertiary centre. A dedicated echocardiogram was performed at 3 and 6 months after procedure. Echocardiographic primary endpoint was a > 50% reduction in left ventricular outflow tract (LVOT) gradient (the definition used for successful procedure). Echocardiographic secondary endpoint was improvement in mitral regurgitation. Clinical primary endpoint was defined as a combined endpoint of cardiac death or hospitalization during follow-up (FU). 110 patients were included, 66.4% women, mean age 65.1 ± 12.2 years. Functional class NHYA class III/IV, angina CCS class II/III and syncope were present in 87.3%, 52.7% and 10.0%, respectively. Baseline LVOT gradients at rest and at Valsalva manoeuvre were 93.6 ± 39.8 mmHg and 118.9 ± 44.2 mmHg. Maximum septal thickness was 21.0 ± 3.3 mm, 24.5% had moderate mitral regurgitation and 52.7% showed systolic anterior motion of mitral anterior leaflet. During hospitalization for ASA, peak creatine kinase after procedure was 1,306 ± 816 U/l. 17 (17.1%) patients required permanent PM due to induction of permanent complete heart block. There was one case of inferior myocardial infarction and one case of cardiac tamponade. Echocardiographic primary endpoint was achieved by 83.6% of patients. At 3 and 6-months follow up, LVOT gradients was significantly decreased in successful comparing with unsuccessful procedure group (24.6 ± 23.9 *vs.* 82.0 ± 28.7 mmHg, p = 0.003 and 31.8 ± 34.5 *vs.* 68.6 ± 27.8 mmHg, p = 0.027, respectively). There was no difference in baseline clinical or echocardiographic parameters between both groups. Regarding the echocardiographic secondary endpoint, among patients with moderate mitral regurgitation, 80% improved to mild regurgitation. A significant reduction in basal septal thickness was achieved in most patients, from 21.0 ± 3.3 mm to 16.4 ± 2.7 mm after ASA (p = 0.001). During mean FU of 3.4 ± 2.1 years, clinical primary endpoint occurred in 25.5%, mainly in unsuccessful procedure group (50.0 *vs.* 20.7%, p = 0.013). Reintervention was performed for recurrence of symptoms in 14 (12.7%) patients, surgical myectomy in 4 (3.6%) and repeated ASA in 10 (9.1%).

Conclusions: ASA allows a significant reduction in LVOT gradient and improvement of mitral regurgitation in the majority of patients with OHCM. Systematic and comprehensive echocardiographic evaluation assumes a paramount importance for the evaluation of procedure success.

CO 112. THREE DIMENSIONAL MYOCARDIAL DEFORMATION PARAMETERS ARE ASSOCIATED WITH FUNCTIONAL CAPACITY IN HYPERTROPHIC CARDIOMYOPATHY

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Introduction: Three-dimensional (3D) echocardiography is an emerging tool for assessment of left ventricular function, with a promising role in the evaluation of cardiomyopathies. Hypertrophic cardiomyopathy (HCM) is often associated with reduced exercise capacity. The aim of this study was to evaluate the importance of 3D myocardial deformation as a predictor of exercise capacity in HCM patients (P).

Methods: This prospective study enrolled P with HCM. Each P underwent a comprehensive transthoracic echocardiogram including 3D speckle-tracking to measure global longitudinal, radial and circumferential strain, twist, torsion and global area strain. Functional capacity was objectively assessed by treadmill cardiorespiratory exercise testing.

Results: 83 P with HCM, 50 (60%) male, mean LV ejection fraction (LVEF) of 68 ± 7%, 27 (33%) with obstructive HCM (LV outflow tract [LVOT] gradient of 89 ± 60 mmHg). Impairment in LV myocardial deformation parameters was significantly correlated with lower peak VO2: global longitudinal 3D strain (r = -0.397, p < 0.001), global radial 3D strain (r = 0.336, p = 0.003) and global circumferential 3D strain (r = -0.353, p = 0.002). Impaired LV twist was significantly correlated with inferior peak VO2 (r = 0.264, p = 0.033) (Fig.) and peak circulatory power (r = 0.371, p = 0.003). Torsion impairment also significantly associated with lower peak VO2 (r = 0.285, p = 0.021), circulatory power (r = 0.380, p = 0.002), time to ventilatory anaerobic threshold (VAT) (r = 0.369, p = 0.003) and (VE/VCO2 slope)/peak VO2 ratio (r = -0.316, p = 0.012). Furthermore, global area strain impairment showed significant relation with decreased peak VO2 (r = -0.368, p = 0.001), lower exercise duration (r = -0.384, p = 0.001), time to VAT (r = -0.404, p < 0.001), circulatory power (r = -0.272, p = 0.032) and (VE/VCO2 slope)/peak VO2 ratio (r = 0.391, p = 0.002). LV twist (r = -0.135, p = 0.284), torsion (r = -0.120, p = 0.341) and global area strain (r = 0.152, p = 0.235) impairment did not correlate with VE/VCO2 slope. Exercise capacity was not associated with LV mass index (r = 0.209, p = 0.095), maximum wall thickness (r = 0.041, p = 0.744), LVEF (r = -0.092, p = 0.458), 2D global longitudinal strain (r = -0.024, p = 0.848) or peak LVOT gradient (r = -0.006, p = 0.964). In a subanalysis examining only the nonobstructive (nHCM) P, we found that peak VO2 had a superior correlation with global longitudinal 3D strain (r = -0.420, p = 0.004), global radial 3D strain (r = 0.356, p = 0.016)

and global circumferential 3D strain (r = -0.357, p = 0.016) as well as LV twist (r = 0.300, p = 0.046) and torsion (r = 0.336, p = 0.024).

Conclusions: Although P with HCM often have supranormal LVEF, 3D speckle-tracking echocardiographic imaging has the potential to demonstrate subclinical impairment of LV function. Impaired LV 3D strain, twist, torsion and global area strain were associated with reduced exercise capacity, particularly in nHCM P.

CO 113. MICROVASCULAR DYSFUNCTION IS ASSOCIATED WITH IMPAIRED MYOCARDIAL WORK IN OBSTRUCTIVE AND NONOBSTRUCTIVE HYPERTROPHIC CARDIOMYOPATHY: A MULTIMODALITY APPROACH

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Introduction: Myocardial work is a dynamic non-invasive method for assessing myocardial deformation. Microvascular dysfunction is a hallmark of hypertrophic cardiomyopathy (HCM). We hypothesized that there is an association between impaired myocardial work, evaluated by echocardiography, and left ventricular (LV) ischemia, detected by cardiac magnetic resonance (CMR).

Methods: Prospective assessment of HCM patients' (P) myocardial strain parameters with 2D speckle-tracking echocardiography. All P underwent CMR protocol (1.5-T) for the analysis of stress perfusion and late gadolinium enhancement (LGE). Perfusion defects were quantified as burden of ischemia (% of LV mass). Results were stratified according to obstructive (oHCM) and nonobstructive (nHCM) HCM as well as according to the presence of significant replacement fibrosis (LGE of ≥ 15% or < 15% of LV mass). Multivariate regression analyses were used to explore the relation between myocardial work and the burden of ischemia.

Results: 75 P with HCM (63% male, age 55 ± 15 years), 61% with asymmetric septal LVH, 29% with apical LVH, 8% with concentric LVH and 28% exhibiting LV outflow tract obstruction (mean maximal LVOT gradient of 89 ± 60 mmHg). Perfusion defects were found in 68 P (90.7%), with a mean of 22.5 ± 16.9% of LV mass and 29 P (38.7%) had LGE ≥ 15% of LV mass. A lower global work index (GWI) significantly correlated with higher burden of myocardial perfusion defects (r = -0.520, β-estimate -0.019, 95%CI -0.028 to -0.010, p < 0.001). Likewise, impaired values of global work efficiency
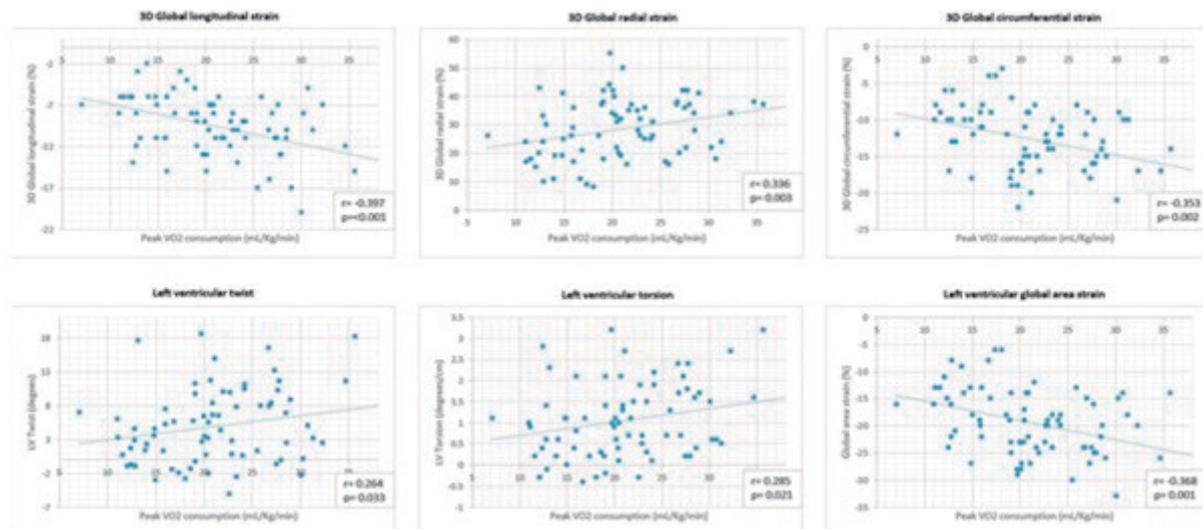
CO 112 Figure
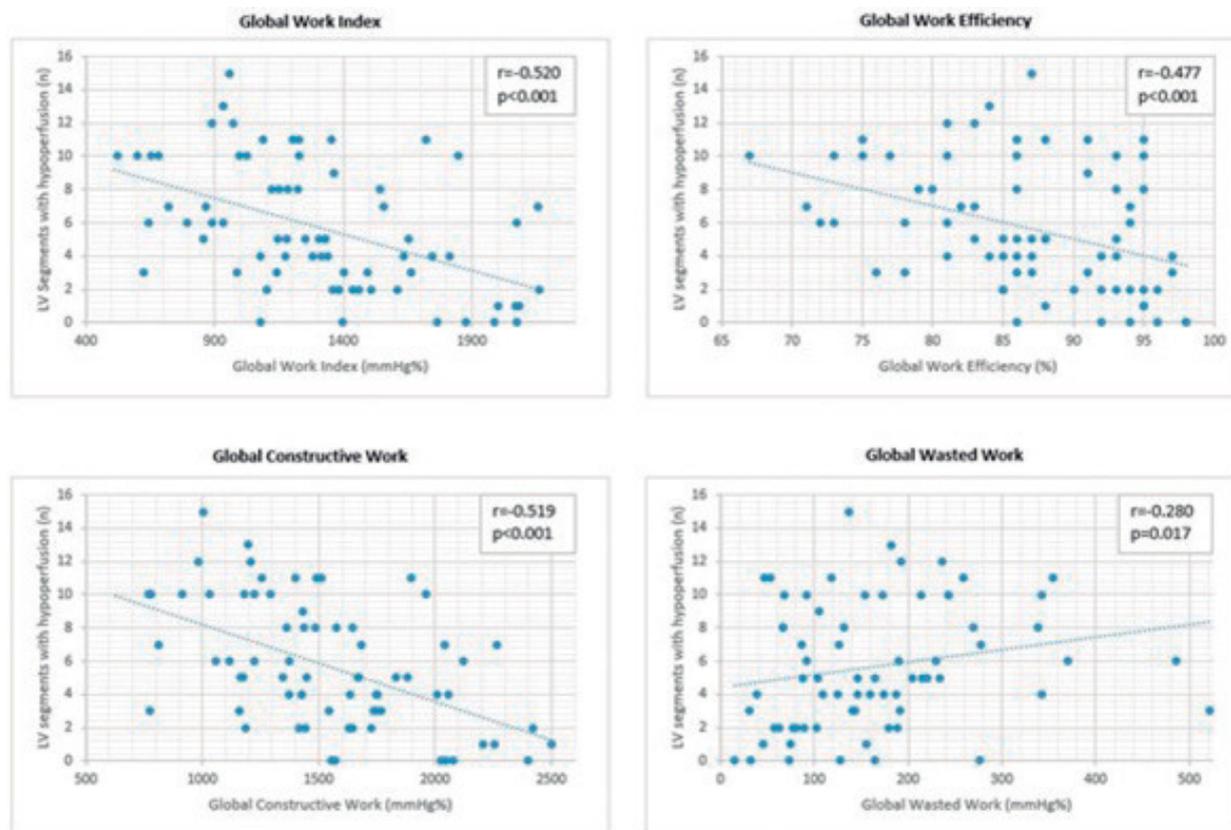
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(GWE) were linked to higher percentage of hypoperfusion (r = -0.477, β-estimate -0.713, 95%CI -1.250 to -0.176, p < 0.001). Moreover, impaired global constructive work (GCW) (r = -0.519, β-estimate -0.021, 95%CI -0.030 to -0.013, p < 0.001) and a higher global wasted work (GWW) (r = 0.280, p = 0.017) were associated with a higher burden of perfusion defects. GWI showed a higher correlation with perfusion defects in oHCM P (r = -0.492, p < 0.001) *vs.* nHCM P (r = -0.158, p = 0.019), and the same was also found with GWE (oHCM: r = -0.591, p = 0.006 *vs.* nHCM: r = -0.317, p = 0.022). Furthermore, GCW showed a slightly higher correlation with hypoperfusion in oHCM P (r = -0.564, p = 0.010) *vs.* nHCM P (r = -0.520, p < 0.001). There was no significant difference between oHCM and nHCM P regarding GWW. In P with LGE ≥ 15%, GWI showed a better correlation with perfusion defects (r = -0.489, p = 0.007) *vs.* P with LGE of < 15% (r = -0.369, p = 0.007). Moreover, GCW showed a higher correlation with hypoperfusion in P with LGE ≥ 15% (r = -0.455, p = 0.013) comparing with P with LGE < 15% LV mass (r = -0.359, p = 0.019). No difference was found regarding GWE and GWW according to LGE burden.

Conclusions: In our cohort of P with HCM, impaired GWI, GWE and GCW and a higher GWW were significantly correlated with the presence of myocardial ischemia in CMR. This correlation was greater in P with oHCM and in P with LGE of ≥ 15% of LV mass.

CO 114. MYOCARDIAL DEFORMATION ANALYSIS USING CARDIAC MAGNETIC RESONANCE IN APICAL HYPERTROPHIC CARDIOMYOPATHY

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Introduction: Apical hypertrophic cardiomyopathy (aHCM) has a broad phenotypic spectrum and still poses many diagnostic and prognostic challenges. Myocardial deformation analysis using cardiac magnetic resonance tissue tracking (CMR-TT) has shown value as an adverse events predictor in classic HCM, but information in aHCM is scarce.

Objectives: To examine the prognostic value of myocardial deformation obtained with CMR-TT analysis in predicting adverse outcomes in aHCM patients.

Methods: We conducted a retrospective study enrolling patients referred to CMR in our Cardiology Department from August 2009 to October 2021, to whom the diagnosis of aHCM was made. CMR-TT analysis was performed to each patient to characterize the myocardial deformation pattern. We further analysed clinical and other complementary diagnostic exams characteristics, as well as follow-up data. Primary endpoint was the composite of all-cause hospitalizations and mortality.

Results: During the 12-year period, 51 patients with aHCM were diagnosed by CMR, with a median age of 64 years-old and male predominance (60.8%). Family history of HCM or sudden cardiac death was present in 7.8%. T-wave inversion on resting electrocardiogram was present in 78.4% of patients and 56.9% had an echocardiogram suggestive of aHCM. Patients expressed the "relative form" in 43.1%, 37.3% had the "pure apical" form and 17.6% the "mixed form". In our population, median maximum left ventricle (LV) thickness was 15 mm, with a median LV mass index of 76 g/m². Late gadolinium enhancement was present in 78.4% of patients, in a median of five LV segments. Applying CMR-TT analysis, median global longitudinal strain was -14.4%, with a median global radial strain of 30.4% and global circumferential strain of -18.0%. During a median follow-up of 5.3 years, no patient had sustained ventricular dysrhythmias, but 21.6% had non-sustained ventricular tachycardia on 24h-Holter. Primary endpoint occurred in 10 patients (21.3%), with a hospitalization rate of 17.8% (cardiac causes in 2%) and all-cause mortality rate of 6.4%. Those patients were older (69.2 *vs.* 59.5 years-old; p = 0.01), had a larger prevalence of chronic obstructive pulmonary disease (20 *vs.* 2.7%; p = 0.047), and lower longitudinal strain rate in apical segments (0.27 *vs.* -0.74 s⁻¹; p = 0.021). After multivariable analysis, only longitudinal strain rate in apical segments was an independent predictor of the primary endpoint (p = 0.023).

Conclusions: CMR-TT analysis, namely through longitudinal strain rate, could be useful in predicting adverse outcomes in aHCM.

CO 115. REDUCED 3D-LEFT ATRIUM EJECTION FRACTION PREDICTS DEVELOPMENT OF ATRIAL FIBRILLATION IN PATIENTS WITH HYPERTROPHIC CARDIOMYOPATHY

Ana Filipa Amador, João Calvão, Catarina Martins da Costa, Ricardo Alves Pinto, Miguel Martins Carvalho, Tânia Proença, Catarina Amaral Marques, André Cabrita, Carlos Xavier Resende, Pedro Grilo Diogo, Cátia Oliveira, Ana Isabel Pinho, Luís Daniel Santos, Carla Margarida Sousa, Filipe Macedo

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Introduction: Atrial fibrillation (AF) is the most common sustained arrhythmia in hypertrophic cardiomyopathy (HCM), occurring in approximately 25% of patients, related to left atrial (LA) dilatation and remodeling. HCM patients who develop AF have increased risk of HCM-related death, functional impairment, and stroke. Accurate risk stratification for AF in this population is crucial as contemporary treatments are highly successful.
Objectives: To assess if new echocardiographic parameters can predict the development of AF in HCM patients.
Methods: HCM patients who underwent comprehensive echocardiographic examination during 2011 were followed and checked for *de novo* AF until November 2021. We searched for associations between AF development and novel echocardiographic parameters such as LA Volume index, Left Atrioventricular Coupling Index (LACI, as LAVI/a'), 3D LA volumes and 3D LA ejection fraction (3D-LAEF).
Results: A total of 43 patients were included, with 62.8% male and mean age 56.1 ± 6.2 years old. 55.8% had the septal asymmetric HCM type and mean LV mass was 326 ± 127 g. Mean LA diameter and biplane 2D volume was 46 ± 7 mm and 78 ± 37 mL, respectively. 11.6% of patients already had AF. During a median follow-up of 9.4 years, the incidence of "de novo" AF was 31.6%. Within the total 17 patients with AF, 35.2% took warfarin and the remaining direct oral anti-coagulation. No stroke was documented. There were 3 deaths (mortality rate of 7.0%), none from cardiac causes. No association was found between AF development and LAVI, LACI or 3D LA volumes. We only found a statistically significant difference regarding 3D-LAEF, which was lower in patients who developed AF compared with those without AF (26 ± 12% VS 39 ± 19%, p = 0.04). Binary logistic regression analysis found that reduced 3D-LAEF predicts the development of AF (p = 0.019, odds ratio [OR] 2.6, 95% confidence interval [CI] 1.0 to 1.1). The area under a receiver operating characteristic curve using 3D-LAEF as a predictive marker for AF development in HCM patients was 0.743 (p = 0.004). When the cut-off value of 3D-LAEF was set at 34.5%, the sensitivity and specificity for AF diagnosis were 66% and 86%, respectively.
Conclusions: In our study, 3D LAEF predicted the development of AF in HCM patients – this may be a useful tool to identify patients at high risk of future AF who may benefit from more intensive rhythm monitoring and a lower threshold for oral anticoagulation.

Domingo, 24 Abril de 2022 | 12:00-13:00

Sala Aquarius | Comunicações Orais (Sessão 24) - Cardiopatias Congénitas, Doença Vascular Pulmonar e Embolia Pulmonar 2 - Foco no Adulto com Cardiopatia Congénita

CO 116. PREGNANCY OUTCOMES IN WOMEN WITH SEVERE CONGENITAL HEART DISEASE - A SPECIALIZED CENTRE EXPERIENCE

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Introduction: Progress in pediatric cardiology and cardiac surgery has dramatically increased the number of women with severe complex congenital heart disease (SC-CHD) that reach reproductive age. Pregnancy in this group of women has an increased risk of adverse cardiac and neonatal events and its predictive factors are not fully defined. Our purpose was to assess the experience of our center regarding pregnancy and neonatal outcomes in women with SC-CHD.
Methods: Retrospective analysis of obstetric data in women with CHD followed at our institution. Pregnancy and neonatal outcomes were evaluated regarding patients presenting SC-CHD and mild and moderate complexity (MMC-CHD), according to ESC CHD guidelines classification.
Results: The study enrolled 680 women with CHD (median age, 27.2 years) who experienced 1,262 pregnancies, resulting in 998 live births. A previous corrective procedure was found in 334 women (49.1%). CHD complexity was considered mild, moderate and severe in 263 (38.7%), 359 (52.8%) and 58 (8.5%), respectively. SC-CHD included 38 women with cyanotic CHD and 18 with pulmonary vascular disease. The most common heart defect in SC-CHD patients was cyanotic tetralogy of Fallot (19%), followed by dextro-transposition of the great arteries with atrial switch/palliative procedures (13.8%) (Fig.). Patients with SC-CHD had successful deliveries in 56.1% comparing with 82.1% in MMC-CHD. Women with SC-CHD had significantly higher incidence of preterm birth (24.6 *vs.* 7.4%, p < 0.001), spontaneous abortion (26.3 *vs.* 12.3%, p = 0.004) and neonatal mortality (10.3 *vs.* 2.3%) comparing with MMC-CHD. Low birth weight was also extremely more frequent in the SC-CHD group (44.7 *vs.* 8.5%, p < 0.001). No difference

Severe CHD	N=58
Tetralogy of Fallot (cyanotic)	11 (19.0%)
Transposition of the great arteries (atrial switch /palliative procedures)	8 (13.8%)
Ventricular septal defect associated with PVD ± cyanotic	6 (10.3%)
Ebstein disease (cyanotic)	6 (10.3%)
Univentricular heart	6 (10.3%)
Atrial septal defect with PVD ± cyanotic	5 (8.6%)
Double-outlet ventricle	4 (7.0%)
Patent ductus arteriosus (cyanotic)	4 (7.0%)
Pulmonary atresia	3 (5.2%)
Truncus arteriosus	2 (3.4%)
Atrioventricular septal defect with PVD ± cyanotic	1 (1.7%)
Tricuspid atresia	1 (1.7%)
Ventriculoarterial connection	1 (1.7%)

PVD: pulmonary vascular disease

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was found relating to the presence of CHD in infants from SC-CHD mothers compared to off-spring from MMC-CHD (8.4 *vs.* 5.3%, p = 0.407). Cesarian deliveries had similar rates independently of increased CHD complexity (34.2 *vs.* 32.1%). Overall, pregnancy was quite well tolerated, although cardiac complications were more common in SC-CHD pregnancies (0.4 *vs.* 4.3%, p 0.013). Only one maternal death was registered, during 1st trimester, in a woman with a large unrepaired ventricular septal defect and cyanosis.

Conclusions: Severe complex CHD remains a challenging condition for pregnancy with increased maternal and neonatal morbimortality. This emphasizes the importance of extensive prepregnancy counselling and centralization of care to address specific risks and requirements of the condition.

CO 117. IMPACT OF COVID-19 IN ADULT PATIENTS WITH CONGENITAL HEART DISEASE

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Introduction: COVID-19 is responsible for a worldwide pandemic, causing more than 18,000 deaths to date in Portugal. Data already exists regarding the increased risk of adverse events in patients with cardiovascular diseases, however the impact of SARS-CoV-2 infection in patients (P) with congenital heart disease (CHD) is still under investigation.

Methods: Adult patients seen at the CHD outpatient's clinic at a tertiary centre, who became infected with SARS-CoV-2 infection up to December 2021 were included. Assessment of patients' symptoms, need for hospitalization and admission in an intensive care unit was assessed based on medical records.

Results: We identified seventy-nine patients (pts) with COVID-19 infection. Symptoms were present in 67 (84%). The median age was 44 (15) years, 52% were females. Eight P (10%) had complex cyanotic disease; seven Tetralogy of Fallot; five (6%) transposition of great arteries; eight (10%) right ventricle obstacle; two (3%) atrioventricular canal defect; sixteen (20%) atrial septal defect; nine (11%) ventricular septal defect; eight (10%) aortic coarctation; two (3%) had Eisenmenger syndrome. 49% of P had previous surgery or percutaneous procedure. 63% of P were at New York Heart Association (NYHA) class of I and 30% at NYHA II. Mild symptoms were reported by 56 P (71%). Ten adults (7.9%) experienced moderate symptoms (dyspnea and hypoxia) that led to hospitalization for oxygen therapy, none required mechanical ventilation. One death was reported in an 83-year-old patient with non-corrected interventricular communication and compromised biventricular function. There was a significant association between the gravity of CHD and hospitalizations (p = 0.02).

Conclusions: Our pts had mainly mild to moderate symptoms and did not appear to have a disproportionately negative outcome; the need for hospitalization was more frequent in patients with higher CHD gravity. These findings are in line with the emerging data regarding COVID-19 in CHD P, and may be in part explained by the patient's young age and functional status.

CO 118. CARDIOPULMONARY EXERCISE TESTING IN REPAIRED TETRALOGY OF FALLOT AND SUPRAVENTRICULAR ARRYTHMIAS

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Introduction: The arrhythmia burden in adult patients (Ps) with tetralogy of Fallot (TOF) is considerable, being a major late complication in repaired TOF. The incidence of atrial arrhythmias is relatively high and one of the main causes of morbidity. Our aim was to assess which cardiopulmonary exercise testing (CPET) parameters best correlate with supraventricular arrythmias (SVA) to potentially improve identification of high-risk Ps.

Methods: A single-center retrospective analysis was performed from 2009 to 2018 on adult Ps with repaired TOF who underwent maximal CPET. Ambulatory ECG monitoring was used to analyze the arrhythmic profile. Demographics, standard measures of CPET interpretation, and major cardiovascular outcomes were collected. Multivariate analysis for the prediction of SVA was performed using Cox Regression, by including all statistically significant variables in the univariate analysis and those considered clinically relevant.

Results: CPET was performed in 63 repaired TOF Ps (57% male, mean age of 34 ± 9 years), with a mean follow-up of 60 ± 33 months. 56% Ps had severe pulmonary regurgitation and 48% Ps underwent pulmonary valve replacement (PVR). Supraventricular arrhythmias occurred in 12 Ps (19%), mainly atrial fibrillation or atrial flutter (67%). There were no statistically significant differences regarding the clinical profile and baseline CPET parameters between both groups, namely: age (p = 0.113), male gender proportion (p = 0.581), proportion of Ps who underwent PVR (p = 0.578), RV systolic dysfunction prevalence (p = 0.854) and peak oxygen uptake (p = 0.083). VE/VCO_2 slope was an independent predictor of SVA (HR 1.41, 95%CI 1.08-1.84, p = 0.012). Exercise capacity assessed by estimated metabolic equivalents (METS), as well as the peak heart rate (PHR) during exercise (HR 0.86, 95%CI 0.76-0.96, p = 0.007), revealed a protective effect regarding SVA (HR 0.71, 95%CI 0.51-0.98, p = 0.045). Neither peak oxygen uptake (p = 0.090) nor cardiorespiratory optimal point (p = 0.427) showed statistically significant correlation with SVA during follow-up. Ps with a PHR above 165 bpm had a significantly higher survival free of SVA (log-rank p = 0.045).

Conclusions: In our population, VE/VCO_2 slope was an independent predictor of SVA during follow-up, while both a higher PHR and a higher exercise capacity had a protective effect. CPET could be an accessible way of improving risk-stratification of TOP Ps and should therefore be included in their routine assessment.

CO 119. BETA-BLOCKERS: A MODIFIER OF THE NATURAL HISTORY OF BICUSPID AORTIC VALVES?

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Introduction: Bicuspid aortic valve (BAV) disease is one of the most common congenital heart diseases, with an incidence of 0.5-2.0%. In BAV disease, aortic dilatation (AD) is frequent and the use of beta-blockers (BB) and angiotensin receptor blockers (ARB) are expected to slow ascending aorta dilation. In BAV patients (pts) the rule of BB an ARB to prevent AD is not established.

Objectives: To characterize a population of BAV pts and evaluate the impact of BB and ARB to prevent AD.

Methods: Single-center retrospective study of consecutive pts with isolated BAV documented on the laboratory center echocardiography from 2014 to 2020. Baseline demographic, clinic (including baseline therapy) and echocardiography data were collected. Follow-up (FUP) data of aortic surgery and death were registered. For statistical analysis we performed Chi-Square, Mann-Whitney, Cox regression and survival analysis with Kaplan-Maier curves.

Results: We included 250 pts with BAV (mean age 53 ± 15 years, 70.8% males), 148 pts (59.2%) with type 1 Sievers classification, 61 pts (24.4%) with type 2, 9 pts (3.6%) with type 3. Clinical characteristics were similar between groups. At baseline, 114 (45.6%) had AD (root, ascending aorta or both). We observed that BAV type 1 was associated with higher rates of aortic valvopathy: more pts with severe aortic regurgitation (total n = 31; 80.6% type 1 *vs.* 19.4% type 2, p = 0.030) and severe aortic stenosis (total n = 43; 55.8% type 1 *vs.* 37.2% type 2, p = 0.042). On the other hand, we didn't find any association regarding the phenotype of BAV and presence

of AD (p = NS). During a mean FUP of 5.6 ± 5.3 years, from 136 pts without previously documented AD, 52 pts (38.2%) developed this complication. At baseline, 46 (34.6%) were under BB and 20 (15%) pts under ARB, while the remaining had no medication. We found that BB therapy was a protective factor for AD during the FUP (log rank: 4.052, p = 0.044), but ARB therapy was not (p = NS). Mortality at FUP occurred in 32 pts (15.2%, more frequent in type 1, n = 15) with no differences according to phenotypes, AD or valvopathy.
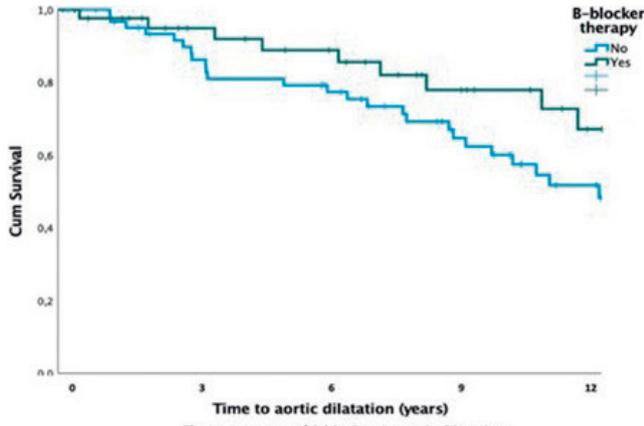

Figure 1: Impact of B-blockers in aortic dilatation.

Conclusions: The natural history of BAV seems worst in BAV type 1 with more valvopathy, but with no differences in terms of mortality. BB therapy seems protective of AD in previous non-dilated aorta in BAV pts. We hypothesize that in BAV pts therapy with BB when started before AD could prevent this complication. A larger study is needed to validate our findings.

CO 120. THE WORLD UPSIDE DOWN – AFTER 20 YEARS FOLLOW-UP OF DEXTRO-TRANSPOSITION OF THE GREAT ARTERIES

Ricardo Alves Pinto, Miguel Martins Carvalho, Tânia Proença, João Calvão, Catarina Costa, Ana Filipa Amador, Catarina Marques, André Cabrita, Cátia Priscila, Luís Santos, Ana Pinho, Cristina Cruz, Filipe Macedo

*Centro Hospitalar Universitário de S. João, EPE.*

Introduction: Congenital Heart Disease (CHD) affects under 1% of newborns and thanks to its prognosis improvement, most patients survive until adulthood. Dextro-transposition of the great arteries (dTGA) is a CHD classically palliated with atrial switch (ATS) procedure and nowadays corrected with an arterial switch (ARS), with better clinical outcomes. Nevertheless, several post-ATS patients remain alive and questions persist regarding their long-term prognosis.

Objectives: To observe a group of dTGA patients followed in an Adult CHD outpatients clinic, access their comorbidities, surgical interventions, complications and clinical outcomes.

Methods: We retrospectively analyzed a group of dTGA patients born between 1974 and 2001. Clinical features were collected and time-to-event statistics were analyzed. Adverse event was defined as a composite of death, stroke, myocardial infarction or coronary revascularization, arrhythmia and ventricular, valvular or conduct dysfunction.

Results: A total of 80 patients were enrolled with a mean follow-up of 26 years after surgery: 46% were female, median age 27 (19-57) year-old. Concerning other concomitant defects, 25% had ventricular septal defect, 12% pulmonary stenosis, 3% aortic coarctation and 1% single coronary ostium. ATS palliation was performed in 54% of patients and ARS in 45% of patients; median age at procedure was 13 months and 10 days, respectively. During follow-up, almost all patients submitted to ARS remained in sinus rhythm (97%) *versus* 64% of ATS patients (p = 0.037). The latter group had higher incidence of arrythmias (40 *vs.* 3%, p = 0.013), mostly atrial flutter or fibrillation (present in 28%), followed by bradyarrhythmia (10%); median time from surgery to first arrhythmic event in these patients was 23 years. Also, systemic ventricle systolic dysfunction (SVSD) and chronotropic incompetence were significantly higher in ATS (41 *vs.* 3%, p < 0.001 and 46 *vs.* 9%, p = 0.005, respectively); mean time to SVSD was 29 years. In respect to long-term outcomes in ARS, the most frequent complications were moderate to severe aortic regurgitation, pulmonary stenosis and regurgitation, occurring in 21%, 7% and 3%, respectively. Concerning both groups, mean time to first adverse-event was 21 years. Regarding gender and demographic features, there were no differences in time-to-adverse-event, comparing patients living in urban *versus* rural neighbourhoods and female *versus* male (log rank, p = 0.368 and p = 0.693). Only one patient died, submitted to ATS, at 46 years-old, from chronic heart failure.

Conclusions: After a long-term free of events, ATS patients experienced more arrhythmic complications and SVSD. ARS complications were anastomosis related. This report highlights the efforts that should be made to identify late complication is this particular population. Of note, no demographic or gender differences were observed.
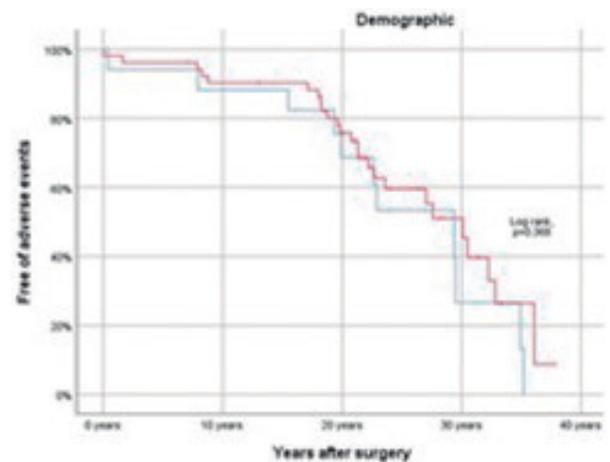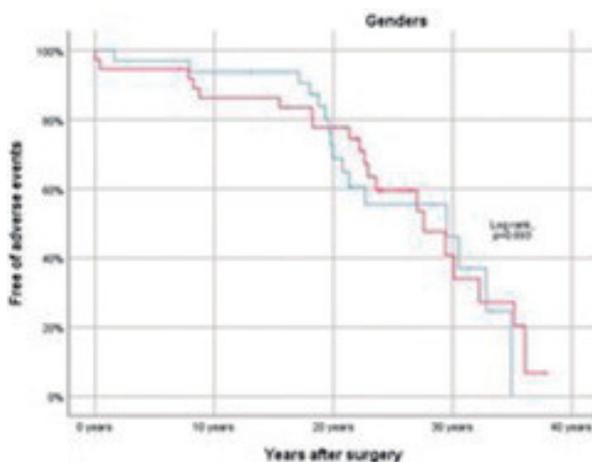
CO 120 Figure

Domingo, 24 Abril de 2022 | 12:00-13:00

Sala Vega | Comunicações Orais (Sessão 25) - Risco CV, Prevenção e Reabilitação Cardíaca 2 - Vários

CO 121. CARDIAC REHABILITATION AND MUSCLE EFFICIENCY IMPROVEMENT IN HEART FAILURE PATIENTS

Daniel A. Gomes, Sérgio Maltês, Gonçalo Cunha, Gustavo S. Mendes, Mariana S. Paiva, Rita R. Santos, Luís Moreno, Anaí Durazzo, Jorge Ferreira, Miguel Mendes

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

Introduction: Cardiac rehabilitation programs (CRP) are known to improve functional capacity in heart failure (HF) patients. However, the underlying mechanisms by which CRP improves exercise tolerance are not yet fully understood. We hypothesize that increased muscle efficiency (ME), which is inversely proportional to oxygen consumption (VO2) for similar load conditions, may explain such benefits by optimizing energy use independently of muscle oxygen delivery.
Methods: Retrospective single-center study enrolling consecutive patients with chronic (> 3 months) and stable HF with reduced ejection fraction (HFrEF < 40%) under optimal medical therapy (including cardiac resynchronization therapy) who completed a phase 2 CRP from 2016 to 2021. Patients underwent four months of CRP as per site protocol, and all had a pre- and post-CRP cardiopulmonary exercise test (CPET) performed within one month before CRP start and two weeks after the end. Those who performed different exercise protocols in both CPETs were excluded (n = 22). VO2 comparison for similar work conditions (eg. 25%, 50%, 75% and 100% of attained metabolic equivalent [METS] at first CPET) before and after CRP was used as a surrogate for ME.
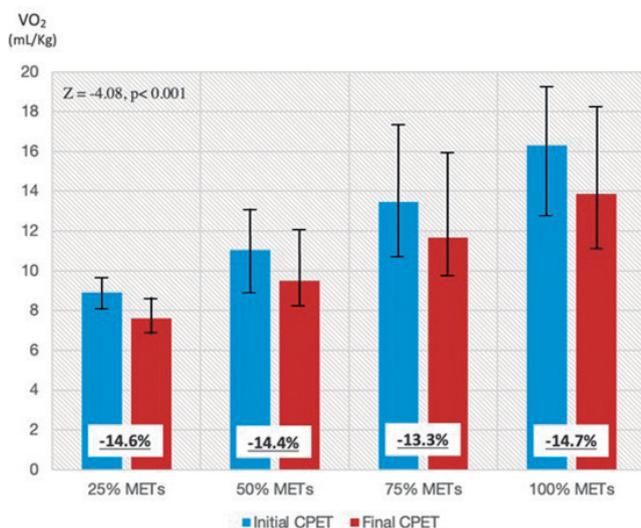

Figure 1 - VO2 comparison for similar work conditions between initial and final CPET (25%, 50%, 75% and 100% of attained METS at first CPET).

Results: Overall, 44 patients (mean age 61 ± 11 years; 80% male; 66% with ischemic HF; median left ventricular ejection fraction of 30% [IQR 25-35]; 93% in NYHA class II-IV) were included. CPET was performed using standard Bruce or Ramp protocol in 20% and 80% of patients, respectively. A significant increase in exercise duration before and after CRP was detected (6.4 [IQR 5.2-7.1] *vs.* 9.3 [IQR 8.5-10.4] minutes, p < 0.001), while no differences were found at peak VO2 and first ventilatory threshold levels. Oxygen consumption for similar workloads was significantly lower in the final CPET at both submaximal (25%, 50% and 75%) and peak exercise level (at 100% METS: 13.9 [11.1-18.2] *vs.* 16.3 [12.8-19.4] mL/kg; Wilcoxon signed ranks test Z = -4.08, p < 0.001) (Fig.). Those with ME increment ≥ 10% at peak exercise (n = 21, 48%) showed a higher exercise capacity improvement after CRP (median estimated METS increase between CPETs: 1.9 [1.2-2.6] *vs.* 1.0 [0.0-1.7], p = 0.01).
Conclusions: In a cohort of HFrEF patients, CRP increased ME by 14% at submaximal (25%, 50%, 75%) and at peak exercise level. These findings suggest that optimal muscle energy use may explain, at least partially, the functional capacity improvement observed after cardiac rehabilitation.

CO 122. IMPACT OF CARDIAC REHABILITATION ON INFLAMMATION IN PATIENTS WITH ISCHAEMIC CARDIOMYOPATHY

Dias de Frias[1], Ricardo Costa[1], Cristine Schmidt[2], Andreia Campinas[1], André Alexandre[1], Anaisa Pereira[1], David Sá-Couto[1], Preza Fernandes[1], Sandra Magalhães[1], Mário Santos[1], Severo Torres[1]

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Introduction: The benefits of cardiac rehabilitation (CR) in patients with ischaemic cardiomyopathy are well-known. However, inflammatory states have been associated to an increased risk of cardiovascular events.
Objectives: Evaluate the impact of CR in the serum levels of inflammatory biomarkers and identify potential predictors of that effect.
Methods: We retrospectively studied consecutive patients with ischaemic cardiomyopathy who completed a CR programme between 2011 and 2017. Patients underwent a supervised exercise training protocol, twice a week during a period of 8 to 12 weeks. Functional capacity was evaluated by metabolic equivalents assessed prior the beginning and 3 months after the programme with a symptom limited exercise treadmill test. Patients without levels of serum C-reactive protein at beginning and at the end of CR programme were excluded. Median variation of serum C-reactive protein was assessed and two groups were defined: one with levels above that and one with levels below.
Results: Of 250 patients (60.3 ± 11.1 years, 84% male), 67% were admitted after an acute myocardial infarction. Left ventricular ejection fraction ≤ 40% before CR was present in 32% of individuals. Median levels of serum C-reactive protein before CR were 8.8 (3.1-21.7) mg/L and median variation after CRP was a decrease of 5.1 (0.9-17.7) mg/L (p < 0.001). Before CR, higher levels of serum C-reactive protein were seen in obese (15.7 [8-52.7] *versus* 8.8 [3.2-27.8], p = 0.04) and those with higher NT-proBNP (p < 0.001). Patients with decrease of > 5.1mg/L of serum C-reactive protein had lower prevalence of hypertension (18% *versus* 30%, p = 0.02), higher prevalence of obesity (16% *versus* 7%, p = 0.03), lower levels of HDL cholesterol (38.3 [11.1] *versus* 43.2 [12.6], p < 0.001) and higher levels of NT-proBNP (1079 [610.3-1,988] *versus* 488 [215-777], p < 0.001) at baseline. An increase of at least of 10% of functional capacity after CR was reached in 65% of patients, similar between groups. Patients with decrease of serum C-reactive protein > 5.1mg/L had also higher reduction of NT-proBNP after CR comparing to baseline (491.1 [142.7-948.5] *versus* 162.0 [30.9-295.2], p < 0.001).
Conclusions: Serum levels of inflammatory biomarkers decreased after CR in patients with ischaemic cardiomyopathy. Normotension, obesity, lower HDL and higher levels of natriuretic peptides are associated to a better response.

CO 123. IS THE OBESITY PARADOX LEADING TO A LESS STRINGENT SECONDARY PREVENTION STRATEGY IN PATIENTS WHO HAVE SUSTAINED AN ACUTE CORONARY SYNDROME?

Dias de Frias[1], Cristine Schmidt[2], Mauro Moreira[3], Preza Fernandes[1], Sandra Magalhães[4], Mário Santos[4], Severo Torres[1]

[1]Centro Hospitalar Universitário do Porto, EPE/Hospital Geral de Santo António.[2]Serviço de Cirurgia e Fisiologia, Faculdade de Medicina da Universidade do Porto. CIAFEL, Faculdade de Desporto da Universidade do Porto. [3]Instituto de Ciências Biomédicas Abel Salazar. [4]Centro Hospitalar e Universitário do Porto. Instituto de Ciências Biomédicas Abel Salazar. Serviço de Cirurgia e Fisiologia, Faculdade de Medicina da Universidade do Porto. CIAFEL, Faculdade de Desporto da Universidade do Porto. UMIB, Instituto de Ciências Biomédicas Abel Salazar.

Introduction: Patients with acute coronary syndrome (ACS) are at very high risk of recurrent cardiovascular (CV) events. Despite being a major CV risk factor, obesity was associated with best survival in patients with ACS, the so-called "obesity paradox". It is uncertain if this finding is leading to a less stringent secondary prevention strategy in this group of patients, and whether it influences prognosis.

Objectives: To analyze the impact of obesity on outcomes after ACS and on other CV risk factor management.

Methods: Single-center, retrospective observational study that included all consecutive post-ACS patients enrolled in a phase 2 cardiac rehabilitation (CR) program in 2017. Patients were classified in 2 groups according to body mass index (BMI) classification at baseline: Group 1 (G1) were obese patients (BMI≥ 30 kg/m²), and Group 2 (G2) were non-obese patients (BMI< 30kg/m²). Major adverse cardiovascular events (MACE) were defined as a composite of death, non-fatal ACS, non-fatal stroke, and unplanned revascularization.

Results: 198 patients were included (mean age of 60.3 ± 10.7 years, 82% male) with a mean BMI of 27.7 ± 4.2 kg/m². Forty-seven patients had a BMI ≥ 30 kg/m². Patients in G1 were more likely to have hypertension (79 *vs.* 55%; p = 0.003) and diabetes (36 *vs.* 20%; p = 0.022). CR program was associated with smoking cessation, significant BMI (G1: -0.69 (95%CI: -0.40 to -0.10); G2: -0.39 (95%CI: -0.20 to -0.57) and LDL-Cholesterol (LDL-C) reduction (G1: -38 (95%CI: -25 to -50); G2: -29 (95%CI: -22 to -36), and functional capacity improvement (G1: +1.2 METs (95%CI: +0.9 to +1.5); G2: +1.1 METs (95%CI: +1.0 to +1.4) in both groups at 3 months, with similar magnitude of improvement. At 24 months, BMI had returned to baseline values in both groups, while the improvement in smoking status, LDL-C and functional capacity persisted. At 24 months, MACE occurrence was numerically increased in obese group (G1: 26.1 *vs.* G2: 17.2%, p = 0.182), with a statistically significant higher incidence of non-fatal recurrent ACS (reACS) in G1 (17 *vs.* 7.3%, p = 0.048).

Conclusions: ACS patients with obesity have worse prognosis, despite the similar improvement in CV risk profile. Our data also suggests that, despite the short-term improvement in BMI, current treatment strategies are not effective in achieving a persistent weight control over 24-months.

CO 124. SYNERGISM OF TWO ACE GENE VARIANTS IN THE ONSET OF HYPERTENSION IN A PORTUGUESE POPULATION

Ana Célia Sousa[1], Roberto Palma dos Reis[2], Carolina Aguiar[1], Carolina Barros[1], Helena Luís[1], Mariana Gomes[1], Eva Henriques[1], Sónia Freitas[1], Mariana Rodrigues[1], Sofia Borges[1], Maria João Oliveira[1], Ana Isabel Freitas[1], Ilídio Ornelas[1], Maria Isabel Mendonça[1]

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

Introduction: The Renin-Angiotensin-Aldosterone system is a important key in arterial hypertension (AHT) regulation. Genetic polymorphisms that interfere in this system are candidate genes for AHT genesis. Particularly, it has been described that genetic variants of angiotensin converting enzyme (ACE) are potentially associated with AHT in some populations, but not in others. The existence or not of synergistic actions between the ACE genetic variants in the appearance of AHT remains unknown.

Objectives: Investigate the association between ACE gene polymorphisms, ACE I/D rs 4340 and ACE A2350G rs4343, and AHT. Additionally, we aim to evaluate whether there is a synergism effect of ACE variants with AHT.

Methods: A case-control study was performed with a total of 715 participants under the age of 50 years, including 339 hypertensive individuals and 376 controls. All collected blood for biochemical and genetic analysis. The frequency of polymorphic variants of the ACE gene, ACE I/D rs 4340 and ACE A2350G rs4343, were evaluated in both groups and the Odds Ratio (OR) was calculated under the inheritance models: dominant, recessive, additive and allelic. Finally, we evaluated the possible synergistic effect between the two ACE gene variants in the appearance of AHT through multivariate analysis.

Results: The genetic variant ACE DD was more frequent in the hypertensive individuals compared to controls (OR = 1.472; CI 1.092-1.984; p = 0.011). ACE 2350GG variant was also more prevalent for the AHT group with an OR of 1.524 (CI 1.029-2.258; p = 0.035). A synergistic effect between the two variants in hypertension onset was verified with an AHT risk (OR) of 1.716 (CI 1.107-2.661; p = 0.016).

Conclusions: This study showed the existence of a statistically significant association between ACE variants (DD and 2350GG) and AHT appearance. Additionally, a synergistic effect on AHT onset between the two variants studied was proved. This result highlights the existence of genetic variants of renin-angiotensin-aldosterone system that favor the appearance of AHT in our population. AHT is not explained in a simple way, with a single polymorphism of a gene, but with complex interactions of polymorfisms, as synergistic effects between polymorphisms of the same gene.

CO 125. EFFECTS OF HOME-BASED ISOMETRIC HANDGRIP TRAINING IN OLDER ADULTS WITH HIGH BLOOD PRESSURE

Diogo Pinto[1], Nuno Dias Rato[1], Maria J. Marques[2], Teresa Amaral[2], Leonor Amaral[2], Pedro Ruivo[2], Ricardo Abreu[3], Cristiana Carneiro[3], Ana P. Oliveira[3], Jorge Polónia[4],José Mesquita-Bastos[5], João l. Viana[1], Linda S. Pescatello[6], Fernando Ribeiro[7], Alberto J. Alves[1]

[1]Research Center in Sports Sciences, Health Sciences and Human Development - University of Maia. [2]Family Health Unit Santa Joana, Aveiro. [3]Family Health Unit Serzedelo, Guimarães. [4]Unidade Local de Saúde de Matosinhos, EPE/Hospital Pedro Hispano. [5]Centro Hospitalar do Baixo Vouga, EPE/Hospital Infante D. Pedro (Aveiro). [6]Department of Kinesiology, College of Agriculture, Health and Natural Resources, University of Connecticut. (7) Universidade de Aveiro.

Introduction: Evidence suggests isometric handgrip training (IHT) lowers blood pressure (BP). However, the impact of IHT in older adults is unclear. Here we report the preliminary results of the HoldAge trial on the effects of home-based IHT and aerobic exercise training (AET) on BP in older adults with high normal blood pressure or hypertension (ClinicalTrials.gov: NCT04275037).

Methods: Participants (n = 35; 46% men; age 72.2 ± 3.5 years) with a resting systolic BP of 140.1 ± 15.9 mmHg and diastolic BP of 80.9 ± 8.6 mmHg were

Synergism between ACE DD and ACE 2350GG in the onset of hypertension

Variables	Odds ratio (95%CI)	P-value
ACE (II)*ACE2350 (AA)	Reference	0.081
ACE (ID)*ACE2350 (AG)	1.206 (0.792 – 1.834)	0.383
ACE (DD)*ACE2350 (AG)	1.800 (0.990 – 3.274)	0.054
ACE (ID)*ACE2350 (GG)	1.500 (0.092 – 24.518)	0.776
ACE (DD)*ACE2350 (GG)	1.716 (1.107 – 2.661)	**0.016**

Logistic regression, Forward wald method (SPSS vs. 25.0). CI – Confidence interval. Statistically significant for p<0.05.

CO 124 Figure

randomized into IHT (n = 14), AET (n = 12), or an attention control group (ACG, n = 9). Participants performed IHT or AET, 3 times/week, for 8 weeks. IHT consisted of 4x45 sec contractions, alternatively with both hands, at an intensity of 50% of the maximum voluntary contraction, with a 1-min interval between sets. AET consisted of walking at an intensity of 50-70% of the peak maximal oxygen consumption. ACG continued with their daily life activities.

Results: Of the 35 enrolled participants, 32 finished the intervention (91.4%), with an adherence rate of 95.2% for IHT and 79.4% for AET. There were no differences between groups at baseline for office SBP (p = 0.137),DBP (p = 0.200), or pulse pressure (PP, p = 0.255). AET reduced SBP (146.4 ± 16.6 *vs.* 135.0 ± 17.2 mmHg; p = 0.048) and PP (61.7 ± 10.2 *vs.* 55.5 ± 10.5; p = 0.025), but not DBP (84.5 ± 8.9 *vs.* 79.5 ± 9.6 mmHg; p = 0.163). IHT reduced SBP (140.6 ± 16.2 *vs.* 128.7 ± 10.7 mmHg; p = 0.004), DBP (80.5 ± 8.4 *vs.* 75.3 ± 8.9 mmHg; p = 0.030), and PP (60.2 ± 11.3 *vs.* 53.4 ± 9.8; p = 0.012). There were no differences in ACG for SBP (131.3 ± 13.9 *vs.* 126.9 ± 20.5 mmHg; p = 0.273), DBP (78 ± 8.3 *vs.* 75 ± 9.5 mmHg; p = 0.058), and PP (53.2 ± 11.5 *vs.* 51.8 ± 13.7; p = 0.628). Moreover, AET and IHT elicited similar reductions in SBP (p = 0.89) and DBP (p = 0.97).

Conclusions: AET and IHT lowered SBP and PP in older adults with high BP, whereas IHT lowered DBP but not AET. Our findings suggest IHT and/ or AET may be used as adjuvant lifestyle therapy for controlling BP in older adults.

Domingo, 24 Abril de 2022 | 13:00-14:00

Sala Aquarius | Comunicações Orais (Sessão 26) - Insuficiência Cardíaca 4 - Vários Tópicos

CO 126. TRANSTHYRETIN AMYLOID CARDIOMYOPATHY: A 2-YEAR SINGLE-CENTRE EXPERIENCE

Bruno M. Rocha, Rita Amador, Sérgio Maltês, Andreia Marques, Catarina Oliveira, Pedro Lopes, Gonçalo Cunha, Mariana Paiva, Christopher Strong, Fernando Abreu, Sophia Pintão, Carlos Aguiar, Miguel Mendes

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

Introduction: Transthyretin Amyloid Cardiomyopathy (ATTR-CM) is an under-diagnosed condition often presenting with Heart Failure (HF). We aimed to
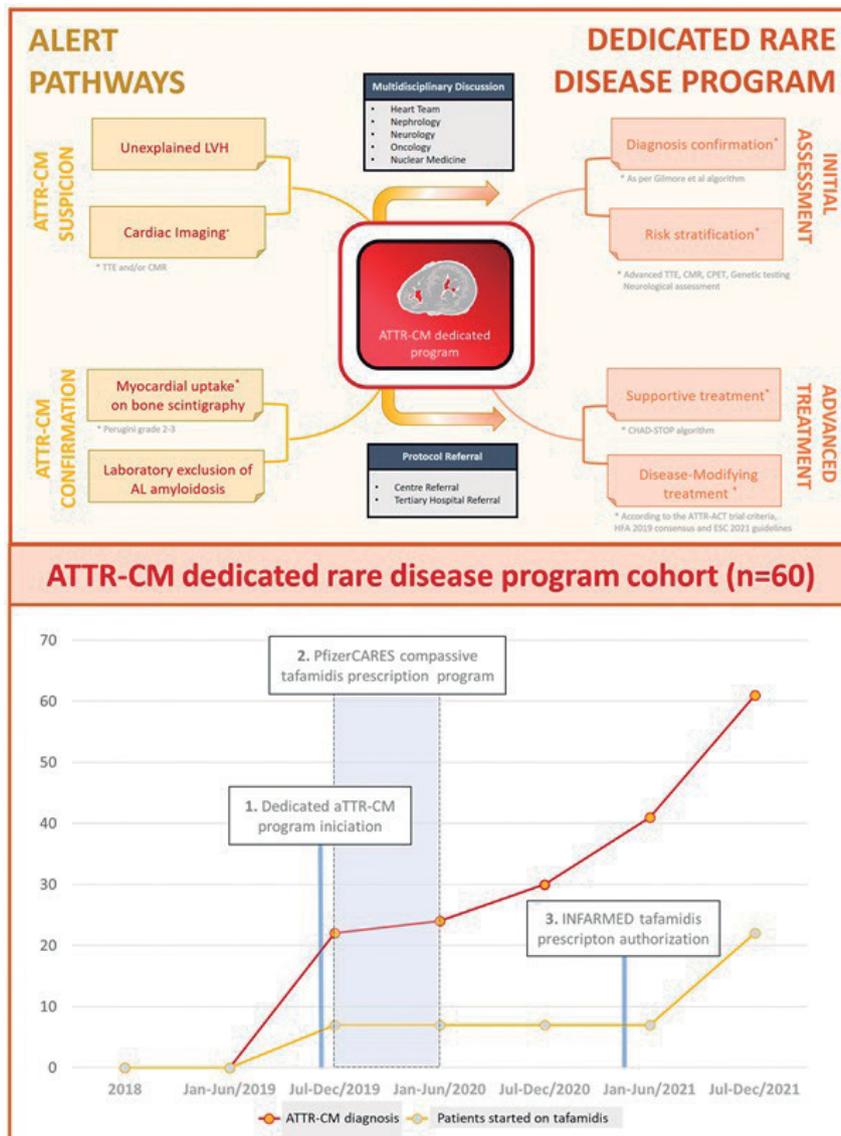
CO 126 Figure

assess a cohort of patients with ATTR-CM and HF, focusing on the centre strategies to identify new cases, prognosticate and tailor treatment.

Methods: We conducted an all-comers single-centre prospective registry of consecutive patients with HF due to ATTR-CM followed in our centre from November 2019 to 2021. As per site protocol, diagnosis is established according to the algorithm by Gilmore et al. and all patients are assessed in our HF outpatient clinic at least twice yearly with systematic electronic chart data collection. We evaluated disease-modifying treatment and compliance with the current European Guidelines and CHAD-STOP management. A summary of this program is presented in the central figure.

Results: Overall, 60 patients were included (mean age 83 ± 7 years; 80% male). ATTR-CM was confirmed by the non-invasive algorithm in all but 8 patients, in whom endomyocardial biopsy was positive. Of those undergoing genetic testing (n = 30), 7 (23%) presented with the hereditary form of ATTR-CM (4 Val50Met and 3 Val142Ile mutations). The initial presentation was most often HF (n = 43), atrial fibrillation (n = 9), or "incidental" myocardial uptake on ^{99m}Tc-HMDP bone scintigraphy (grade 2-3) performed for cancer staging (n = 5). Beta-blockers were reduced or stopped in 40 (67%) patients, all of whom improved in NYHA class and/or NT-proBNP (> 30% reduction) at 1-3 months. Tafamidis 61mg was started in 22 patients and 15 more currently await approval. Those initiated on or referred to tafamidis 61 mg (n = 37) had less severe HF, as per NYHA (class I-II – 94 *vs.* 50%, p = 0,033) and performance status (e.g. Karnofsky score 80-100 – 79 *vs.* 21%, p = 0,010). Of those already on tafamidis (n = 22), NYHA class remained stable or improved in all but 1 patient. In the year following *vs.* preceding treatment there was 2 *vs.* 3 total HF hospitalizations. No drug-related severe adverse events were reported. Over a 2-year follow-up, 14 (23.3%) patients died, of whom 1 was on tafamidis (compassionate use for 19 months).

Conclusions: ATTR-CM recognition is improving in our dedicated rare disease program, possibly due to the implementation of several alert pathways. The identification of the disease at an earlier stage allows targeted treatment, compliant with the recommendations. Nonetheless, the rarity of this disease and the required expertise for its optimal management argues in favour of a national strategic plan based on referral centres for ATTR-CM.

CO 127. I NEED HELP: FROM THE ACRONYM TO THE RISK SCORE FOR PREDICTING ADVERSE OUTCOMES IN CHRONIC HEART FAILURE WITH REDUCED EJECTION FRACTION

Mariana Sousa Paiva, Daniel A. Gomes, Sara Guerreiro, Bruno Rocha, Rita Bello, Sérgio Maltês, Gonçalo l. Cunha, Catarina Brízido, Christopher Strong, Pedro Freitas, António Tralhão, Carlos Aguiar, Miguel Mendes

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

Introduction: Although many risk scores for patients with heart failure (HF) have been proposed, the majority comprises innumerous variables, hampering their regular use. I NEED HELP is a simple acronym created to support the physician's referral to a HF specialist. The aim of this study was to convert the acronym into an easily appliable risk score for ambulatory patients with chronic HF and reduced ejection fraction (HFrEF).

Methods: Single-center retrospective cohort including consecutive patients with HFrEF (< 50%) who underwent both transthoracic echocardiography and cardiac MRI from 2018-2020. The acronym was transformed into the following variables: (I) need for intravenous inotropes; (N) NYHA functional class III-IV or NT-proBNP ≥ 1,000 pg/mL; (E_{rh}) renal dysfunction (GFR ≤ 30 mL/min/1.73m² by MDRD formula) or hepatic dysfunction (serum total bilirubin ≥ 1.8 mg/dL; (E_{ef}) EF ≤ 30%; (D) appropriate defibrillator shocks; (H) more than one HF hospitalization in the previous year; (E_d) combination of diuretics; (L) systolic blood pressure (SBP) ≤ 90 mmHg or heart rate (HR) ≥ 100 bpm; (P) intolerance to betablockers or renin angiotensin aldosterone inhibitors. The primary outcome was a composite of HF hospitalization and all-cause mortality. Cox Regression analysis was performed to explore the relationship between variables and outcomes. A scoring system was developed giving one point to each variable of the acronym.

Results: A total of 200 patients were included (median age 66 years (IQR: 57-74), 74% male, 65% in NYHA II-III), of whom 66% had HF for more than 18 months. Over a mean follow-up of 25 ± 12 months, a primary outcome

occurred in 56 patients (28%). The score median was 1 point (IQR: 0-2) and 58 patients had 0 points. Cox Regression analysis applied to the model confirmed its prognostic value (hazard ratio 1.5 for each point, p < 0.001). The model exhibited good discriminative power, with a C-statistic of 0.78 (95%CI 0.71-0.8) (Fig. 1A). Thereafter, the sample was stratified in 3 groups: low risk – 0 points; moderate risk – 1 point; high risk – 2+ points. Mean survival according to the predefined groups, in months, was 44 [95%CI 41-46] for the low-risk group, 37 [95%CI 33-41] for the moderate-risk group and 23 [95%CI 19-28] for the high-risk group (log-rank < 0.001) (Fig. 1B).

Receiver Operating Characteristic curve for "I NEED HELP" risk score
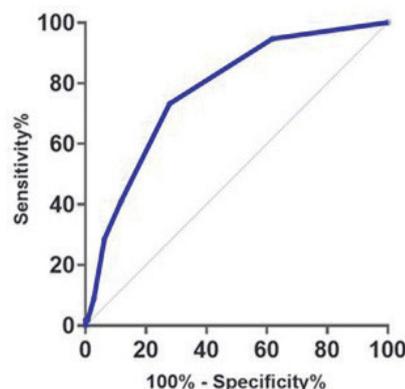
Kaplan Meier analysis according to risk group
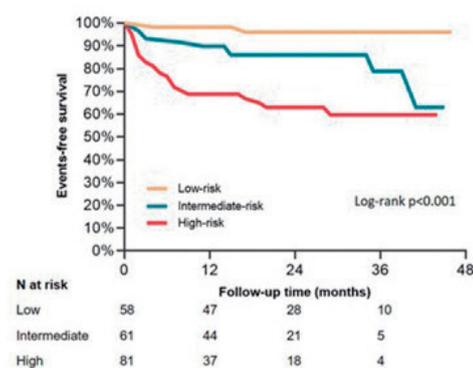
Conclusions: This is the first validation of the acronym "I NEED HELP" in a real-world population of patients with HFrEF. This new risk score "I NEED HELP" is simple to apply and strongly predicts adverse outcomes in HFrEF.

CO 128. CARDIORENAL SYNDROME AND DEATH RISK IN PATIENTS WITH HEART FAILURE OR CHRONIC KIDNEY DISEASE: AN UNMET CARDIORENAL NEED?

Tiago Taveira-Gomes[1], Carla Santos Araújo[2], Daniel Seabra[2], Filipa Bernardo[3], Johan Bodegård[3], Cristina Gavina[1]

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Introduction : Heart failure (HF) and chronic kidney disease (CKD) have interlinked pathophysiological pathways and patients having both conditions simultaneously are defined as having cardiorenal syndrome (CRS).

Outcomes for CKD, HF and CRS groups vs control

Outcome	Group	HR	5%	95%
All cause death	CKD	4.91	4.48	5.38
	HF	4.65	4.15	5.22
	CRS	7.14	6.44	7.91
Cardiovascular death	CKD	8.69	7.10	10.63
	HF	8.62	6.85	10.85
	CRS	13.71	11.06	16.99
Non-fatal MACE	CKD	4.63	4.00	5.35
	HF	7.44	6.33	8.74
	CRS	7.13	6.11	8.34

Hazard Ratio
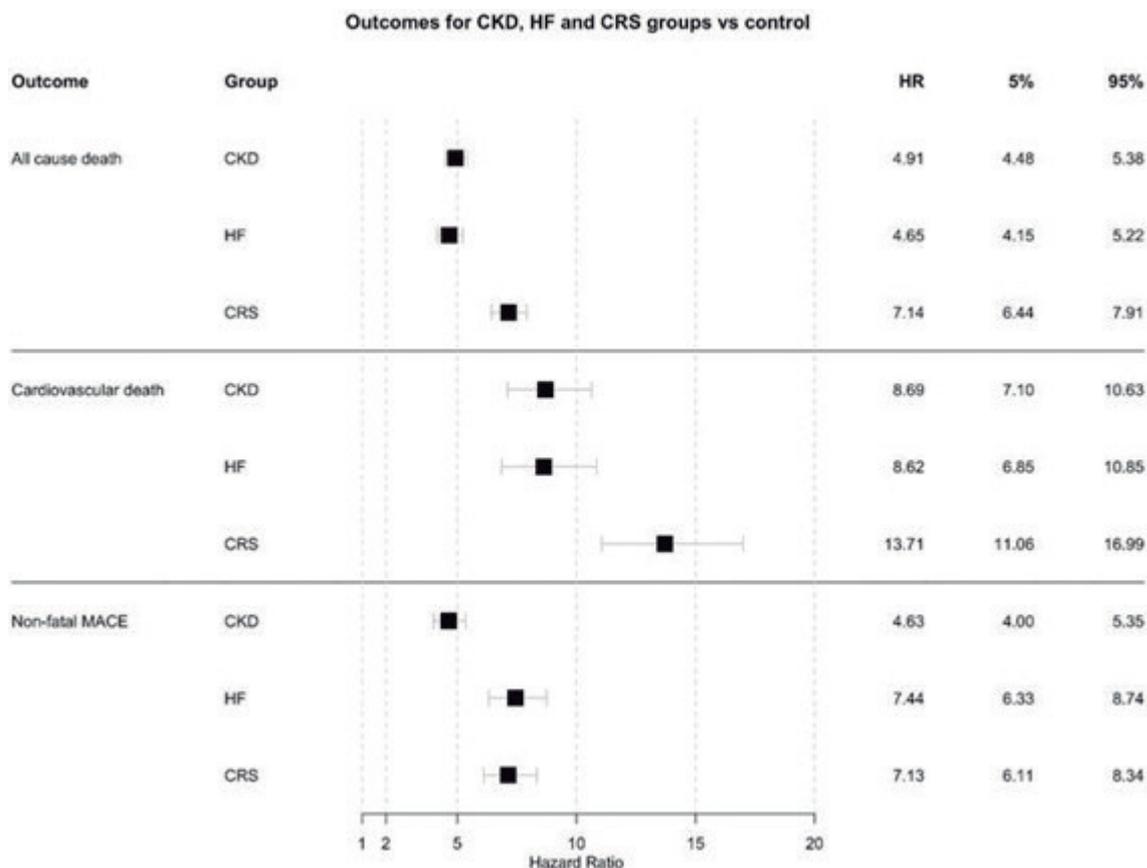
CO 128 Figure

Objectives: To estimate the risk of CRS in patients with initial presentation of HF (without prior CKD) or CKD (without prior HF) compared to mean age overall population in a real-world clinical setting. Also, to estimate the risk of all-cause death, cardiovascular (CV) death and non-fatal major CV events (MACE) in patients with HF, CKD and CRS compared to the mean-age overall population.

Methods: Clinical database analysis of a single primary and secondary healthcare institution from 2008-2019. We defined 4 incident cohorts: Control - patients at age 75; HF - HF patients without prior CKD; CKD - CKD patients without prior HF; CRS - patients with HF and CKD. Patients were indexed at the date of first event and followed one year. We defined HF as either: i) Ejection Fraction (EF) ≤ 40% and NT-proBNP ≥ 200 pg/mL (≥ 600 pg/mL if atrial fibrillation (AF)) OR BNP ≥ 100 pg/mL (≥ 125 pg/mL if AF); ii) EF> 40% in the presence of structural cardiac abnormalities. We defined CKD as eGFR ≤ 60 mL/min using EPI-CKD formula. All definitions were constructed using laboratory-level data complemented with episode-level data. Hazard ratios (HR) and 95% confidence intervals were estimated using Cox regression models adjusted for age, sex, age-sex interaction, prior history of hypertension, myocardial infarction, stroke, peripheral artery disease and type 2 diabetes.

Results: We identified 3,973 patients with HF, 13,990 with CKD, 6784 with CRS and 16,182 controls. Patients were in general 75-77 years old. The majority were females and were well treated with CV risk reducing drugs (Table). All-cause death risk was 4.7 (4.1-5.2) for HF and 4.9 (4.5-5.4) for CKD. CV death risk was 8.6 (6.8-10.8) for HF and 8.7 (7.1-10.6) for CKD. Non-fatal MACE risk was 7.4 (6.3-8.7) for HF, 4.6 (4.0-5.3) for CKD, and 7.1 (6.1-8.3) for CRS. CRS was associated with the highest risks of all-cause and CV death when compared with the control group - 7.1 (6.4-7.9) and 13.7 (11.7-17.0), respectively (Figure). More than half of events occurred in the first 90 days of follow-up for all outcomes.

Conclusions: Cardiorenal disease (HF or CKD) was associated with very high short-term risk (1 year) of developing CRS or death. Consecutively, patients with established CRS had the highest risk of dying. These results demonstrate serious cardiorenal risks in a real-world setting, supporting an urgent need for improved primary and secondary prevention of cardiorenal disease and cardiorenal syndrome.

CO 129. EXERCISE OSCILLATORY VENTILATION – IS THERE MORE TO IT THAN JUST UPS AND DOWNS?

Gonçalo Lopes da Cunha, Bruno Rocha, Sérgio Maltês, Pedro Freitas, Francisco Gama, Carlos Aguiar, Luís Moreno, Anaí Durazzo, Miguel Mendes

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

Introduction: Exercise Oscillatory Ventilation (EOV) is fundamentally defined by the presence of an oscillatory phenomenon of the ventilation/minute with a given amplitude and frequency. Recently, it was proposed that a delay in O_2 consumption (VO2) peak to minute ventilation (VE) peak during ventilatory oscillation predicts a worse prognosis in patients with Heart Failure (HF) and left ventricular ejection fraction (LVEF) < 50%. We aimed to evaluate whether these characteristics add further prognostic value to the subset of HF patients with EOV.

Methods: This was a single-centre retrospective cohort of consecutive patients with HF and LVEF < 50% that underwent cardiopulmonary exercise testing (CPET) from 2016-2020. EOV was defined as per Vainshelboim and colleagues (i.e. ≥ 3 consecutive cyclic fluctuations of ventilation during exercise, average amplitude over 3 ventilatory oscillations ≥ 5L and an average length of three oscillatory cycles 40-140s). Ventilation/minute graphs, with a rolling average of 5 consecutive breaths, were evaluated by 3 independent observers. The presence of EOV was established if at least 2 observers agreed on the classification. A second graph was then plotted, with both VO2 and VE over time and the mean delay between VO2 peak to VE peak during EOV was manually calculated. The primary endpoint

was a composite of time to all-cause death, heart transplantation or left ventricular assistance device (LVAD) implantation.

Results: Of the overall cohort of 285 patients with HF and LVEF < 50%, 78 (27%) were classified as having EOV (mean age 58 ± 12, mean LVEF 31 ± 10%; ischaemic HF – 63%). Sixty three percent of patients had over 1 second of mean VO2 peak to VE peak delay and 22% had over 10 seconds of mean delay. During a median follow-up of 27 (17-43) months, there were 32 patients with a primary outcome event: 4 LVAD, 12 heart transplants and 18 deaths. The rate of the primary outcome was 19% and 36% at 1- and 2-years, respectively. The amplitude, frequency, and maximum number of EOV cycles were not associated with the likelihood of the primary endpoint. Contrastingly, the mean delay of VO2 peak to VE peak during EOV was predictive of time to primary endpoint. The predictive capacity of this new parameter remained significant after adjustment for peak VO2 and VE VCO2 slope (adjusted HR: 1.06 95%CI 1.01-1.11). We found a cut-off of 5 seconds to be the most useful to predict the primary outcome at 2-years, with a sensitivity and specificity of 48 and 84%, respectively.

Kaplan-Meier analysis of primary outcome according to peak VO2 to peak VE to delay

Number at risk				
≤ 5 seconds of delay	50	44	40	33	26
>5 seconds of delay	23	19	12	8	4
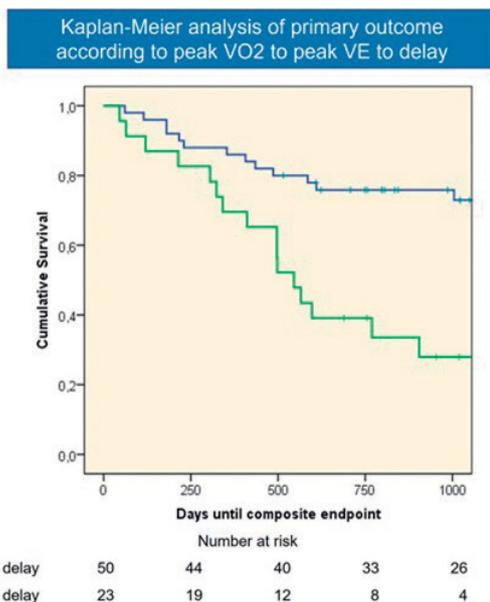
Conclusions: A novel CPET parameter associated with time to all-cause death, heart transplantation or LVAD implantation in patients with HF, reduced LVEF (< 50%) and EOV. VO2 peak to VE peak delay may have an added value in the prognostication of patients with HF and reduced LVEF.

CO 130. MODIFIED *VERSUS* CONVENTIONAL BODY MASS INDEX IN PATIENTS ADMITTED DUE TO ACUTE HEART FAILURE: ASSOCIATION WITH ADVERSE PROGNOSIS

Vanda Devesa Neto, João Miguel Santos, Inês Pires, Joana Laranjeira Correia, Gonçalo Ferreira, Luís Ferreira Santos

Centro Hospitalar Tondela-Viseu, EPE/Hospital de São Teotónio.

Introduction: Conventional body mass index (cBMI) and serum albumin (SA) are frequently used to predict malnutrition status. cBMI does not reflect fluid accumulation, so modified body mass index (mBMI) (SA x cBMI) has recently emerged as a marker for poor prognosis and mortality in critically ill patients. However, there is limited evidence of the impact of mBMI in patients with Acute Heart Failure (HF).
Objectives: Identify the association between mBMI and 12-month (12MM) mortality compared with cBMI in patients admitted with acute HF.
Methods: Retrospective study of 264 patients admitted for acute heart failure in a Cardiology Department. Baseline characteristics, laboratory findings, and disease severity were analyzed. BMI and SA were measured at admission, and mBMI was calculated for each patient. Analysis of the

receiver operating characteristic (ROC) curves was performed to evaluate mBMI and cBMI predictive value for post-hospitalization mortality. Kaplan-Meyer survival plots were used to assess 12MM. The Mann-Whitney U test was used for mean comparison between groups.

Results: Mean age was 75.0 ± 11.4 years; 51% were men. Mean left ventricular ejection fraction (LVEF) was 46.6 ± 16.7%. Mean SA and BMI values were 3.8 ± 0.5 g/dL and 27.0 ± 9.8 kg/m², respectively. 7% received inotropic treatment. 1.1% presented with cardiogenic shock at admission. The optimal cut-off point for cBMI assessed by Youden index was 22.2 (sensitivity (S)≈ 39% and specificity (E)≈ 86%; Youden index (IY = 0.2411) and the optimal cut-off point for mBMI was 107.2 (S≈ 81% and E≈ 49%; IY = 0.3005). 45% of patients had mBMI higher than 107.3 and 55% had mBMI lower than 107.3. 82% of patients had cBMI higher than 22.2 and 18% had cBMI lower than 22.2. Lower mBMI was correlated with 12MM (p < 0.01), treatment with inotropes during hospital stay (p = 0.05), age (p < 0.01), LVEF (p = 0.05) and number of days of hospitalization (p < 0.01). Lower cBMI was correlated with 12MM (p < 0.01) and age (p < 0.01). In survival analysis, both cBMI (18 *vs.* 7%; p < 0.01; χ^2 7.9) and mBMI (13 *vs.* 5%; p < 0.01; χ^2 8.5) were associated with 12MM. ROC curve analysis revealed that mBMI had the best predictive performance for 12MM (AUC 0.661; p < 0.01; 95%CI 0.596;0.721) compared to cBMI (AUC 0.603; p = 0.13; 95%CI 0.537;0.666).

mBMI

Sensitivity: 80,8
Specificity: 49,3
Criterion: ≤107,2701

AUC = 0,661
P = 0,006
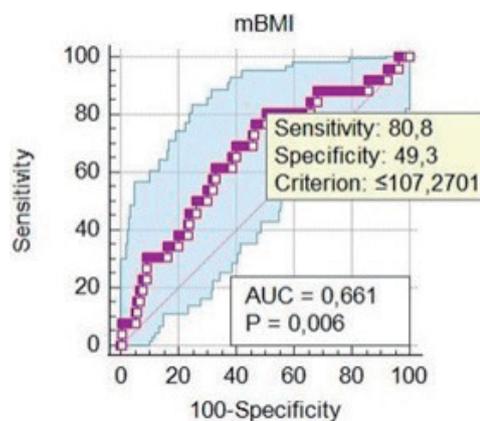
Conclusions: Both cBMI and mBMI have a significant association with 12MM. mBMI has a better predictive performance for 12MM than cBMI and should be considered to assess malnutrition status and prognostic impact in patients with heart failure.

Domingo, 24 Abril de 2022 | 14:00-15:00

Sala Vega | Comunicações Orais (Sessão 27) - Imagem 2 - Ecocardiografia e *Strain*

CO 131. REGIONAL IMPAIRMENT OF LEFT VENTRICULAR LONGITUDINAL STRAIN IN AORTIC REGURGITATION – HAVE WE FOUND THE MISSING PIECE?

Joana Silva Ferreira[1], Liliana Marta[2], João Presume[2], Pedro Freitas[2], Sara Guerreiro[2], João Abecasis[2], Carla Reis[2], Eduarda Horta[2], Regina Ribeiras[2], Miguel Mendes[2], Maria João Andrade[2]

[1]*Centro Hospitalar de Setúbal, EPE/Hospital de São Bernardo.* [2]*Centro Hospitalar Universitário de Lisboa Ocidental, EPE/Hospital de Santa Cruz.*

Introduction: Aortic regurgitation (AR) has been shown to have an impact on myocardial mechanics and recent studies have proved the value of global
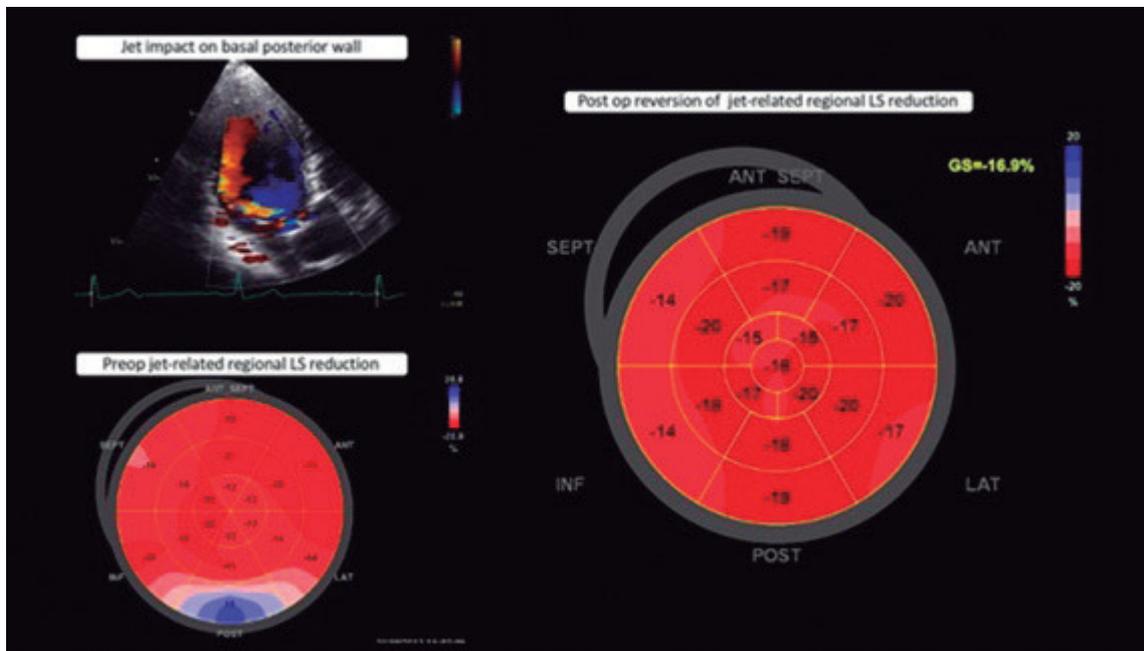
CO 131 Figure

longitudinal strain (GLS) as an additional parameter in the assessment of disease severity and prognosis. However, a direct and localized influence of the regurgitant jet (RJ) on regional deformation has not yet been demonstrated.

Objectives: To assess if there is a regional pattern of impairment of longitudinal strain (LS) in AR connected to the direction of the RJ, as well as its potential reversibility and prognostic impact.

Methods: We studied patients (pts) with chronic moderate and severe isolated AR referred for echocardiographic evaluation. For each patient, we established the direction of the RJ according to the myocardial segments impacted by its turbulent portion. Pts were considered to have a jet-related LS reduction (JRSR) when the wall segments impacted by the jet had a relative reduction in LS of at least 30% compared to non-affected segments. Parameters of AR severity and left ventricular (LV) size and function were also assessed. For those who underwent surgical correction of AR, the postop TTE was also compared with the preop.

Results: Of the 203 AR pts screened, 80 met inclusion criteria (median age 57 years, 83% male). Mean GLS and ejection fraction (EF) were -16% and 54%, respectively. In 34 of the 80 pts, there was a regional reduction of 10 percentage points in the absolute value of LS in the segments impacted by the jet, compared to non-affected segments (median of -8 *vs*. -18%, p < 0.001), corresponding to a 56% relative decrease. The predominant jet directions were basal septum (44%), mid posterior and lateral (24%), and basal inferior (12%). Demographics, severity of AR and parameters of systolic and diastolic function did not significantly differ between those who had JRSR or not. Of the 34 pts with JRSR, 20 underwent corrective surgery. In an early postop TTE, the difference in LS between the segments impacted by the jet and the non-affected segments attenuated (4.7% absolute difference *vs*. 10% in the preop TTE, p = 0.001). Pts with JRSR in the preop echo had lower rates of improvement of GLS (11 *vs*. 46% of pts improved at least 2.5%, p = 0.043) and a tendency towards lower rates of recovery of EF after surgery (17 *vs*. 46% recovered at least 5% in EF, p = 0.07).

Conclusions: This study identifies an association between the parietal impact of the RJ in AR and regional LS impairment. It suggests that external factors such as blood flow dynamics affect myocardial deformation. Additionally, the longstanding impact of the jet might damage the myocardium to the point of limiting recovery of systolic function after corrective surgery. This is, to our knowledge, the first reported case series showing the negative effect of the jet's impact on LV longitudinal function and, most importantly, on postop outcomes. Longer follow-up is needed to confirm its prognostic role.

**CO 132. A CMR MYOCARDIAL STRAIN PATTERNS ANALYSIS IN LEFT BUNDLE BRANCH BLOCK**

M. Raquel Santos[1], Mariana da Silva Santos[2], Sara Guerreiro[3], Daniel A. Gomes[3], Gonçalo Lopes da Cunha[3], Bruno M. Rocha[3], Pedro Freitas[3], João Abecasis[3], Ana Santos[3], Carla Saraiva[3], Miguel Mendes[3], António Miguel Ferreira[3]

[1]Hospital Dr. Nélio Mendonça. [2]Centro Hospitalar Barreiro/Montijo, EPE/Hospital do Montijo. [3]Centro Hospitalar de Lisboa Ocidental, EPE/Hospital de Santa Cruz.

Introduction: Recently, a classification with four types of septal longitudinal strain patterns was described using a speckle tracking based strain analysis in echocardiography suggesting pathophysiological continuum of LBBB-induced LV remodeling. Little data exist on feature tracking cardiac magnetic resonance (FT-CMR) in LBBB patients, and whether such patterns could be reproduced in CMR is not established yet. Therefore, in this study, we aimed to: 1) Assess and reproduce the new strain patterns classification by CMR and 2) Evaluate its association with LV remodeling and myocardial scar in a LBBB cohort.

Methods: Single center registry which included LBBB patients with septal flash (SF) referred to CMR to assess the structural cause of LV dysfunction. LBBB was defined according to Strauss criteria as strict LBBB, non-strict LBBB or nonspecific LV conduction delay. A semi-automated FT-CMR (Circle CVI42®) was used to quantify myocardial strain and detect the four septal longitudinal and radial strain patterns, according to the recent classification (LBBB-1 through LBBB-4) (Fig.). Extent of SF was visually scored as mild, moderate, or prominent.

Results: A total of 115 patients were included (mean age 66 ± 11 years; 57% men; 38% with ischemic heart disease). Median duration of QRS was 150 ± 26ms and majority of the patients (n = 90, 78%) were classified as strict LBBB. In longitudinal strain analyses LBBB-1 was observed in 23 (20%), LBBB-2 in 37 (32.1%), LBBB-3 in 25 (21.7%), and LBBB-4 in 30 (26%) patients. Patients at higher LBBB stages (longitudinal or radial pattern) had more prominent septal flash, greater LV volumes, lower LV ejection fraction and lower absolute global longitudinal, circumferential and radial strain values compared with patients in less advanced stages (p < 0.05 for all). There was no difference between patterns in clinical characteristics, ischemic etiology, QRS duration and time delay between septal and lateral LV wall. Late gadolinium enhancement (LGE) was found in 63 patients (54.8%), with a septal location in 34 (29.6%) patients, lateral in 4 (3.5%) patients, septal
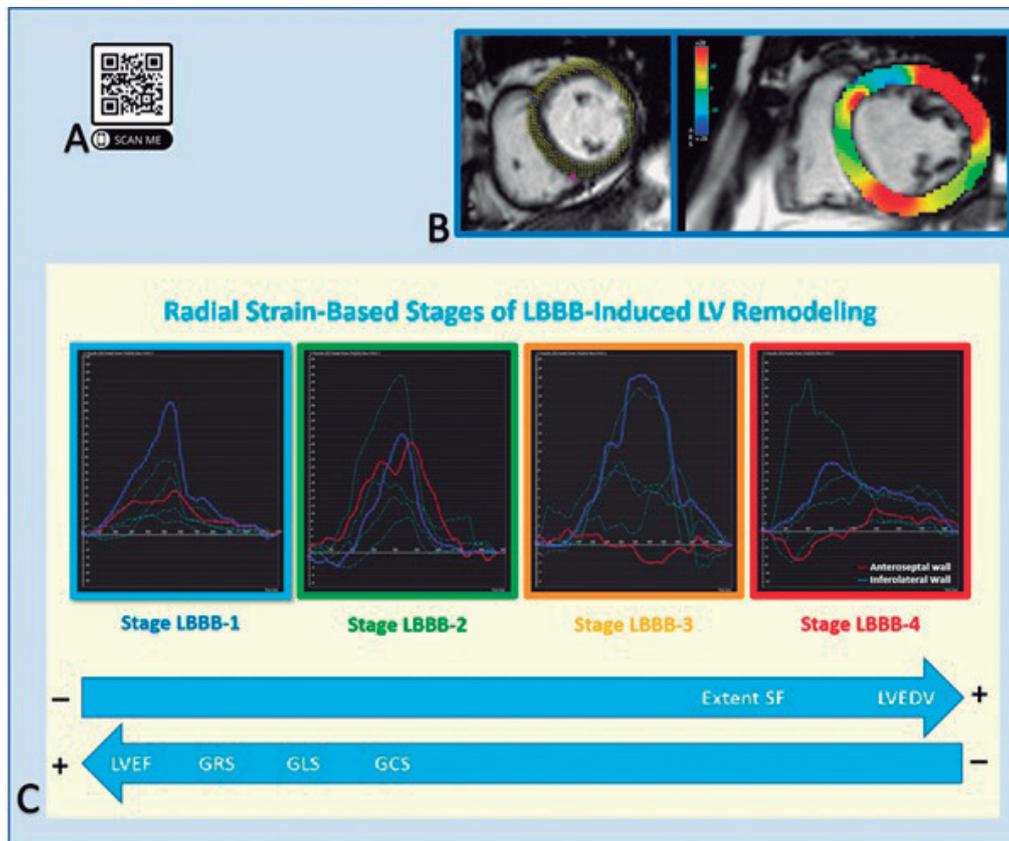
A. Link to the reference article. **B.** Image at medial short-axis level showing how to obtain radial strain by CMR. **C.** Radial strain-based stages of LBBB-induced LV remodeling. The 4 stages of LBBB induced strain patterns and their relationship with LV adverse remodeling and SF.
LVEDV – LV end-diastolic volume; LVEF – LV ejection fraction; GRS – global Radial strain; GLS – global longitudinal strain; GCS – global circumferential strain.

CO 132 Figure

and lateral in 11 (9.6%) patients. Furthermore, no difference was found for LGE presence, distribution or location between the four strain patterns.
Conclusions: Among patients with LBBB, our study found a good association between longitudinal and radial strain patterns with the degree of LV remodeling and LV dysfunction by FT-CMR analysis. Additionally, myocardial fibrosis didn't seem to interfere with the staged LBBB classification.

CO 133. RELATIVE APICAL SPARING IN SEVERE AORTIC STENOSIS: DOES IT MEAN CONCOMITANT AMYLOID CARDIOMYOPATHY?

Rita Reis Santos[1], João Abecasis[1], Sérgio Maltês[1], Gustavo Sá Mendes[1], Sara Guerreiro[1], Carolina Campino Padrão[1], Pedro Freitas[1], António Ferreira[1], Regina Ribeiras[1], Maria João Andrade[1], Nuno Cardim[2], Victor Gil[3], José Pedro Neves[1], Sância Ramos[1], Miguel Mendes[1]

[1]Centro Hospitalar Universitário de Lisboa Ocidental, EPE/Hospital de Santa Cruz. [2]Faculdade de Ciências Médicas de Lisboa/NOVA Medical School. [3]Hospital da Luz Lisboa.

Introduction: Relative apical sparing (RAS) of left ventricular (LV) longitudinal strain (LS) is a red flag marker for the suspicion of amyloid cardiomyopathy. However, it has also been described in patients with severe aortic stenosis (AS).
Objectives: To assess the prevalence of RAS in patients with severe symptomatic AS referred for surgical aortic valve replacement (AVR), to evaluate its clinical significance and assess its presence after surgery.
Methods: We prospectively studied 135 consecutive patients (age: 73y [IQR 68-77 y], 49% men) with severe symptomatic AS - mean transaortic pressure gradient (AVmean): 60.9 ± 17.7 mmHg; mean aortic valve area: 0.7 ± 0.2 cm[2], referred for surgical AVR with no previous history of ischemic cardiomyopathy or other. Beyond 12 lead-ECG and transthoracic echocardiography (TTE), all patients underwent cardiac magnetic resonance (CMR) before surgery. RAS was defined by the ratio> 1 of *average LS at apical segments/sum of the average basal and mid LS* at speckle tracking analysis. AVR with septal myocardial biopsy, for investigational purposes, was performed in 80 patients. AS severity indexes, LV remodeling and tissue characterization parameters were compared in both groups of patients, with and without RAS. LS deformation pattern was reassessed at 3-6 months after AVR.
Results: RAS was present in 24 patients (18%). In the whole cohort there were neither pseudoinfarct pattern or low voltage ECG criteria, nor infiltration suspicion from CMR (native T1 value 1,053 ms [IQR 1,025-1,071 ms] for institutional reference values: 972-1,070 ms; ECV 24% [IQR 21-27%]). None of the patients had amyloid deposition at histopathology. Overall, mean CMR LV ejection fraction (LVEF) was 59.6 ± 10.5% and 98 patients (74%) had non-ischemic delayed enhancement, with a median fibrosis fraction of 4.1% [IQR 1.6-7.8%]. RAS cohort had a significantly higher AVmean gradient, relative wall thickness, maximum septal thickness, peak systolic dispersion, with lower global LS at TTE, as well as higher LV mass and lower LVEF at CMR. RAS group has also higher NT-proBNP ambulatory values (Table). Follow-up evaluation after AVR revealed RAS disappearance in 19 patients (79.2%).
Conclusions: RAS occurs in almost one-fifth of the patients in this cohort despite the absence of signs of myocardial infiltration. This deformation pattern elapses with worse indexes of LV remodeling consistent with a more advanced stage of the disease, being reversible after AVR, which stands for the absence of concomitant myocardial infiltration.
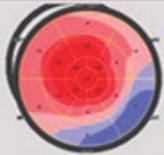
			p-value
AV mean (mmHg)	70.2 ± 20.1	59.3 ± 16.6	p=0.006
Relative wall thickness	0.6 ± 0.1	0.5 ± 0.1	p=0.002
Maximum septal thickness (mm)	17.8 ± 3.2	15.8 ± 2.5	p=0.002
Peak systolic dispersion (ms)	71 (59-85)	60.1 (49-71.5)	p=0.022
Global longitudinal strain (%)	-13.2 (-13.9 - -10.6)	-15.5 (-17.5 - -12)	p<0.001
LV ejection fraction (%)	54.1 ± 10.4	60.6 ± 10.3	p=0.006
LV indexed mass (g/m2) (CMR)	97.1 ± 28.7	77.6 ± 24.4	p<0.001
NT-proBNP (ng/mL)	1479 (429 – 2999)	512 (217 – 1428.5)	p=0.002

Figure 1 – Comparative analyses of distinct TTE and CMR indexes in patients with and without pre-operative
RAS (AV – aortic valve; LV – Left ventricle).

CO 133 Figure

CO 134. LEFT ATRIAL STRAIN ANALYSIS IN PATIENTS WITH SEVERE RHEUMATIC MITRAL STENOSIS SUBMITTED TO MITRAL BALLOON VALVULOPLASTY

João Presume, Daniel Gomes, Mariana Paiva, Francisco Albuquerque,
Joana Ferreira, Sara Guerreiro, Liliana Marta, Pedro Freitas,
João Abecasis, Marisa Trabulo, Maria João Andrade,
Pedro Araújo Gonçalves, Manuel Almeida, Miguel Mendes, Regina Ribeiras

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

Introduction: Left atrial (LA) strain is a novel tool to evaluate LA dysfunction. Little is known about its role to evaluate patients with severe rheumatic mitral stenosis (MS) treated with balloon mitral valvuloplasty (MBV). The aim of our study was to assess the prognostic impact of peak atrial longitudinal strain (PALS) and LA ejection fraction (EF) in a cohort of patients with severe rheumatic MS.

Methods: We conducted a single-centre retrospective study enrolling patients with rheumatic mitral stenosis submitted to mitral balloon valvuloplasty (MBV) from 2010 to 2021. All patients included underwent transthoracic echocardiogram before and after the procedure. PALS and LAEF were assessed by 2D speckle tracking in apical 4-chamber view (as per EACVI current recommendations). PALS variation after MBV was assessed by the difference between PALS after MBV and PALS before MBV. The primary outcome was a composite of mitral valve surgery or death.

Results: A total of 26 patients were included (50 ± 19 years old, 19% male), 54% with permanent atrial fibrillation. Overall, the main echocardiographic findings of this cohort before intervention were: median anatomical and functional mitral valve area of 1.1 [0.6;1.2] and 1.3 cm^2 [0.7;1.3], respectively; median mean transmitral gradient of 9 mmHg [7;23]; median Wilkins score of 9 [6;10]; and a median pulmonary artery systolic pressure of 56 [40;80] mmHg. MVB resulted in the following results: a median anatomical valve area of 2.0 [1.3;2.3] cm^2; median mean transmitral gradient of 5 [4;9] mmHg; median pulmonary artery systolic pressure of 41 [32;50] mmHg; and only 2 patients ended up with moderate mitral regurgitation (no severe cases). During a mean follow-up of 33 ± 23 months, the primary outcome occurred in 9 (34.6%) patients (5 submitted to surgery, 4 died). On LA strain analysis before the procedure, mean PALS was 10 ± 4% and mean LAEF was 26 ± 11%. After MBV, there was a significant increase in PALS to 14% (p = 0.004) and in LAEF to

Table 1 – a) Paired t-test analysis of peak atrial longitudinal strain and left atrial ejection fraction before and after mitral balloon valvuloplasty; b) Univariate cox regression analysis for the primary outcome (mitral surgery or all-cause death).

a)

	Mean value before MBV	Mean value after MVB	p-value	Improved (n)	Neutral (n)	Worsened (n)
PALS	10%	14%	0.004	15	5	6
LA EF	26%	36%	<0.001	18	0	6

b)

Strain parameter	HR (95% CI)	p-value
LAEF before MBV	0.864 (0.747-0.999)	p=0.048
PALS before MBV	0.857 (0.699-1.050)	p=0.137
PALS variation after MBV	0.871 (0.738-1.028)	p=0.102

LAEF - Left atrial ejection fraction; MBV – Mitral balloon valvuloplasty; PALS - Peak atrial longitudinal strain;

CO 134 Figure

36% (p < 0.001) (Table 1a). On univariate Cox regression (Table 1b), LAEF was significantly associated with the primary outcome (HR 0.864; 95%CI 0.747-0.999). There was also a non-significant positive trend for PALS (HR 0.857; 95%CI 0.699-1.050) and PALS variation after MBV (HR 0.871, 95%CI 0.738-1.028).

Conclusions: LA strain and EF seem to be significantly impaired in severe rheumatic MS. Moreover, our findings highlight these markers as potentially useful prognostic markers in rheumatic MS.

CO 135. PROGNOSTIC VALUE OF GLOBAL LONGITUDINAL STRAIN IN PATIENTS WITH TRANSTHYRETIN AMYLOID CARDIOMYOPATHY

Ana Abrantes, Sara Couto Pereira, Pedro Silvério António, Joana Brito, Beatriz Valente Silva, Pedro Alves da Silva, Ana Beatriz Garcia, Catarina Oliveira, Ana Margarida Martins, Miguel Azaredo Raposo, Catarina Gregório, Joana Rigueira, Dulce Brito, Ana G. Almeida, Fausto J. Pinto

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

Introduction: Transthyretin amyloid cardiomyopathy (ATTR-CM) is an important cause of heart failure (HF) in older patients (pts), frequently underdiagnosed, that carries a bad prognosis when untreated. Transthoracic echocardiography (TTE) plays a key role in the diagnosis by allowing early recognition of ATTR-CM findings, like left ventricular hypertrophy (LVH) and apical sparing on global longitudinal strain (GLS).

Objectives: To evaluate the prognostic value of GLS in a population with ATTR-CM.
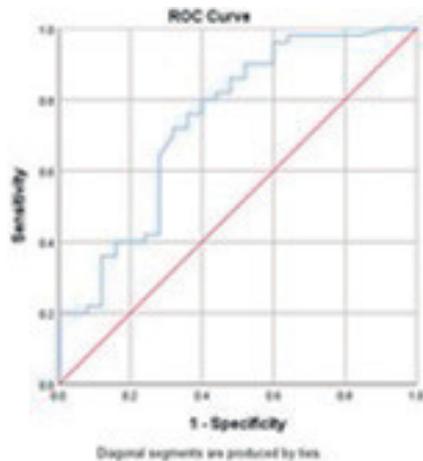

Figure 1 – ROC curve showing optimal GLS cut off value for predict mortality in ATTR-CM (AUC 0.779, p=0.001, -9.35: specificity 47% and sensibility 90%).

Methods: Retrospective, single-center study of consecutive pts diagnosed with hereditary ATTR-CM (hATTR-CM) and wild-type ATTR-CM (wtATTR-CM) followed in a tertiary center. We performed speckle tracking strain for GLS using Echopac GE Healthcare software in the diagnostic TTE. Clinical, TTE and epidemiological data were recorded. Statistical analysis was performed with non-parametric tests (Chi-square and Mann-Whitney). Survival analysis was performed with Kaplan-Meier and Cox regression. ROC curves were obtained to determine the optimal cut-off values of GLS.

Results: We included 66 pts, 24 with wtATTR-CM and 42 with hATTR-CM. Mean age was 71 ± 12 years, 83.3% being man. Regarding clinical characteristics, 42 pts had hypertension, 12 pts diabetes, 29 pts dyslipidemia, 31 pts chronic kidney disease (eGFR < 60 mL/min/m²), 69.7% pts presented polyneuropathy and 50% autonomic dysfunction. Most of the pts were at NYHA II (54.5%) or III (37.9%). The mean NT-proBNP at diagnosis was 3,961 ± 6,624 pg/mL. At baseline, mean GLS was -12.5 ± 4, LVEF 54 ± 12.7% and TAPSE 18.5 ± 3.5 mm. During a mean follow-up period (FUP) of 22.2 ± 22.6 months, 34.5% pts were hospitalized with HF decompensation. Seventeen pts died, most of them had wtATTR-CM (12 *vs.* 5 pts). ATTR-CM

pts with GLS ≤ -9.0 presented higher risk of mortality during FUP (log rank 19.1, p < 0.0001). A cut-off of GLS -9.35 was a strong predictor of mortality in the global population (AUC 0.779, p = 0.001, specificity 47% and sensibility 90%, Fig.). On multivariate analysis, NT-proBNP (p = 0.001, HR: 1.00, 95%CI: 1-5) and GLS (p = 0.0015; HR: 1.331, 95%CI: 1.058-1.674) at baseline were independent predictors of mortality as opposed to age and LVEF.

Conclusions: Our study shows that pts with ATTR-CM and GLS ≤ -9% have a high mortality risk, with GLS -9.35% as a strong predictor of mortality in this subset of pts. Therefore, we found that GLS can be considered a valuable prognostic tool in the assessment of ATTR-CM pts.

Domingo, 24 Abril de 2022 | 15:00-16:00

Sala Vega | Comunicações Orais (Sessão 28) - Cardiopatias Congénitas, Doença Vascular Pulmonar e Embolia Pulmonar 3 - Vários Tópicos

CO 136. RISK STRATIFICATION IN PULMONARY ARTERIAL HYPERTENSION: DO OUR PATIENTS BENEFIT FROM A 4-STRATA MODEL?

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Introduction: Risk stratification plays an essential role in the management of patients with pulmonary arterial hypertension (PAH). The current European guidelines propose a 3-strata model to categorize risk as low, intermediate, or high, based on the expected 1-year mortality. However, with this model, most patients are categorized as intermediate risk. A recent publication purposed a refined risk assessment model for PAH based on 4 risk categories (low, intermediate-low, intermediate-high and high risk), based in simple and non-invasive measures like functional class (FC), 6-minute walking distance (6MWD) and NTproBNP.

Objectives: To analyze the prognostic impact of further risk substratification in intermediate-low and intermediate high in patients with PAH.

Methods: Retrospective longitudinal study that included all patients with pulmonary arterial hypertension (PAH) followed in a referral center. Uncorrected complex congenital heart disease and Eisenmenger physiology were excluded. Baseline data was collected to calculate patient risk using COMPERA risk score. Intermediate risk group was subdivided using refined cut-off values into intermediate-low (FC I-II; 6MWD 320-440 m; NTproBNP 300-649 ng/L) or intermediate-high (FC III, 6MWD 165-319 m; NTproBNP 650-1,100 ng/L). Adverse events during follow-up included initiation of parenteric prostanoid therapy, referral for lung transplantation and death.

Results: The cohort included 75 patients (82.1% female, mean age at diagnosis 47.4 ± 17.6 years). Baseline characteristics: WHO Functional class I/II/III/IV 2.7%/25.3%/54.7%/17.3%, respectively; 6MWD 386.7 ± 128.7m, cardiac index 2.26 ± 0.64 L/min/m², mean pulmonary vascular resistance 11.54 ± 5.60 WoodsU (Table). Using COMPERA risk score, 23% of the patients were at low risk, 62.2% on intermediate risk and 14.9% at high risk. Substratification of the 46 pts in the intermediate-risk category based on the mentioned methodology identified 22 pts (47.8%) in the intermediate-low and 26 pts (52.2%) in the intermediate-high risk categorie. Mean COMPERA risk score using 4 strata for this pts was 2.022 ± 0.39 and 3.04 ± 0.39, respectively. Baseline clinical differences between the 4 risk groups are represented in the table. The Kaplan-Meier survival analysis (Figure) revealed worse outcome for pts in intermediate-high compared to intermediate-low risk: log-rank 0.019; HR 0,382 (0,16-0,89).

Conclusions: In pts with PAH further risk stratification of intermediate risk group into intermediate-high and intermediate-low using refined cut-offs for FC, 6MWT and NTproBNP, can identify patients at higher risk of adverse
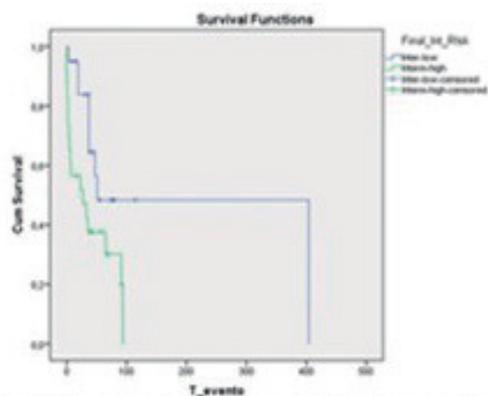
Figure 1 Kaplan-Meier survival curve for intermediate-high and intermediate-low risk groups (log-rank 0,019).

	Low (n=17)	Intermediate-low (n=22)	Intermediate-high (n=26)	High (n=11)	All	p-value *
Mean age (years)	40.47 +/- 13.40	50.00 +/- 16.89	52.91 +/- 17.40	43.55 +/- 13.85	47.44 +/- 17.55	0.570
Female (%)	47.1	81.8	83.3	63.6	82.1	0.890
WHO FC I (%)	5.9	4.5	0	0	2.7	0.012
WHO FC II (%)	64.7	36.4	4.2	0	25.3	
WHO FC III (%)	29.4	59.1	83.3	36.4	54.7	
WHO FC IV (%)	0	0	12.5	63.6	17.3	
6MWD (m)	484.7 +/- 56.3	409.4 +/- 105.8	335.7 +/- 135.6	304.8 +/- 80.1	386.7 +/- 128.7	0.070
NTproBNP (ng/L)	177 (446)	377 (347)	1634 (2134)	4178 (3307)	1040 (1634)	0.001
RAP (mmHg)	6.31 +/- 4.13	7.12 +/- 4.19	8.32 +/- 4.58	15.55 +/- 6.74	8.90 +/- 5.60	0.406
PAPm (mmHg)	50.57 +/- 16.27	51.20 +/- 16.98	48.32 +/- 14.32	56.00 +/- 8.43	49.94 +/- 11.77	0.564
PCWP (mmHg)	10.71 +/- 7.02	9.44 +/- 4.21	10.23 +/- 5.12	10.00 +/- 5.12	10.89 +/- 7.00	0.502
CI (l/min/m2)	2.78 +/- 0.50	2.05 +/- 0.63	2.30 +/- 0.54	1.68 +/- 0.42	2.26 +/- 0.64	0.212
PVR (WU)	9.22 +/- 3.41	14.22 +/- 12.54	11.83 +/- 7.06	17.21 +/- 5.39	11.54 +/- 5.60	0.420
SvO2 (%)	72.84 +/- 5.56	67.90 +/- 9.15	68.20 +/- 9.88	52.65 +/- 8.13	65.95 +/- 10.72	0.921

Table 1 Baseline clinical differences between the 4 risk groups.
*P-value reports comparison between intermediate-low and intermediate-high group
Continuous variables are expressed as mean ± standard deviation with exception of NT proBNP expressed as median and Q3.
Abbreviations: WHO FC – WHO functional class; 6MWD – 6-minute walking distance; NT proBNP – N-terminal pro-brain natriuretic peptide; RAP – right atrial pressure; PAPm – mean pulmonary arterial pressure; PCWP – pulmonary capillary wedge pressure; CI – cardiac index; PVR – pulmonary vascular resistance; SvO2 – mixed venous oxygen saturation

CO 136 Figure

events. This pts might benefit from a more aggressive upfront combination therapy at the time of diagnosis.

CO 137. FOLLOW-UP OF CHILDREN WITH BRUGADA SYNDROME: EXPERIENCE FROM A TERTIARY PAEDIATRIC REFERRAL CENTRE

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Introduction: Brugada syndrome (BrS) is an autosomal dominant channelopathy, which typically presents in young adults. It can also be diagnosed in children, but data in this age group is scarce.
Objectives: To describe the clinical features, management and long-term follow-up of children with BrS history followed-up in a tertiary paediatric referral centre.
Methods: Single centre retrospective study of consecutive patients with history of BrS, defined as having a BrS positive phenotype (BrS (+)), or a negative phenotype-positive genotype (BrS (-)). They were all followed up in a paediatric heart rhythm clinic. Clinical and demographical data were collected and analysed according to the phenotype.
Results: 30 patients were included, with a median age at diagnosis of 7 years (IQR 1-13) and a mean follow-up time of 7 ± 3 years. Sixteen patients were BrS(+), predominantly male (n = 13, 81%). 88% (n = 14) performed a genetic test, which was positive in 57% (n = 8); the most frequent mutation was SCN5A (n = 5). Family history of BrS was present in 56% (n = 9) and almost one third had family history of sudden cardiac death (SCD). Most of the patients had a type 1 Brugada ECG pattern (n = 14) and 2 patients presented a fever and drug induced pattern, respectively. Fourteen patients were BrS(-), mostly female (n = 11, 79%) with a loss-of-function mutation in the SCN5A gene (n = 10). They all had family members with BrS, mainly from the paternal side, and 43% (n = 6) mentioned SCD history. Although most of the patients were asymptomatic, the prevalence of rhythm or conduction disturbances was not infrequent, particularly in BrS(+) patients (n = 12, 75%). Also, in this group and during follow-up, 3 patients had documented supraventricular tachyarrhythmias, and 2 patients had syncope episodes, one of which required an implantable cardioverter-defibrillator. No events were reported in the BrS (-) patients. Nine patients (n = 9/30, 30%) were hospitalized, 3 due to an arrhythmic event (all in the BrS(+) group). Overall, no sudden cardiac death event was reported during follow-up.
Conclusions: In our study, although the majority of the patients were asymptomatic, the occurrence of arrhythmic events was not negligible, especially in the BrS(+) patients. Despite the significant family history, patients with BrS(-) had no events reported during follow-up. Nevertheless, the management of these patients is not clear cut, and a personalized therapeutic strategy with close follow-up is essential.

CO 138. THORS SCORE, A BETTER PREDICTOR OF IN-HOSPITAL AND LONG-TERM MORTALITY AFTER ACUTE PULMONARY EMBOLISM?

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Introduction: Pulmonary embolism (PE) is a frequent and life-threatening disorder associated with significant in-hospital mortality (IHM). Several scores for mortality prediction have been validated in these patients. Our purpose was to evaluate if a simple and objective score - THORS score - can predict prognosis in acute PE, comparing it to other previously validated scores.
Methods: A retrospective analysis of 134 patients admitted for acute PE was performed. Patients with shock or hemodynamic instability at admission were excluded. FAST, PESI and BOVA scores were calculated for each patient. The newly designed THORS score (variables: Systolic blood pressure, Heart rate, Right ventricular pressure overload signs on CT scan, Troponin I serum levels and pO2/FiO2 ratio) was calculated for each patient (range 0-12 points), after identification of the variables significantly associated with IHM (points attributed for each variable according to *odds ratio*). ROC curve analysis was performed to evaluate the predictive value of the different scores for IHM. Kaplan-Meyer survival plots were used to assess 8-year follow-up mortality (8YM) and the composite endpoint of 8-year re-hospitalization for cardiovascular causes or death (8YHD).
Results: Mean age was 62 ± 17y; 62.7% were female; 15.7% had previous history of venous thromboembolism; 16.4% and 53.7% of patients, respectively, had an identifiable major or minor precipitating factor for PE. 32.8% had low-risk PE, 58.2% intermediate-low risk PE and 9% intermediate-high risk PE, as defined by current guidelines. Mean PESI was 94 ± 38, mean BOVA 3.7 ± 1.9, mean FAST 2.6 ± 1.6 and mean THORS score was 4.4 ± 2.8. IHM was 5.9%. 8YM and 8YHD rates were 27.1% and 55.6%, respectively. ROC curve analysis revealed that THORS score had the best predictive performance for IHM (AUC: 0.922, p = 0.001), followed by FAST score (AUC: 0.750, p = 0.04). Other scores had poor predictive performance for this outcome. The optimal cut-off point for IHM using THORS, assessed by the Youden index (YI), was 6 (YI: 0.857, sensitivity: 85.7%, specificity: 100%). When stratified by risk categories (high risk if THORS score > 6 and low risk if THORS ≤ 6), we observed no in-hospital mortality in low-risk patients, while high-risk patients had 30.4% IHM risk. Kaplan Meyer analysis by risk subgroup revealed significantly lower median time to 8-year mortality in patients with high-risk THORS score (1,964 ± 276 days *vs.* 2,505 ± 99.4 days, mortality 43.5 *vs.* 21.3%, χ^2 = 4.966, p = 0.026) in comparison with low-risk patients. Analysis of 8YHD rate did not reveal significant differences between groups (p = 0.541).
Conclusions: THORS is a simple and objective score that allows excellent IHM risk prediction in patients hospitalized due to acute PE. This new score might be a better tool for IHM prediction in patients hospitalized due to PE and particularly useful for defining a low-risk subgroup, with very low IHM risk.

CO 139. ACUTE PULMONARY EMBOLISM CATHETER-DIRECTED THERAPY: A SAFETY AND FEASIBILITY ANALYSIS

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Introduction: Pulmonary embolism (PE) is the third most common cause of cardiovascular death. It has a broad clinical spectrum of severity. Systemic fibrinolysis is associated with reduction of circulatory collapse, long-term pulmonary hypertension (PH) and death in intermediate-high- and high-risk PE patients, when compared to anticoagulation alone. Dedicated multidisciplinary Pulmonary Embolism Response Teams (PERT) were created to deliver better care for these patients, centered in innovative catheter directed therapies (CDT) with mechanical thrombolysis and local fibrinolysis with the potential to reduce the systemic hemorrhagic effects of fibrinolysis.

Objectives: This analysis focus on the safety and feasibility of our PERT early experience with CDT.

	%	n		%	n
Clinical data			**Admission Transthoracic Echo**		
Mean age	55.9 ± 19.3 y/o		RV dilatation	100%	14
Gender (% of male)	36 %	5	RV dysfunction	62%	8
Previous oncologic disease	7%	1	TAPSE (mm)	15.7 ± 3.3	
Active oncologic disease	14%	2	Estimated PASP (TR jet)	54.3 ± 16.3	
Thrombophilia	0%	0	**Admission blood tests**		
Recent SARS-CoV2 infection (<1M)	0%	0	Peak hs-troponin I	2043	
Previous PE	7%	1	Admission NT-proBNP	7372	
Syncope	65%	13	Peak D-dimer	11084	
Dyspnea	30%	6	**RHC and Pulmonary angiogram**		
Initial evaluation			RA pressure	9.2 ± 3.3	
Systolic blood pressure	113.3 ± 16.7		PA systolic pressure	54.1 ± 18.7	
Heart rate	104.4 ± 25.9		PA diastolic pressure	21.4 ± 7.8	
Lactate at admission	1.5 ± 0.7		PA mean pressure	34.1 ± 11.2	
PaO2/FiO2	267.3 ± 119.7		Cardiac Output	4.9 ± 1.6	
CT-scan			Cardiac Index	2.5 ± 0.8	
RV/LV ratio	1.3 ± 0.2		PA resistance (Wood units)	3.6 ± 2.1	
Central PE	43%	6	Modified Miller Index	9.7 ± 3.0	

Table 1. Baseline Characteristics (SARS-CoV2 – Severe Acute Respiratory Syndrome Coronavirus 2; PE – Pulmonary Embolism; RV – right ventricle; LV – left ventricle; TAPSE – Tricuspid Annular Plane Systolic Excursion; PASP – Pulmonary Artery Systolic Pressure; TR – Tricuspid Regurgitation; NT-proBNP – N-terminal pro-hormone type-B natriuretic peptide; RA – Right Atrium; PA – Pulmonary Artery)

	%	n		%	n
Major/ potentially fatal bleeding	0%	0	Cardiogenic shock	0%	0
Retroperitoneal	0%	0	CTEPH	7%	1
Intracranial	0%	0	Submitted to PEA	7%	1
Alveolar / pulmonary	0%	0	Re-hospitalizations	0%	0
PA perforation	0%	0	All-cause death	14%	2
PA dissection	7%	1	In-hospital death	7%	1
PV moderate/severe regurgitation	0%	0	Cardiovascular death	0%	0
Vascular access complication	0%	0	Oncologic death	7%	1

Table 2. Procedure-related complications and Outcomes (PA – Pulmonary Artery; PV – Pulmonary Valve; CTEPH – Chronic Thromboembolic Pulmonary Hypertension; PEA – Pulmonary Endarterectomy)

Methods: During 2021, consecutive intermediate-high- and high-risk PE patients considered suitable for CDT from our PERT, were prospectively enrolled in a single tertiary center. CDT options included mechanical thrombolysis using the Penumbra aspiration system and local fibrinolysis (alteplase perfusion 1mg/h, for 12 hours) through a 5F Craig McNamara catheter in the pulmonary artery (PA). Baseline characteristics, procedure data, complications and outcomes were noted.

Results: 14 patients (mean age 55.9 ± 19.3 years old, 36% male) were submitted to CDT for intermediate-high-risk PE (Table). Mean admission lactate levels and PaO2/FiO2 ratio were 1.5 ± 0.7 mmol/L and 267 ± 120, respectively. Mean peak hs-troponin I and NT-proBNP levels were 2,043 pg/ml and 7,372 pg/ml, respectively. CT-scan showed a central PE in 43% (n = 6) and a mean RV/LV ratio of 1.3 ± 0.2. Pre-procedural Transthoracic echocardiogram revealed RV dilation in 100% (n = 14) and RV dysfunction in 62% (n = 8), with mean TAPSE of 15.7 ± 3.3 mm and estimated PASP of 54.3 ± 16.3 mmHg. Right heart catheterization showed mean right atrium (RA) pressure of 9.2 ± 3.3 mmHg and PA systolic, diastolic and mean pressures of 54.1 ± 18.7 mmHg, 21.4 ± 7.8 mmHg and 34.1 ± 11.2 mmHg, respectively. Cardiac Output and Cardiac Index were 5.9 ± 1.6 L/min and 2.5 ± 0.8 L/min/m². Mean PA resistance was 3.6 ± 2.1 Wood units. Pulmonary Angiogram revealed a modified Miller Index of 9.7 ± 3.0. Regarding complications, no major or potentially fatal bleeding were noted. It was noted a PA dissection, treated conservatively and no PA perforations or moderate/severe pulmonary valve regurgitation. Two patients died (one in-hospital death due to oncologic disease progression and another of unknown cause after hospital discharge). No re-hospitalizations were noted during the follow-up period (average of 6.5 months).

Conclusions: Intermediate-high risk patients constitute a particularly challenge group of PE patients. We believe that PERT improves care in this subset, when a strict by-protocol application of CDT is implemented. Our first experience data supports the safety and feasibility of our approach.

CO 140. CARDIOPULMONARY EXERCISE TESTING IN REPAIRED TETRALOGY OF FALLOT AND RIGHT VENTRICLE DILATATION

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Introduction: Long standing pulmonary regurgitation (PR) is a common occurrence after the repair of tetralogy of Fallot (TOF). Exposure of the right ventricle (RV) to a chronic regurgitant load leads to RV dilatation and has been associated with exercise intolerance, arrhythmia, and sudden cardiac death. Our aim was to assess which CPET parameters best correlate with RV dilatation to potentially improve risk stratification of this population.

Methods: A retrospective review was done from 2009 to 2018 on adult patients with repaired TOF who underwent maximal CPET. Demographics, standard measures of CPET interpretation, and major cardiovascular outcomes were collected. RV dilatation was defined as an echocardiographically measured basal RV linear diameter > 41 mm and/or a mid-cavity RV linear diameter > 35 mm in the RV-focused view. Multivariate analysis for the prediction of RV dilatation was performed using Cox Regression, by including all statistically significant variables in the univariate analysis and those considered clinically relevant.

Results: CPET was performed in 63 repaired TOF patients (57% male, mean age of 34 ± 9 years), with a mean follow-up of 60 ± 33 months. 56% of patients had severe pulmonary regurgitation and 48% were submitted to pulmonary valve replacement (PVR). 80.4% of repaired TOF patients had RV dilatation, with a mean RER of 1.06 ± 0.08 and a mean peak oxygen uptake of 25.7 ± 6.4 ml/kg/min. These patients had undergone a higher rate of PVR (56.8 vs. 11.1%, p = 0.023) and had a higher arrhythmia burden (31.4 vs. 0%, p = 0.048), while presenting significantly higher VE/VCO2 slope: 32.0 ± 5.7 vs. 28.1 ± 5.l, p = 0.048. A previous PVR (HR 21.06, 95%CI 1.56-28.47, p = 0.022) and VE/VCO2 slope (HR 1.21 95%CI 1.02-1.47, p = 0.049) were independent predictors of RV dilation. Peak oxygen uptake (p = 0.845) showed no statistically significant correlation with RV dilatation during follow-up.

Conclusions: VE/VCO2 slope was an independent predictor of RV dilatation, thus this CPET parameter may be used to refine risk stratification and improve this population's follow-up and management.

Domingo, 24 Abril de 2022 | 16:00-17:00

Sala Vega | Comunicações Orais (Sessão 29) - Doenças do Miocárdio e Pericárdio 2 - Vários Tópicos

CO 141. MICROVASCULAR DYSFUNCTION AND MYOCARDIAL FIBROSIS IMPACT ON LEFT VENTRICULAR MYOCARDIAL DEFORMATION IN HYPERTROPHIC CARDIOMYOPATHY – PER SEGMENT ANALYSIS BY MAGNETIC RESONANCE IMAGING

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Introduction: Left ventricular hypertrophy (LVH) and microvascular dysfunction are hallmarks of hypertrophic cardiomyopathy (HCM). We hypothesized that microvascular dysfunction contributes to LV myocardial deformation impairment.

Table 1. Multivariable linear regression analysis for left ventricular myocardial deformation parameters

Longitudinal strain			
Model	β-estimate	95% confidence interval	p-value
Thickness ≥15 mm	2.31	0.91 to 3.70	<0.001
Obstructive HCM	2.44	1.15 to 3.72	<0.001
Diabetes mellitus	1.84	0.26 to 3.42	0.023
Hypertension	1.28	0.11 to 2.45	0.032
BMI > 25 kg/m²	3.35	1.87 to 4.84	<0.001
Circumferential strain			
Model	β-estimate	95% confidence interval	p-value
Thickness 12-14mm	2.31	1.36 to 3.25	<0.001
Thickness ≥15 mm	5.29	4.47 to 6.12	<0.001
Perfusion defect	2.75	2.00 to 3.50	<0.001
LGE	2.49	1.77 to 3.22	<0.001
Obstructive HCM	1.25	0.44 to 2.06	0.003
Diabetes mellitus	1.26	0.27 to 2.25	0.013
Male gender	1.58	0.83 to 2.33	<0.001
Radial strain			
Model	β-estimate	95% confidence interval	p-value
Thickness 12-14mm	-10.64	-13.95 to -7.33	<0.001
Thickness ≥15 mm	-20.67	-23.36 to -17.97	<0.001
Perfusion defect	-10.60	-13.08 to -8.13	<0.001
LGE	-10.49	-12.86 to -8.11	<0.001
Obstructive HCM	-3.27	-5.96 to -0.58	0.017
Diabetes mellitus	-3.78	-7.07 to -0.49	0.027
BMI > 25 kg/m²	-3.28	-6.36 to -0.20	0.037
Hypertension	-2.74	-5.17 to -0.32	0.027
Male gender	-5.72	-8.21 to -3.24	<0.001

Reference categories: Wall thickness ≤11 mm, non-obstructive HCM, absence of perfusion defect, female gender, BMI ≤25 kg/m². p-values were obtained by mixed effects regression models. BMI: Body mass index, LGE: Late gadolinium enhancement, HCM: hypertrophic cardiomyopathy.

Methods: Prospective evaluation of adult patients with HCM (patients with "end-stage" HCM, prior septal reduction therapy or epicardial coronary artery disease were excluded). All underwent a cardiac magnetic resonance (CMR) protocol (1.5-T), from which the following parameters were analysed: maximal LV wall thickness (MLVWT), T1 and T2 mapping, extracellular volume, late gadolinium enhancement (LGE) and stress perfusion assessment. Three-dimensional (3D) strain analysis was obtained by using feature-tracking from cine images. Results were stratified according to the 16 American Heart Association segments. Multivariate regression analyses for longitudinal, circumferential and radial strain were performed.

Results: A total of 1200 myocardial segments were analysed (75 patients, 63% male, age 54.6 ± 14.7 years) including 61% with asymmetric septal LVH, 29% with apical LVH, 8% with concentric LVH, 28% exhibiting LV outflow tract obstruction Mean MLVWT was 20 ± 4.5 mm. Higher values of longitudinal strain (lower deformation) were found in segments with MLVWT ≥ 15 mm (β-estimate: 2.31, 95%CI 0.91-3.70, p < 0.001) and in patients with obstructive HCM (β-estimate: 2.44, 95%CI 1.15-3.72, p < 0.001]) (Table). No association was found between perfusion defects, LGE and longitudinal strain. Higher values of circumferential strain (lower deformation) were found in segments with MLVWT 12-14 mm (β-estimate: 2.31, 95%CI 1.36-3.25, p < 0.001), ≥ 15 mm (β-estimate: 5.29, 95%CI 4.47-6.12, p < 0.001), with perfusion defects (β-estimate: 2.75, 95%CI 2.0-3.5, p < 0.001), with LGE (β-estimate: 2.49, 95%CI 1.77-3.22, p < 0.001) and in patients with obstructive HCM (β-estimate: 1.25, 95%CI 0.44-2.06, p = 0.003). Lower radial strain values were found in segments with MLVWT 12-14 mm (β-estimate: -10.64, 95%CI -13.95 to -7.33, p < 0.001), MLVWT ≥ 15 mm (β-estimate: -20.67, 95%CI -23.36 to -17.97, p < 0.001), with perfusion defects (β-estimate: -10.60, 95%CI -13.08 to -8.13, p < 0.001), and with LGE (β-estimate: -10.49, 95%CI -12.86 to -8.11) (Table). Diabetes, hypertension, BMI > 25 kg/m² and male gender were also associated with impaired myocardial deformation. No association was found between parametric mapping values and LV myocardial deformation.

Conclusions: In patients with HCM, 3D speckle tracking parameters for LV systolic function were particularly impaired in segments with LVH, microvascular dysfunction or fibrosis. LVH was associated with abnormal longitudinal, circumferential and radial strain while perfusion defects and LGE correlated with impaired circumferential strain and radial strain.

CO 142. MECHANICAL DISPERSION: CAN IT PREDICT THE OCCURRENCE OF VENTRICULAR ARRHYTHMIAS IN FABRY DISEASE?

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Introduction: Fabry disease (FD) is an X-linked progressive and multisystemic disease, that could lead to left ventricular hypertrophy (LVH). Mechanical dispersion (MD) has been associated to a risk of ventricular arrhythmias and sudden death in several cardiomyopathies.

Objectives: To evaluate MD and arrhythmic burden in FD patients with and without LVH.

Methods: We conducted a prospective study encompassing FD patients followed in a Reference Center of Lysosomal Storage Disorders. All patients performed a complete echocardiographic evaluation, including left ventricular (LV) strain analysis by two-dimensional speckle tracking imaging. Clinical characteristics, echocardiographic parameters and 24h-holters results were analysed. FD patients were divided in two groups according to the presence or absence of LVH. Chi-square test and Student's t-test were applied for categorical and continuous variables, respectively. The significance level was 0.05.

Results: A total of 91 FD patients were included, with female predominance (62.6%) and a LVH prevalence of 36.3%. Patients with LVH were older (63.6 vs. 44.2 years-old; p < 0.001), were predominantly male (60.6 vs. 24.1%; p = 0.001), and had a larger prevalence of arterial hypertension (63.6 vs. 10.3%; p < 0.001) and stroke (9.1 vs. 0%; p = 0.02). In FD patients with LVH, mean interventricular septum thickness was 16.4 mm, mean LV mass index was 157.7 g/m², mean left atrial volume index was 34.4 ml/m² and mean E/e' was 12.6 with 63.6% of these patients having diastolic dysfunction. Global longitudinal strain (GLS) was lower in patients with LVH (-15.6 vs.

-19.6%; p < 0.001), with a higher base-to-apex longitudinal strain gradient (9.3 *vs.* 6.5%; p = 0.013). Global radial and circumferential strains were not statistically different between both groups. Interestingly, twist was higher in patients with LVH (17.5º *vs.* 13.8º) despite the lower GLS, but this finding did not reach statistical significance (p = 0.077). MD was higher in patients with LVH (72.4 *vs.* 38.3 ms; p < 0.001), as well as the prevalence of premature ventricular contractions (PVC) (93.8 *vs.* 61.8%; p = 0.001) and non-sustained ventricular tachycardia (NSVT) (18.8 *vs.* 9.1%; p = 0.191). Patients with higher frequency of PVC had higher MD (55.2 *vs.* 35.6 ms; p = 0.001) and the same was verified for NSVT (65 *vs.* 48.6 ms; p = 0.054), despite not reaching statistical significance.

Conclusions: FD patients with LVH present lower GLS, with a higher base-to-apex longitudinal strain gradient and higher MD, compared to patients without LVH. Both PVC and NSVT were significantly associated with LVH and higher MD, but the latter did not reach statistical significance.

CO 143. CLINICAL AND ECHOCARDIOGRAPHIC PROGNOSTIC FACTORS IN WILD TYPE TRANSTHYRETIN CARDIAC AMYLOIDOSIS

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Introduction: Transthyretin amyloid cardiomyopathy (ATTR-CM) is an increasingly recognized etiology of heart failure (HF) due to the possibility of non-invasive diagnosis and emergence of treatment options. Early recognition and prognosis assessment of ATTR-CM are crucial to guide proper management and treatment. This study aims to identify independent predictors of prognosis in patients with wild-type ATTR-CM.

Methods: This is a retrospective single-center study including all patients with diagnosis of wild-type ATTR-CM between January 2014 and May 2021. ATTR-CM diagnosis was based on the AHA diagnostic criteria. The primary endpoint was the composite endpoint of hospitalization due to HF or death for any cause. Clinical, laboratory and echocardiographic data were compared between patients reaching and not reaching primary endpoint in order to identify prognostic factors. Regression analysis was performed to identify independent predictors of prognosis.

Results: 60 patients with wild-type ATTR-CM were included (mean age 86 ± 5 years, 68.3% males, 56.7% atrial fibrillation, baseline left ventricular ejection fraction (LVEF) 53% ± 14). The mean follow-up was 30 ± 23 months. During follow-up, the primary endpoint occurred in 37 patients (61.7%); 27 patients (45%) died within 2.5 years of their diagnosis, 13 of them (48%) by cardiovascular cause. Patients reaching the primary endpoint had more commonly a pro-B-type natriuretic peptide (proBNP) above 3,000 pg/ml (86.7 *vs.* 47.1%, p = 0.004) and a higher frequency of left ventricular systolic dysfunction (LVSD) (59.5 *vs.* 17.4%, p = 0.0001), right ventricular systolic dysfunction (59.5 *vs.* 30.4%, p = 0.029) and CKD (59.5 *vs.* 30.4, p = 0.029). In these patients, mean LVEF was lower (47 ± 14 *vs.* 61 ± 10%, p < 0.001) and mean global longitudinal strain (GLS) was significantly worse (-9.7 ± 2.9 *vs.*

14.1 ± 3.8%, p < 0.001). Index left ventricular mass was higher (196 ± 47 *vs.* 168 ± 41 p = 0.031) as well as right ventricular thickness (10.4 ± 1 *vs.* 8.5 ± 1, p = 0.015). In a multivariate logistic regression analysis, LVSD and pro-BNP value were the only independent predictors of the primary endpoint (HR 7.8 95%CI 1.6-37.8, p = 0.011; HR 7.0 95%CI 1.4-34.6, p = 0.016, respectively).

Conclusions: LVSD and BNP value are independent predictors of the occurrence of the primary endpoint of hospitalization due to HF or death of any cause in wild-type ATTR-CM patients. Prospective studies assessing the incremental value of prognostic factors are needed.

## CO 144. DOES MY TAVR PATIENT HAVE CARDIAC AMYLOIDOSIS?

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Introduction: Aortic stenosis (AS) is highly age-related, and its prevalence is increasing rapidly in high-income countries. There are 2 major types of amyloid protein responsible for cardiac amyloidosis (CA) - transthyretin (TTR) and immunoglobulin lightchain (AL). Previous cohorts report an incidence ranging from 9 to 16% for the presence of CA in patients with AS referred for TAVR. These patients appear to have a similar prognosis to those with lone AS when undergoing TAVR, but a trend toward worse prognosis if left treated. We aimed to investigate the prevalence of CA in patients with severe AS referred for TAVR in the Portuguese population.

Methods: We prospectively recruited 60 consecutive patients referred for TAVR at our tertiary center between November 2020 and May 2021. 59 patients agreed to participate and signed an informed consent, approved by the local Ethics Commission. All patients performed coronary angiogram, echocardiogram, thoracic abdominal pelvic CT scan, ECG, bone scintigraphy (99mTc-3.3-diphosphono-1,2-propanodicarboxylic acid [DPD]) and blood and urine monoclonal immunoglobulin testing (Figure).

Results: About half (54.2%) of patients were male, average age was 82 years and the prevalence of ischemic heart disease and cardiovascular risk factors was high. About one third of patients had atrial fibrillation and 27.1% were pacemaker carriers. Echocardiographic baseline findings were: maximum aortic valve gradient 72.77 ± 18.18 mmHg ; mean aortic valve gradient 43.49 ± 11.60; aortic valve area 0.65 ± 0.15 cm2; interventricular septum thickness 1.30 ± 0.23 cm; left ventricular ejection fraction (LVEF) 52.06 ± 11.35%; E/E' 14.63 ± 7.5; tricuspid annular plane systolic excursion 19.2 ± 4 mm; right ventricle/right atrial gradient 38.1 ± 14.32 mmHg. CA was diagnosed in 6 (10.2%) patients. Perugini grade was 1 (n = 3) and 3 (n = 3). One patient (Perugini grade = 3) was found to have plasma cell dyscrasia, producing monoclonal IgG Kappa protein. CA patients were all male, older (86.5 *vs.* 81.30 years, p = 0.049), more frequently pacemaker carriers (66.7 *vs.* 22.6%, p = 0.041) and had a tendency to have a thicker interventricular septum (1.48 *vs.* 1.28 cm, p = 0.065).
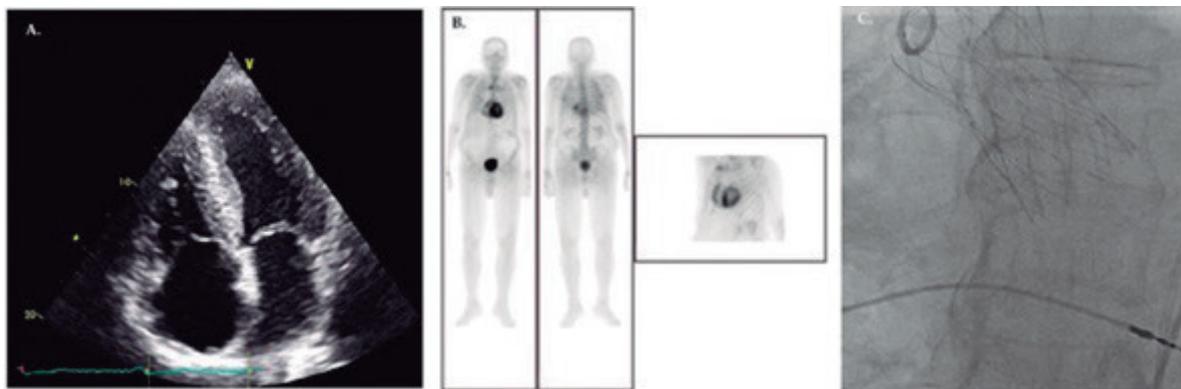
CO 144 Figure

Conclusions: We show that in the Portuguese population, the prevalence of CA in severe AS patients referred for TAVI is in line with what is observed in other countries. This has important consequences regarding the diagnosis and management of these patients.

CO 145. MYOCARDITIS, PERICARDITIS AND COVID-19 VACCINATION - A TRUE CONCERN?

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Introduction: Myocarditis and pericarditis are inflammatory diseases affecting 1 to 10 persons in 100,000/year. During Covid-19 pandemic, anti-SARS-Cov-2 vaccines are being widely used worldwide, and concerns about its association with a higher risk of cardiac inflammatory syndromes are being raised. National data are warrant to clarify the true prevalence of these possible side effects.

Objectives: To compare the prevalence and severity of myocarditis and/or pericarditis admissions before and after COVID-19 vaccination.

Methods: We retrospectively analysed all patients admitted to a Cardiology Department due to myocarditis and/or pericarditis during COVID-19 pandemic and compared the clinical data between two 10-months periods, before and after Covid-19 vaccination in Portugal. Pre-vaccination period (PVp) was defined from March to December 2020 and vaccination period (VCp) from January to October 2021.

Results: A total of 23 patients were enrolled, 12 in PVp and 11 in VCp, with a median age of 28 year-old. Of total, 44% had perimyocarditis, 30% myocarditis and 26% pericarditis. In VCp there was significatively more man admitted (50 *vs.* 90%, p = 0.019). Concerning clinical data, the two periods were similar; 9% had hypertension, 9% dyslipidemia, 4% were obese, 21% were smokers or previous smokers, and none was diabetic. Only 4% had previous paroxysmal AF and none had CKD. Median CRP was 68 mg/L, and in perimyocarditis or myocarditis median troponin and BNP were 10 250 ng/L and 38 pg/mL, respectively. The majority of patients had ECG abnormalities, mostly ST-elevations (39%) and repolarization abnormalities (20%). At presentation, left systolic function was preserved in all patients in PVp group, while 27% had mildly to moderate reduced ejection fraction in VCp (p = 0.052); all of them improved to normal function. Of the 17 patients with myocarditis or perimyocarditis, 14 were submitted to MRI (median 6 days after the event): 60% had high signal intensity in T2 weighted sequences suggestive of oedema and 73% had LGE enhancement compatible with myocarditis. Median left and right ventricular ejection fraction by MRI were both 61%. In PVp group, 55% of patients were previous vaccinated (3 patients with Moderna, 1 with Pfizer and 2 with Janssen vaccines). The median time between last vaccine administration and event was 73 days (2-112). In this group, five patients with myocarditis diagnosis previous vaccinated three had no-LGE enhancement while all of non-vaccinated exhibited LGE-enhancement (p = 0.038).

Conclusions: In a Cardiology Department, during two equal periods of 10-months before and after Covid-19 vaccination in Portugal, there was no difference in the number of patients admitted with myocarditis and/or pericarditis. Most had a favorable outcome with preserved systolic function. Curiously patient with previous Covid-19 vaccination exhibited less LGE-enhancement on MRI.