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Sexta-feira, 30 Abril de 2021 | 10H30-11H30

Sala Virtual 2 | CO 01 - Doença coronária

CO 4. ISCHEMIA LBBB STUDY - IS AN ANATOMICAL APPROACH SUPERIOR TO A FUNCTIONAL APPROACH FOR THE DIAGNOSIS OF OBSTRUCTIVE CORONARY ARTERY DISEASE IN PATIENTS WITH LEFT BUNDLE BRANCH BLOCK?

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Introduction: The diagnostic investigation of obstructive coronary artery disease (CAD) in the presence of left bundle branch block (LBBB) or ventricular pacing (VP) is challenging because the inherent changes in ventricular depolarization may cause wall motion abnormalities or septal perfusion defects. These have been described as causes for false positive ischemia tests. The authors hypothesised that an anatomic test - computerized tomography coronary angiogram (CTCA) - might be more suitable than functional tests - single-photon emission computed tomography myocardial perfusion imaging (SPECT-MPI) and dobutamine stress echocardiography (DSE) - for the diagnosis of CAD in these patients.

Methods: This was an observational multicentre study including consecutive patients with LBBB or VP referred for SPECT-MPI, DSE and CTCA. An analysis of accuracy, false discovery rate (FDR) and ROC curve was performed, including patients referred to coronary angiography (CA) after these exams. Exclusion criteria were acute coronary syndrome or previous CAD with incomplete revascularization. To avoid referral bias, a second analysis was performed evaluating the normalcy rate (NR) in a sample of low-risk patients (pre-test probability < 10%). A modified NR was used due to the reduced referral of patients with a pre-test probability < 5%.

Results: Of the 346 patients included in the study, 132 were referred to CA - 77 after SPECT-CT, 28 after DSE and 27 after CCTA. The median age was 68 years (95%CI 60-75), 59% were male and 9% had undergone previous revascularization. CA revealed CAD in 32%, similar for all non-invasive exams (30%, 36% and 33% for SPECT-MPI, DSE and CTCA respectively, p = 0.836). Accuracy was significantly inferior for SPECT (34%) than DSE (68%, p = 0.003) or CTCA (63%, p = 0.012). FDR was significantly higher for SPECT-MPI (71%) than DSE (44%, p = 0.049) and similar to CTCA (53%, p = 0.167). There was no significant difference between CTCA and DSE (p = 0.781 for accuracy, p = 0.746 for FDR). The ROC curves revealed that SPECT-MPI was a poor discriminator of CAD in these patients (AUC 0.503, 95%CI 0.361-0.644). DSE (AUC 0.700, 95%CI 0.503-0.897) and CTCA (AUC 0.722, 95%CI 0.533-0.911) were decent discriminators. For the modified NR analysis, 214 low risk patients were included (93 for SPECT-CT, 40 for DSE and 81 for CCTA). Median age was 60 years (95%CI 54-64), 43% were male. The modified NR was significantly inferior for SPECT-MPI (27%) than DSE (83%, p < 0.001) or CTCA (85%, p < 0.001), but not significantly different between DSE and CTCA (p = 0.792).

Table 1: Accuracy analysis - diagnostic performance and comparison between exams

	SPECT-MPI (n=77)	DSE (n=28)	CTCA (n=27)
Positive	91% (n=70)	54% (n=18)	70% (n=19)
Negative	9% (n=7)	36% (n=10)	30% (n=8)
Accuracy	34%	68%	63%
False discovery rate	71%	44%	53%
False omission rate	14%	10%	0%

SPECT-MPI vs. DSE	SPECT-MPI vs. CTCA	DSE vs. CTCA
p= .003	***p= .012***	*p= .781*
p= .049	*p= .167*	*p= .746*
p= .999	*p= .467*	*p= .999*

Conclusions: In patients with LBBB or VP, SPECT-MPI performed poorly for the diagnosis of CAD, with a low accuracy, high FDR and a low modified NR. Despite the poor performance of SPECT-MPI, DSE and CTCA performed well, suggesting that an anatomical based approach is not superior to a functional based approach for the diagnosis of CAD in these patients.

CO 5. INCORPORATING CORONARY CALCIFICATION INTO PRETEST ASSESSMENT OF THE LIKELIHOOD OF CORONARY ARTERY DISEASE-VALIDATION AND RECALIBRATION OF A NEW DIAGNOSTIC TOOL

Pedro M. Lopes[1], João Presume[1], Pedro de Araújo Gonçalves[2], Francisco Albuquerque[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: A new clinical tool was recently proposed to improve the estimation of pre-test probability of obstructive coronary artery disease (CAD) by incorporating coronary artery calcium score (CACS) with clinical risk factors. This new model (Clinical+CACS) showed improved prediction when compared to the method recommended by the 2019 ESC guidelines on chronic coronary syndromes, but was never tested or adjusted for use in our population. The aim of this study was to assess the performance of this new method in a Portuguese cohort of symptomatic patients referred for coronary computed tomography angiography (CCTA), and to recalibrate it if necessary.
Methods: We conducted a two-center cross-sectional study assessing symptomatic patients who underwent CCTA for suspected CAD. Key exclusion criteria were age < 30 years, known CAD, suspected acute coronary syndrome, or symptoms other than chest pain or dyspnea. Obstructive CAD was defined as any luminal stenosis ≥ 50% on CCTA. The Clinical+CACS prediction model was assessed for discrimination and calibration. A logistical recalibration of the model was conducted in a random sample of 50% of the patients and subsequently validated in the other half.
Results: A total of 1,910 patients (mean age 60 ± 11 years, 60% women) were included in the analysis. Symptom characteristics were: 39% non-anginal chest pain, 30% atypical angina, 19% dyspnea and 12% typical angina. The observed prevalence of obstructive CAD was 12.9% (n = 247). Patients with obstructive CAD were more often male, were significantly older, had higher prevalence of typical angina and cardiovascular risk factors, and higher CACS values. The new Clinical+CACS tool showed greater discriminative power than the ESC 2019 prediction model, with a C-statistic of 0.83 (95%CI 0.81-0.86) versus 0.67 (95%CI 0.64-0.71), respectively (p-value for comparison < 0.001). Before recalibration, the Clinical+CACS model underestimated the likelihood of CAD in our population across all quartiles of pretest probability (mean relative underestimation of 49%), which was subsequently corrected by the recalibration procedure (Figure).
Conclusions: In a Portuguese cohort of symptomatic patients undergoing CCTA for suspected CAD, the new Clinical+CACS model showed better discrimination power than the 2019 ESC method. The underestimation of the Clinical+CACS model was corrected by recalibrating it for our population. This new tool might prove useful for guiding decisions on the need for further testing.

CO 2. RAPID ATRIAL FIBRILLATION INCREASES CARDIAC BIOMARKERS: DECISION TO PERFORM CORONARY ANGIOGRAPHY BASED ON NOVEL HIGH-SENSITIVITY TROPONIN I PEAK

Ana Fátima Esteves[1], Leonor Parreira[1], Marta Fonseca[1], José Maria Farinha[1], Antonio Pinheiro Cumena Candjondjo[1], Joana Silva Ferreira[1], Rui Antunes Coelho[2], Dinis Mesquita[1], Pedro Amador[1], Nuno Fonseca[1], Ricardo Santos[2], Filipe Seixo[1], Cátia Costa[1], Rui Caria[1]

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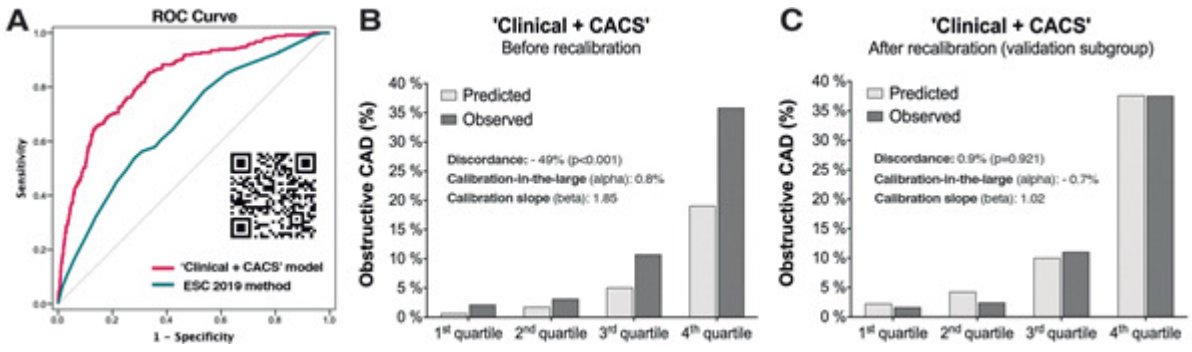
Introduction: Since January 2018 the availability of high sensitivity Troponin I (hsTnI) has improved ischemia diagnosis. In patients with rapid atrial fibrillation (AF), the decision to undergo coronary angiography is usually due to elevated cardiac biomarkers. However, evidence to support the rentability of this approach is sparse.
Objectives: Evaluate if hsTnI in patients with rapid AF and elevated cardiac biomarkers has a good discriminative power to predict a positive coronary angiography.
Methods: We retrospectively studied consecutive patients admitted to the emergency department (ED) between January 2018 and December 2019 with rapid AF that underwent coronary angiography and had multiple hsTnI values obtained. We analysed risk factors, initial and peak hsTnI, time from ED admission to peak hsTnI and ST-T segment abnormalities (ST depression and/or T wave inversion). We evaluated the presence of significant coronary artery stenosis with the need of revascularization at coronary angiography. Univariable and multivariable analysis was performed to obtain the Odds Ratio (OR, 95%CI, p-value) for significant coronary artery disease (CAD). Receiver operator characteristics (ROC) curve and area under the curve (AUC) were obtained to determine the discriminative power of peak hsTnI as predictor of a positive coronary angiography. Optimal cut-point value was obtained (Youden index) and patients were divided according to this value.
Results: From 1,407 patients admitted to the ED with rapid AF, 30 patients, 60% male, median age 74 (IQR 61.25-80.75) years, were submitted to coronary angiography. Significant coronary artery stenosis was present in 17 (57%) patients. Age, ST-T segment abnormalities and peak hsTnI were predictors of significant CAD, respectively 1.203, 1.064-1.361, 0.003; 25.00, 3.522-177.477, 0.001; and 1.000, 1.000-1.001, 0.015. Optimal cut-point value for predicting the presence of significant coronary artery stenosis at coronary angiography was a peak hsTnI of 359 pg/mL (AUC 0.869, p-value 0.001, 95%CI 0.742-0.995). The two groups with hsTnI < 359 and hsTnI > 359 differed in age and ST-T segment abnormalities (Table). After adjustment, peak hsTnI >359 pg/mL was the only independent predictor of significant CAD (23.894, 1.310-435.669, 0.032).



CO 5 Figure

	Total sample n=30	Peak hsTnI <359 pg/mL n=10	Peak hsTnI >359 pg/mL n=20	p-value
Peak hsTnI, median (IQR)	1928.25 (66.28-6005.78)	36.25 (22.55-66.27)	5138.90 (1704.48-8402.95)	<0.001
Age in years, median (IQR)	74 (61.25-80.75)	61 (57.50-74.25)	77 (67.25-84.75)	0.014
Time from ED admission to peak hsTnI in hours, median (IQR)	14.7 (5.285-22.93)	6.74 (2.63-39.73)	17.18 (12.06-22.93)	0.696
Type 2 diabetes mellitus, n (%)	10 (33.3)	3 (33.3)	7 (35.0)	0.999
Previous history of CAD, n (%)	6 (20.0)	2 (20.0)	4 (20.0)	0.999
ST-T segment abnormalities, n (%)	18 (60.0)	2 (20.0)	16 (80.0)	0.004

Conclusions: In this group of patients with rapid AF, peak hsTnI >359 pg/mL was the only independent predictor of significant coronary artery disease. Therefore, those patients should undergo coronary angiography.

CO 1. AGE AND FUNCTIONAL RELEVANCE OF CORONARY STENOSIS: A POST-HOC ANALYSIS OF THE ADVISE II TRIAL

D. Faria[1], Joo Myung Lee[2], Tim Van Der Hoef[3], Hernán Mejía-Rentería[4], Mauro Echavarría-Pinto[5], Sérgio Bravo Baptista[6], Enrico Cerrato[7], Hector García-García[8], Justin Davies[9], Yoshinobu Onuma[10], Habib Samady[11], Jan j Piek[3], Patrick W. Serruys[9], Amir Lerman[12], Javier Escaned[4]

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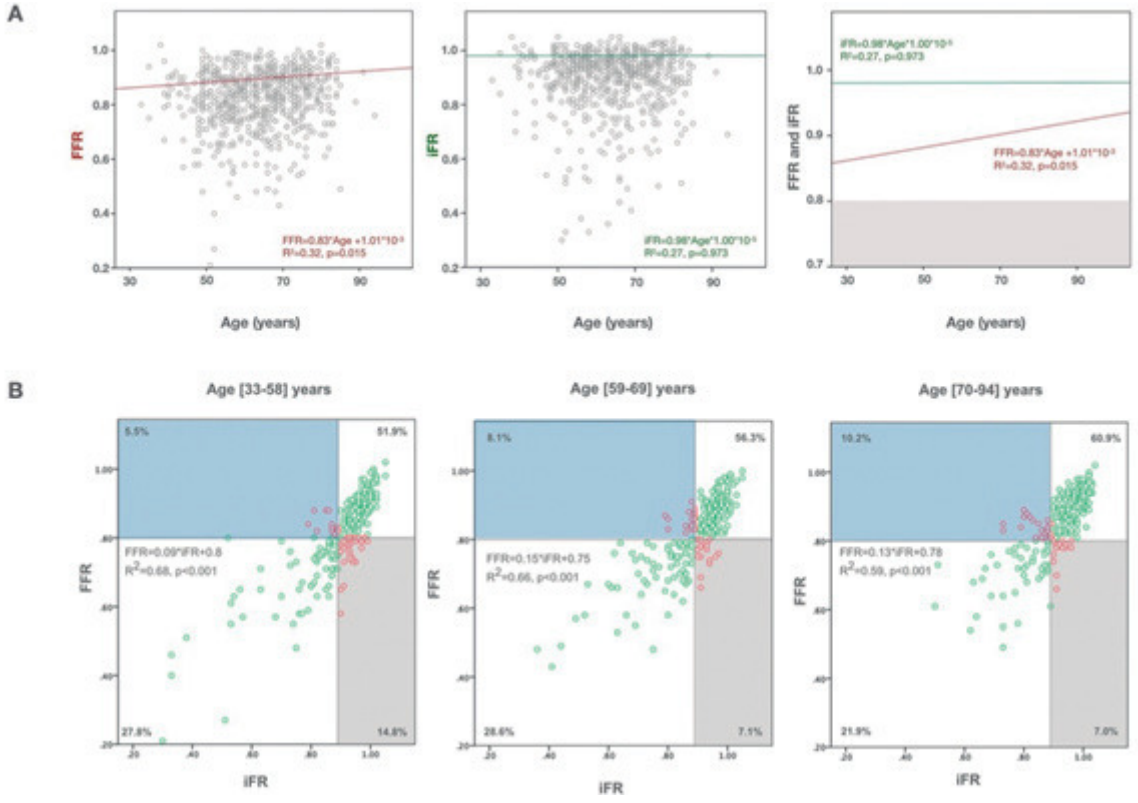
Objectives: The influence of age-dependent changes on fractional flow reserve (FFR) or instantaneous free-wave ratio (iFR) and the response to pharmacological hyperaemia has not been investigated. We investigated the impact of age on these indices.

Methods and results: This is as post-hoc analysis of the ADVISE II trial, including a total of 690 pressure recordings (in 591 patients). Age-dependent correlations with FFR and iFR were calculated and adjusted for stenosis severity. Patients were stratified into three age terciles. The hyperaemic response to adenosine, calculated as the difference between resting and hyperaemic pressure ratios, and the prevalence of FFR-iFR discordance were assessed. Correlations between coronary physiology indices and age were adjusted for several potential cofounders, including: visual lesion severity, interrogated target vessel with proximal LAD artery lesion, presence of hypertension, diabetes, renal failure, number of vessels interrogated per patient and patients presenting with an ACS. Age correlated positively with FFR (r^2 = 0.08, 95%CI: 0.01 to 0.15, p = 0.015), but not with iFR (r^2 = -0.03, 95%CI: -0.11 to 0.04, p = 0.411) (Figure A). The hyperaemic response to adenosine decreased with patient age (0.12 ± 0.07, 0.11 ± 0.06, 0.09 ± 0.05, for the 1st [33-58 years], 2nd [59-69 years] and 3rd [70-94 years] age tertiles, respectively, p < 0.001) and showed significant correlation with age (r^2 = -0.14, 95%CI -0.21 to -0.06, p < 0.001). The proportion of patients with FFR≤ 0.80 + iFR>0.89 discordance doubled in the first age-tercile (14.1% vs 7.1% vs 7.0%, p = 0.005) (Figure B).

Conclusions: The hyperaemic response of the microcirculation to adenosine administration is age-dependent. FFR values increase with patient age, while iFR values remain constant across the age spectrum. These



CO 1 Figure

findings contribute to explain differences observed in functional stenosis classification with hyperaemic and non-hyperaemic coronary indices.

CO 3. PRE-TEST PROBABILITY OF CHRONIC CORONARY SYNDROME

Miguel Carias de Sousa, Francisco Cláudio, Rita Rocha, Mafalda Carrington, João Pais, Diogo Brás, Rui Guerreiro, Ângela Bento

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Introduction: The pre-test probability (PTP) of a patient with clinical suspicion of chronic coronary syndrome (CCS) can be calculated through sex, age and symptoms, namely characteristic of chest pain and the presence or not of dyspnea, the latter included in the last CCS guidelines (2019). The 2013 ESC guidelines used the updated Diamond and Forrester model to calculate PTP. The most recent 2019 guidelines changed the calculation method. However, PTP depends on the prevalence of CAD in the population, so the under or over-estimation of PTP can have consequences in the approach of each patient.
Objectives: Compare the Diamond-Forrester model, defended by the 2013 guidelines, with the model presented in the most recent guidelines (2019), with the prevalence of coronary artery disease to see which is closer to reality.
Methods: Unicentric retrospective observational study. Patients undergoing cardiac catheterization for suspected chronic coronary syndrome with a positive ischemia test were included, including exercise stress test (treadmill ergometer), stress echocardiogram, scintigraphy or cardiac magnetic resonance. Each patient's PTP was calculated using the Diamond-Forrester model (2013 guidelines) and the model presented in the most recent guidelines. Both methods were compared with the prevalence of obstructive coronary artery disease diagnosed by cardiac catheterization, defined by the presence of coronary lesion, with luminal stenosis ≥ 50%. Statistical analysis performed using STATA v13, with $p < 0.05$ being considered as statistically significant.
Results: 2,472 patients were included, 62.66% male, with an average age of 65.13 ± 9.98 years-old. Regarding cardiovascular risk factors, 69.66% had dyslipidemia, 35.76% diabetes mellitus and 82.36% arterial hypertension. The prevalence of CAD in the analyzed sample was higher than the PTP calculated either by the Diamond Forrester method and by the new method in patients of both sexes with atypical chest pain, non-cardiac chest pain and dyspnea ($p < 0.05$). In patients of both sexes with typical chest pain, the Diamond Forrester method overestimated and the new model underestimated the prevalence of CAD.
Conclusions: The new guidelines changed the method of calculating PTP, and this new method underestimates the prevalence of CAD, moving further away from the reality observed in our population. Between the two methods of calculation compared, the Diamond Forrester model was the one that came closest to the reality of our population.

Sexta-feira, 30 Abril de 2021 | 09H00-10H15

Estúdio 4 Porto Douro | CO 07 - Miocardiopatias Infiltrativas

CO 36. IATROGENIC TRANSTHYRETIN CARDIAC AMYLOIDOSIS AFTER SEQUENTIAL LIVER TRANSPLANTATION

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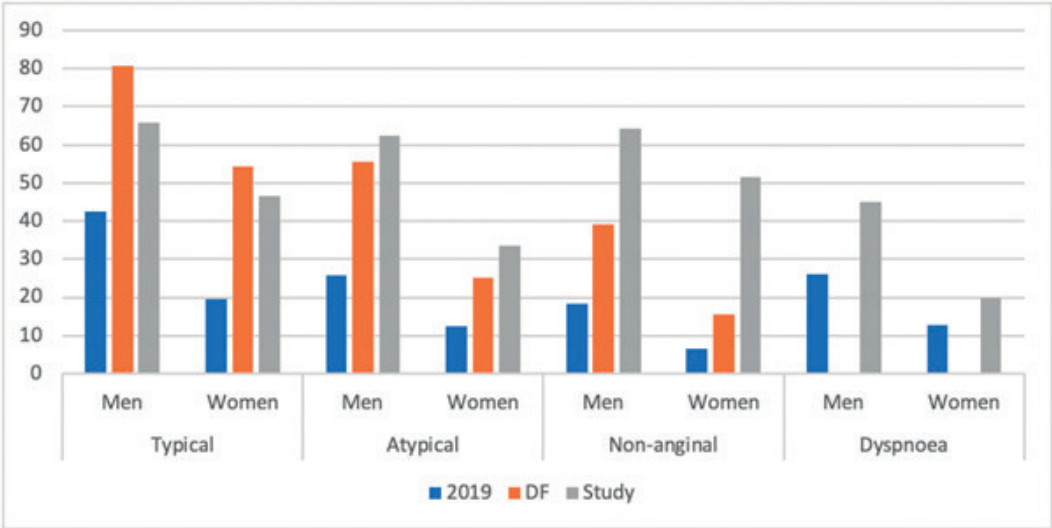
Introduction: Sequential liver transplantation (SLT) uses livers excised from patients with hereditary transthyretin-related amyloidosis during liver transplantation as grafts to other patients with severe hepatic pathologies and a reserved prognosis. The analysis of this highly selected population could help to a better understanding of the transthyretin amyloidosis' pathophysiology.
Objectives: We aimed to investigate the development of cardiac manifestations consistent with iatrogenic transthyretin amyloidosis (iATTR) in patients submitted to SLT.
Methods: We retrospectively analyzed the medical records of 72 consecutive patients submitted to SLT between 2007 and 2010, who received livers with V30M mutation.
Results: Our sample had 79% males and mean age at transplantation was 55 ± 6 years. During a median follow-up time of 80 months 44% patients died. One-year mortality rate after SLT was 7%. Clinical manifestations of iATTR occurred in 29% of individuals, on average 6 years after SLT, and amyloid was identified in 76% of those who underwent biopsy. At baseline, left ventricular hypertrophy (LVH) was identified in 58% of patients. During follow-up, there was a significant increase of the left ventricular wall thickness (11 ± 1 to 13 ± 3 mm; $p < 0.001$) and 61% of patients reached the criteria of de novo LVH or basal LVH worsening. Age (55 ± 5 vs 58 ± 5, $p = 0.25$) and incidence of hypertension (52% vs 64%, $p = 0.365$) were similar between groups but



CO 3 Figure

patients with de novo LVH or basal LVH worsening had higher incidence of chronic kidney disease (CKD; 68% vs 29%, p = 0.02). During follow-up, all-cause death was numerically higher in patients with de novo LVH or worsening LVH but not significantly, probably due to the sample size (23% vs 7%, p = 0.221, log rank test p = 0.262). Significant conduction changes were rarely seen (1 patient); however, there was a trend towards an increase in PR interval. Atrial fibrillation was reported in 8% of cases.
Conclusions: In our sample, probable iATTR was often seen within a decade after SLT. Development of possible infiltrative pattern was more common and conduction disorders were rarer than one would extrapolate from hereditary early onset ATTR V30M patients, suggesting a phenotype more similar to late onset ATTR V30M. Our data suggests that these patients should probably undergo periodic cardiac imaging.

CO 34. HOW TO DISTINGUISH BETWEEN HYPERTROPHIC CARDIOMYOPATHY AND LEFT VENTRICULAR HYPERTROPHY SECONDARY TO FABRY DISEASE?

Raquel Menezes Fernandes[1], Olga Azevedo[2], Filipa Cordeiro[2], Mário Rui Lourenço[2], António Lourenço[2]

[1]Centro Hospitalar do Algarve, EPE/Hospital de Faro. [2]Centro Hospitalar do Alto Ave, EPE/Hospital da Senhora da Oliveira.

Introduction: Fabry disease (FD) commonly leads to left ventricular hypertrophy (LVH) that could mimic sarcomeric hypertrophic cardiomyopathy (HCM).
Objectives: To determine the differences in echocardiographic parameters between FD patients with LVH and HCM patients.
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 strain analysis by two-dimensional speckle tracking imaging. Demographic, clinical characteristics and echocardiographic parameters were analysed. FD patients with LVH were compared with HCM patients, using Chi-square test for categorical variables and Student's t-test for continuous variables. The significance level was 0.05.
Results: A total of 91 FD patients were included, with a median age of 51 years-old and 62.6% of female predominance. 16.5% of patients were under enzymatic replacement therapy with agalsidase alpha and 7.7% were treated with chaperone therapy (migalastat). 33 FD patients (36%) had LVH and were older than HCM patients (63.6 vs 59.3 years-old; p = 0.106). FD patients with LVH had lower interventricular septum (IVS) thickness (16.4 vs 19.6 mm, p < 0.001), IVS/posterior wall ratio (1.3 vs 1.8, p < 0.001) and left atrial volume index (34.45 vs 42.2 ml/m2; p = 0.014). Left ventricle mass index was similar between the two groups (157.7 vs 155.5 g/m^2; p = 0.819), with lower left ventricular ejection fraction in FD patients (64.5% vs 70.5%; p < 0.001). There were no significant differences in global longitudinal strain (-15.6% vs 15.9%; p = 0.687), global circumferential strain (-19.9% vs -21.1%; p = 0.218) and global radial strain (35.3% vs 33.7%; p = 0.623). Interestingly, FD patients had lower base-to-apex circumferential strain gradient (5.7% vs 9.1%; p = 0.002) and lower twist (17.5 vs 26.1°°; p = 0.001) than HCM patients. No significant differences were reported regarding mechanical dispersion (72.4 vs 71.2 ms; p = 0.841).
Conclusions: The pattern of LVH is different between FD and HCM patients. In our study, we revealed that base-to-apex circumferential strain gradient and twist are echocardiographic parameters that could help distinguish both entities.

CO 37. [18F]FDG-PET IN CARDIAC SARCOIDOSIS: A SINGLE-CENTRE STUDY IN A SOUTHERN EUROPEAN POPULATION

João Borges Rosa, Manuel Oliveira-Santos, Rodolfo Silva, José Paulo de Almeida, Lino Gonçalves, Gracinda Costa, Maria João Vidigal Ferreira

Centro Hospitalar e Universitário de Coimbra.

Introduction: Cardiac sarcoidosis (CS) is clinically diagnosed in 5% of patients with sarcoidosis and is associated with poor prognosis. However, imaging studies suggest higher prevalence, up to 55%, with worldwide variation. Growing evidence highlights the role of ^{18}F-fluorodeoxyglucose positron emission tomography ([^{18}F]FDG-PET) in non-invasive diagnosis and follow-up. We aimed to evaluate the prevalence and clinical manifestations of CS, diagnosed through [^{18}F]FDG-PET, in a southern European population.
Methods: We retrospectively assessed all patients evaluated with [^{18}F]FDG-PET for sarcoidosis screening between 2009 and 2020, and selected those with a histological diagnosis of extracardiac sarcoidosis. We collected data on clinical manifestations, cardiac magnetic resonance (CMR) results, and mortality outcomes and compared those with and without cardiac involvement. We applied the criteria for the diagnosis of CS from Heart Rhythm Society.
Results: Of the 400 patients screened with [^{18}F]FDG-PET, 128 had a histological diagnosis of extracardiac sarcoidosis (54.7% females, mean age 51.0 ± 14.2 years). None underwent endomyocardial biopsy. Ten patients had a pattern of [^{18}F]FDG uptake consistent with CS defined as diffuse (n = 5), focal (n = 3), and focal on diffuse (n = 2). Of the 128 patients, 14 also underwent CMR, which identified 2 subjects with positive findings in both modalities and 3 additional patients: focal (n = 1), multifocal mid-wall (n = 2), focal mid-wall (n = 2), and multifocal subepicardial (n = 1) delayed gadolinium enhancement. Overall, 13 patients (10.2%) fulfilled the criteria for probable CS (53.8% female, mean age 56.2 ± 12.6 years), all with multiorgan involvement, mostly lung and lymph nodes (each 92%), followed by skin and central nervous system (each 15%). Median left ventricle ejection fraction was 62% [55-65] and there were cardiac manifestations of CS in 6 patients (46%): sick sinus syndrome (n = 2), complete heart block (n = 1), frequent premature ventricular complexes (n = 1), ventricular tachycardia plus heart failure (n = 1), and bifascicular block plus heart failure (n = 1). Eleven patients (85%) with probable CS were medicated with immunosuppressant drugs: corticosteroids (n = 9), methotrexate (n = 4), and azathioprine (n = 2). Four patients with previous [^{18}F]FDG screening were revaluated after treatment, each showing no cardiac uptake. After a mean follow-up of 4.0 ± 1.0 years, mortality was three-fold higher in patients with cardiac involvement, despite the absence of statistical significance (15% vs. 5%, p = 0.151).
Conclusions: In this single-centre study, 10.2% of the patients with proven extracardiac sarcoidosis were diagnosed with CS, of whom 54% were clinically asymptomatic. Cardiac imaging with [^{18}F]FDG-PET plays an important role by improving diagnostic yield and monitoring response to therapy, while CMR is still underused.

CO 38. WHICH ECG FEATURES CAN HELP US DIAGNOSE AMYLOIDOSIS IN PATIENTS WITH RESTRICTIVE AND HYPERTROPHIC HEARTS?

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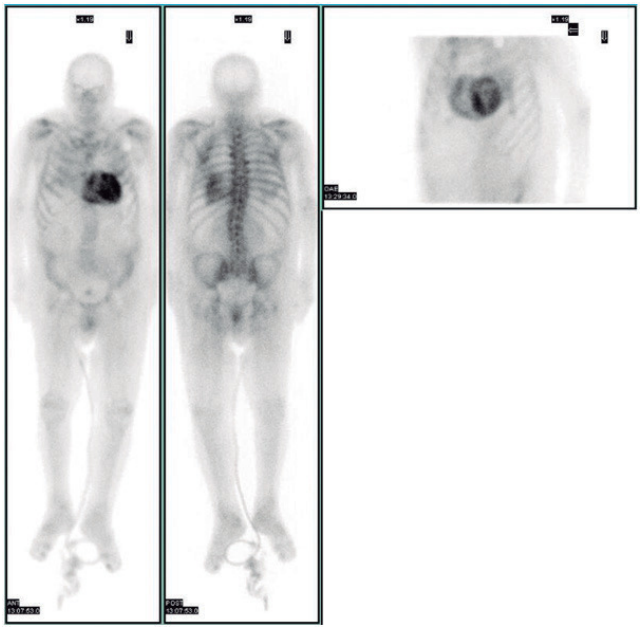
Objectives: ECG patterns suggestive of cardiac amyloidosis (CA) have been described and include low voltage QRS complexes, strain-like repolarization, and AV and interventricular conduction delays. However, these parameters were identified by comparing amyloidosis patients with normal populations, but are shared among other causes of restrictive and hypertrophic cardiopathy. We aimed to evaluate the diagnostic accuracy of various eletrocardiographic (ECG) parameters in a cohort of patients with a high suspicion of CA that went through further testing to either confirm or exclude it.
Methods: The study subjects comprised consecutive patients referred to perform diphosphonate scintigraphy for suspected CA between 2018 and 2021 (n = 76) and with referencing information of either a restrictive or hypertrophic phenotype. The study population was categorized for analysis into 2 groups: patients with proven CA (n = 31) and patients without a final diagnosis of CA after investigation (n = 45). All patients underwent a complete diagnostic work-up including clinical evaluation diphosphonate (DPD) scintigraphy (Figure), blood counts, serum and urine biochemistry, and serum and urine free light chain assay along with immunofixation

electrophoresis. ECG variables potentially predictive of CA from univariable binary logistic regression analyses were selected. Categorical variables were compared between groups using chi-squared test and continuous using student t-test.
Results: 43 patients were referenced to DPD scintigraphy based on an echocardiogram suggestive of a restrictive phenotype and 33 patients suggestive of a hypertrophic phenotype. Among patients with a hypertrophic phenotype, 14 had severe aortic stenosis. The overall prevalence of CA was 41%. 4 patients had AL CA and 31 patients had wild type transthyretin related CA. 16 patients had pacemaker rhythm, 37 had sinus rhythm, 9 1st degree AV block, 9 LBBB, 8 RBBB, 15 left axis deviation, 15 low voltage pattern, 16 any kind of ventricular conduction delay, 13 strain-like repolarization. These were not statistically different between groups. Mean heart rate was 73 bpm ± 16 and mean QRS was 117 ms ± 30 and they were not statistically different between groups. Mean QTc was 445 ms ± 34 and was statistically higher in CA group (mean QTc 458 ± 32 in CA group vs 438 ms ± 32 in non-CA group). QTc was associated with the presence of CA in our binary logistic regression model (χ^2 = 5.2, p = 0.02).



Conclusions: QTc duration on ECG was associated with the presence of CA in a population of patients with echocardiographic suspicion for this diagnosis. This variable has the potential to be added to multi-parametric scores for the diagnosis of CA.

CO 39. ORTHOSTATIC HYPOTENSION IN MUTATED ATTR VAL30MET AMYLOIDOSIS: PREDICTORS AND ASSOCIATED CLINICAL FEATURES

André Frías, Patrícia Rodrigues, Ricardo Costa, Andreia Campinas, Anaisa Pereira, André Alexandre, Hipólito Reis, Severo Torres

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

Introduction: The prevalence of orthostatic hypotension (OH) in patients with mutated transthyretin (TTR) amyloidosis (mATTR) is 40-60%. According to previous studies, OH is frequent and an early feature in patients with Val30Met mutation (the most prevalent form of mATTR).
Objectives: To characterize TTR Val30Met patients with OH and to identify clinical characteristics associated with OH development.
Methods: Retrospective study of consecutive Val30Met TTR patients with suspected cardiac involvement observed at our cardiology clinic during 2019. Two groups were defined: group 1: patients without OH; group 2: patients with OH. Data was obtained by chart review. Statistically significant predictors of OH were found using logistic regression.
Results: We included a total of 248 patients (group 1-173; group 2-75). Group 1 patients were 52% male, median age 45 [interquartile range (IQR) 39-55] and median age at onset 34 (IQR 29.75-46.25) years. Left ventricle hypertrophy [LVH, defined as maximal LV wall thickness (LVT) ≥ 12 mm] occurred in 26.5%, with median maximal LVT 10 mm (IQR 9-12); 49.7% had conduction disturbances, 30.6% gastrointestinal (GI), 17.3% genitourinary (GU) manifestations and 5% were in Coutinho staging ≥ 2/3. Group 2 had 56% male, median age of 49 years at evaluation (IQR 42-65) and 35 years at onset (IQR 30-59). LVH was present in 42.9%, with median maximal LVT 11 mm (IQR 10-14); 74.7% had conduction disturbances, 56% GI and 42.7% GU manifestations and 21% were in Coutinho staging ≥ 2/3. In univariate analysis, higher age (p = 0.005), presence of LVH (p = 0.009), conduction disturbances (p < 0.001), GU manifestations (p < 0.001) and higher Coutinho staging (p < 0.001) were all associated with the presence of OH, while age at onset was not (p = 0.648). In multivariate analysis, only Coutinho staging [odds ratio (OR) 2.609; 95% confidence interval (95%CI) 1.344-5.065] and GU manifestations (OR 3.151; 95%CI 1.595-6.225) were found to be significant predictors of OH.
Conclusions: Our study suggests that OH is more associated with GU manifestations and Neurologic staging, than with amyloid cardiomyopathy or age, suggesting a predominant neurogenic component. The prevalence of OH in our sample of Val30Met patients was lower than previously described.

CO 35. TWIST, LEFT VENTRICULAR LONGITUDINAL AND CIRCUMFERENTIAL STRAIN ARE EARLY MARKERS OF CARDIAC INVOLVEMENT IN FABRY DISEASE

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Introduction: Fabry disease (FD) is an X-linked progressive and multisystemic disease. Cardiac involvement is common and left ventricular hypertrophy (LVH) is the main cardiac manifestation.
Objectives: To determine the differences in echocardiographic parameters between FD patients without LVH and healthy controls.
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 strain analysis by two-dimensional speckle tracking imaging. Demographic, clinical characteristics and echocardiographic parameters were analysed. FD patients without LVH were compared with healthy controls, using chi-square test for categorical variables and Student's T-test for continuous variables. The significance level was 0.05.
Results: A total of 91 FD patients were included, with a median age of 51 years-old and 62.6% of female predominance. 16.5% of patients were under enzymatic replacement therapy with agalsidase alpha and 7.7% were treated with chaperone therapy (migalastat). 58 patients (64%) did not present LVH. FD patients without LVH were younger (44.2 vs 52.9 years-old, p < 0.001), had higher interventricular septum thickness (9.3 vs 8.4 mm, p = 0.006) and left ventricular mass index (77.2 vs 68.4 g/m^2, p = 0.003) than healthy controls. Left ventricular ejection fraction was preserved in both groups (63.3% vs 65.4%; p = 0.067). Global longitudinal strain (-19.6% vs -20.9%; p = 0.003) and global circumferential strain (-17.9% vs -20.9%; p < 0.001) were significantly lower in FD patients without LVH compared to healthy controls. Global radial strain was also lower, although without statistical significance (36.4% vs 41.4%, p = 0.058). FD patients without LVH presented a lower base-to-apex circumferential strain gradient (5.7% vs 7.7%; p = 0.035), but a higher base-to-apex longitudinal strain gradient (7.5% vs 4.3%; p < 0.001), compared to controls. Left ventricular twist was also significantly lower in FD patients without LVH (13.8 vs 21.7º, p < 0.001).
Conclusions: Left ventricular strain and twist analysis are useful to identify subclinical myocardial impairment in FD patients without LVH.

Sexta-feira, 30 Abril de 2021 | 10H15-11H15

Sala Virtual 3 | CO 02 - Cardiovascular Nursing

CO 11. ADESÃO AO REGIME TERAPÊUTICO DOS DOENTES SUBMETIDOS A CIRURGIA CARDÍACA - UM ESTUDO RETROSPETIVO

Bruno Pinheiro, Emília Sola

Centro Hospitalar e Universitário de Coimbra.

Introdução: A adesão ao regime terapêutico é um foco de atenção dos enfermeiros e a não adesão um enorme peso nos gastos com a saúde e um grande impacto na qualidade de vida das pessoas e na economia. A relação de proximidade do enfermeiro com os doentes proporciona uma excelente oportunidade de monitorização da adesão, planeamento e implementação de intervenções que conduzam os doentes a adotar o regime terapêutico eficaz nos seus hábitos diários, dotando-as de conhecimentos e habilidades.
Métodos: Realizou-se um estudo retrospetivo com o objetivo de caracterizar a adesão ao regime terapêutico dos doentes desta unidade de saúde, com dados de utentes submetidos a cirurgia cardíaca entre os anos de 2015 e 2019, recolhidos através de uma base de dados de gestão dos cuidados de Enfermagem. Sendo este tema complexo, na medida em que pode incluir uma grande diversidade de recomendações terapêuticas e de comportamentos, foram seriados os comportamentos considerados mais relevantes e realizada a sua avaliação através de observação direta e/ou entrevista em dois momentos-chave: entre o 4.º dia de pós-operatório e a alta e à data da 1.ª consulta da especialidade.
Resultados/Conclusões: Através deste estudo retrospetivo, a unidade de saúde pôde verificar a evolução demográfica da sua população-alvo. Foi possível constatar a alteração do *status* de diagnóstico nos autocuidados ao longo do internamento até à alta. Foram também detetadas as fragilidades/dificuldades mais comuns ao nível da promoção da adesão ou gestão do regime terapêutico. Após análise destes dados, foram desenvolvidas ações/estratégias formativas na equipa de enfermagem de forma a promover a adesão dos doentes ao regime terapêutico. É disso exemplo o alargamento do período de visita para envolvimento de familiares no regime terapêutico (em época pré-Covid19) ou a criação/adaptação de informação escrita a disponibilizar aos doentes.

CO 7. PREVENÇÃO DA INFEÇÃO DO LOCAL CIRÚRGICO NA IMPLANTAÇÃO DE DISPOSITIVOS CARDÍACOS: CONTRIBUTOS PARA UM CUIDADO DE ENFERMAGEM DE EXCELÊNCIA

Ana Barros[1], Amâncio Carvalho[2], Cristina Imaginário[2]

[1]Centro Hospitalar de Trás-os-Montes e Alto Douro, EPE/Hospital de São Pedro. [2]Escola Superior de Saúde - UTAD.

Introdução: Os dispositivos cardíacos eletrónicos implantáveis são atualmente o tratamento de primeira linha de arritmias que ameaçam a vida ou de casos de falência cardíaca, assistindo-se a um aumento progressivo de indivíduos portadores desses sistemas. Contudo, a infeção associada ao procedimento cirúrgico é uma das complicações mais temidas. A prevenção da infeção do local cirúrgico assenta atualmente numa prática de cuidados baseada num feixe de intervenções que emerge da evidência científica, mas que nem sempre é cumprido pelos profissionais de saúde.
Objectivos: Analisar o impacto de um programa educacional nos conhecimentos dos enfermeiros da UCIC e Serviço de Cardiologia, de um hospital português da região Norte, acerca do feixe de intervenções de prevenção da infeção do local cirúrgico e no cumprimento deste em procedimentos de implantação de dispositivos cardíacos eletrónicos.
Métodos: Estudo quase-experimental, de desenho antes-após de grupo único, longitudinal e de abordagem quantitativa, com uma amostra de 47 enfermeiros. Foram construídos de raiz dois instrumentos de recolha de dados: um questionário e uma grelha de avaliação de critérios, que foram aplicados antes e após a realização de uma sessão de formação, na qual os enfermeiros foram sensibilizados para o cumprimento do feixe de intervenções em doentes que implantam dispositivos cardíacos eletrónicos.
Resultados: A maioria dos enfermeiros da amostra eram do sexo feminino (74,5%), com idade entre 21 e 44 anos (57,4%), licenciados (91,5%), com cinco ou mais anos de atividade profissional (91,5%) e de experiência na área da Cardiologia (57,4%) e sem formação em prevenção da infeção do local cirúrgico (78,7%). Os participantes possuíam baixos níveis de conhecimento sobre o feixe (23,4% insuficiente e 66,0% suficiente) tendo havido um aumento da pontuação média dos conhecimentos de 10,87 ± 2,028 para 16,64 ± 1,983 após a formação. Igualmente, a pontuação média de cumprimento do feixe de intervenções foi superior após a formação, passando de 49,95 ± 17,74 para 75,81 ± 11,08, aumentando em 4% o número de procedimentos com adesão total ao mesmo.
Conclusões: O programa de formação foi eficaz e teve um impacto positivo, uma vez que se traduziu na aquisição de conhecimentos e em alterações do comportamento dos enfermeiros ao nível da prevenção da infeção do local cirúrgico. Os enfermeiros consciencializaram-se da importância de cumprir este feixe de intervenções nos doentes que implantam dispositivos cardíacos eletrónicos, contudo nem sempre possuem as condições ideais para tal. A educação e o treino dos profissionais de saúde são preponderantes para aumentar a sua adesão às recomendações.

CO 10. BOAS PRÁTICAS DO ENFERMEIRO NA COLHEITA DE AMOSTRAS PARA HEMOCULTURAS NUMA UNIDADE DE CUIDADOS INTENSIVOS CARDÍACOS DE UM CENTRO HOSPITALAR DA ZONA NORTE DE PORTUGAL: O PAPEL DA FORMAÇÃO E DA INTRODUÇÃO DE UM PROCEDIMENTO PADRÃO NA DIMINUIÇÃO DAS TAXAS DE CONTAMINAÇÃO

Ana Rita Pires Olo Machado, Cristina Maria Inocência Imaginário

Centro Hospitalar de Trás-os-Montes e Alto Douro, EPE/Hospital de Vila Real.

Introdução: A contaminação de hemoculturas tem um impacto negativo na qualidade dos cuidados de saúde, diminuindo a eficiência e a segurança do atendimento prestado aos doentes, conduzindo à administração de antibióticos desnecessários e à realização de mais exames para identificar o motivo da hemocultura positiva, levando ao aumento do tempo de internamento e dos custos. As taxas de contaminação variam entre 0,6% a 12,5%, sendo o objetivo mantê-las abaixo dos 3%. A taxa de contaminação de hemoculturas da UCIC no ano de 2020 foi de 8,8%. Estudos demonstram que é na fase pré-analítica que a maioria dos erros ocorre e que são vários os fatores que contribuem para a contaminação das amostras, tornando-se necessária uma abordagem que englobe a mudança de mais do que uma prática, sendo crucial uma intervenção de enfermagem norteada pela melhor evidência científica.
Métodos: A intervenção realizada incluiu: i) a realização de uma sessão de formação em serviço através da plataforma Zoom onde se apresentaram os dados estatísticos sobre a contaminação de hemoculturas da UCIC, uma revisão da literatura sobre as boas práticas na colheita de amostras para hemoculturas e uma proposta de procedimento padrão de colheita; ii) a implementação de um procedimento padrão que inclui: a utilização de um kit de colheita, a higienização das mãos, a punção venosa direta, a desinfecção do local de punção com solução alcoólica de clorexidina a 2%, a utilização de um campo cirúrgico, o uso de luvas esterilizadas, a colheita do volume de sangue indicado nos frascos de hemoculturas, a rejeição de 0.5ml do sangue colhido, a priorização do frasco de aeróbios, a utilização do sangue obtido de uma punção apenas para um conjunto de frascos e o preenchimento de um checklist no final da colheita.
Resultados: Espera-se diminuir a taxa de contaminação das hemoculturas colhidas na UCIC para valores inferiores a 3% até ao final do ano de 2021.
Conclusões: A avaliação do impacto da intervenção será realizada através do cálculo da taxa de contaminação. O preenchimento do checklist do procedimento permitirá averiguar a adesão ao procedimento padrão implementado. O estudo avaliará o efeito da intervenção realizada no seu

global e não o de cada elemento da intervenção separadamente, não sendo possível perceber se o conjunto dos elementos que compõem a intervenção é mais eficaz do que cada elemento sozinho. Para além disso, o estudo será realizado em apenas um serviço, pelo que os resultados obtidos não poderão ser extrapolados. Por último, as características dos doentes constituem também um fator enviesador dos dados, uma vez que não serão analisadas. No entanto, as características dos doentes não são consideradas um fator *major* na contaminação de hemoculturas.

CO 6. INDICADORES DE ENFERMAGEM SENSÍVEIS AOS CUIDADOS DE ENFERMAGEM DE REABILITAÇÃO EM CARDIOLOGIA-EXPERIÊNCIA DE UM CENTRO

Patrícia Silva, Joana Antunes, Raúl Pinto, Ana Carina Ferreira, Cristiana Teles, Licinia Aguiar, Cátia Ferreira

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

Introdução: Os cuidados de Enfermagem de Reabilitação (ER) constituem uma área de intervenção especializada que contribui para a obtenção de ganhos em saúde. Como forma de monitorizar esses ganhos sensíveis aos cuidados de ER, é necessária a definição de indicadores, sustentada na Classificação para a Prática de Enfermagem e compatíveis com o sistema de informação utilizado para os registos de Enfermagem. Atendendo à especificidade e importância da prevenção de complicações nos doentes com patologia cardíaca, a equipa de enfermeiros especialista em ER considerou pertinente definir como indicador a gestão de regime terapêutico (GRT).
Métodos: Avaliar a GRT antes e após a intervenção da ER, no período de junho a setembro de 2020, após a criação de um algoritmo de registo sobre a GRT.
Objectivos: Aumentar a taxa de resolução do conhecimento de GRT-medicamentoso, dietético e exercício no serviço de Cardiologia em 50%.
Resultados: Verificámos que antes da intervenção da ER, de janeiro a dezembro de 2019, foi identificado a gestão do regime terapêutico a 18 doentes, com ganhos 0. No período de junho a setembro 2020 foram seguidos pela equipa de ER 121 doentes. A 81 foi identificado o diagnóstico de potencial para melhoria do conhecimento na GRT medicamentoso, dietético e exercício, o que equivale a 66.9% da amostra. Verificamos uma taxa de resolução quanto ao conhecimento sobre regime medicamentoso de 69,1%, no conhecimento sobre regime dietético de 70,4% e no conhecimento sobre o regime de exercício de 74,1%.
Conclusões: Ao tentarmos dar resposta à questão inicialmente formulada sobre que indicadores sensíveis aos cuidados de ER surgem na análise dos registos do SClínico, percebemos que embora consigamos mostrar os ganhos do programa implementado em termos melhoria dos indicadores GRT, ainda é longo o caminho a percorrer e o trabalho a desenvolver em matéria de indicadores de ER em Cardiologia.

CO 8. MOMENTO DE EXERCÍCIOS DE ALONGAMENTO - SATISFAÇÃO DOS PROFISSIONAIS DE SAÚDE

Ana Ferreira, Sónia Ferreira, Patrícia Silva, Joana Antunes, Licinia Aguiar, Raúl Pinto, Cristiana Teles

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

Os alongamentos são exercícios que previnem a lesão das fibras musculares e, consequentemente, conduzem ao aumento da flexibilidade. Por sua vez, quanto maior a flexibilidade maior a amplitude de movimento possível de uma determinada articulação (Ferreira, Henriques, Amaro, & Morouço, 2015). O enfermeiro especialista em Enfermagem de Reabilitação (EEER), ocupa uma posição crucial na promoção da saúde e bem-estar, incentivando a adoção de estilos de vida saudáveis e mudança de comportamentos, e concebe programas de exercício com vista à promoção da saúde e prevenção de lesões. Assim, foi implementada a prática de um momento de exercícios de alongamento (MEA) num serviço de Cardiologia, tendo por base estudos e orientações que têm demonstrado vantagens à sua implementação no local de trabalho, como a diminuição da incidência de lesões músculo-esqueléticas nos profissionais, promoção do relaxamento muscular, correção da postura corporal, consciência corporal, redução do nível de ansiedade e *stress*, melhoria na autoestima e qualidade de vida em qualquer faixa etária (Silva & Mocarzel, 2019), (Jesus, 2018), bem como o aumento da satisfação e motivação dos trabalhadores (Ferreira, 2015), (Moura, 2019). O MEA, orientado pelo EEER e direcionado para toda a equipa multidisciplinar, teve início a 4 de novembro de 2019 e acontece de segunda a sexta-feira no início do turno da manhã, com a duração de 3 a 7 minutos, acompanhado por música. Decorridos seis meses após o início desta prática, pedimos à equipa que nos desse o seu *feedback* relativamente a esta temática, através do auto-preenchimento de um questionário. Foi constituída uma amostra de 25 profissionais, obtendo-se uma taxa de amostragem de aproximadamente 45% da população em estudo. Os profissionais do serviço reconhecem a importância do MEA e, na generalidade, mostram-se satisfeitos pela sua implementação, pelos seus objetivos, horário e tipologia. Estes resultados demonstram o quanto a intervenção do EEER juntos das equipas profissionais pode ser de grande importância, com o intuito de minimizar as lesões músculo-esqueléticas, maximizar efeitos sobre o bem-estar físico e emocional e contribuir para a melhoria da satisfação profissional.

Sexta-feira, 30 Abril de 2021 | 10H15-11H30

Sala Virtual 1 | CO 26 - Populações especiais

CO 139. OI&HEART STUDY: CARDIOVASCULAR PROFILE OF PORTUGUESE PATIENTS WITH OSTEOGENESIS IMPERFECTA

Andreia Magalhães[1], Céu Barreiros[1], Mónica Rebelo[1], Patrícia Dias[1], André Travessa[1], Afonso Nunes Ferreira[1], Ana G. Almeida[1], Susana Gonçalves[1], Laura Santos[1], Isabel m. Pinho[1], Irina Neves[1], Ana Paixão[1], Fernando Ribeiro[1], Fátima Godinho[2], Fausto J. Pinto[1]

[1]*Centro Hospitalar de Lisboa Norte, EPE/Hospital de Santa Maria.*
[2]*Associação Portuguesa de Osteogénese Imperfeita.*

Introduction: Osteogenesis imperfecta (OI) is a rare inherited disorder which involves the connective tissue. Mutations in type 1 procollagen genes (COL1A1, COL1A2) are the most common pathogenesis of OI. Although it´s main clinical features are related to bone tissue and fragility, other extra-skeletal manifestation can be present. Collagen type 1 is an important constituent of different parts of the cardiovascular system, however the prevalence of cardiac disorders in this population is still unknown.
Objectives: We aimed to identify and evaluate the presence of potential subclinical cardiac disorders in OI, to better understand the risk of heart disorders in this population.
Methods: Prospective study of 64 patients (pts) with clinical confirmed OI diagnosis that were divided in two groups: G1 - Children (0-18 years) and G2 - Adults (>18 years). Pts were evaluated according to a specific protocol, designed to identify clinical, anatomical and electrical abnormalities: clinical assessment, ECG, transthoracic echocardiogram with speckle-tracking analysis, 24h Holter monitoring and 24h ambulatory blood pressure monitoring. The adult pts repeated this assessment a year later.
Results: Sixteen children were included (50% male, age range 4 to 17 years). In this group clinically OI was classified as: mild 88%, moderate 6% and severe 6%. Gene mutation in COL1A1 56%, COL1A2 6%, SERPINF1 6% were present. 6% had type I obesity identified as cardiovascular (CV) risk factor and no concomitant cardiac pathologies were identified. In the adult group 48 pts were evaluated, 74% female, mean age 42 years. Clinically OI was classified as: mild 58%, moderate 29% and severe 13%. The majority of pts had gene mutation in COL1A1 69%. The most frequent symptom reported was palpitations (26%). CV risk factors were present in 47% of

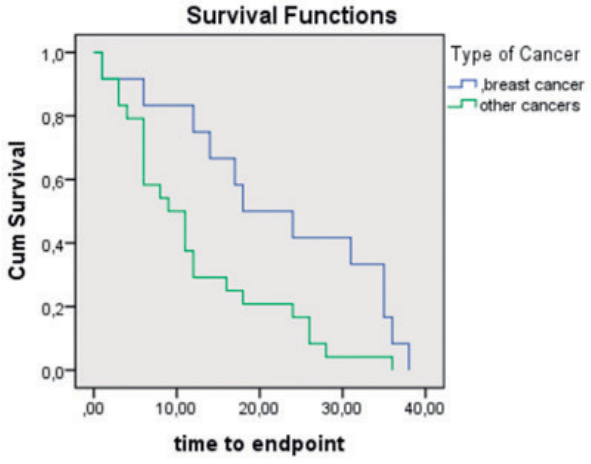
pts, specially obesity (39%) and hypertension (30%). In 43% of ABPM was detected hypertension, and 6% of Holter monitoring showed moderated findings (supraventricular tachycardia and idioventricular rhythm). The echocardiogram identified left atrial enlargement in 28% of pts and aortic dilatation in 22% of pts. Mitral regurgitation was detected in 15 pts, with 2 of them showing moderate regurgitation. A reduced global longitudinal strain was found in 5 pts and 2 had reduced left ventricle ejection fraction. No significant differences were found in the evaluation carried out in the following year. In 5 pts extra visits were performed mainly to introduce antihypertensive therapy and to investigate pts with reduced left ventricle ejection fraction.
Conclusions: OI pts seem to have CV system involvement, specially aortic and mitral valve abnormalities and these are evident only in the adult population. This study is the first prospective study addressing the global impact of this disease in CV system and intends to assess the evolution of these changes in a longer follow-up.

CO 135. MORBIDITY AND MORTALITY IN CARDIO-ONCOLOGY CLINIC PATIENTS-WHO'S THE GUILTY ONE: IS IT THE HEART, THE CANCER OR THE PATIENT?

Mariana Saraiva, Nuno Craveiro, Ana Rita Moura, Bruno Castilho, Ana Rita Veiga, Isabel Monteiro, Luz Pitta, Vítor Martins

Hospital Distrital de Santarém, EPE.

Introduction: The purpose of cardio-oncology (CO) is to prevent and treat cardiovascular (CV) comorbidities in cancer patients (pts), improving quality of life and survival. Nevertheless, despite both oncology and cardiology efforts, an important burden of disease still lingers, with multiple hospital admissions, for CV and non-CV causes, and high mortality. A deeper knowledge of this population might help improve these pts' follow-up and prognosis.
Objectives: Evaluate the prognosis of pts under CO surveillance and find predictors of adverse prognosis.
Methods: Retrospective study of a population followed in CO consultation. Primary endpoint: hospital admission for CV and non-CV causes or death during follow-up. Statistical analysis of demographic, clinical, echocardiographic, laboratorial data was made.



Results: We included 78 patients, mean age 66.08 ± 1.16 years, 59% female, with mean follow-up of 19.9 ± 16.7 months. About half (51.3%) had breast cancer, followed by gastrointestinal tract (19.2%) and haematological (9%) malignancies, with a significant proportion with advanced disease (38.5% were metastatic). Prevalence of CV risk factors was high (hypertension in 74.4%, dyslipidaemia in 44.9%, type 2 diabetes mellitus in 19.2%), but also coronary artery disease (CAD) (23.1%) and atrial fibrillation (AF) (19.2%). A diagnosis of cardiotoxicity was made in 19.2%, mainly in the form of left ventricular systolic dysfunction. At baseline, 16.7% of patients had a left ventricular ejection fraction (LVEF) under 50% and 37.7% a reduced global longitudinal strain (GLS). All of them were treated with different types of chemotherapy and 49.4% of pts with radiotherapy. The overall mortality rate during follow-up was 21.8% and 46.2% of pts had ≥ 1 hospital admission. The same proportion (46.2%) of patients reached the endpoint, mostly male pts (p = 0.001), with metastatic disease (p = 0.001), receiving radiotherapy (p = 0.039). Moreover, hypertension (p = 0.046), CAD (p = 0.047), AF (p = 0.019), lower baseline LVEF (p = 0.001) and GLS (p = 0.004) increased the likelihood of reaching the endpoint. These pts also had more frequent consultations (p = 0.024). There was no difference regarding the diagnosis of cardiotoxicity (p = 0.076) or measurement of cardiac biomarkers. Pts with breast cancer were significantly less likely to have an adverse event (p = 0.003) and had longer time to endpoint (breast cancer 22.25 ± 3.67 months vs other than breast cancers 12.08 ± 1.95 months, p = 0.016). After multivariate regression analysis, male gender (p = 0.046), metastatic disease (p = 0.049), AF (p = 0.047), baseline LVEF (p = 0.017) and more frequent consultations (p = 0.007) remained independent predictors of the outcome.
Conclusions: in this complex population, multiple factors contribute to an adverse prognosis, either related to the patient, the cancer or to CV disease, suggesting benefit from a holistic approach.

CO 136. THE 90S ARE THE NEW 70S: APPROACH TO NONAGENARIAN PATIENTS WITH MYOCARDIAL INFARCTION: DATA FROM THE REAL WORLD REGISTRY ON ACUTE CORONARY SYNDROMES

João Grade, Alexandra Briosa, Ana Rita Pereira, Ana Marques, Sofia Alegria, Daniel Sebaiti, Ana Catarina Gomes, Inês Rangel, Gonçalo Morgado, Rita Calé, Cristina Martins, Hélder Pereira, em Nome Dos Investigadores do Registo Nacional de Síndromes Coronárias Agudas

Hospital Garcia de Orta, EPE.

Introduction: The approach to Acute Coronary Syndromes is based on robust high quality evidence, currently systematized in European endorsed guidelines. However most trials that support such guidelines excluded or included a small percentage of the very elderly and the clinical decision in this age range is subjected to high interpersonal and inter-hospital variability.
Objectives: Our aim was to assess the approach to nonagenarian patients with Acute Coronary Syndromes (ACS), in what regards the choice of percutaneous coronary intervention or conservative management and determine in-hospital and at 1 year outcomes.
Methods: We performed a 9 year retrospective analysis of all patients with age equal or greater than ninety (90) admitted with ACS in Portugal. Medical records were analysed for demographic, procedural data and outcomes.
Results: 714 nonagenarian patients were admitted with ACS, which corresponded to 2.4% of the total cohort. The mean age was 92 ± 2 with a female preponderance (58.7%). There was a high rate of cardiovascular risk factor with hypertension in 81.3%; Dyslipidemia in 46.1% Diabetes Mellitus in 23.4%; and other comorbidities with 21% of prior ACS, 14.4% with Heart Failure and 11% with cerebrovascular events. The ACS was categorized as ST elevation Myocardial Infarction (STEMI) in 43.9%, non- STEMI (NSTEMI) in 45.8%, and unstable angina (UA) in 2%. 268 patients, 37.8% of the cohort, were submitted to percutaneous coronary intervention (PCI), mainly due to STEMI (68.3%). This cohort were composed of patients with less comorbidities (statistically significant less valvular heart disease, heart failure, peripherical artery disease and dementia although more oncological diseases). There was no difference in the severity of ACS, as categorized by the Kilip Kimbal (KK) classification, mechanical complication or depressed ejection fraction between the 2 groups. (p > 0.05 for all). There was a statistically significant increase of advanced atrioventricular block (AAB) (10.6 vs 4.4%; p 0.002; Logistic regression OR 3.12; IC95 [1.37-7.15], p 0.007) and major bleeding (1.8 vs 5.5%; p 0.008; Logistic regression OR 3.36; IC95 [1.36-8.32] p 0.009) in the PCI group. There was no difference in in-hospital re-infarction, cardiac arrest, stroke or death. (p > 0.05 for all). The follow up at 1 year was performed in two hundred and fifty-six (256) patients, 30.9% submitted to PCI. Although the survival analysis demonstrated a trend towards improvement in 1-year survival and cardiovascular readmissions in the intervention group, it did not reach statistical significance. (p>0.05 for all).

Conclusions: PCI was performed in about a third of nonagenarians presenting with ACS. Our cohort demonstrated a greater rate of in-hospital complications without a significant in-hospital or at 1 year clinical benefit.

CO 137. MYOCARDIAL WORK BRINGS A NEW INSIGHT INTO LEFT VENTRICULE REMODELLING IN CARDIOONCOLOGY PATIENTS

Vera Ferreira, Madalena Coutinho Cruz, Luísa Moura Branco, Ana Galrinho, Ana Teresa Timóteo, Pedro Rio, Luís Almeida Morais, Silvia Aguiar Rosa, Ana Leal, Sónia Oliveira, Alexandra Castelo, Pedro Garcia Brás, Rui Cruz Ferreira

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

Introduction: Serial echocardiographic assessment of 2D left ventricular ejection fraction (LVEF) and global longitudinal strain (GLS) is the gold standard screening method for cancer therapeutics-related cardiac dysfunction (CTRCD). Non-invasive left ventricular (LV) pressure-strain loop (PSL) provides a novel method of quantifying myocardial work (MW) with potential advantages, as it incorporates measurements of myocardial deformation and LV pressure.
Objectives: To evaluate the impact of cardiotoxic treatments in MW indices.
Methods: Prospective study of female breast cancer patients (P) submitted to therapy (TH) who underwent serial monitoring by 2D, 3D transthoracic echocardiography (TTE) and concomitant blood pressure assessment. P were evaluated at T0, T1 and T2 (before, ≥ 6 and ≥ 12 months after starting TH). PSL analysis allowed the calculation of the following indices: Global Work Index (GWI), Global Constructive Work (GCW), Global Work Waste (GWW) and Global Work Efficiency (GWE). CTRCD was defined as an absolute decrease in 2D LVEF > 10% to a value < 54% or a relative decrease in 2D GLS > 15%, according to literature.
Results: 122 patients (mean age 54.7 ± 12.0 years), mostly treated with anthracyclines (77.0%, cumulative dose 268.6 ± 71.8 mg/m^2), anti-HER (75.4%) and radiotherapy (77.0%) were included. 2D and 3D LVEF were significantly reduced during TH, however remaining within the limits of normality (2D LVEF T0-T1 64.2 ± 7.6 vs 61.1 ± 8.2%, p = 0.006 and 3D LVEF T0-T1 60.2 ± 6.7 vs 56.9 ± 6.3%, p = 0.022). 2D GLS was also more impaired at T1 (-19.8 ± 2.7% vs -18.5 ± 3.0%, p = 0.003). All MW indices were significantly reduced at T1 compared to baseline (GWI 1756.9 ± 319.2 vs 1614.3 ± 338.5 mmHg%, p = 0.005; GCW 2105.6 ± 352.0 vs 1970.5 ± 376.2 mmHg %, p = 0.015; GWW 121.1 ± 66.6 vs 161.1 ± 84.1 mmHg %, p = 0.001; GWE 93.5 ± 3.1 vs 91.1 ± 4.5%, p = 0.001). Between T1 and T2 no statistical difference was found but a partial recovery of parameters was observed when comparing T2 to T0 (GWI (T2) 1,650.6 ± 357.5 mmHg%, p = 0.035; GCW (T2) 2,013.3 ± 379.3 mmHg%, p = 0.086; GWW (T2) 148.0 ± 85.0 mmHg%, p = 0.02 and GWE (T2) 92.0 ± 4.7%, p = 0.012). During a mean follow-up of 14.9 ± 9.3 months, 36 patients (29.5%) developed CTRCD. P presenting CTRCD revealed a significant decrease in GWI and GWE at T1 comparing with women without CTRCD (GWI 1.8 ± 21.6 vs -14.2 ± 18.5%, p = 0.004 and GWE -1.0 ± 3.0 vs -3.6 ± 3.9%, p = 0.005). GWW had a substantially increase at T1 in P with cardiotoxicity (27.6 ± 76.3% vs 64.1 ± 68.0%, p = 0.051).
Conclusions: Left ventricular systolic function study with MW showed a reduction in cardiac performance with a peak at 6 months from the start of chemotherapy and partial recovery after term. Assessment of myocardial deformation parameters, namely MW, proved to be a useful tool for a better characterisation of cardiac remodelling, and could enhance patient selection for cardioprotective therapeutics.

CO 140. PREVENTIVE ROLE OF CARDIOPROTECTIVE DRUGS IN HER2 POSITIVE BREAST CANCER

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

Centro Hospitalar de S. João, EPE.

Introduction: In patients with breast cancer, anti-HER2-targeted therapies (AHT) are highly associated with cardiotoxicity (CT), being the main reason for treatment interruption in patients receiving adjuvant trastuzumab. Guidelines recommend regular left ventricular ejection fraction (LVEF) assessments and CT's management with cardioprotective drugs (CPD). However, while secondary prevention has already entered clinical practice, despite persistent unresolved questions, primary prevention is still in the research domain. Our aim was to evaluate risk of CT and the role of CPD in a subset of breast cancer patients treated with AHT.
Methods: We retrospectively analyzed a population of breast cancer female patients treated with AHT referred to Cardio-oncology consultation at a tertiary center from January 2017 to November 2019. All patients were evaluated with echocardiogram before treatment initiation and at least at 3, 6, 9 and 12-months. CT was defined as LVEF under 50% or decline of at least 10% in LVEF during follow-up. As CPD we considered renin-angiotensin-aldosterone system inhibitors and beta-blockers.
Results: A total of 74 patients were included with mean age of 52.9 ± 10 year-old. Concerning cardiovascular risk factors (CVRF) 12.2% had diabetes, 33.8% dyslipidaemia, 29.7% hypertension and 23.0% were smokers or previous smokers; most patients had a high or very-high CT risk score (98.6% with score ≥ 5). Besides AHT, 66.2% and 82.2% were also on anthracyclines and radiotherapy, respectively. Patients were followed for a median follow-up of 17 months. At baseline, mean high sensitivity troponin I (hs-cTnI) was 4.1 ng/L and mean LVEF was 63.4%, with all patients with normal cardiac function. During follow-up, 18.9% of patient developed CT with a higher prevalence in patients concomitantly on anthracyclines (24.5% vs 8%, p = 0.087). CPD was initiated or titrated in 85.7% of patients and 28.6% needed to suspend AHT; overall 92.9% of CT patients recovered. When comparing patients already medicated with CPD before cancer treatment (41.9%) to those naïve of CPD, the first group present a significative lower incidence of CT [6.5% vs 27.9%, p = 0.020, OR = 0.18 (95%CI 0.04-0.87)]. When analysed all sample (with or without CT), patients already on CPD also presented a higher LVEF at 12 months follow-up (62.0% vs 59.1%, t(55) = -2.4, p = 0.018), despite of similar LVEF at baseline (62.8% vs 63.8%, p = 0.292). Medication with statins before chemotherapy did not reduce the risk of CT.
Conclusions: Patients submitted to AHT had higher risk of developing CT, especially when concomitantly on anthracyclines therapy. Pre-treatment

TTE Variable	T0	T1	T2	p-value (T0 vs T1)	p-value (T1 vs T2)	p-value (T0 vs T2)
2D LAEDV (ml)	44.4±14.8	50.3±14.1	48.6±15.1	**0.007**	0.424	**0.049**
2D LVEDV (ml)	75.1±19.0	82.9±20.2	78.9±18.6	**0.005**	0.122	0.137
2D LVESV (ml)	27.0±10.0	32.5±12.2	30.5±11.2	**0.001**	0.204	**0.019**
2D LVEF (%)	64.2±7.6	61.1±8.2	61.6±8.0	**0.006**	0.656	**0.016**
2D GLS (%)	-19.8±2.7	-18.5±3.0	-18.7±3.1	**0.003**	0.686	**0.012**
3D LVEF (%)	60.2±6.7	56.9±6.3	58.7±5.5	**0.022**	0.166	0.271
3D LVEDV (ml)	81.8±18.5	91.4±18.8	84,2±18.8	**0.017**	0.079	0.545
3D LVESV (ml)	32.8±10.6	39.8±11.7	34.9±9.8	**0.005**	**0.046**	0.332
GWI	1756.9±319.2	1614.3±338.5	1650.6±357.5	**0.005**	0.465	**0.035**
GCW	2105.6±352.0	1970.5±376.2	2013.3±379.3	**0.015**	0.427	0.086
GWW	121.1±66.6	161.1±84.1	148.0±85.0	**0.001**	0.281	**0.02**
GWE	93.5±3.1	91.1±4.5	92.0±4.7	**0.001**	0.171	**0.012**

CO 137 Figure

with CPD was significantly associated with a lower prevalence of CT and a higher LVEF at 12-months follow-up. These results highlight the importance of cardiac evaluation in HER2+ patients and strengthen the value of primary prevention in these patients.

CO 138. DEXRAZOXANE ROLE IN THE PREVENTION OF ANTHRACYCLINE CARDIOTOXICITY IN CHILDREN WITH ACUTE LEUKEMIA: A META-ANALYSIS

José Pedro Sousa[1], Luís Puga[1], João Gameiro Lopes[1], Ana Rita Gomes[2], Carolina Saleiro[1], Diana de Campos[2], Carolina Lourenço[1], Lino Gonçalves[3]

[1]Centro Hospitalar e Universitário de Coimbra, EPE/Hospital Geral. [2]Centro Hospitalar e Universitário de Coimbra. [3]Centro Hospitalar e Universitário de Coimbra/Hospitais da Universidade de Coimbra.

Introduction: Anthracyclines have played a central role in improving the overall survival of acute leukemia patients. However, cardiotoxic side effects limit its net benefit. Dexrazoxane has been proved cardioprotective in the setting of low-dose anthracycline exposure, but its value in children, who are expected to receive high cumulative dosages, remains elusive.
Objectives: To perform a meta-analysis intended to appraise the efficacy and safety of dexrazoxane in pediatric acute leukemia patients managed with anthracycline chemotherapy.
Methods: We systematically searched MEDLINE, Embase, Web of Science, Cochrane Central and Google Scholar databases, using the terms "leukemia", "anthracycline" and "dexrazoxane", from inception to June 21st, 2020. Studies targeting cardiac events, subclinical cardiotoxicity, primary cancer progression or relapse, secondary malignancy, drug-associated adverse effects and mortality were included. The primary endpoint was a composite of incidental heart failure, left ventricular systolic function deterioration, significant ventricular arrhythmias and cardiovascular (CV) mortality. Investigational arms were those of dexrazoxane and no drug or placebo. A random-effects model with Mantel-Haenszel method was performed to calculate pooled ORs.
Results: We encompassed 9 studies, of which 6 were prospective, including 5 randomized controlled trials (RCTs), albeit from only 2 databases. 5 studies focused on pediatric acute lymphoblastic leukemia patients, while 3 addressed children with acute myeloid leukemia, with 1 study covering both patient populations. Doxorubicin was the most represented anthracycline. 2,375 patients were included, of whom 838 were under dexrazoxane. There were 47 primary endpoint events, including 6 CV deaths. Additionally, 177 failed primary cancer responses to treatment, 19 secondary malignant neoplasms and 63 chemotherapy-related deaths were reported. Dexrazoxane was found to numerically reduce both the primary endpoint (5 studies, OR 0.29, 95%CI 0.08-1.03, p 0.06, i^2 0%) and CV mortality (3 studies, OR 0.47, 95%CI 0.04-5.46, p 0.55, i^2 0%) and to significantly decrease subclinical cardiotoxicity, assessed as serum cardiac troponin T elevation (2 studies, OR 0.19, 95%CI 0.1-0.35, p < 0.00001, i^2 0%). Primary cancer outcome and the risk of secondary malignancy did not differ significantly between the 2 arms (3 studies, OR 0.84, 95%CI 0.59-1.18, p 0.3, i^2 0% and 5 studies, OR 1.98, 95%CI 0.74-5.33, p 0.18, i^2 0%, respectively). Likewise, severe mucositis and chemotherapy-related mortality were similar in both groups (2 studies, OR 0.97, 95%CI 0.29-3.22, p 0.96, i^2 82%, and 4 studies, OR 1.15, 95%CI 0.57-2.31, p 0.7, i^2 0%, respectively).
Conclusions: Dexrazoxane seems to maintain its cardioprotective properties and its ability not to deteriorate major cancer outcomes in pediatric acute leukemia patients.

Sexta-feira, 30 Abril de 2021 | 09H00-10H15

Sala Virtual 2 | CO 03 - Flutter/atrial fibrilation

CO 13. A NEW APPROACH TO ATRIAL FLUTTER ABLATION USING FUNCTIONAL SUBSTRATE MAPPING WITH WAVEFRONT DISCONTINUITY DURING SINUS RHYTHM

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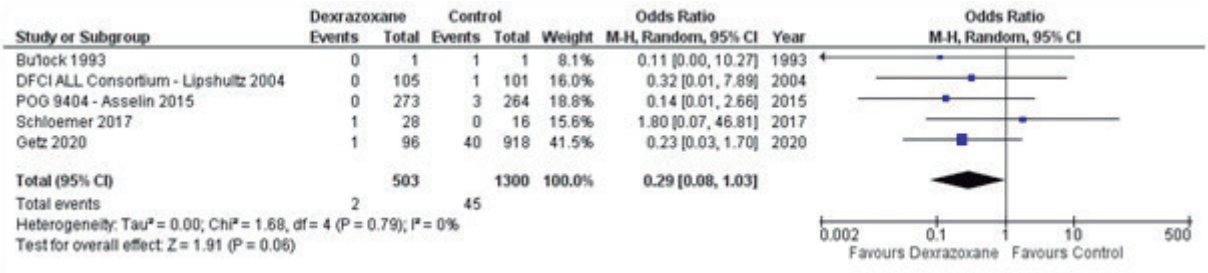
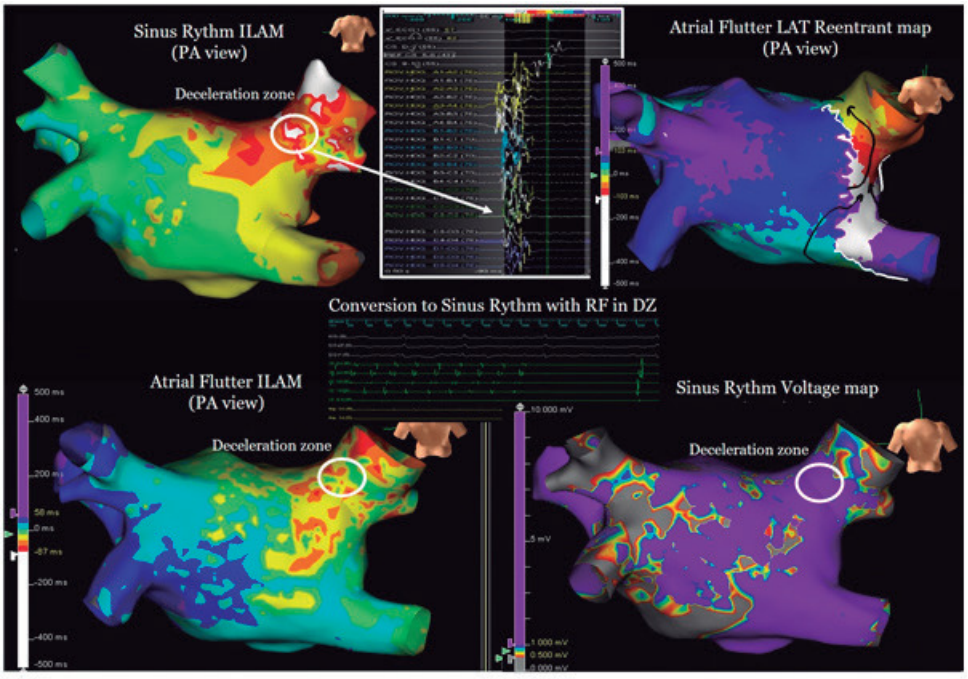
Introduction: Ultra high-density (UHD) mapping allows accurate identification of local abnormal electrograms and low voltage within a small area range, allowing precise identification of reentry circuits. Areas with high isochronal density in a small area known as deceleration zones (DZ) are responsible for reentry.
Objectives: Identify the DZ and areas of low voltage in sinus rhythm (SR) and evaluate the feasibility of performing atrial flutter (AFL) ablation by targeting those zones.
Methods: We prospectively enrolled patients in SR referred for AFL ablation (either typical or atypical). An isochronal late activation mapping (ILAM) during SR with UHD catheter was performed, annotating latest deflection of local electrograms. DZ were defined as areas with > 3 isochrones within 1cm radius, prioritizing zones with maximal density. Atrial flutter was then induced and ILAM during flutter was performed for comparison. Voltage mapping was also assessed (0.1-0.5 mV). Ablation targeted DZ in SR that displayed the higher voltage. DZ in SR were compared to DZ in AFL. Radiofrequency (RF) applications needed to terminate AFL were assessed. After AFL termination, complete line of the slow conduction zone was completed, and pulmonary vein isolation (PVI) was done in case of left AFL. Categorical variables are presented in absolute and relative values and median and interquartile range were used for numerical variables, as well t-Student test for correlation of numerical variables.
Results: We studied 6 AFL (4 atypical, 66.7%) in 5 patients, 2 male (40%), median age 70 (64-72). UHD ILAM in SR with 2,195 points (1,212-2,865) and 2,197 points (1,356-3,102) in AFL (p = 0.62). The UHD ILAM identified a median of 1 (1-1.75) DZ in SR, that colocalized with AFL isthmus and DZ in AFL in 100%. DZ were not always located in low voltage areas. Aiming at the higher voltage in the DZ terminated the AFL in all cases, with a median RF time of 38 (25-58) seconds and AFL was no longer inducible. However, according to protocol, the complete line of slow conduction zone was done, with a median RF time of 1,049.5 (274-1194) seconds (p = 0.009).



CO 138 Figure



CO 13 Figure

Conclusions: Isochronal mapping in sinus rhythm with UHD catheters can display the functional substrate for reentry in AFL, allowing a substrate guided ablation in case of non-inducible AFL. Targeting the areas of high isochronal density, is effective in terminating AFL, obviating the need for extensive ablation.

CO 14. RADIOFREQUENCY CATHETER ABLATION FOR PERSISTENT ATRIAL FIBRILLATION

André Azul Freitas[1], Pedro A. Sousa[1], Cátia Ferreira[1], José Paulo Almeida[1], Sofia Martinho[1], Valdirene Gonçalves[2], João Rosa[1], Gustavo Campos[1], Natália António[1], Luís Elvas[1], Lino Gonçalves[1]

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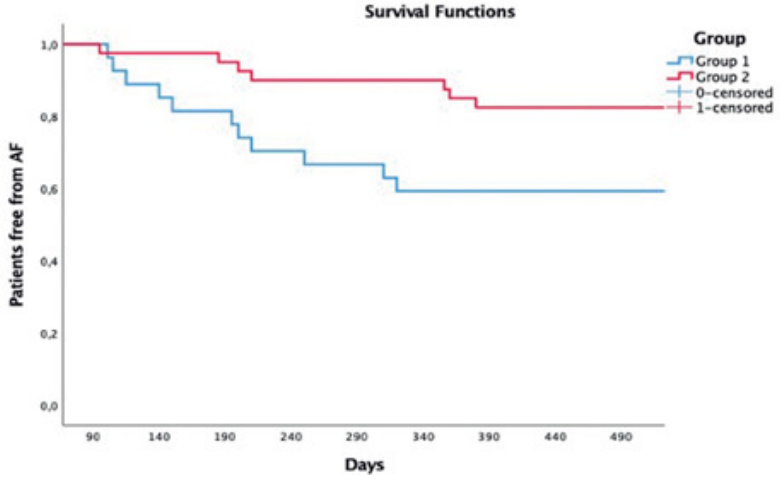
Introduction: Catheter ablation has become the first-line treatment for symptomatic patients with atrial fibrillation (AF). Several approaches of substrate ablation have been used for persistent and long-standing persistent AF and the best protocol procedure is yet to be established. The purpose of this study was to evaluate the outcomes of patients submitted to catheter ablation of persistent and long-standing persistent AF adding extra-pulmonary substrate approaches to pulmonary vein isolation.

Methods: We retrospectively studied 67 consecutive patients referred for the first procedure of catheter ablation of persistent or long-standing persistent AF from May 2016 to October 2018. The first 27 patients were subjected to pulmonary vein isolation and complex fractionated atrial electrograms (CFAE) ablation (group 1) and the last 40 patients were subjected to a tailored approach guided by voltage map areas and CFAE (group 2). Patient characteristics, procedure details and follow-up were assessed, and predictors of recurrence were determined.

Figure 1. Patients free from Atrial Fibrillation over time (days): Group 1 versus Group 2. (Log Rank X^2 5.076, P= 0.024)



CO 14 Figure

Results: Mean age was 59 ± 11 years with 58% being male. During a mean follow-up of 16 ± 6 months 27% of the patients showed AF recurrence. There were no differences in baseline characteristics of group 1 and 2. A higher recurrence rate was found in group 1 by comparison with group 2 (40.7% vs 17.5%, Log Rank X^2 = 5.076, p = 0.024) (Figure). Also, recurrence was associated with a longer AF duration, an increased baseline Brain Natriuretic Peptide (BNP), an increased left atrium (LA) volume, the presence of hyperthyroidism, the absence of sinus rhythm after procedure, the inducibility of AF post-ablation and the absence of an antiarrhythmic drug at hospital discharge. After adjustment for other confounders, the patient group (HR 5.16 [1.23-21.71], p = 0.025), a long-standing AF (HR 9.09 [1.41-58.82] p = 0.020), the BNP value at admission (HR 1.03 [1.01-1.05] p = 0.033) and the LA volume index (HR 1.13 [1.02-1.25], p = 0.017) were the only independent predictors of recurrence.
Conclusions: Ablation of persistent and long-standing persistent AF is feasible with good results when a substrate approach is added to pulmonary vein isolation. A tailored approach seems to be more efficient, showing best outcomes in mid-term follow-up. A long-standing AF, higher BNP value and the LA enlargement are important predictors of recurrence and should be used to better select patients and to manage follow-up.

CO 15. A NEW ELECTROPHYSIOLOGICAL TRIAD FOR ATRIAL FLUTTER CRITICAL ISTHMUS IDENTIFICATION AND LOCALIZATION

Pedro Adragão, Daniel Matos, Pedro Galvão Santos, Francisco Costa, Gustavo Rodrigues, João Carmo, Pedro Carmo, Diogo Cavaco, Francisco Morgado, Miguel Mendes

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

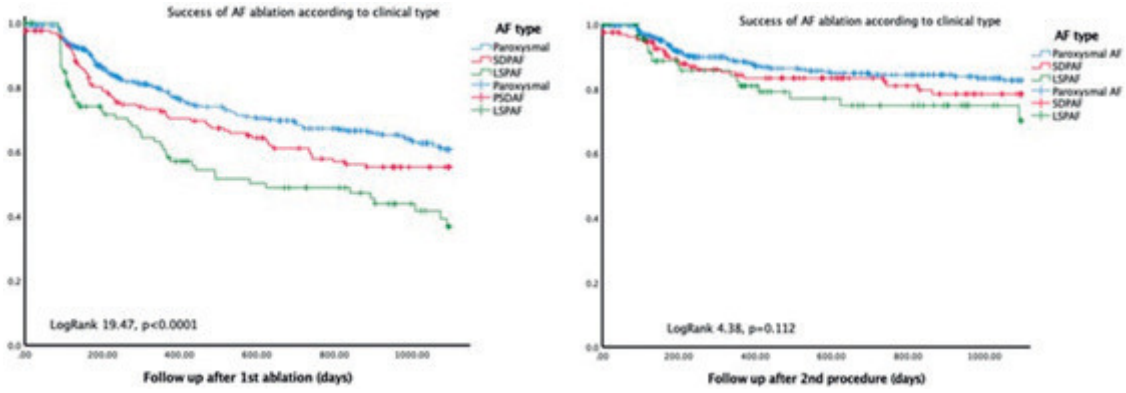
Introduction: In a previous retrospective study it was demonstrated that an electrophysiological triad was able to identify critical isthmus in atrial flutter (AFL) patients. This triad is based in the Carto® electroanatomical mapping (EAM) version 7, which displays a histogram of the local activation times (LAT) of the tachycardia cycle length (TCL), in addition to the activation and voltage maps. This study aimed to prospectively assess the ability of an electrophysiological triad to identify and localize the AFL's critical isthmus.
Methods: Prospective analysis of a unicentric registry of individuals who underwent left AFL ablation with Carto® EAM. All patients with non-left AFL, lack of high-density EAM, less than 2000 collected points or lack of mapping in any of the left atrium walls or structures were excluded. Ablation sites of arrhythmia termination were compared to an electrophysiological triad constituted by: areas of low-voltage (0.05 to 0.3 mV), sites of deep histogram valleys (LAT-Valleys) 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 TCL. The longest LAT-Valley was designated as the primary valley, while additional valleys were named as secondary.
Results: A total of 12 patients (9 men, median age 72 IQR 67-75 years) were included. All patients presented with left AFL and 67% had a previous atrial fibrillation and/or flutter ablation. The median TCL and number collected points were 250 (230-290) milliseconds and 3150 (IQR 2,340-3,870) points, respectively. All AFL presented with at least 1 LAT-Valley in the analysed histograms, which corresponded to heterogeneous low-voltage areas (0.05 to 0.3 mV) and encompassed more than 10% of TCL. Eleven of the 12 patients presented with at least 1 secondary LAT-Valley. All arrhythmias were effectively terminated after undergoing radiofrequency ablation in the primary or the secondary LAT-Valley location.
Conclusions: In a prospective analysis, an electrophysiological triad was able to identify the AFL critical isthmus in all patients. Further studies are needed to assess the usefulness of this algorithm to improve catheter ablation outcomes.

CO 16. CATHETER ABLATION OF LONG-STANDING PERSISTENT ATRIAL FIBRILLATION: THE UGLY TYPE OF AF?

Joana Brito, Tiago Rodrigues, Sara Pereira, Pedro Silverio Antonio, Beatriz Silva, Pedro Alves da Silva, Ceu Barreiros, Gustavo Lima da Silva, Luis Carpinteiro, Nuno Cortez-Dias, João de Sousa, Fausto j. Pinto

Centro Hospitalar de Lisboa Norte, EPE/Hospital Pulido Valente.

Introduction: In atrial fibrillation (AF) patients (pts), catheter ablation (CA) by isolating pulmonary veins (PVI) is the most effective therapeutic option in order to maintain sinus rhythm. The success rate of CA relies on type and duration of AF, being more successful in pts with paroxysmal AF and presenting suboptimal success in pts with long-standing persistent AF (LSPAF, > 12 months).
Objectives: To evaluate the success of AF ablation, particularly in LSPAF.
Methods: Single-center prospective study of pts submitted to CA between 2004 and 2020. The strategy, regardless of the type of AF, was based on PVI, complemented by cavo-tricuspid isthmus line (CTI) in pts with history of flutter. Additional CA strategies were selectively considered in pts with stable atypical flutter conversion, persistent triggers or no electrograms in the VPs. Pts were monitored with Holter/7-day event loop recorder (3, 6, 12 months and annually up to 5 years). Success was defined after the 90th day ablation, according to the absence of recurrences of any sustained atrial arrhythmias (> 30 sec). Cox regression and Kaplan-Meier survival were used to compare the success of ablation as a function of the clinical type of AF.
Results: 862 pts were submitted to AF ablation (67.3% male, mean age of 58 ± 0.41 years), including 130 pts (15.1%) with LSPAF, 63.3% with paroxysmal AF and 21.6% with short-duration persistent AF (SDPAF). In LSPAF, PVI was performed with irrigated catheter in 26.4%, PVAC in 39.5% and cryoablation in 34.1%. With a mean follow up period of 838 (IQ 159-1469) days, the 3-year success rate after a single procedure was 54.1% in LSPAF, compared to 72.4% in paroxysmal AF and 61.6% in SDPAF (LogRank - p < 0.0001, Figure 1). The risk of arrhythmic recurrence was 37% higher in patients with LSPAF comparing with other groups (HR 0.63 CI 95% 0.43-0.92, p 0.016). However after a mean of 1.17 procedures/patients, the success difference between groups was not detect (LogRank-p = 0.112, Figure 2). With additional ablation procedures (REDO), the success rate at 3 years was 82.9% LSPAF pts, compared 88.2% in paroxysmal AF pts and 83.6% in SDPAF pts. In LSPAF pts, different ablation techniques did not predict arrhythmic recurrence. Regarding comorbidities, higher prevalence of peripheral arterial disease (PAD, p = 0.005) a higher NT-proBNP (p = 0.006) and left auricular volume (p = 0.045) were associated with arrhythmic relapse.



CO 16 Figure

Conclusions: AF ablation is more effective when performed earlier in the natural history of the disease. However, even in LSPAF pts, an acceptable rate of success can be achieve with additional procedures, independently from the ablation techniques.

CO 17. LONG-TERM RISK OF MAJOR CARDIOVASCULAR EVENTS AFTER CAVOTRICUSPID ISTHMUS ABLATION: WHEN AND IN WHOM TO DISCONTINUE ORAL ANTICOAGULATION?

Joana Brito, Tiago Rodrigues, Pedro Silvério António, Beatriz Silva, Pedro Alves da Silva, Nelson Cunha, Ana Bernardes, Luís Carpinteiro, Gustavo Lima da Silva, Nuno Cortez-Dias, João de Sousa, Fausto J. Pinto

Centro Hospitalar de Lisboa Norte, EPE/Hospital Pulido Valente.

Introduction: Cavotricuspid isthmus ablation (CTA) is the 1st-line therapy to accomplish rhythm control in patients (pts) with typical atrial flutter (AFL). While AF embolic risk is well established, data regarding AFL and formal recommendations for long-term anticoagulation after CTA in pts with isolated AFL.
Objectives: To determine the risk of major adverse cardiovascular events (MACE) after CTA and to compared it with the presence of concomitant AF, concomitantly performing pulmonary vein isolation (PVI) and persistence on long-term oral anticoagulation (OAC).
Methods: Single-center retrospective study of pts submitted to CTA between 2015 to 2019, comprising three groups: I-pts with lone AFL; II-patients with AFL and prior AF submitted to CTA only; and III-pts with AFL and prior AF submitted to IVP and CTA. Clinical records were analyzed to determine the occurrence of MACE during the long-term follow up (FUP), defined as death (cardiovascular or unknown cause), stroke, clinically relevant bleed or hospitalization due to heart failure or arrhythmic events. Long-term OAC was defined as its persistence over 18 months after CTA. Analysis was performed with Kaplan Meier and Cox regression.
Results: 476 pts (66 ± 12 years, 80% males) underwent CTA: group I-284 pts (60%), II-109 pts (23%) and III-83 pts (17%). Baseline characteristics were similar between groups, except for age with group I pts being older (68 ± 12, 67 ± 11, 61 ± 11, p < 0.03). The mean baseline CHA_2DS_2VASc was 2.3 ± 1.5 and the median post-CTA follow-up was 2.8 year. The 1, 3 and 5years MACE risk was 6.8%, 21.1% and 32.1%, respectively and did not differ significantly between groups. OAC was suspended on the long-term in 105 pts (23%), at a mean of 241 days post-CTA. Suspension of OAC was associated with lower MACE risk (HR: 0.26, 95%CI 0.12-0.56, p 0.001). This effect was independent of age and CHA_2DS_2VASc, also a significant prognostic predictor (HR1.28, 95%CI 1.08-1.53, p0.005). The prognostic benefit of OAC suspension was driven by the group I and was not verified in pts with concomitant AF. In group I, withdraw of anticoagulation (56 pts 27.3%) was associated with 70% relative risk reduction in the 5year MACE risk (16.1% vs 42.9%, HR0.30, 95%CI 0.13-0.69, p 0.005). In group I, OAC was suspended in younger pts (65 ± 11 vs. 69 ± 12, p = 0.002), lower CHA_2DS_2VASc (1.9 ± 1.6 vs. 2.7 ± 1.4, p < 0.001) and lessen cerebrovascular disease (1.4% vs. 8.1%, p 0.036), heart failure (14.1% vs. 37.9%, p0.001), ischemic cardiomyopathy (8.5% vs 18.8%, p 0.04) and hypertension (60.6% vs. 75.3%, p 0.019).
Conclusions: In pts with AFL submitted to CTA, long-term risk of MACE was high, even in those without concomitant AF. Among pts with prior AF documented with typical AFL submitted to CTA, the long-term prognosis was similar. In pts with lone AFL submitted to successful CTA, it may be reasonable to suspend OAC within 18 months provided that concomitant AF is carefully excluded during FUP.

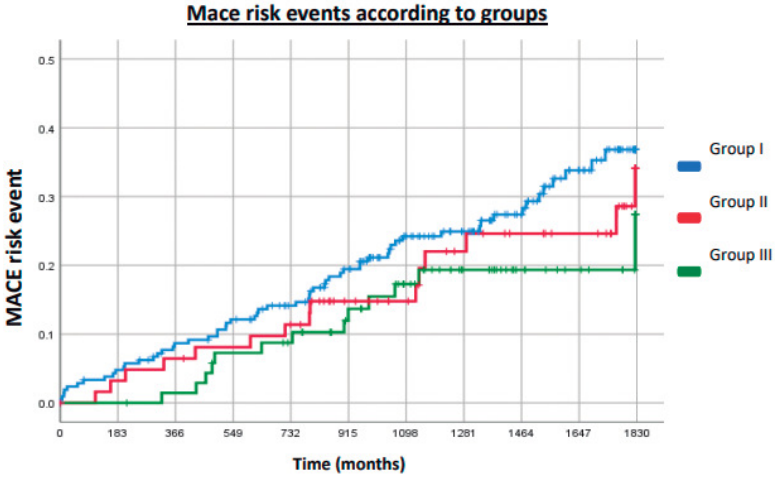
CO 12. PREVALENCE AND PREDICTOR FACTORS OF PERSISTENT PULMONARY VEIN ISOLATION IN REDO AF ABLATION PROCEDURE

Mariana Ribeiro da Silva, Gualter Santos Silva, Pedro Ribeiro Queirós, Rafael Teixeira, João Almeida, Paulo Fonseca, Marco Oliveira, Helena Gonçalves, Alberto Rodrigues, João Primo, Ricardo Fontes-Carvalho

Centro Hospitalar de Vila Nova de Gaia/Espinho.

Introduction: Atrial fibrillation (AF) catheter ablation is a well-established procedure for the treatment of AF. The cornerstone of AF ablation is the complete isolation of pulmonary veins (PV). However, persistent PV isolation (PVI) is difficult to accomplish, with PV reconnection rates of > 70%. The factors associated with persistent PVI are still uncertain.
Objectives: To assess the PVI status in patients undergoing a redo ablation and to determinate the predictors associated with persistent PVI.
Methods: Consecutive patients who underwent a redo ablation between 2016 and 2020 were identified in a single-centre retrospective study. PVI status was assessed during electrophysiologic study with electroanatomic mapping system. Index procedures included second generation cryoballoon (CB), conventional radiofrequency (RF) before 2018 and "CLOSE" protocol

Endpoint	12-months	36-months	60-months
MACE	6.8%	21.1%	32.1%
Death (any cause)	2.4%	8.8%	14.4%
Stroke	0.9%	3.6%	7.1%
Clinically relevant bleeding	0.7%	2.4%	5.6%
Hospitalization of HF or arrhythmic event	3.2%	12%	16.2%



CO 17 Figure

guided RF ablation after 2018. Persistent PVI was defined by the absence of reconnection of all pulmonary veins.
Results: We included 83 patients with a mean age of 55.9 ± 11.9 years; 71.1% (n = 59) were male with a mean CHA2DS2-VASc score of 1.14 ± 1.0. Seventy-five percent had paroxysmal AF and undergone a redo 35.0 months (± 30.9) after the index PVI. Seventeen patients (20.5%) had persistent PVI whereas 66 patients (79.5%) had at least one PV reconnected after the index procedure, with a reconnection rate of 51.8% for right superior and inferior PV, 47.0% for left superior PV and 36.1% for left inferior PV. No statistically significant differences were noticed between patients with persistent and non-persistent PVI in baseline (clinical and echocardiographic characteristics). Regarding index ablation procedure, persistent PVI occurred more frequently in patients who underwent a "CLOSE" protocol-guided index PVI compared to RF pre-2018 and CB (45.5% vs 16.7%; p = 0.043). Twenty-nine percent of patients with persistent PVI had a "CLOSE" protocol-guided index PVI whereas only 9.1% of non-persistent PVI patients had a "CLOSE"-guided index PVI (p = 0.043). In this cohort, "CLOSE" protocol-guided index PVI was the only predictor of persistent PVI (odds ratio 4.2, 95% confidence interval 1.1-15.9; p = 0.037).
Conclusions: In patients undergoing redo AF ablation procedures, only 20.5% had persistent PVI. "CLOSE" protocol-guided index PVI presented significantly higher rates of persistent PVI. "CLOSE" protocol-guided index PVI was the only predictor for persistent PVI in patients with AF recurrence requiring a redo procedure.

Sexta-feira, 30 Abril de 2021 | 13H00-14H00

Sala Virtual 2 | CO 04 - Doença coronária-genética-avaliação funcional

CO 20. CIRCULATING ENDOTHELIAL PROGENITOR CELLS AS PREDICTORS OF LONG-TERM CARDIOVASCULAR MORTALITY AFTER MYOCARDIAL INFARCTION: WHICH DEFINITION SHOULD WE USE?

Diogo de Almeida Fernandes[1], Vânia Leal[2], Bárbara Oliveiros[3], Sónia Silva[2], Lino Gonçalves[4], Carlos Fontes Ribeiro[3], Natália António[4]

[1]Centro Hospitalar e Universitário de Coimbra/Hospitais da Universidade de Coimbra. [2]Faculdade de Farmácia da Universidade de Coimbra. [3]Faculdade de Medicina de Coimbra. [4]Centro Hospitalar e Universitário de Coimbra.

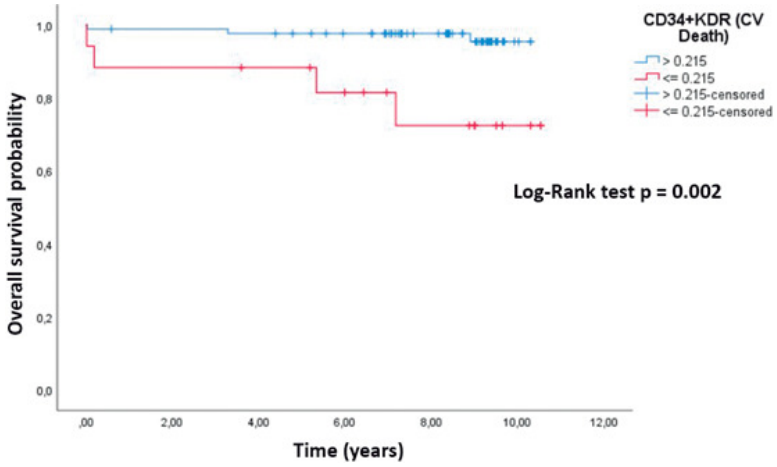
Introduction: Endothelial progenitor cells (EPCs) are bone marrow-derived cells that play a crucial role in vascular repair after an acute myocardial infarction (AMI). Recent studies suggest that circulating EPCs levels may be useful as a surrogate biomarker for cardiovascular (CV) events. Nevertheless, the lack of a consensual definition and phenotypic characterization of EPCs hampers its use in clinical practice. CD34+KDR+, CD45dimCD34+KDR+ and CD34+CD133+KDR+ are among the most used antigenic phenotypes to define circulating EPCs but the best phenotype to predict CV outcomes remains to be determined.
Objective: To determine the EPCs' surface phenotype that best predicts long-term CV death after an AMI, and to evaluate its optimal cut-off point.
Methods: One-hundred AMI patients were prospectively enrolled in the study. Circulating EPCs were quantified through high-performance flow cytometer within the first 24 hours of admission using different surface markers combinations allowing to simultaneously compare three EPCs definitions: 1) CD34+KDR+, 2) CD45dimCD34+KDR+, 3) CD34+CD133+KDR+. Mean follow-up time was 8.0 ± 2.2 years.
Results: The mean age of our population was 59.7 ± 11.0, the majority of patients were male (90%), 65% had ST-elevation myocardial infarction (STEMI) and 35% non-ST segment elevation myocardial infarction (NSTEMI). Diabetes mellitus was present in 38% and hypertension in 67% of the studied sample. During the long-term follow-up, 34 patients had re-admissions due to cardiovascular causes, 11 of them for AMI. Thirty-one patients had major adverse cardiovascular events (MACE) and 19 died. Using ROC curves, the CD34+KDR+ phenotype showed the biggest area under the curve regarding prediction of CV mortality (0.722; p = 0.010; confidence interval 95% (95%CI): 0.554 to 0.890). Patients with lower levels of EPCs according to this definition (≤ 0.022%) are 7 times more likely to die from CV causes at any time (hazard ratio = 7.55; p = 0.008; 95%CI 1.69 to 33.83).
Conclusions: The CD34+KDR+ phenotype appears to be the best definition of circulating EPCs for predicting long-term CV mortality after AMI. Further studies with larger samples are needed to clarify the optimal cut-off point for determining patients at risk and its role in everyday Cardiology.

CO 19. A GENETIC RISK SCORE PREDICTS RECURRENT EVENTS AFTER MYOCARDIAL INFARCTION IN YOUNG PATIENTS WITH A LOW LEVEL OF TRADITIONAL RISK FACTORS

Flávio Mendonça[1], Isabel Mendonça[2], Margarida Temtem[2], Marina Santos[2], Adriano Sousa[2], Ana Célia Sousa[2], Eva Henriques[2], Sónia Freitas[2], Mariana Rodrigues[2], Sofia Borges[2], Graça Guerra[2], António Drumond[1], Roberto Palma dos Reis[3]

[1]Hospital Central do Funchal. [2]Unidade de Investigação, Hospital Dr. Nélio Mendonça. [3]Nova Medical School.

Introduction: Coronary Heart Disease (CAD) is a multifactorial disease, including environmental and genetic risk factors. Current smoking, dyslipidemia and diabetes have a significant impact in long- term mortality and morbidity. However, several genetic variants associated with CAD



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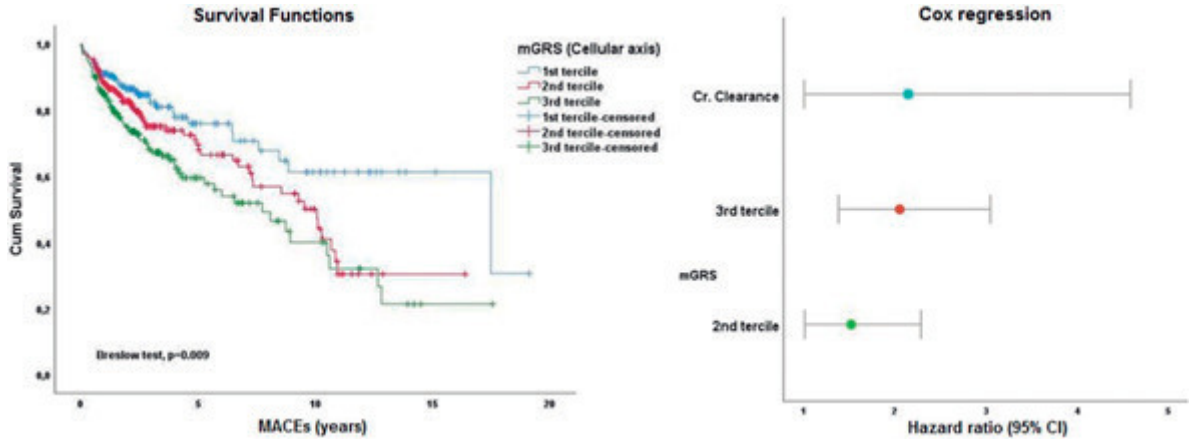

CO 19 Figure

but not with traditional risk factors (TRFs) has been reported to improve prediction of events and extended mortality, in younger CAD people.
Objectives: To evaluate the clinical utility of a GRS composed by variants from GWAS associated to CAD but not with TRF to predict life-long residual risk in patients under 55 years old and a low level of TRFs.
Methods: We conducted a prospective study with 573 consecutive patients aged < 55 years presenting with AMI and a low level of TRFs (without diabetes and with LDL cholesterol > 150 mg/ml). We analysed several biochemical markers and performed a GRS with variants not associated with TRFs (TCF21 rs12190287, CDKN2B-AS1 rs1333049, CDKN2B rs4977574, PHACTR1 rs1332844, MIA3 rs17465637, ADAMTS7 rs3825807, ZC3HC1 rs11556924, SMAD3 rs17228212 and GJA4 rs618675). We studied the GRS association with a primary composite endpoint of all-cause vascular morbidity and mortality including recurrent acute coronary syndrome (myocardial infarct and unstable angina), coronary revascularization (coronary artery bypass grafting (CABG) and percutaneous coronary intervention (PCI), re-hospitalization for heart failure, ischemic stroke and cardiovascular dead.
Results: A total of 573 patients were studied and followed up for a mean of 4.7 ± 4.0 years. There were 169 recurrentcardiovascular events. The GRS was sub-divided into terciles, verifying that patients in the third tercile (high risk) had a higher number of risk alleles. Compared with the low-risk GRS tercile, the multivariate-adjusted HR for recurrences was 1.520 (95%CI 1.011-2.286); p = 0.044 for the intermediate-risk group and was 2.051 (95%CI 1.382-3.044); p < 0.0001 for the high-risk group. Inclusion of the GRS in the model with TRFs alone (low risk) improved the C statistic (DC-statistic = 0.030; with statistical significance, p = 0.004), cNRI (continuous net reclassification improvement) (30.8%), and the IDI (integrated discrimination improvement) index (0.022).
Conclusions: A multilocus GRS can identify young patients with coronary heart disease with a low level of TRFs, but with a significant risk of recurrence of long-term events. Genetic information can improve clinical risk stratification and be essential to define the best approach to managing these patients.

CO 21. THE QUEST FOR GRACE 3.0: IMPROVING OUR BELOVED RISK SCORE WITH MACHINE LEARNING

José Pedro Sousa[1], Afonso Lima[2], Paulo Gil[2], Jorge Henriques[2], Lino Gonçalves[3]

[1]Centro Hospitalar e Universitário de Coimbra, EPE/Hospital Geral.
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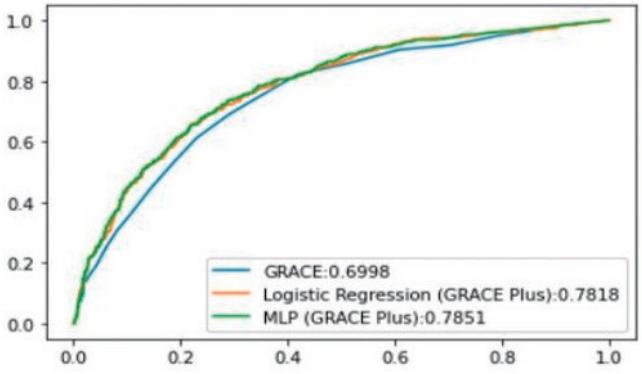
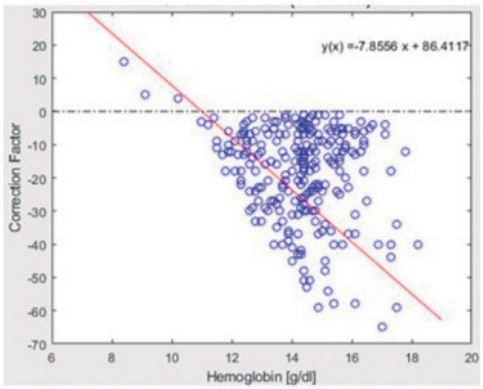
[3]Centro Hospitalar e Universitário de Coimbra/Hospitais da Universidade de Coimbra.

Introduction: Although widely recommended for risk assessment of patients with acute coronary syndrome (ACS), the Global Registry of Acute Coronary Events (GRACE) score famously lacks discriminative power. On the other hand, in-hospital serum hemoglobin levels (HG) have been shown to simultaneously forecast both thrombotic and hemorrhagic hazards.
Objectives: To ascertain the extent to which the incorporation of HG in the GRACE score is able to increase its predictive ability.
Methods: Retrospective single-center study encompassing ACS patients consecutively admitted to a Cardiac Intensive Care Unit. Inclusion criteria comprised the acquaintance of GRACE score, HG and vital status on a 6-month follow-up, which served as the outcome. 3 discriminative models were first created: (standard) GRACE score (model 1); GRACE score plus HG, by means of logistic regression (model 2); GRACE score plus HG, by means of multilayer perceptron (a class of feedforward artificial neural network) (model 3). Hereafter, if models 2 and/or 3 were to be found significantly more discriminative than model 1, a correction factor would be calculated, also allowing for the conception of the most predictive model possible (model 4). The discriminative ability was estimated by both the area under the receiver-operating characteristic curve (AUC), and the dyad sensitivity/specificity.





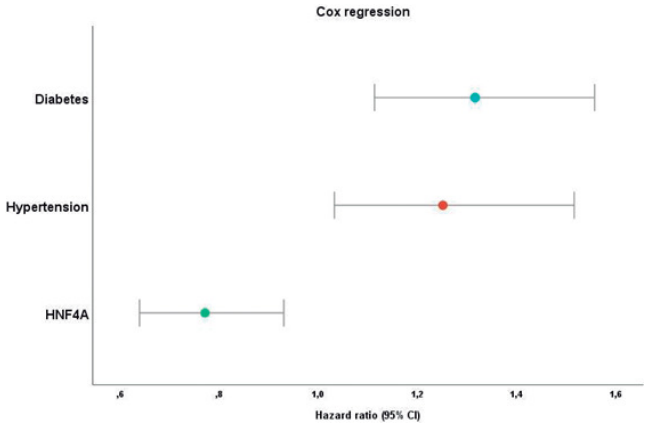
Results: Between April 2009 and December 2016, 1468 patients met study inclusion criteria. Mean age was 68.0 ± 13.2 years and 29.8% were female, while 36.9% presented with ST-segment elevation myocardial infarction. Mean GRACE score was 145.5 ± 47.0 and mean HG was 13.5 ± 2.0. All-cause mortality reached 10.5%, at 6 months. Predictive power for models 1, 2 and 3 may be quantified as follows: AUC 0.6998, sensitivity 77.7% and specificity 62.5%; AUC 0.7818, sensitivity 36.3% and specificity 92.2%; AUC 0.7851, sensitivity 47.7% and specificity 88.5%, respectively. Both models 2 and 3 exhibited more discriminative ability than model 1 (p < 0.001), due to their higher specificity. As such, a correction factor was computed (y = -7.8556x + 86.4117) and model 4 was created, displaying a sensitivity of 65.9% and a specificity of 76.5%.
Conclusions: HG single-handedly provides incremental predictive value-namely more specificity-to the GRACE score. In particular, the latter seems to overestimate ACS patients' risk if HG is normal or close to normal.

CO 22. HNF4A GENE CAN BE A GENETIC PROTECTOR FOR CORONARY ARTERY DISEASE

Margarida Temtem[1], Marco Gomes Serrão[2], Isabel Mendonça[2], Marina Santos[2], Flávio Mendonça[2], Adriano Sousa[2], Ana Célia Sousa[2], Eva Henriques[2], Sónia Freitas[2], Mariana Rodrigues[2], Sofia Borges[2], Graça Guerra[2], António Drumond[3], Roberto Palma dos Reis[4]

[1]Hospital Central do Funchal. [2]Unidade de Investigação, Hospital Dr. Nélio Mendonça. [3]Hospital Dr. Nélio Mendonça. [4]Nova Medical School.

Introduction: Hepatocyte nuclear factor4 A (HNF4A) gene was considered by GWAS associated with atherosclerosis and CAD susceptibility. Loss-of-function mutations in human hepatocyte nuclear factor 4α (HNF4α), a transcriptor factor encoded by the HNF4A gene, are associated with maturity-onset diabetes of the young and lipid disorders. However, the mechanisms underlying the lipid disorders are poorly understood.
Objectives: We propose to identify Hepatocyte nuclear factor4 A genetic predisposition to atherosclerosis progression and events occurrence or regression and better prognosis, through a cohort study from GENEMACOR population.
Methods: We investigated a cohort of 1712 patients who underwent coronary angiography with more than 70% stenosis of at least one main coronary vessel. 33 SNPs associated with the risk of CAD in previous GWAS were genotyped by TaqMan assays methodology, including HNF4A. We evaluated the best genetic model associated with CAD prognosis (events) with a 95%CI in bivariate analysis. The hazard function was performed by a Cox survival regression model adjusted for age, sex, type 2 diabetes, hypertension, and hypercholesterolemia, to evaluate their relationship with the event´s incidence. Finally, we constructed Kaplan-Meier cumulative-event curves for the significant genetic variants.



Results: Our evaluation revealed, among the 33 SNPS, a SNP paradoxically associated with protection from atherosclerosis progression and events occurrence: rs1884613 C>G in the HNF4α gene on chromosome 20 dominant model [OR = 0.653; 95%CI (0.522-0.817); p = 0.0002]. Cox survival regression model showed a CAD protective effect of HNF4α with a Hazard ratio (HR) of 0.771; p = 0.007. The Kaplan-Meier cumulative event analysis disclosed that the CG+GG vs CC genotype of rs1884613 HNF4α was associated with a better prognosis (Breslow test, p = 0.004) at the end of the follow-up.
Conclusions: We identified, in this study, one SNPs paradoxically associated with a better CAD prognosis rs1884613 in HNF4α. The HNF4α gene variants could induce loss of HNF4α function, modifying and modulating hepatic lipase and lipid metabolism conferring a beneficial effect on atherosclerosis progression and events occurrence.

CO 18. VIRTUAL FRACTIONAL FLOW RESERVE DERIVED FROM CORONARY ANGIOGRAPHY -ARTERY AND LESION SPECIFIC CORRELATIONS

Tânia Mano, Vera Ferreira, Rúben Ramos, Eunice Oliveira, Ana Santana, João Melo, Cristina Fundinho, Isabel Cardoso, Bárbara Teixeira, Duarte Cacela, Rui Cruz Ferreira

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

Introduction: Virtual Fractional flow reserve (vFFR) from standard non-hyperaemic invasive coronary angiography (ICA) has emerged as a promising non-invasive test to assess hemodynamic severity of coronary artery disease (CAD). We aim to investigate the difference in vFFR analysis between vessels and specific lesions.
Methods: Retrospective analysis of consecutive patients (pts) who underwent invasive functional assessment (iFA) in a tertiary center between 2019 and 2020. vFFR was calculated using dedicated software (CAAS Workstation 8.4) based on coronary angiograms of the acquired in ≥ 2 different projections, by operators blinded to iFA results. Diagnostic performance of vFFR was evaluated and correlated with iFA, according to coronary vessel, vessel diameter at stenosis, diameter stenosis and area stenosis at lesion. vFFR was considered positive when < 0.80. FFR < 0.8 and iFR/RFR < 0.90 were classified as positive according to current clinical standards.
Results: 106 coronary arteries of 95 pts (78% male, mean age 67.8 ± 9.7 years) underwent vFFR evaluation. ICA indications were chronic coronary syndrome in 63% or acute coronary syndrome (non-culprit lesion) in the remaining pts. VFFR accuracy was good (AUC 0.839 (p < 0.001) and Pearson's correlation coefficient 0.533 (p < 0.001) when vFFR was measured in the distal vessel segment. The correlation improved when vFFR were assessed at lesion site (r = 0.631, p < 0.001) or up to 1cm below the stenosis (0.610, p < 0.001). Binary concordance of 89% were observed in RCA and LAD (Sensibility -S 68%, Specificity-Sp 96%, False positive -FP 3.8%, False negative - FN 31%, predictive positive value-PPV 87%, predictive negative value- PNV 89%), while in the circumflex coronary artery binary concordance were of 77% (S 50%; Sp 82%; FP 18%; FN 50%; PPV 33% and PNV 90%). Correlation between vFFR and iFA was higher in vessels ≥ 2 mm (r = 0.730, p < 0.001) and in lesions in the extremes of the severity spectrum (Table).

Table 1. Correlation of virtual Fractional Flow Reserve and Invasive functional assessment derived from coronary angiography, according to diameter and area of stenosis.

	Diameter of stenosis		Area of stenosis	
	<30%	>50%	<1.0mm2	>6.0mm2
Correlation (R)	0.720	0.708	0.826	0.835
(p value)	P<0.001	p=0.02	p<0.001	p=0.001

Conclusions: vFFR has a moderate to high linear correlation to iFA, depending on the artery and type of lesion studied. The higher correlation was found when vFFR were measured at lesion site, in non-circumflex artery stenosis, in vessels ≥ 2 mm and in vessels with mild or severe stenosis.

Sexta-feira, 30 Abril de 2021 | 09H00-10H00

Sala Virtual 3 | CO 05 - Ciência Básica

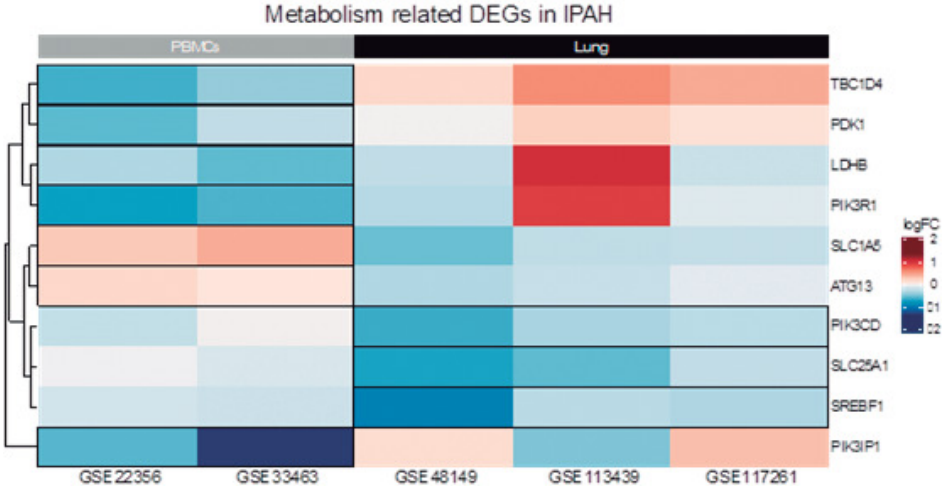
CO 27. ESTA COMUNICAÇÃO FOI RETIRADA A PEDIDO DOS AUTORES

CO 23. METABOLIC REPROGRAMMING IN PULMONARY ARTERIAL HYPERTENSION: IS IT A CANCER-LIKE DISEASE?

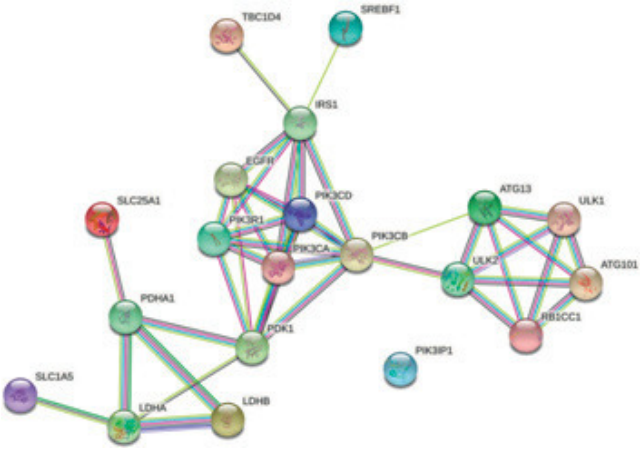
Cátia Santos Ferreira, Mónica Abreu, Rui Baptista, Lino Gonçalves, Henrique Girão, Graça Castro

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

Introduction: Idiopathic Pulmonary arterial hypertension (iPAH) is a rare and chronic disease associated with poor outcomes. Previously considered a disease restricted to the pulmonary circulation, PAH is now being recognized as a systemic disorder that is associated with metabolic dysfunction. The aim of this study is to analyze the metabolic reprogramming in the lung and peripheral blood mononuclear cell (PBMCs) of iPAH patients and explore their potential roles in PAH pathophysiology.
Methods: Five independent datasets, containing transcriptomic data of human PBMCs (GSE22356 and GSE33463) and lung (GSE48149, GSE113439 and GSE117261) samples, from 139 iPAH patients and 96 healthy controls, were downloaded at the GEO database. In each dataset, the samples were normalized and a pair-wise comparison between control and IPAH samples was performed using limma package, for the R programming language. Genes with a p-value lower than 0.05 were considered differentially expressed between the two groups. A subset of metabolism related genes was selected, and their expression was compared across the datasets.
Results: Among the 13 genes with differential expression identified, only 10 had a coherent expression across all datasets (Figure 1). Firstly, we report an association with insulin resistance through impairment of PI3K signaling in iPAH patients, by expressing lower levels of the heterodimer PIK3CD and regulatory PIK3IP1 and PIKR1 subunits in PBMCs, and by expressing higher levels of its downstream targets in the lung (TBC1D4). However, more extensive metabolic dysfunction was observed. A significant glycolytic shift in the lung and PBMCs was present, as a consequence of deregulation in genes involved in aerobic glycolysis and decreased fatty acid oxidation,



CO 23 Figure 1. Metabolism related differential gene expression (DEGs) in IPAH.



CO 23 Figure 2. Protein-protein interaction network showing 20 nodes: the 10 DEGs plus 10 closely related genes. Generated with STRING.

namely increased expression of PD1K and lower levels of expression of LDHB. The findings of decreased SLC25A1 protein in both PBMCs and lung suggest impairment of the tricarboxylic acid (TCA) cycle flux in PAH. Additionally, SLC1A5 highlights the involvement of glutamine metabolism and glutaminolysis derangements in PAH. Conversely, SREBP1 is involved in sterol biosynthesis and lower levels in PMBCs results in impaired resolution of inflammatory responses. Finally, although the role of autophagy in iPAH is complex, higher levels of expression of ATG13 in PBMCs and lower levels in the lung confirm autophagy deregulation in iPAH. Interestingly, all the metabolic pathways identified (Figure 2) are hallmarks of the metabolic reprogramming seen in cancer cells, a finding already suggested by the clonal proliferation of pulmonary artery smooth muscle cells described in plexiform lesions.

Conclusions: Our results provide novel insights into the metabolic regulation in iPAH. Molecularly, these cells exhibit many features common to cancer cells, suggesting the opportunity to exploit therapeutic strategies used in cancer to treat iPAH.

CO 25. HOMEOSTASIS RESCUE: THE EFFECT OF DRUG VS LIFESTYLE APPROACH IN LOW DOSE OF DOXORUBICIN TREATED RATS

Filipa Machado, Ângela Amaro-Leal, Ana I. Afonso, Isabel Rocha, Vera Geraldes

Faculdade de Medicina da Universidade de Lisboa.

Doxorubicin (DOX) is a highly effective anticancer agent that improved survival and patient's quality of live but causes dose-dependent cardiotoxic effects leading to a severe and irreversible cardiomyopathy in many patients. Different preventive strategies, such physical exercise and β-blockers, have been proposed to maintain the physiological homeostasis. However, besides the extensive research has been done to understand the mechanism and pathophysiology of DOX it is not clear what is the most effective preventive approach to maintain the physiological homeostasis. In the present work, we intended to compare the efficacy of two different approaches, one pharmacological intervention, using atenolol, a β1 selective antagonist without antioxidant properties, and other non-pharmacological intervention using a treadmill training in an animal model of DOX. Female Wistar rats were divided into 4 groups: Doxorubicin (DOX; ip. cumulative dose 8 mg/kg, 1 time/week, for 4 weeks), DOX with physical exercise (DOX + EX; treadmill, 22 cm/seg for 30 minutes, 5 times/week), DOX with β-blocker (DOX + ATN: DOX; ip. cumulative dose 8 mg/kg, 1 time/week and 4 mg/ml, Atenolol; oral administration, 5 times/week, for 4 weeks) and controls (ip. with saline solution). Blood pressure (BP), cardiac (HR) and respiratory (RF) frequency, baro- and chemoreflexes were evaluated. Our results reveal that DOX treatment triggered a significant decrease in BP and HR, caused hypopnea, decreased baro and chemoreflexes, without evidence of sympatho-excitation. These changes can be explained by the decline in cardiac function, respiratory muscle weakness, autonomic dysfunction and vascular changes induces by low doses of DOX. During treatment with DOX, the physical activity protocol countered some of the adverse effects caused by DOX. It normalized BP, HR and RF to physiological values, and decreases the loss in baroreflex gain. Chemoreflex sensitivity, sympathetic and parasympathetic activities remained similar. Atenolol treatment, similar to physical activity effect, also increased baroreflex gain and RF to normal values, causing also a clear tendency to maintain BP values. Although complementary data is still needed, with these results we can conclude that treadmill training was more effective than atenolol in counteracting the adverse effects of the cumulative low dose of DOX administered, suggesting that physical activity is a good non-pharmacological alternative to atenolol for preserving the homeostasis during DOX therapy.

CO 26. MULTI-SPECIES TRANSCRIPTOMIC DATA ANALYSIS REVEAL THREE CANDIDATE GENES, RESPONSIBLE FOR THE TRANSITION FROM COMPENSATED LEFT VENTRICLE HYPERTROPHY TO HEART FAILURE

Mónica Abreu[1], Cátia Ferreira[2], Lino Gonçalves[2], Henrique Girão[1], Rui Baptista[1]

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

Introduction: Heart failure (HF) is the common final syndrome for a wide spectrum of heart diseases, including hypertrophic cardiomyopathy, systemic arterial hypertension, aortic stenosis and aortic coarctation, usually following a variable period of compensated left ventricle hypertrophy (cLVH). Despite its importance, the transition from a cLVH phenotype to overt HF in humans is poorly understood. In this study, we aimed to find a molecular signature for the transition from cLVH to decompensated HF conserved among species and mechanisms of disease.

Methods: Four datasets, containing gene expression data of cLVH and HF samples, were selected from GEO data repository. The selected datasets included three different species: Rattus norvegicus (GSE4286 and GSE47495), Canis lupus familiaris (GSE5247) and Cavia porcellus (GSE78077) and different models of cLVH (pressure overload, genetic, and both). The intensity files (CEL files) containing the expression data were analysed using the Transcriptome Analysis Console 4.0 (TAC 4.0.2.15, Applied Biosystems). To identify differentially expressed genes (DEGs) a p-value cutoff of 0.05 was applied.

Results: The lists of DEGs obtained in the comparison cLVH versus HF, in each dataset, were uniformized to human identifiers and merged, resulting in a list containing 8,307 genes. Most of the genes were differentially expressed in only one dataset (6,252, 75.3%). DEGs present in two datasets were 1,850 (22.3%), in three datasets 202 (2.4%), and finally, present in all datasets only 3 genes were found. The first gene identified was CDKS1B (CDK regulatory protein), which belongs to a family of proteases related to the cell cycle. CKS1B upregulation activates the STAT3 and MEK/ERK pathways and promotes cell proliferation. Indeed, negative regulation of the MEK/ERK reduces cardiac hypertrophy induced by pressure overload. Secondly, type 2 phosphatidylinositol-5-phosphate 4-kinase (PI5P4K) converts phosphatidylinositol-5-phosphate to phosphatidylinositol-4.5-bisphosphate, and plays an important role in inflammatory response and autophagy. However, its role in the heart remains unknow. Lastly, the Mesenteric Estrogen Dependent Adipogenesis (MEDAG) adipokine was also differentially expressed in HF. Its role in myocyte metabolism is not defined but may parallel nutrient uptake role seen in adipose and reflect reliance on lipid oxidation.

Conclusions: We identified three genes that are differentially expressed in HF compared to cLVH, involved in cell proliferation, autophagy, inflammation, and lipid metabolism. This data requires confirmation in human studies. Such advance would be an important step toward identifying those risk factors, especially genetic variation, that predispose individuals with cLVH to develop HF.

CO 24. PHYSICAL EXERCISE OR ATENOLOL: WHAT IS THE BEST STRATEGY TO COUNTERACT THE BEHAVIORAL MODIFICATIONS INDUCED BY LOW DOSES OF DOXORUBICIN?

Ângela Raquel Amaro Leal, Filipa Machado, Ana I. Afonso, Isabel Rocha, Vera Geraldes

Faculdade de Medicina da Universidade de Lisboa.

Doxorubicin-induced cognitive impairment and cardiovascular disorders are widely recognized as common complications of cancer therapies, which dramatically deteriorates the patients' quality of life, preventing them from restoring their pre-cancer life. Often termed "chemobrain", these anatomical and functional cardiac changes, including the autonomic nervous system, could interfere with the control of different cognitive domains, with changes in various aspects of memory and executive function, and emotional factors, such as anxiety and depression. Different preventive strategies, such as beta-blockers or physical activity affect positively brain function and can prevent anthracycline-induced sympathoexcitation. Thus, the current study was undertaken to test the hypothesis that beta-blockers or physical exercise can prevent or relieve Dox-induced cognitive and behavioral impairments. We also assess the relationship between heart rate variability (HRV), as a measure of autonomic nervous system (ANS) functioning, and behavioral performance in an animal model of low dose of doxorubicin (DOX). For that, adult female Wistar rats (n = 30), aged more than 20 weeks, were randomly divided into 3 groups, namely doxorubicin (DOX; ip cumulative dose 8 mg/kg, 1 time/week, for 4 weeks), DOX with beta-blockers (DOX+ATN; Atenolol, OA 4 mg/ml, 5 times/week), DOX with exercise training (DOX+EXER; treadmill, 30 min to 22 cm/seg, 5x/week). Anxiety (elevated plus maze), locomotor activity (open-field test) and working memory (Y maze test) were analyzed 2 and 4 weeks after DOX initiation. Overall, our results showed that low dose DOX therapy results in anxiety-like behavior over time and tended to reduce locomotor activity, without evidence of sympatho-excitation. Nevertheless, working memory were not affected. Atenolol treatment significantly increased the amount of time that DOX animals spent in the open arms of the elevated plus maze, mitigating the DOX induced-anxious behavior. This beta-blocker tended to increase locomotor activity and working memory over-time. Physical exercise protocol, similar to atenolol effect, tended to increase the time spent in the open arms, the total distance travelled and the percentage of alternation, suggesting improvements in locomotion and working memory and relieving anxiety associated with DOX therapy. Although both pharmacological and non-pharmacological interventions appear to have a positive effect on behavioral function, atenolol had a more pronounced protective effect. Our preliminary results also provide additional evidence that an increased sympathetic activity, but not decreased parasympathetic activity, is associated with better cognitive performances. However, complementary biochemical and molecular analysis are needed to substantiate this claim.

Sexta-feira, 30 Abril de 2021 | 12H45-14H00

Sala Virtual 3 | CO 06 - Valvulopatias

CO 33. FUNCTIONAL MITRAL REGURGITATION PROFILE AND REFERRAL PATTERNS FOR MITRAL VALVE INTERVENTION OF A REAL-WORLD COHORT OF HEART FAILURE PATIENTS

João Presume, Francisco Albuquerque, Pedro Lopes, Pedro Freitas, Marisa Trabulo, Maria João Andrade, Miguel Mendes, Regina Ribeiras

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

Introduction: Patients with heart failure and reduced ejection fraction (HFrEF) frequently have significant functional mitral regurgitation (FMR), which carries important prognostic impact. Randomized clinical trials on transcatheter mitral-valve repair have shown conflicting results, and their representativeness in real-world populations are unclear. This real-world study sought to identify the proportion of patients who would be eligible for mitral valve intervention and describe the current referral patterns at an academic center.
Methods: We conducted a single center cross-sectional study enrolling consecutive patients with HFrEF and FMR under guideline directed medical therapy from January 2010 to December 2018. Moderate FMR was defined as the presence of an effective regurgitant orifice area (EROA) of ≥ 20 mm^2 or a regurgitant volume (Regvol) of ≥ 30mL/beat, according to American Society of Echocardiography guidelines. Demographic, clinical, echocardiographic and treatment data were assessed. Main MITRA-FR and COAPT Trial eligibility criteria (NYHA class, left ventricular ejection fraction (LVEF), left ventricle end-systolic diameter, pulmonary artery systolic pressure, and right ventricle dysfunction) were applied according to trial protocols. Patterns

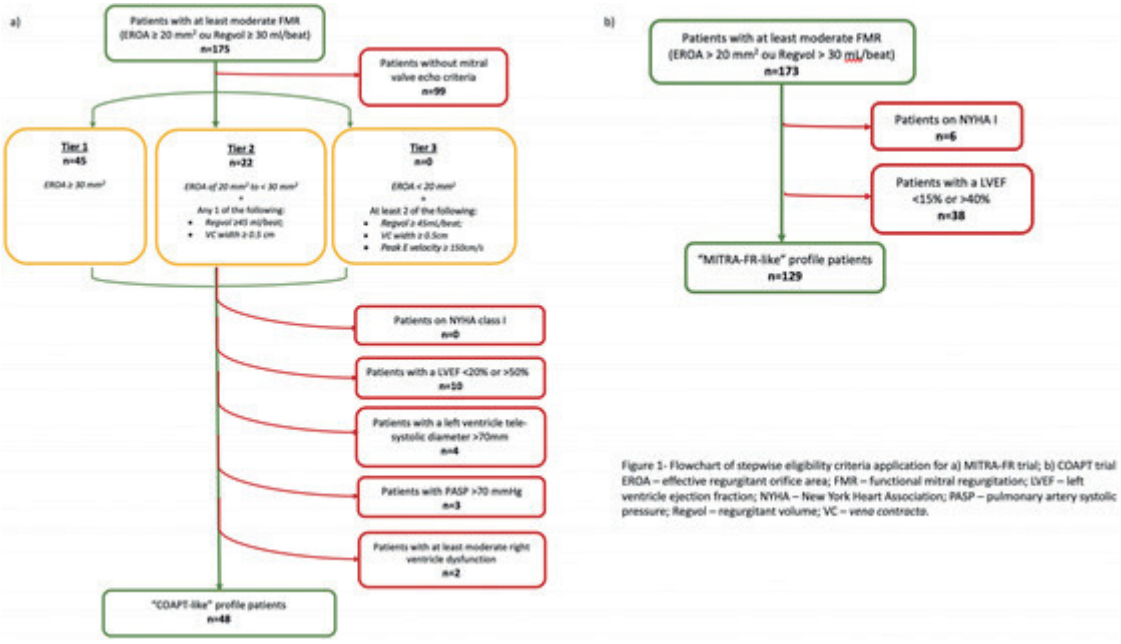


Figure 1- Flowchart of stepwise eligibility criteria application for a) MITRA-FR trial; b) COAPT trial
EROA – effective regurgitant orifice area; FMR – functional mitral regurgitation; LVEF – left ventricle ejection fraction; NYHA – New York Heart Association; PASP – pulmonary artery systolic pressure; Regvol – regurgitant volume; VC – *vena contracta*.

CO 33 Figure

of referral for mitral valve intervention were assessed by pre-procedural transesophageal echocardiography for mitral regurgitation evaluation.
Results: A total of 175 patients with at least moderate FMR were included in the analysis (mean age 70 ± 12 years, 80% male, mean LVEF 32% ± 9). After applying the main eligibility criteria for each study, 73.7% (n = 129) of patients would have been enrolled in MITRA-FR trial, whereas only 27.4% (n = 48) patients would have met criteria for COAPT trial (Figure 1). Patients with MITRA-FR profile had a mean EROA 25 ± 8 mm^2; mean Regvol 36 ± 9 mL/beat; mean LVEDV 205 ± 72 mL; EROA/LVEDV ratio 0.13 ± 0.04. "COAPT-like" patients had a mean EROA 33 ± 10 mm^2; mean Regvol 48 ± 13 mL/beat; mean LVEDV 203 ± 65 mL; mean EROA/LVEDV ratio 0.17 ± 0.05. Only 13.1% (n = 23) were referred for transesophageal echocardiography in order to establish the criteria of feasibility for mitral intervention. A total of 16 patients (9.1%) were submitted to mitral valve intervention during follow-up.
Conclusions: In a real-world population of HFrEF patients with significant FMR, more than one fourth of patients had a "COAPT-like" profile and could have benefited from percutaneous mitral valve intervention. The referral rate for evaluation for a potential intervention was low, which precludes patients from benefiting from this type of treatment.

CO 32. LEFT VENTRICULAR MYOCARDIAL WORK IN PATIENTS WITH HIGH GRADIENT SEVERE SYMPTOMATIC AORTIC STENOSIS

Gustavo Sá Mendes[1], João Abecasis[1], Sérgio Maltez[1], Sara Guerreiro[1], Pedro Freitas[1], Eduarda Horta[1], Telma Lima[1], Regina Ribeiras[1], Maria João Andrade[1], Nuno Cardim[2], Victor Gil[3]

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Introduction: Left ventricular myocardial work (LVMW) is a novel method to evaluated left ventricular (LV) function using pressure-strain loops. It might correct global longitudinal strain (GLS) for afterload, being eventually useful to assess whether GLS reduction is due to reduced contractility (reflected as reduced myocardial work) or increased afterload (reflected as increased myocardial work).
Objectives: to describe indices of LVMW in a group of patients with severe symptomatic aortic stenosis (AS).
Methods: we prospectively studied 104 consecutive patients (age: 71 years [IQR 66.5-75.5] years, 51% men) with severe symptomatic high gradient AS: mean transaortic pressure gradient: 56.5 mmHg [IQR 46.8-67.8]; aortic valve area: 0.73 cm2 [IQR 0.61-0.88]; indexed stroke volume: 47.7 ± 1.3 mL/m2 (11 patients with low-flow AS), preserved LV ejection fraction (EV) (LVEF: 56.0% [51.0-61.3]; GLS: -14.5% [IQR -16.1- -10.6]), with no previous coronary artery disease and no history of cardiomyopathy. Beyond complete transthoracic echocardiography, all patients underwent cardiac magnetic resonance for LV myocardium tissue characterization. As proposed for AS, LV systolic pressure was corrected adding the mean transaortic pressure gradient to non-invasive systolic blood pressure cuff measurement in the echocardiographic algorithm. Four LVMW indices were collected in 83 patients (patients excluded for atrial fibrillation, left bundle branch block or absence of non-invasive blood pressure registration) and correlated to LV function indexes, LV hypertrophy and remodeling, myocardial tissue characterization, BNP and troponin levels (Pearson or Spearman correlation). These same indexes were compared in patients with LV ejection fraction (EF) below and above 50%, normal and reduced flow and presence of replacement fibrosis.
Results: Global constructive work (GCW) (2,658.6 ± 76.4 mmHg%), global myocardial work (GMW) (2,218.7 ± 74.9 mmHg%) and global wasted work (GWE) (262.0 mmHg% [198.8-339.5]) were high above normal with concomitant lower work efficiency (WE) (88.0% [83.2-91.8]. Weak correlations were found between LVMW indexes and parameters describing aortic valve severity, flow and LV function (table). Except for significant differences of LVMI in patients with reduced LV ejection fraction (GCW 2,770.3 ± 687.4 vs 2,056.0 ± 380.7 mmHg%, p = 0.014 and GMW 2,362.5 ± 657.9 vs 1,621.3 ± 319.9, p = 0.021 in patients with LV EF > 50% vs. LV EF< 50%, respectively) work indexes were neither significantly different in low-flow patients nor in those with myocardial late gadolinium enhancement.
Conclusions: Global constructive and myocardial work are increased in these patients with severe aortic stenosis. This might reflect an increased afterload predominance rather than a LV functional impairment, particularly relevant in this group of patients with exclusive high gradient disease and preserved LVEF.

CO 31. ASSESSING PROPORTIONATE AND DISPROPORTIONATE FUNCTIONAL MITRAL REGURGITATION WITH INDIVIDUALIZED THRESHOLDS OUTPERFORMS THE RISK STRATIFICATION PROPOSED BY CURRENT GUIDELINES

Pedro M. Lopes, Francisco Albuquerque, Pedro Freitas, Francisco Gama, Eduarda Horta, Carla Reis, João Abecasis, Marisa Trabulo, António M. Ferreira, Carlos Aguiar, Manuel Canada, Regina Ribeiras, Miguel Mendes, Maria J. Andrade

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

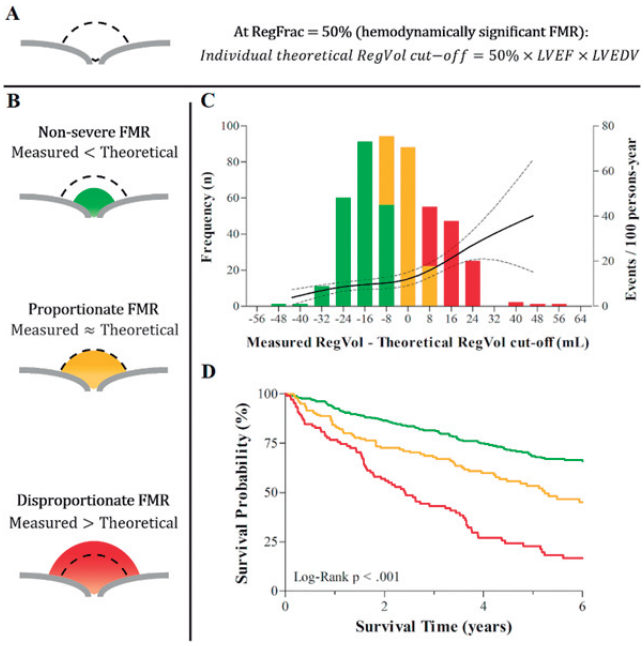
Introduction: The clinical application of the concept of Proportionate and Disproportionate Functional Mitral Regurgitation (FMR) has been limited by the lack of a simple way to assess it. The aim of our study was to evaluate the prognostic value of an individualized method of assessing FMR Proportionality and to compare it with current established guidelines.
Methods: Patients with at least mild FMR and reduced left ventricular ejection fraction (LVEF < 50%) under guideline-directed medical therapy

		r (correlation coefficient)	p-value			r (correlation coefficient)	p-value
GLS	GCW	-0.406	0.000	AVA	GCW	-0.016	0.887
	GMW	-0.389	0.001		GMW	0.013	0.907
PDS	GCW	-0.198	0.095	AVmean	GCW	0.237	0.033
	GMW	-0.046	0.703		GMW	0.212	0.049
LVEF	GCW	0.492	0.000	NT- pro BNP	GCM	-0.016	0.887
	GMW	0.534	0.000		GMW	-0.035	0.763
SVi	GCW	0.451	0.000	Troponin	GCW	-0.238	0.041
	GMW	0.434	0.000		GMW	-0.213	0.070
Indexed Mass [CMR]	GCW	-0.068	0.556	Zva	GCW	-0.236	0.035
	GMW	-0.073	0.428		GMW	-0.239	0.034

Correlations between left ventricle myocardial work and parameters describing Left ventricle function and flow (GLS [global myocardial strain]; PDS [mechanical dispersion]; LVEF [left ventricle ejection fraction]; SVi [indexed stroke volume]; indexed LV Mass CMR [cardiac magnetic resonance]; NT-pro BNP; Troponin, aortic valve severity (AVA [aortic valve area]; Avmean [mean transaortic gradient]) and Zva [valvuloarterial impedance].

CO 32 Figure

were retrospectively identified at a single-center. Considering regurgitant fraction ≥ 50% as the threshold for hemodynamically significant FMR, an individualized theoretical regurgitant volume (RegVol) cut-off can be derived by a simple equation that accounts for LV dilation and dysfunction (Figure panel A). Accordingly, the difference between the measured RegVol and the individual theoretical RegVol cut-off can be used to categorize FMR proportionality as non-severe, proportionate or disproportionate (Figure panel B). The discriminative ability (area under the ROC curve-AUC) of FMR proportionality status was compared against the European and American guidelines. Integrated discrimination improvement (IDI) was used to ascertain if FMR disproportionality improves individual risk stratification provided by both guidelines. The primary endpoint was all-cause mortality. **Results:** A total of 572 patients (median age 70 years; 76% male) were included. Median LVEF was 35% (IQR 28-40) and LVEDV was 169 ml (IQR 132-215). Disproportionate FMR was present in 109 patients (19%), Proportionate FMR in 148 patients (26%) and Non-Severe FMR in 315 patients (55%). During a median follow-up of 3.8 years (IQR 1.8-6.2), 254 patients died. The unadjusted mortality incidence per 100 persons-year (black line, Figure panel C) and the survival probability (Figure panel D) worsened as the degree of FMR disproportionality increased. On multivariable analysis, disproportionate FMR remained independently associated with all-cause mortality (adjusted HR: 1.79; 95%CI: 1.25-2.55; p = 0.001). The FMR proportionality concept showed greater discriminative power (AUC 0.64; 95%CI: 0.60-0.68) than the American (AUC 0.58; 95%CI: 0.55-0.62; P for comparison < 0.001) and European guidelines (AUC 0.58; 95%CI: 0.55-0.62; P for comparison < 0.001). When added to any of these guidelines, FMR proportionality also improved risk stratification by reclassifying patients into lower and higher risk subsets (IDI = 0.037 [p < 0.001] and 0.034 [p < 0.001], respectively).



Conclusions: Disproportionate FMR assessed by an individualized method was independently associated with an increased risk of all-cause mortality. When added to the American and European guidelines, FMR proportionality also improved risk stratification by reclassifying patients into lower and higher risk subsets.

CO 29. EPIDEMIOLOGY OF INFECTIVE ENDOCARDITIS IN PORTUGAL, A POPULATIONAL STUDY

Catarina Sousa[1], Paulo Nogueira[2], Fausto J. Pinto[2]

[1]Centro Hospitalar Barreiro/Montijo, EPE/Hospital Nossa Senhora do Rosário. [2]Faculdade de Medicina da Universidade de Lisboa.

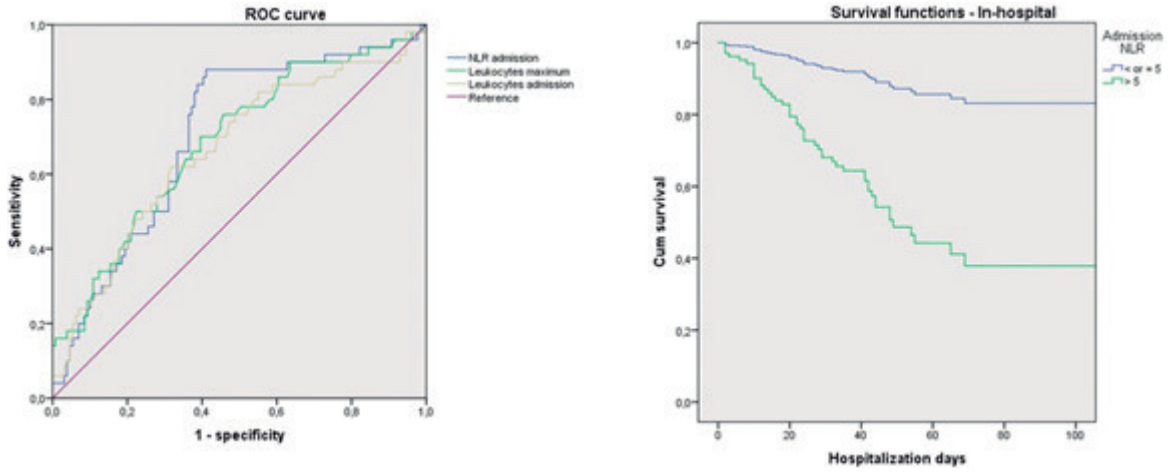
Introduction: Nationwide series have contributed to a reliable assessment of the changing epidemiology of infective endocarditis, even though conclusions are not uniform.
Objectives: We sought to use a recent populational series to describe the temporal trends on the incidence of infective endocarditis, its clinical and outcome results, in Portugal.
Methods: A nationwide retrospective temporal trend study on the incidence and clinical characterization of patients hospitalized with infective endocarditis, between 2010 and 2018, in Portugal.
Results: 7,574 patients were hospitalized with infective endocarditis from 2010 to 2018 in Portuguese public hospitals. The average length of hospitalization was 29.3 ± 28.7 days, predominantly men (56.9%), and 47.1% had between 60 and 79 years old. The most frequent infectious agents involved were Staphylococcus (16.4%) and Streptococcus (13.6%). During hospitalization, 12.4% of patients underwent heart valve surgery and 20% of the total cohort died. The annual incidence of infective endocarditis was 8.31 per 100,000 habitants, being higher in men and increased with age. In-hospital mortality rate significantly increased during the analyzed period, the strongest independent predictors being ischemic or hemorrhagic stroke, sepsis, acute renal failure and older age.
Conclusions: In Portugal, between 2010 and 2018, the incidence of infective endocarditis presented a general growth trend with a deceleration in the most recent years. In addition, a significant rate of in-hospital complications, a mildly lower than expected stable surgical rate and a still high and growing mortality rate were observed.

CO 28. PROGNOSTIC ROLE OF NEUTROPHIL-LYMPHOCYTE RATIO IN INFECTIVE ENDOCARDITIS: A SIMPLE PREDICTOR FOR A COMPLEX DISEASE?

João Gameiro, André Freitas, Diana Campos, Carolina Saleiro, José Sousa, Ana Rita Gomes, Luís Puga, Eric Monteiro, Gonçalo Costa, Joana Silva, Lino Gonçalves

Centro Hospitalar e Universitário de Coimbra.

Introduction: Infective endocarditis (IE) is a infectious disease with high morbidity and mortality. Because of its complex and heterogeneous nature, identifying high risk patients is both challenging and crucial. The neutrophil-to-lymphocyte ratio (NLR), as an inexpensive and easily accessible inflammatory marker, is gaining interest as an independent predictor of worse prognosis in some infectious and cardiovascular diseases. Whether NLR can have a prognostic role in IE is still under investigation.
Objectives: The purpose of this study is to assess and compare, in patients (P) with IE, the prognostic value of 3 variables: NLR at hospital admission, total number of leukocytes at hospital admission and the highest total number of leukocytes during hospital stay.
Methods: A retrospective cohort study from consecutive P diagnosed with definite IE (Duke criteria), admitted to our cardiology ward between January 2010 to December 2020. Baseline clinical data and in-hospital mortality were determined. Receiver operating characteristic (ROC) curves and area under curve (AUC) were calculated for the 3 variables and used for comparison. The cut-off value for the NLR was derived from the Youden index. Predictors of in-hospital mortality and time to the first event were analysed using logistic regression and survival analysis with multivariate Cox regression model.
Results: A total of 262 P were included (70.6% male sex, mean age of 63.8 ± 15). In this cohort, the mean length of stay was 38 ± 27 days. A prosthetic valve was present in 30 % of P and an implanted device in 26% of P. The aortic valve was the most affected valve (43.5%). In 50.8 % of P, blood cultures were positive. The most common organism was Staphyloccocus aureus (19.1%). P were referred to cardiac surgery in 29% of cases. The mean level of NLR in this cohort was 10.67 ± 8. In-hospital mortality in our study was 30.5%. The NLR at admission yielded an acceptable prognostic performance in predicting in-hospital death using ROC analysis (AUC: 0.705, 95%CI: 0.621-0.789, p < 0.001) and performed better than the other variables in predicting death (total number of leukocytes at hospital admission: AUC: 0.665, p = 0.001; highest total number of leukocytes during hospital stay: AUC: 0.684, p < 0.001). A NLR of 5 was suggested as a predictive cut-



CO 28 Figure

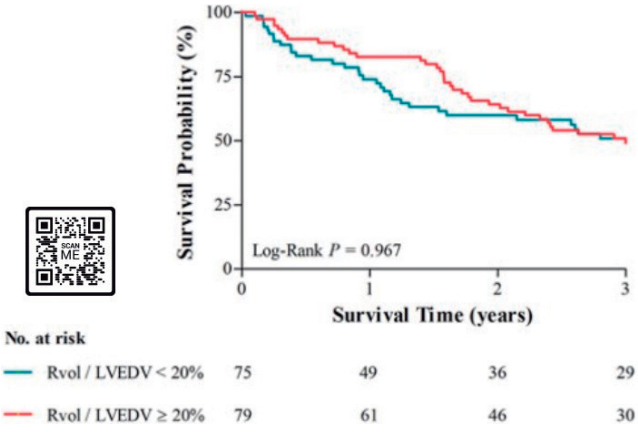
off by the Youden index calculated with this analysis. After dividing our cohort in two groups (NLR ≤ 5 and NLR > 5), we used a multivariate Cox regression analysis adjusted to confounding factors (age, gender, multiple cardiovascular risk factors and other typical IE prognostic factors) that demonstrated a significant statistical impact of NLR > 5 on hospital mortality (HR adjusted: 5.257; p = 0.001).
Conclusions: NLR at admission is an easy to calculate marker with good capacity to predict in-hospital mortality. A NLR level > 5 was significantly associated with higher in-hospital mortality.

CO 30. REGURGITANT VOLUME TO LEFT VENTRICULAR END-DIASTOLIC VOLUME RATIO: THE QUEST TO IDENTIFY DISPROPORTIONATE MR IS NOT OVER

Francisco Albuquerque, Pedro M. Lopes, Pedro Freitas, Eduarda Horta, Carla Reis, António m. Ferreira, João Abecassis, Marisa Trabulo, Manuel Canada, Regina Ribeiras, Miguel Mendes, Maria João Andrade

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

Introduction: Quantification of secondary mitral valve regurgitation (SMR) remains challenging. Proportionate and Disproportionate SMR provides a conceptual framework that relates the degree of SMR to left ventricular dilatation and dysfunction. In line with this concept, regurgitant volume to LV end-diastolic volume ratio (Rvol/LVEDV) was recently proposed as a possible strategy to identify patients with Disproportionate SMR. The aim of this study was to validate this approach in a Portuguese cohort.
Methods: In a single center cohort of patients with heart failure and reduced left ventricular ejection fraction (HFrEF < 50%) under optimal guideline-directed medical therapy (GDMT), we retrospectively identified those with at least moderate SMR. According to the published literature, we divided the study population into 2 risk groups: those with a Rvol/LVEDV ratio ≥ 20% (greater MR/smaller LVEDV) and those with a ratio < 20% (smaller MR/larger EDV). Cox regression and Kaplan-Meier survival analysis were used to assess the association between Rvol/LVEDV ratio and all-cause mortality.
Results: A total of 154 patients (mean age 69 ± 12 years; 81% male) were included. Mean LVEF was 31 ± 8% and median LVEDV was 193 mL (IQR: 155 to 236 mL). There were 74 patients (48.1%) with a Rvol/LVEDV ratio < 20% and 80 patients (51.9%) Rvol/LVEDV ratio ≥ 20%. Regarding GDMT, 141 (91.6%) received beta-blockers, 139 (90.3%) angiotensin converting-enzyme inhibitors/angiotensin receptor blockers and 77 (50.0%) were under mineralocorticoid therapy. Also, there were patients 49 (31.8%) under cardiac resynchronization therapy and 40 patients (26.0%) had an implantable cardioverter defibrillator. During a median follow-up of 2.1 years (IQR 0.7 to 3.8 years), 92 (59.7%) patients died. Cox regression and survival analysis showed no mortality difference between patients with a Rvol/LVEDV ratio < 20% and those with a ratio ≥ 20% (HR: 1.04; 95%CI 0.69-1.57; p = 0.854; Log-rank p = 0.967)-see also figure.



Conclusions: In a Portuguese cohort of HFrEF patients under optimized GDMT and with at least moderate SMR, the Rvol/LVEDV ratio was not associated with an increased risk of all-cause mortality. As such, the Rvol/LVEDV ratio does not seem to be a reliable surrogate of Disproportionate SMR, possibly because it does not account for the degree of LV dysfunction.

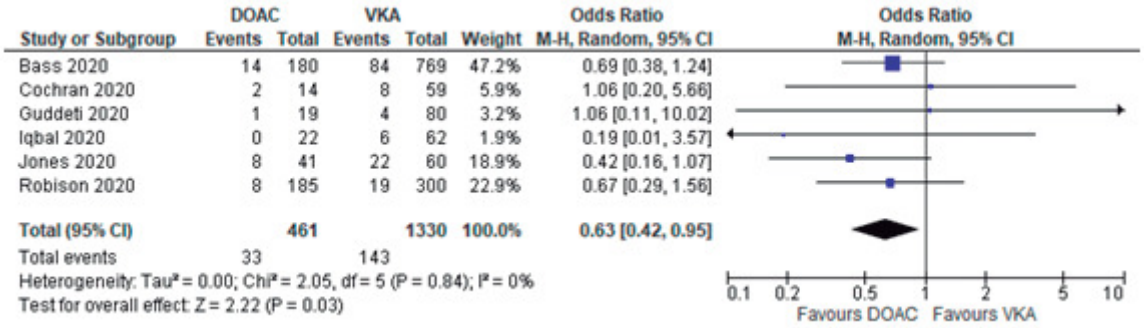
Sexta-feira, 30 Abril de 2021 | 16H30-17H30

Sala Virtual 2 | CO 25- Miscelânea

CO 133. DIRECT ORAL ANTICOAGULANTS COMPARED WITH VITAMIN K ANTAGONISTS FOR LEFT VENTRICULAR THROMBI: AN UPDATED SYSTEMATIC REVIEW AND META-ANALYSIS

Gonçalo Ferraz Costa[1], Carolina Saleiro[2], Vanda Devesa Neto[3], Lino Gonçalves[4], Rogério Teixeira[4]

[1]Centro Hospitalar e Universitário de Coimbra. [2]Centro Hospitalar e Universitário de Coimbra, EPE/Hospital Geral. [3]Centro Hospitalar Tondela-Viseu, EPE/Hospital de São Teotónio, EPE. [4]Centro Hospitalar e Universitário de Coimbra/Hospitais da Universidade de Coimbra.



CO 133 Figure

Introduction: Left ventricular thrombus (LVT) is a frightening complication primarily occurring in patients with LV dysfunction following large myocardial infarction. The role of direct oral anticoagulants in this clinical setting remains controversial.
Objectives: To compare DOACs versus vitamin K antagonists (VKA) in LVT treatment.
Methods: We systematically searched PubMed, Embase and Cochrane databases, in January 2020, for interventional or observational studies comparing DOAC with VKA on LVT treatment.
Results: Seven retrospective studies were included, providing a total of 1,791 patients, 461 patients on DOACs and 1,330 on VKA. In terms of efficacy, our meta-analysis revealed a similar rate of LVT resolution (pooled OR 0.78 [0.55, 1.09], p = 0.14, I^2 = 0%) and systemic embolism (pooled OR 1.13 [0.54, 2.40], p = 0.74, I^2 = 51%), although with moderate heterogeneity in the latter. Nevertheless, regarding total bleeding events, DOAC presented a significant reduction of events (pooled OR 0.63 [0.42, 0.95], p = 0.03, I^2 = 0%).
Conclusions: Our pooled data suggests DOACs as a safer approach to LVT, with no significantly reduced efficacy on LVT reduction.

CO 130. LEFT VENTRICLE REMODELLING AND MECHANICAL IMPROVEMENT AFTER LAPAROSCOPIC SLEEVE GASTRECTOMY

Lígia Mendes[1], Isabel[1], Vasco Atalaia[1], Raquel Seiça[2], Hans Eickhoff[2]

[1]Hospital da Luz Setúbal/Santiago. [2]Instituto de Fisiologia da FMUC.

Introduction: Although obesity is a well-recognized risk factor for heart failure with preserved ejection fraction and weight loss improves prognosis underlying mechanisms are not yet completed understood.
Objectives: We studied the modification of mechanical deformation and workload of the left ventricle after weight loss in the wake of laparoscopic sleeve gastrectomy (LSG).
Methods: Fourteen female patients undergoing LSG for standard indications were enrolled. All subjects underwent a physical examination with biometric evaluation, a glucose tolerance test, homeostatic model assessment of insulin resistance (HOMA-IR), and a comprehensive echocardiography performed according to the EACVI recommendations before surgery (0M) and 6 months post-operatively (6M). All values are presented as mean with standard deviation. Pre-and postoperative time points were compared using a paired t-test.

Variables	0 M	6 M	p value
Left ventricle volume (mL)	106 ± 20	114 ± 25	0.071
Left atrium (mL)	72 ±15	70 ± 14	0.477
FEVE (%)	61± 5	61 ± 5	0.85
Relative thickness of the wall	0.41 ± 0.08	0.32 ± 0.05	0.001
E' septal	9± 2.9	11 ± 3.2	0.012
E' lateral	13 ± 3.5	14.8 ± 3.7	0.044
Global longitudinal strain GLS (%)	17 ± 2.4	19 ± 2.2	0.003
Global Work Efficiency GWE (%)	93 ± 2.7	96 ± 1.6	0.007

Results: Mean weight loss was 29 ± 5.6 Kg (p < 0.0001), systolic blood pressure decreased by 24 ± 16 mmHg (p < 0.0001), and mean heart rate by 9 ± 5 bpm (p < 0.0001). HOMA-IR decreased from 5.2 ± 2.6 to 1.8 ± 1.6 (p = 0.0001). Echocardiographic variables are shown in the table.
Conclusions: LSG induced significant weight loss at 6 months, decreased insulin resistance and improved left ventricle myocardial work efficiency. This last finding, the increase in GWE, was primarily driven by the increment in the longitudinal deformation, since there was a decrease in the afterload.

CO 134. SINDROME MULTISSISTÉMICA PEDIÁTRICA TEMPORALMENTE ASSOCIADO A INFEÇÃO SARS-COV2: ESTUDO DE SEIS CASOS

Marta Novo[1], Luís Salazar[2], Carla Teixeira[2], Alexandre Fernandes[2], Laura Marques[2], Daniel Meireles[2], Alzira Sarmento[2], Filipa Vila-Cova[2], Mariana Magalhães[2], Marília Loureiro[2], Sílvia Alvares[2]

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Introdução: A infeção SARS-CoV2 pode estar temporalmente associada à emergência de uma entidade pediátrica de inflamação multissistémica e choque (Sindrome Multissitémico Pediátrico Temporalmente Associado a Infeção SARS-CoV2, PIMS-TS) que pode apresentar semelhanças à Doença de Kawasaki (KW) e choque tóxico.
Métodos: Foi realizado um estudo descritivo restrospectivo dos doentes com < 18 anos, admitidos em internamento de hospital nível III desde 1 Outubro de 2020 até 15 Janeiro de 2021, que cumpriam critérios de diagnóstico para PIMS-TS da OMS. Analisaram-se dados demográficos, comorbilidades, sintomas, fenótipo associado, investigação analítica/imagiológica, complicações e tratamento.
Resultados: Dos 151 doentes diagnosticados com COVID-19/infeção SARS-CoV2, 36 (23,8%) necessitaram de internamento hospitalar, dos quais 6 (4,0%) cumpriam critérios de diagnóstico PIMS-TS com idade média de 10 anos (5-15 anos), 4 (66%) do sexo masculino e 3 (50%) apresentavam comorbilidades (estenose pulmonar valvular ligeira e asma). 3 casos com PCR positiva a SARS-Cov2 (50%), 3 com serologia IgG positiva e todos com história prévia de contacto com Covid19. Três casos (50%) com fenótipo de Kawasaki-like (2 completo e 1 incompleto com choque cardiogénico). Na apresentação todos tinham febre e hiperémia conjuntival; 83% com exantema, 50% com mucosite, 33% com adenopatias (33%) e 16% edema das mãos. Os sintomas gastrointestinais estavam presentes em 66%. Analiticamente todos apresentavam elevação da proteína C-reactiva e da ferritina, 5 (50%) com elevação da velocidade de sedimentação. Todos com elevação do NT-proBNP, D-dimeros e fibrinogénio, 4 (66%) com elevação da Troponina T. Três (50%) com admissão na UCIP por choque/hipotensão (50%), necessidade de suporte inotrópico (33%), derrame pericárdico (50%), miocardite (33%). Nenhum caso com dilatação/aneurisma das artérias coronárias e 1 com hipertrofia concêntrica do ventrículo esquerdo transitória. IgIV, corticoterapia e antibioterapia em todos os casos e ácido acetilsalicílico em 2 (33%). Tempo médio de internamento hospitalar 10 dias e não se registou nenhum óbito.
Conclusões: PIMS-TS foi recentemente reconhecido e surge 3-4 semanas após infeção SARS-CoV2. É grave e potencialmente fatal. Não se correlaciona com

a gravidade da clínica aguda da infeção viral e pode ocorrer após infeções assintomáticas. O diagnóstico e tratamento precoces são fundamentais para controlar a imunodesregulação multiorgânica, mas com acentuado cardiotropismo. É necessário um elevado índice de suspeição e averiguar a história epidemiológica dos contactos, porque PCR SARS-CoV2 pode ser negativa como vemos nesta série.

CO 131. AVALIAÇÃO DA CAPACIDADE FUNCIONAL POR TESTE DE MARCHA APÓS INFEÇÃO POR COVID 19

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Introdução: COVID 19 é uma infeção nova e complexa, a evidência disponível sugere que muitos doentes (dts) após a cura mantém limitações associadas à doença, em especial dts que necessitaram de hospitalização.
Objetivo: Caracterizar a população de dts infetados com COVID 19 que necessitaram de internamento superior a cinco dias, analisar se houve impacto na capacidade funcional através de teste de marcha dos 6 minutos (TM6M) e verificar se existe associação entre os resultados obtidos no teste de marcha com os sintomas percecionados três a seis meses após a cura, subdividindo os doentes de acordo com a existência de sintomas.
Métodos: Estudo prospetivo, quantitativo e transversal que incluiu todos os doentes infetados com SARS-COV2 que necessitaram de internamento superior a cinco dias e que realizaram TM6M três a seis meses após a cura, dividindo os dts em dois grupos: grupo (G) 1-dts que referem queixas/limitações após a cura; G2-restantes dts.
Resultados: De 06/20 a 12/20, foram incluídos 25 dts, idade média 55 anos, 52% sexo masculino. O tempo médio de internamento foi de 20 dias, 72% dos dts referiam sintomas, sendo os mais frequentes mialgias (32%) e cansaço (60%). O valor médio do TM6M foi 436 ± 115 m, 83,4% do valor previsto e apenas 29% realizou um valor previsto inferior a 75%. A saturação basal foi >94% em todos os doentes; nenhum recebeu oxigénio suplementar durante o teste e nenhum dos testes foi interrompido precocemente. Observou-se no pico de esforço dessatauração em 80% dos dts, com o valor médio de 2,6 ± 3,5% e foi ≥ 4% em 36% dos dts, 40% referiram um índice fadiga na escala de Borg ≥ 5. A distância percorrida no teste de marcha não diferiu significativamente entre os grupos (430 *versus* 451 m, respetivamente p = 0,695) e não foi encontrada associação entre o valor absoluto de metros percorrido pelos dts no TM6M e a perceção de sintomas (χ^2 = 121,87, p = 0,435), no entanto foi possível encontrar associação entre a dessaturação no pico de esforço e a perceção de sintomas (χ^2 = 117,18 p = 0,02).
Conclusões: Os resultados obtidos confirmam que uma percentagem significativa de doentes após a cura mantem sintomas após infeção por SARS-COV2, sendo os mais comuns mialgias e cansaço. Embora a capacidade funcional quando avaliada por TM6M não se encontre comprometida, foi possível encontrar associação entre a dessaturação no TM6M e a perceção de sintomas. São necessários mais estudos para confirmação destes resultados e para compreender os mecanismos e as implicações prognósticas destes achados.

CO 132. CATH LAB ACTIVITY DURING COVID-19 PANDEMIC: REPORT FROM ONE CENTRE

João Baltazar Ferreira, Daniel Faria, Inês Fialho, Marco Beringuilho, Mariana Passos, Joana Lopes, Miguel Santos, Pedro Farto e Abreu, Carlos Morais

Hospital Prof. Doutor Fernando Fonseca.

Introduction: Covid-19 pandemic broadly influenced the clinical activity during the year of 2020 worldwide. In Portugal, the first case was reported on the beginning of March, and given the following rising number of infection cases, the state of emergency was declared. It was again declared from November on following a new raise of the number of infection cases. We therefore consider there were 2 major waves of Covid-19 in Portugal. We aim to investigate how the pandemic waves may have interfered with the cath lab activity in our centre.
Methods: We retrospectively analyzed data from cath lab procedures from the beginning of 2016 to the end of 2020. We compared data from the months of the 2 major waves of Covid-19 in Portugal (March-April and November-December) with baseline data from 2016 to 2018 (we did not considered data from 2019 for baseline purposes because there were several months of inactivity on that year due to technical equipment failures).
Results: There was a reduction on global cath lab activity during both pandemic waves compared to baseline, but it was only statistically significant on the first wave (142 and 183 procedures for first and second wave respectively, with a 34.3% (p < 0.001) and 14.8% (p = 0.11) global reduction respectively compared to baseline monthly activity. The most significant reduction on procedures on first wave was from programmed ambulatory procedures (12.7% vs 23.8% baseline, p = 0.002); that reduction was not observed on the second wave where ambulatory patients represented 31.15% of total procedures. There was no significant difference on the proportion of angioplasty procedures on both waves (51.8 and 51.1% vs 50.3% baseline; p = 0.79 and p = 0.88). There was not a significant difference on proportion of ST-elevation myocardial infarction (STEMI) patients on both waves (23% and 21.3% vs 18.8% baseline; p = 0.22 and p = 0.4). Also regarding STEMI patients from first pandemic wave there was no significant differences on severity at presentation (considering as severe those patients presenting with Killip class III or IV) (3.1% vs 6.6% baseline, p = 0.23). Demographic patient characteristics were similar, as there was not a significant difference of mean age on patients admitted in both waves (mean age 66.57 and 67.34 years vs 65.97 years baseline, p = 0.57 and p = 0.15).
Conclusions: Covid-19 pandemic influenced broadly the global clinical activity, and the activity of the cath lab was no exception. Although there were less overall procedures, that difference was more evident and significant during the first wave of pandemic, and especially regarding ambulatory procedures. Several adaptation efforts were made after the first wave, which reflected positively on the second wave. Therefore, this reinforce the importance for prompt and efficient responses in cases of future pandemic, in order to preserve to the maximum the care of these patients.

Sexta-feira, 30 Abril de 2021 | 11H45-12H45

Sala Virtual 2 | CO 08 - Insuficiência cardíaca crónica

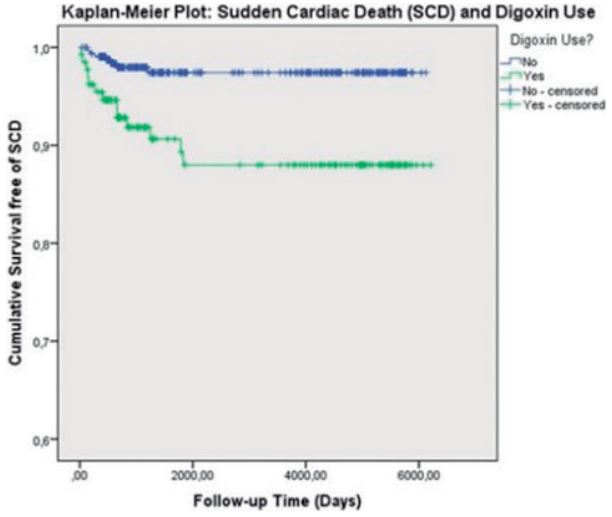
CO 40. PROGNOSTIC IMPACT OF DIGOXIN USE IN A HEART FAILURE POPULATION

Ana Rita Teixeira, João Ferreira Reis, António Valentim Gonçalves, Pedro Brás, Rita Ilhão Moreira, Tiago Pereira da Silva, Ana Timóteo, Rui M. Soares, Bárbara Teixeira, Sofia Jacinto, Rui Cruz Ferreira

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

Objectives: Digoxin (D) may be considered in patients (pts) in sinus rhythm with symptomatic HFrEF to reduce the risk of hospitalization and in pts with HFrEF and atrial fibrillation (AF) for rate control. There are some controversies regarding its safety in this population, with some studies suggesting a higher risk of events, while others showed no deleterious effect on mortality.
Methods: Prospective evaluation of adult pts with HFrEF submitted to CPET in a tertiary centre. Pts were followed up for at least 1 year for the primary endpoints of cardiac death, urgent heart transplantation/ventricular assist device implantation in the first year of follow-up (MH1) and sudden cardiac death (SCD). Univariate followed by Cox multivariate regression analysis were performed to evaluate the impact of D use in the study's endpoints. Survival analysis was performed using Kaplan-Meier plots.

Results: CPET was performed in 487 HRrEF pts, with a mean age of 56.3 ± 12.5 years, of which 79.1% were male, 46.3% of ischemic aetiology (IA), with a mean LVEF of 30.4 ± 7.6%, a mean heart failure survival score (HFSS) of 8.6 ± 1.1. At baseline, 134 (29.3%) pts were receiving D. These pts presented lower LVEF (26.7% vs 30.9%, p < 0.001), HFSS (8.3 vs 8.7, p < 0.001) and sodium values (137.0 vs 138.3, p < 0.001), a lower prevalence of coronary artery disease (38.8% vs 49.2%, p = 0.042), but a higher prevalence of AF (38.8% vs 19.8%, p < 0.001). There was no difference regarding patient's age, prevalence of chronic kidney disease (CKD), peak oxygen uptake (pVO2) or VE/VCO2 slope values. Baseline D use was independently associated with an increased risk of SCD in our population (HR: 3.45; 95%CI 1.28-9.27, 0.014), as well as in pts of IA (HR: 4.45, 95%CI 1.25-15.83, p = 0.014) and with CKD (HR: 15.57, 95%CI 1.97-123.02, p = 0.009). There was no association with SCD in pts of non-ischemic aetiology, preserved renal function and AF. Pts taking D presented a significantly higher incidence of SCD (log rank p < 0.001). D use was not independently associated with MH1 in the general population (p = 0.122 in multivariate analysis), but it was in pts of IA (HR: 4.94, 95%CI 1.32-18.39, p = 0.017).



Conclusions: In our HF population, D use was an independent predictor of SCD, particularly in pts with coronary artery disease and CKD.

CO 41. SARCOPENIA IN HEART FAILURE: WHEN THE IMAGE HOLDS MORE THAN THE BLOOD

Mariana Sousa Paiva, Gonçalo Cunha, Pedro Freitas, Bruno Rocha, João Adriano Sousa, Sara Guerreiro, António m Ferreira, Carlos Aguiar, Miguel Mendes

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

Introduction: Sarcopenia (reduced muscular mass) is an ominous sign in patients (pts) with heart failure (HF). The aim of this study was to compare the prognostic value of 3 surrogate markers of sarcopenia in pts with HF and left ventricular ejection fraction (LVEF) < 50%: serum albumin, modified body mass index (mBMI), and area of pectoralis major muscles (PM).

Methods: This was a retrospective single-centre cohort study of pts with HF undergoing cardiac magnetic resonance imaging (CMR). The key exclusion criteria were LVEF > 50%, known neuromuscular disorders, hematologic malignancies and infiltrative diseases. Laboratory data were collected from electronic records up to 6 months from the CMR. By definition, mBMI was the product of body mass index (kg/m^2) by serum albumin (g/dL). To estimate sarcopenia, we considered the area of PM measured in CMR on standard axial images at the level of the carina (figure 1A). PM area was expressed as the difference between the pt's PM area and the mean PM area of a healthy cohort, expressed in standard deviations of the controls (z-score). The primary outcome was a composite of all-cause mortality or HF hospitalization.

Results: A total of 246 pts were included (mean age 63 ± 13 years, 76.8% male, 61% in NYHA II-III). We found a weak correlation between mean PM z-score and serum albumin, mBMI, serum creatinine (Pearson r = 0.258; 0.258; -0.015, respectively; p values 0.01 to 0.042). Over a median follow-up of 25 months, 59 pts had a primary outcome event. In univariable analysis, all of the 3 surrogate markers were able to predict the occurrence of events. However, after adjustment for serum creatinine, NT-proBNP, LVEF and gender, only the mean PM z-score retained statistical significance (HR 0.595, 95%CI 0.450-0.792, p = 0.005). Splitting the study population according to the best cut-off value for mean PM z-score yielded good risk stratification (figure 1B).

Conclusions: A simple measurement of muscular area in patients undergoing CMR seems to be an independent predictor of outcome in patients with HFrEF. In contrast, and despite their accessibility, serum albumin and mBMI add little prognostic value to well-defined markers.

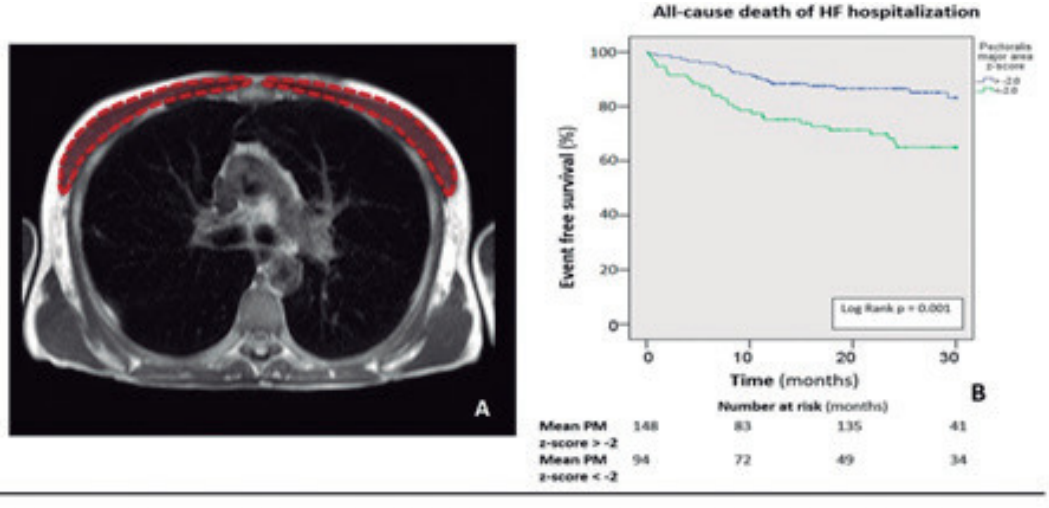


Figure 1A – Standard axial CMR image at the level of carina with pectoralis major muscles tracing. Figure 1B – Kaplan-Meier estimate curve for mean pectoralis major z-score of -2. In the ROC curve, -2 is the best cut-off(AUC 0.645), with a sensibility of 57.7% and a specificity of 65.4% to predict the ocurrence of the composite outcome in one year.

CO 41 Figure

CO 42. RECALIBRATING THE MECKI SCORE IN A PORTUGUESE COHORT OF PATIENTS WITH HEART FAILURE

Sérgio Maltês, Pedro Freitas, Bruno Ml Rocha, Gonçalo Jl Cunha, Catarina Brízido, Christopher Strong, António Tralhão, António Ventosa, António m Ferreira, Carlos MT Aguiar, Miguel Mendes

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

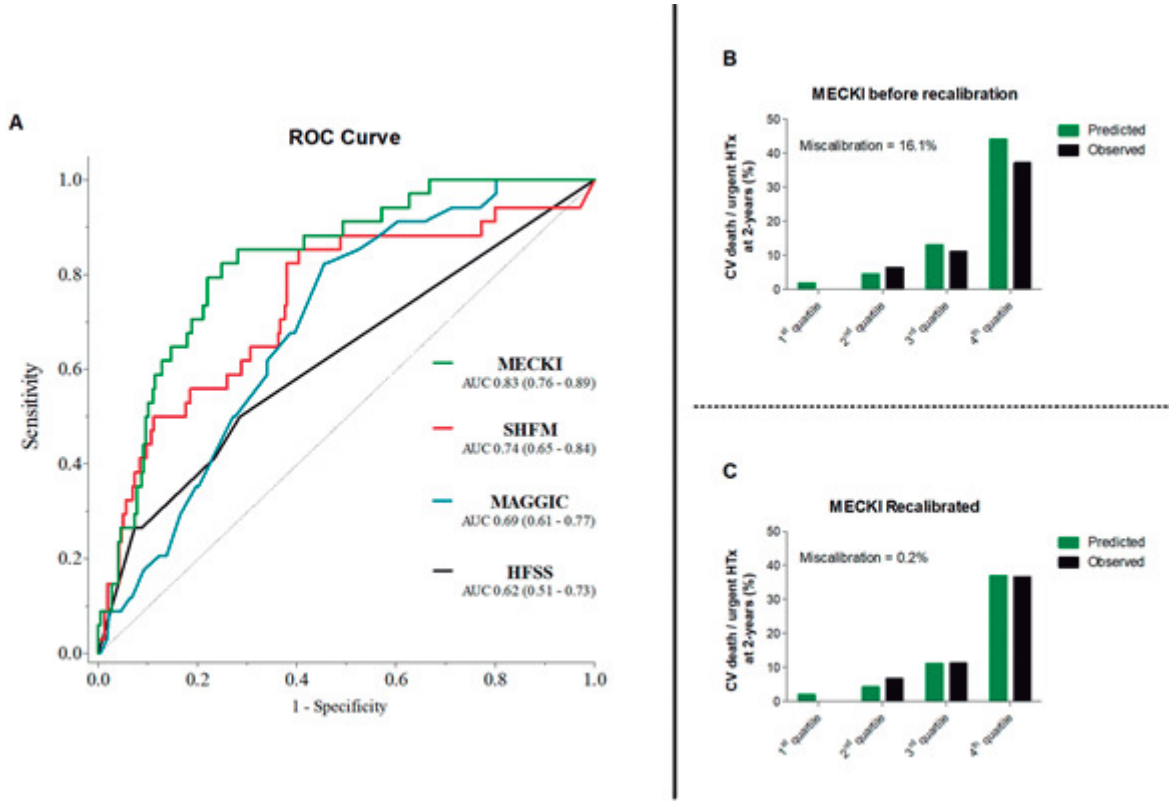
Introduction: Recalibration is often needed when applying new models to external populations where patient characteristics might be different. Risk assessment in the setting of advanced heart failure (HF) is particularly troublesome since critical decisions are often based on these models. The purpose of this study was to assess the performance of 4 different HF prognostic scores, and recalibrate the risk predictions of the best one in a Portuguese cohort.
Methodology: This is a single-center retrospective cohort of HF patients with reduced left ventricle ejection fraction (LVEF < 40%) undergoing cardiopulmonary exercise testing (CPET) between 2003 and 2018. Patients were excluded if they performed a suboptimal CPET (defined by a respiratory exchange ratio < 1.10). The Heart Failure Survival Score (HFSS), Seattle Heart Failure Model (SHFM), Meta-analysis Global Group in Chronic Heart Failure (MAGGIC), and Metabolic Exercise Cardiac Kidney Index (MECKI) were assessed for the discrimination ability (area under the ROC curve) to predict a combined endpoint of cardiovascular death or urgent Heart Transplantation (HTx) at 2-years. Calibration analysis was conducted, and logistical recalibration performed as needed.
Results: A total of 251 patients (mean age 57 ± 12 years; 79% male; 53% with ischemic HF) were included. Mean LVEF was 28 ± 6%. Over a 2-year follow-up period after CPET, 24 cardiovascular deaths occurred and 16 patients received an urgent HTx. There were no urgent LVADs implanted used in our population. The original MECKI score showed the best discrimination ability to predict 2-year risk of cardiovascular death or urgent HTx (AUC 0.83; 95%CI 0.76 to 0.89; p < 0.001)-see figure panel A. However, the original MECKI score tended to overestimate event occurence (overall miscalibration of 16.1%), especially in the highest risk subgroups-see figure panel B. After recalibration-see figure panel C-miscalibration diminished to 0.2%, allowing a more accurate prediction of CV death or urgent HTx at 2-years.
Conclusions: The MECKI score showed the best discriminative ability to predict CV death or urgent HTx at 2-years, but significantly overestimated the risk of events. This overestimation was corrected by recalibrating the model for our population. The newly calibrated MECKI score might prove useful for guiding decisions in Portuguese patients with advanced HF.

CO 43. RIGHT VENTRICULAR DYSFUNCTION IS A PREDICTOR OF NON-RESPONSE TO CARDIAC RESYNCHRONIZATION THERAPY

Tâmara Pereira, Pedro Von Hafe Leite, Geraldo Dias, Ana Filipa Cardoso, Mariana Tinoco, Olga Azevedo, Mário Lourenço, Sílvia Ribeiro, Francisco Ferreira, Victor Sanfins, António Lourenço

Centro Hospitalar do Alto Ave, EPE/Hospital da Senhora da Oliveira.

Introduction: Cardiac resynchronization therapy (CRT) has been of great benefit to many heart failure (HF) patients with reduced ejection fraction (EF) and intraventricular conduction delay. However, approximately 30% of patients fail to respond to CRT. We investigated baseline characteristics that might influence response to CRT.
Methods: We retrospectively enrolled 227 patients undergoing CRT implantation between 2013 and 2020 according to the guidelines. 118 patients were included in our analysis, from whom all data were available. Clinical, electrocardiographic and echocardiographic parameters were evaluated at baseline and 6 months after CRT implantation. Response to CRT was defined as an increase in left ventricular ejection fraction (LVEF) > 10%. Right ventricular systolic dysfunction (RVSD) was defined as S' velocity < 9.5 cm/s or tricuspid anular plane systolic excursion (TAPSE) < 17 mm. Chronic kidney disease (CKD) was defined as GFR < 60 ml/min/1.73 m^2.
Results: 118 patients were included (mean age 69 ± 11 years, 66.1% males, 39.8% ischemic etiology; 35.6% atrial fibrillation, baseline LVEF 27.6 ± 6%). After 6 months of CRT, 65 patients (55.1%) were considered responders. Responders were more frequently female than non responders (43.1% vs 22.6, p = 0.02).



CO 42 Figure

Atrial fibrillation and CKD were more prevalent in non responders (47.2% vs 26.2%, p = 0.018; 62.3% vs 21.5%, p < 0.001, respectively). RVSD was present in 60.4% of non responders vs 16.9% of responders (p < 0.001). In responder group, the mean S' velocity was 10.9 ± 2.1 cm/s vs 9.1 ± 2.1 cm/s in non responder group, p < 0.001. The mean TAPSE was also higher in responder group (20.3 ± 7.2 mm vs 16.5 ± 4.4 mm, p = 0.031). On multivariate analysis only RVSD (OR 7.754; 95%CI 2.968-20.282 p < 0.001] and CKD (OR 5.434; 95%CI 2.109-14.002; p < 0.001) were independently associated with non-response to CRT.
Conclusions: From a range of preoperative characteristics, multivariate analysis only identified RVSD and CKD as independent predictors of CRT response, with S' < 9.5 cm/s and TAPSE < 17 mm associated with non-response to CRT. This study highlights the importance of routine RV assessment in order to improve patient selection and optimize CRT response in heat failure patients.

CO 44. SACUBITRIL/VALSARTAN IN HFREF PATIENTS WITH LOW NT-PROBNP LEVELS-ANY BENEFIT?

Beatriz Silva [1], João Agostinho[2], Tiago Rodrigues[2], Nelson Cunha[2], Pedro Silvério António[2], Sara Couto Pereira[2], Joana Brito[2], Pedro Alves da Silva[2], Joana Rigueira[2], Nuno Lousada[2], Doroteia Silva[2], Fausto J. Pinto[2], Dulce Brito[2]

[1]Centro Hospitalar de Lisboa Norte, EPE/Hospital de Santa Maria. [2]Serviço de Cardiologia, Departamento Coração e Vasos, Centro Hospitalar Universitário Lisboa Norte, CAML, CCUL, Faculdade de Medicina, Universidade de Lisboa.

Introduction: PARADIGM-HF trial included patients (pts) with symptomatic heart failure (HF) with reduced ejection fraction (HFrEF) and NTproBNP levels above > 600 pg/mL or > 400 pg/mL if they had been hospitalized for HF within the previous 12 months. Data regarding therapy with sacubitril/valsartan (S/V) in pts with lower NTproBNP are lacking.
Objectives: To evaluate the clinical and prognostic effects of S/V in patients with HFrEF and low NTproBNP.
Methods: Nested case-control study of pts with HFrEF followed in HF Clinic and medicated with S/V. The study group (SG) was composed of pts with NTproBNp < 600 pg/mL or < 400 pg/mL if they had been admitted due to HF in the 12 months previous to S/V initiation; the control group (CG) was composed of pts with higher levels of NTproBNP. Groups were matched for NYHA, left ventricular ejection fraction (LVEF), age, estimated glomerular filtration rate (eGFR) and HF etiology. A ratio of 2 control group pts to 1 study group pt was used. The 2 groups were compared regarding clinical and prognostic variables after a follow up of 20 ± 12 months.
Results: 27 patients in a cohort of 191 HFrEF patients medicated with S/V met the SG criteria; the CG included 54 patients from the same cohort. At baseline, there were no differences regarding age, NYHA, LVEF, eGFR and HF etiology. Male gender was more prevalent in both groups (74 and 76%), median age was 65 years (IQR 55-71) and 67 years (IQR 57-74), respectively, and median LVEF was 28% (IQR 22-34) in the SG, and 30% (IQR 22-35) in the CG. The most frequent HF etiology was ischemic disease (59% in both groups). Most pts were in NYHA II (78 vs 82%). The median NTproBNP levels were 337 (IQR 238-396) pg/mL in the SG and 1,845 (IQR 1,074-3,251) pg/mL in the CG (p < 0.001). Although no patients from the SG died during the follow-up (vs 7 pts in the control group), there were no significant differences regarding hospitalization or mortality rates (p = NS). LVEF improved similarly in both groups (8 ± 9% vs 9 ± 13%; p = 0.712).There was a clinically significant improvement in NYHA functional class in both groups, but this improvement was more pronounced in the SG (48% of patients improved 1 NYHA functional class; 4% improved 2 classes) in comparison to the CG (28% of patients improved 1 class only) - p = 0.013. The safety profile of S/V was similar in both groups, with no differences in drug withdrawal between groups. A trend for higher doses of S/V use in the study group was observed: 16 (59%) pts in the SG tolerated 49/51 mg vs 20 (37%) pts in the CG, although the dose of 97/103 mg was attained similarly in both groups [5 (19%) pts in the SG vs 12 (22%) pts in the CG].
Conclusions: This study suggests that in patients with HFrEF, low levels of NTproBNP should not be used to define an indication to start S/V. Although not included in the ancillary trial (PARADIGM-HF), pts with low levels of NTproBNP showed a better functional improvement and attained prognostic benefit similar to pts with higher levels.

Sábado, 01 Maio de 2021 | 09H00-10H15

Sala Virtual 3 | CO 09 - Cardiologia Preventiva

CO 49. EPICARDIAL ADIPOSE TISSUE (EAT) VOLUME IS RELATED TO SUBCLINICAL ATHEROSCLEROSIS AND MAJOR ADVERSE CARDIOVASCULAR EVENTS (MACE) IN ASYMPTOMATIC SUBJECTS

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

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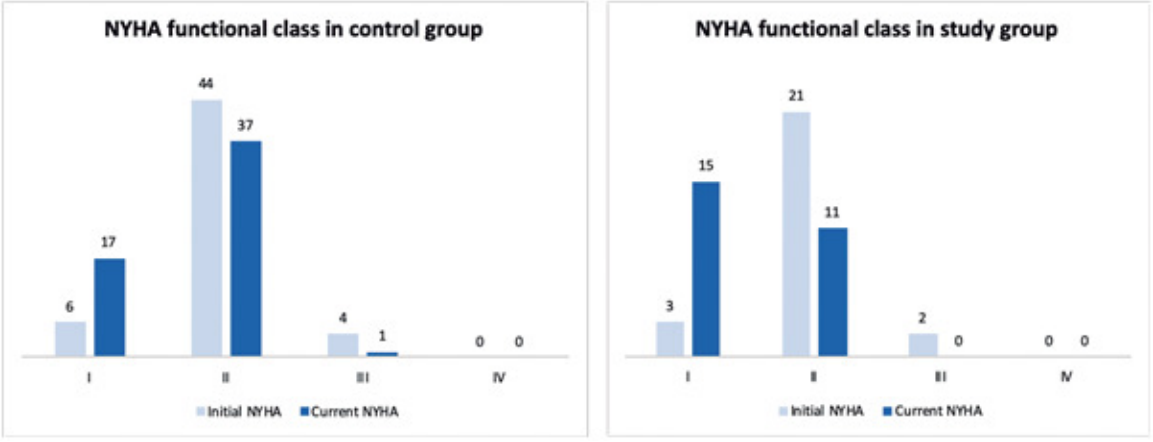
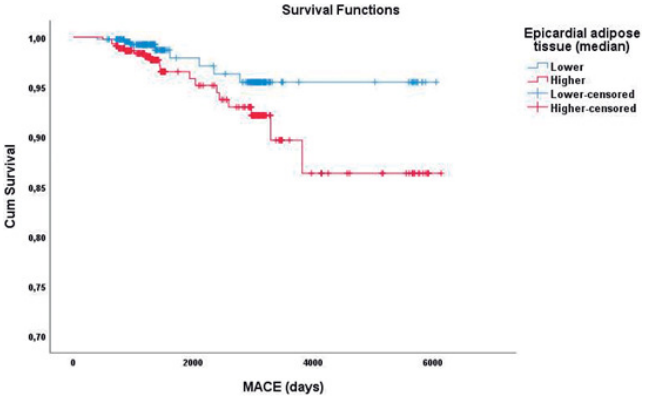
Introduction: Epicardial adipose tissue (EAT) is an emerging cardiovascular risk marker. It has been suggested to be an inflammatory mediator with a



CO 44 Figure

role in subclinical atherosclerosis and coronary artery disease. However, its prognostic relevance in hard clinical outcomes remains thoroughly unexplored in the literature.
Objectives: Evaluate the prognostic relevance of EAT, regarding the occurrence of major adverse cardiovascular events (MACE) in an asymptomatic population.
Methods: 895 asymptomatic volunteers were prospectively enrolled in a single Portuguese center (mean age 51.9 ± 7.7, 78.5% male) and underwent a median follow-up time of 3.7 years (IQR 5.0). EAT volume was measured by Cardiac Computed Tomography (CCT) using a modified simplified method. Participants were distributed into two groups, above and below the EAT-volume median. We compared both groups regarding the occurrence of MACE through univariate analysis, Kaplan-Meier Survival curves and log-rank test. Association to subclinical atherosclerosis was addressed using correlation between EAT volume and calcium score (Agatson).
Results: There is a significant correlation between EAT volume and calcium score (r = 0.205, p < 0.0001) on non-contrast CCT scan, sustaining that it may play an important role in mediating coronary artery disease and subclinical atherosclerosis. Patients with higher EAT volume, were exposed to higher occurrence of MACE on follow-up [70.4% (19 of 27) vs 49.4% (429 of 868), p = 0.032] with a clearer separation of the curves after 5.7 years.



Conclusions: In an asymptomatic population, EAT volume seems to be related to subclinical atherosclerosis and to the occurrence of adverse cardiovascular events on long-term follow-up. Our study addresses some unanswered questions, such as the prognostic relevance of EAT as an emerging cardiovascular risk marker.

CO 45. HOW COST-EFFECTIVE IS THE CNIC POLYPILL FOR THE SECONDARY PREVENTION OF CARDIOVASCULAR AND CEREBROVASCULAR DISEASE IN PORTUGAL? AN ASSESSMENT OF ITS HEALTH- ECONOMIC VALUE

Gabriel Rubio Mercade[1], Carlos Aguiar[2], Francisco Araújo[3], David Carcedo[4], Tânia Oliveira[5], Silvia Paz[6], Jose Maria Castellano[7], Valentín Fuster[8]

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Introduction: The cardiovascular (CV) polypill strategy has proven to successfully reduce healthcare costs by decreasing the CV risk in secondary prevention patients. Previous pharmacoeconomic studies based the improvements in health outcomes on the increased adherence exerted by the CV polypill. Real-life clinical studies have now demonstrated the superiority of the CV polypill over usual care in positively modifying CV risk factors.
Objectives: To assess the cost-effectiveness of the CV polypill (aspirin 100 mg, atorvastatin 20/40 mg, ramipril 2.5/5/10 mg) compared to usual care-combination of individual components - to satisfactorily modify CV risk factors in patients with a history of coronary heart disease (CHD) or ischaemic stroke (IS) in Portugal.
Methods: A Markov cost-effectiveness model (payer perspective; direct medical costs; lifetime horizon) based on changes in CV risk factors obtained from a real-life study conducted in Mexico (limitation) was set for Portugal. The probability of transition between states was based on the SMART risk equation. Cost-effectiveness was calculated for a mixed cohort of post-CHD (representative of the population in the proACS registry) and post-IS patients (representative of the database of the Portuguese Ministry of Health's Central Administration for the Health System) (n = 1,000). Outcomes were costs (€2020) per life year (LY) and Quality Adjusted LY (QALY) gained. One-way (OWA) and probabilistic sensitivity analyses (PSA) tested the consistency of results.
Results: In the weighted population, the incremental cost reaches 607,053 €, 757,092 € for post-CHD and 394,539 € for post-IS. There are less subsequent CV events (90) and CV deaths (17) with the polypill compared to usual care in the overall population, as well as in post-CHD (CV events: 90, CV deaths: 16) and post-IS (CV events: 82.5, CV deaths: 16). The overall incremental cost-effectiveness ratio (ICER) is 5,508€/LY, or 6,519€/LY for CHD and 4,455€/LY for IS; and the incremental cost-utility ratio (ICUR) is 6,324€/QALY in the mixed cohort, and 6,320€/QALY for CHD and 6,378€/QALY for IS. Assuming a willingness-to-pay (WTP) threshold of 30,000 €/QALY gained, there is a 71% chance for the polypill being a cost-effective strategy compared to usual care and 24% of being cost saving.
Conclusions: The polypill is a cost-effective strategy in post-CHD and post-IS patients compared to the individual monocomponents in the secondary prevention of CV disease in Portugal.

CO 46. HOW TO COUNTERACT PHYSICAL INACTIVITY DURING COVID-19 PANDEMIC THROUGH A DIGITAL HOME-BASED MULTIDISCIPLINARY CARDIAC REHABILITATION PROGRAM?

Rita Pinto[1], Mariana Borges[2], Madalena Lemos Pires[2], Mariana Liñan Pinto[2], Catarina Sousa Guerreiro[2], Carla Rodrigues[3], Sandra Miguel[3], Olga Santos[3], Marta Ramalhinho[3], Edite Caldeira[3], Mariana Cordeiro Ferreira[3], Inês Ricardo[4], Nelson Cunha[4], Pedro Alves da Silva[4], Fausto J. Pinto[2], Ana Abreu[2]

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Introduction: Many centre-based cardiac rehabilitation (CR) programs have been forced to close during the first wave of COVID-19 pandemic. Resulting from the suspension of the centre-based CR programs, a major problem emerges regarding the potential harmful effects on the profound increase of physical inactivity and unhealthy lifestyle routines. Therefore, the development of alternative models to maintain access to CR programs and to avoid physical inactivity should be tested and delivered.
Objectives: To assess physical activity (PA) levels in patients with known cardiovascular disease (CVD) after completing 3-months of a home-based multidisciplinary digital CR program, an alternative model to the centre-based CR suspended program.
Methods: 116 patients with CVD (62.6 ± 8.9 years, 95 males) who were previously attending a face-to-face CR program were included and the following parameters were assessed at baseline and 3 months: self-reported PA and sedentary behaviour, adherence to the online CR program, cardiovascular and non-cardiovascular symptoms, safety and adverse events. The intervention consisted in an online multidisciplinary digital CR program including: exercise training sessions, educational sessions, psychological group sessions, risk factor control, nutritional and psychological consults and patient regular assessment.
Results: Ninety-eight CVD patients successfully completed the online assessments (15.5% drop-out). A significant increase was observed from moderate-to-vigorous PA (230 ± 198 min/week to 393 ± 378 min/week, p < 0.001) and a decrease of the sedentary time at 3-months (6.47 ± 3.26 hours/day to 5.17 ± 3.18 hours/day, p < 0.001). Almost 70% of the patients

met the PA recommendations and 41% reached more than 300 min/week of moderate-to-vigorous PA at 3 months. Forty-seven percent did at least more than one online exercise training per week and attended at least one of the online educational sessions. There were no major adverse events reported and only one minor non-cardiovascular event occurred.
Conclusions: Patients with CVD, who suspended their centre-based CR due to COVID-19 pandemic and started a home-based multidisciplinary digital CR program, had an improvement in PA levels and a decrease in sedentary time after 3 months. Therefore, home-based CR programs showed to be a good alternative option for selected clinically stable patients who cannot attend a centre-based CR program due to COVID-19 pandemic or other reasons.

CO 50. CARDIOVASCULAR RISK FACTOR CONTROL: IS IT POSSIBLE WITH A HOME-BASED CARDIAC REHABILITATION PROGRAM?

Nelson Cunha[1], Inês Aguiar-Ricardo[1], Tiago Rodrigues[1], Sara Couto Pereira[1], Pedro Silvério António[1], Pedro Alves da Silva[1], Beatriz Valente Silva[1], Beatriz Garcia[1], Rita Pinto[1], Madalena Lemos Pires[1], Mariana Borges[1], Alda Jordão[2], Carla Rodrigues[3], Fausto J. Pinto[1], Ana Abreu[1]

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Introduction: Cardiovascular risk factors (CVRF) control, needing different strategies, through patient education, lifestyle changes and therapeutic optimization is a central core of cardiac rehabilitation. However, further studies are needed to demonstrate effectiveness of home-based Cardiac Rehabilitation (CR-HB) programs in controlling CVRF.
Objectives: To evaluate the effectiveness of a CR-HB program in controlling cardiovascular risk factors.
Methods: Prospective cohort study including patients who were previously participating in a centre-based CR program and accepted to participate in a CR-HB program due to forced closure of the centre-based CR program for COVID-19 pandemic. The CR-HB consisted of a multidisciplinary digital CR program, including patient regular assessment, exercise, educational, and psychological and relaxation sessions. A structured online educational program for patients and family members/caregivers was provided including educational videos, and powerpoints and webinars. A real time Webinar regarding "nutritional myths and facts" was organized with the duration of 90 minutes as a substitution of the regular face-to-face regular workshop provided at our centre-based CR program. Also, self-control of blood pressure and heart rate and of glycemia in diabetics were promoted, as well as smoking cessation.
To assess the impact of the CR-HB on risk factors control, all the patients were submitted to a clinical and analytical evaluation before and after the end of this at distance program.
Results: 116 cardiovascular disease patients (62.6 ± 8.9 years, 95 males) who were attending a face-to-face CR program were included in a CR-HB program. Almost 90% (n = 103) of the participants had coronary artery disease. Regarding risk factors, obesity was the most prevalent risk factor (74.7 %) followed by hypertension (59.6%), family history (41.8%), dyslipidaemia (37.9%), diabetes (18.1%), and smoking (12.9%). Regarding the blood pressure control, 80% of the patients stated that almost daily they measured blood pressure at home; baseline systolic pressure decreased from 117 ± 13 to 113 ± 12 mmHg, p = 0.007, while there was no significant change in diastolic pressure. The majority (76%) of diabetic patients said they controlled blood glucose; HbA1c decreased from 6.1 ± 1.1 to 5.9 ± 0.9 mg/dL (p = 0.047). Considering the lipid profile, LDL decreased (from 75 ± 30 to 65 ± 26 mg/dL, p = 0.012). The Nt-proBNP also decreased (818 ± 1,332 vs 414 pg/ml ± 591, p = 0.042). There were no other statistically significant differences concerning risk factors modification.
Conclusions: Our study showed that a Home-based Cardiac Rehabilitation program can improve or maintain cardiovascular risk factors control, which has important prognostic implications and is frequently a difficult task to achieve.

CO 47. MORTALITY OF YOUNG PATIENTS WITH SEVERE CORONARY DISEASE AND NO IDENTIFIABLE CARDIOVASCULAR RISK FACTORS

Pedro Custódio[1], Luís Oliveira[2], Gonçalo Cunha[2], Mariana Gonçalves[2], Afonso Oliveira[2], Gustavo Mendes[2], Sérgio Madeira[2], João Brito[2], Sílvio Leal[2], Rui C. Teles[2], Luís Raposo[2], Henrique M. Gabriel[2], Pedro Gonçalves[2], Manuel de Sousa Almeida[2], Miguel Mendes[2]

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Introduction: Clinically significant coronary artery disease has a strong correlation with traditionally identifiable cardiovascular risk factors (CRF), namely obesity (defined as IMC > 30), diabetes mellitus(DM), dyslipidemia, tobacco consumption, hypertension and chronic renal disease. The majority of these comorbidities are thought to accelerate the atherosclerotic pathways through an inflammasome mediated response, that may take decades to become symptomatic. In young patients with severe coronary artery disease without any of the aforementioned comorbidities, other genetically or environmental factors have a potential role. Despite this, the same cardiovascular risk scores are used.
Objectives: Identify the prevalence of young patients with severe coronary artery disease without any CRF. Evaluate the 5 year mortality in these patients and compare it to patients with CRF.
Methods: Retrospective single center study of consecutive patients admitted to the CATH LAB younger than 60years, between January 2007 and December 2015, with a SYNTAX SCORE greater that 22 or with angiographically significant disease (> 50% stenosis) of the left main or the proximal left anterior descendent coronary artery. Patients that were not treated surgically nor percutaneously were excluded as were those with a hybrid approach. The presence of CRF was assessed and patients were divided based on having or not at least one of those. Binary logistic regression was used to search for differences between populations and Cox multivariate regression performed to sought for statistical differences in the 5 year mortality accounting for syntax score, age and coronary artery bypass grafting.
Results: A total of 1,103 patients were included. Mean age 52.9 ± 6.1 years; 924 (83.8%) were male. As for the prevalence of CRF: DM 27.6%; HT 60.5%; Dyslpidemia 61%; Tobacco consumption 66.1%; CRD 3.5% and obesity 25.2%. 47 patients had no identifiable CRF (4.3%). The global 5 year mortality was 5.3% (5% for patients with CRF vs 10.6% for those without). The two subgroups showed no differences in terms of age, syntax score and previous CABG. There was no statistically significant difference in the 5 year mortality between the two groups (B = 0.83; p = 0.079), showing a discrete trend toward lower risk in those with CRF. As expected, there was statistically significant differences in mortality according to the syntax score (p = 0.003) and age (p = 0.05). CABG surgery showed a trend toward lower mortality (p = 0.057).

Table 1. Cox regression for 5year mortality between patients with and with CRF

	B	SE	Wald	gl	Sig.	Exp(B)
Factores de risco cardiovascular	-0.830	0.468	30.140	1	0.076	0.436
BYPASS	-0.628	0.330	30.615	1	0.057	0.534
Idade	0.050	0.025	30.849	1	0.050	1.051
Scores ScoreHemoSyntax	0.037	0.013	80.595	1	0.003	1.038

Table 2. Statistical diferences between populations

		B	E.P.	Wald	gl	Sig.	Exp(B)
Passo 1a	BYPASS	0.057	0.336	0.029	1	0.864	1.059
	Idade	0.039	0.021	3.378	1	0.066	1.040
	Scores ScoreHemoSyntax	-0.001	0.015	0.008	1	0.929	0.999
	Constante	1.084	1.109	0.956	1	0.328	2.957

a. Variável(is) inserida(s) no passo 1: BYPASS, Idade, Scores ScoreHemoSyntax.

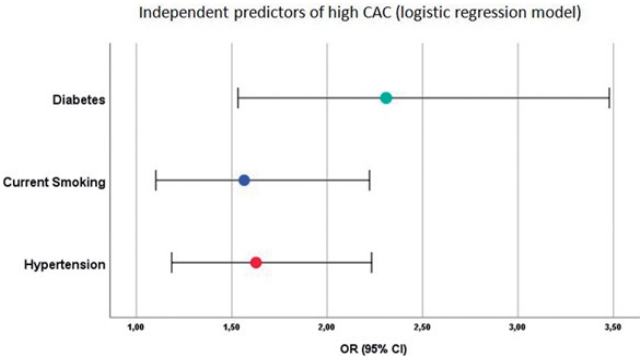
Conclusions: Out of the younger patients with severe coronary artery disease, 4.3% showed no CRF. No statiscally significant difference in the 5 year mortality was found when comparing this population to the one with CRF. Currently used cardiovascular risk scores are probably inadequate to estimate future CV events in this population, which may deserve a closer follow-up.

CO 48. IS THERE A DIFFERENT IMPACT OF TRADITIONAL RISK FACTORS ON CORONARY CALCIUM SCORE, IN AN ASYMPTOMATIC POPULATION?

Margarida Temtem[1], Marco Gomes Serrão[2], Isabel Mendonça[2], Marina Santos[2], Flávio Mendonça[2], Adriano Sousa[2], Ana Célia Sousa[2], Sónia Freitas[2], Eva Henriques[2], Mariana Rodrigues[2], Sofia Borges[2], Graça Guerra[2], António Drumond[3], Roberto Palma dos Reis[4]

[1]Hospital Central do Funchal. [2]Unidade de Investigação, Hospital Dr. Nélio Mendonça. [3]Hospital Dr. Nélio Mendonça. [4]Nova Medical School.

Introduction: The coronary calcium score has been increasingly used to stratify and predict cardiovascular risk, particularly in low and intermediate-risk persons. Understanding which determinants have more impact on coronary calcium score level, could lead to the development of new stricter preventive measures for reducing coronary artery calcification (CAC) and, consequently, cardiovascular risk.
Objectives: Our study aimed to investigate the impact of the traditional risk factors (TRFs) on the CAC score level and if there is a different association between this TRFs and CAC score degrees, in an asymptomatic population.
Methods: The study cohort comprised 1,122 consecutive asymptomatic individuals without known coronary artery disease (CAD) belonging to the healthy controls of GENEMACOR study, referred for computed tomography for CAC assessment. The traditional risk factors considered were (1) current cigarette smoking, (2) dyslipidemia, (3) diabetes mellitus, (4) hypertension and (5) family history of coronary artery disease. According to the Hoff´s nomogram, 3 categories were created: low CAC (0 ≤ CAC < 100 and p < 50); moderate CAC (100 ≤ CAC < 400 or P50-75) and high or severe CAC (CAC ≥ 400 or P > 75). We evaluated the association of the different TRFs with these levels of CAC score (chi-square test). Finally, we performed a logistic regression model adjusted for all significant TRFs selected in the bivariate analyses.



Results: Smoking was significantly associated with high levels of CAC score, 28.4% vs 21.7%; p = 0.038 as well as hypertension, 58.8% vs 45.6%; p = 0.001, type 2 diabetes 21.1% vs 9.6%; p < 0.0001, dyslipidemia, 73.0% vs 66.1%; p = 0.057. Family history did not show a significant association with CAC (p = 0.717). Then, we constructed a logistic regression model adjusted the significant risk factors in previous analysis. The final multivariate analysis, selected as independent predictors of high CAC: Type 2 diabetes (OR = 2.309; 95%CI 1.533-3.479; p < 0.0001), hypertension (OR = 1.627; 95%CI 1.185-2.233; p = 0.003) and smoking (OR = 1.565; 95%CI 1.102-2.222; p = 0.012).
Conclusions: In this study, well-known and modifiable traditional risk factors are associated with high calcium score levels. However, diabetes and hypertension seem to be preferentially associated with higher CAC scores, while tobacco, although it has a significant association, seems to be not so strong as diabetes and hypertension. This concept may mean that smoking has its primary role in plaque instability and not so much in the growing and calcification of plaques.

Sábado, 01 Maio de 2021 | 09H00-10H15

Sala Virtual 2 | CO 10 - Insuficiencia cardíaca crónica

CO 56. RESSINCRONIZAÇÃO CARDÍACA EM DOENTES COM INSUFICIÊNCIA CARDÍACA GRAVE: É POSSIVEL PREVER O PROGNÓSTICO AOS CINCO ANOS?

Sónia Maria Medeiros Oliveira[1], Pedro Silva Cunha[2], Miguel Mota Carmo[3], Bruno Valente[4], Inês Ricardo[1], Pedro Alves da Silva[1], Hua Yang[5], Ana Sofia Delgado[4], Luís Oliveira[6], Nelson Cunha[1], Tiago Rodrigues[1], Fausto Pinto[1], Mário Martins Oliveira[4], Ana Abreu[7]

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Introdução: A Insuficiência Cardíaca Crónica (ICC) constitui um desafio crescente para a gestão global dos recursos em saúde. O prognóstico depende da otimização farmacológica, controle de comorbilidades e fatores de risco, mudanças no estilo de vida e tratamentos invasivos, como a terapêutica de ressincronização cardíaca (TRC) e o transplante cardiaco.

	"não sobreviventes" (n=44)	"sobreviventes" (n=56)	p - valor
BNP	640,95±606,23	370,41±353,36	0.018
HMR late	1,35±0,16	1,47±0,17	0.001
FEVE	27±6,77	26±7,47	ns
Não respondedores	16 (36%)	12 (21%)	ns
VTdVE	225±73,28	191±58,5	<0.001
VTsVE	166,5±63,93	141,24±48,7	ns
hs-PCR	10,33±22,85	5,02±9,27	ns
Duração PCR	363,9±246,4	387,5±233,9	ns
VO2p	14,02±5,16	14,83±5,4	ns
SDNN	132,2±76,2	127,5±68,5	ns

Tabela 1 – Comparação dos grupos "não sobreviventes" vs "sobreviventes" (teste t student)

CO 56 Figura

Objectivo: Avaliar em doentes (D) com ICC grave e referenciados a TRC, a associação de variáveis basais, com a mortalidade em cinco anos de seguimento.
Métodos: Análise post-hoc, de uma coorte prospectiva, D com IC submetidos a TRC (2013-2015). Pré-implantação de TRC, foram avaliados dados demográficos, etiologia e classe NYHA, peptido natriurético plamático (BNP), proteína C reativa de alta sensibilidade (hs-PCR), razão coração/mediatino tardia (late HMR) por cintigrafia cardíaca com 123I-MIBG, fração de ejeção (FE) do ventrículo esquerdo (VE), volumes do VE tele-diastólico (VTd) e tele-sistólico (VTs) avaliados por ecocardiografia, duração da prova de esforço e consumo pico de oxigénio (VO2p) avaliada por prova cardiorrespiratória (PCR), análise do desvio-padrão de todos os intervalos RR normais (SDNN) no Holter de 24 horas. A mortalidade foi avaliada em cinco anos e a população foi dividida em dois grupos: «sobreviventes» e «não sobreviventes». Os dados foram analisados por estatística descritiva. O teste de Spearman foi utilizado para medir a correlação entre as variáveis basais e a morte e entre a resposta a TRC e a morte.
Resultados: 102 doente com ICC foram incluídos (idade 68,8 ± 10 anos), 68,6% homens, 70% dislipidemia, 40% diabetes mellitus, 29% cardiopatia isquémica, 74% NYHA III/IV, FEVE basal de 26 ± 7%. Destes, 27% não responderam à TRC. No seguimento de cinco anos, 1,96% foram perdidos para follow-up, 54% sobreviveram e 43% morreram (8% no primeiro ano, 14% no 2.º-3.º ano e 22% no 4.º-5º). As variáveis basais nos dois grupos («nãosobreviventes» e «sobreviventes») estão presentes na tabela 1. A análise estatística correlacionando as variáveis basais com a morte, através do teste de Spearman, mostrou uma correlação fraca, sendo as variáveis com correlação mais forte, HMR late com correlação negativa de 0,34 e VTdVE com correlação positiva 0,26. No grupo dos respondedores à TRC morreram menos doentes (34%) que no grupo dos não respondedores (57%), com uma tendência mas sem atingir significado estatístico (p = 0,07).
Conclusões: A mortalidade aos cinco anos de D com ICC grave e TRC foi elevada (43%). As variáveis pré-TRC HMR late e VTdVE tiveram a correlação mais forte com a mortalidade, podendo alertar para um pior prognóstico em D com ICC grave submetidos a TRC.

CO 51. PILL BURDEN AND OUT-OF-POCKET MEDICATION COSTS OF A CONTEMPORARY HEART FAILURE WITH REDUCED EJECTION FRACTION COHORT

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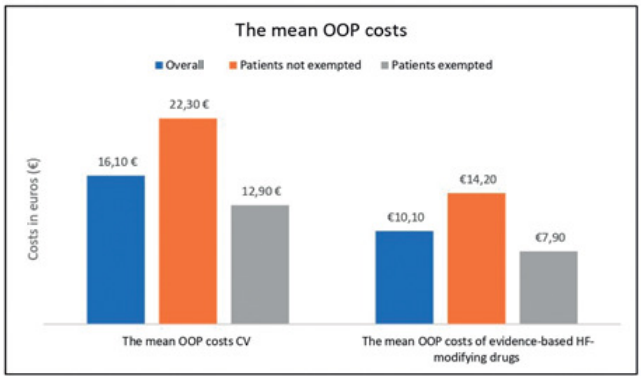
Introduction: Modern pharmacological treatment of heart failure with reduced ejection fraction (HFrEF) dramatically improves its prognosis. However, the increasingly complexity and associated costs might threat their effective uptake in clinical practice. We aimed to study the pill burden and out-of-pocket costs of cardiovascular drug therapy of a contemporary cohort of HFrEF patients.
Methods: We performed a retrospective, cross-sectional, single-center study on a convenience sample of 100 consecutive HFrEF patients assessed at our HF outpatient clinic (January-June 2020). The pill burden was assessed by the number of prescribed different cardiovascular drugs and pills per day. The out-of-pocket (OOP) costs were defined using the total patients co-payment of cardiovascular medications per month of treatment, taken in account the exemptions provided by the Portuguese National Health System (NHS). The included drug classes were antiplatelets, anticoagulants, statins, HF drugs (Beta-blockers [BB], angiotensin-converting enzyme inhibitors [ACEi]/angiotensin receptor blockers [ARBs]/angiotensin receptor-neprilysin inhibition [ARNI], mineralocorticoid antagonists [MRA], sodium glucose cotransport inhibitors [iSGLT2], digoxin, loop diuretic) and antiarrhythmics.
Results: The mean age was 62 ± 12 years and only 24% were female. The etiology of HF was ischemic in 42% of the patients, 86% were in NYHA II class and 5% in NYHA III-IV. The mean LVEF was 34 ± 5% and the median NT-proBNP was 482 pg/mL [172-1,120]. 92% of patients were on BB, 67% on ACEI/ARBs, 25% on ARNI, 81% on MRA and 30% on iSGLT2. The use of implantable cardioverter-defibrillators was 38% and 20% of patients were resynchronized. The number of cardiovascular (CV) drugs per day was 5.4 ± 1.6 per patient and the number of CV pills per day was 6.6 ± 2. Most patients (65%) had low income and had the maximal exemption on medication costs provided by NHS. Overall, the mean OOP costs was €16.1 per month of treatment and the mean OOP costs for patients exempted and not exempted was €12.9 and €22.3, respectively. The mean OOP costs of evidence-based HF-modifying drugs (BB, ACEI/ARBs, ARNI, MRA, iSGLT2) was €10.1 and the mean OOP costs of evidence-based HF-modifying drugs for patients exempted and not exempted were €7.9 and €14.2, respectively. However, for patients on ARNI the mean OOP costs was almost 3 times higher (€33.6).

Figure1: The mean OOP costs. OOP, out-of-pocket, CV, cardiovascular, HF, heart failure.



Conclusions: In this optimally treated contemporary cohort of HFrEF, the pill burden due to cardiovascular therapy only is high (7 pills/day). With the exception of patients on ARNI, the overall OOP costs of HF-modifying prognostic drugs are low. Further studies are needed to assess the impact of these variables in the adherence of HF treatment.

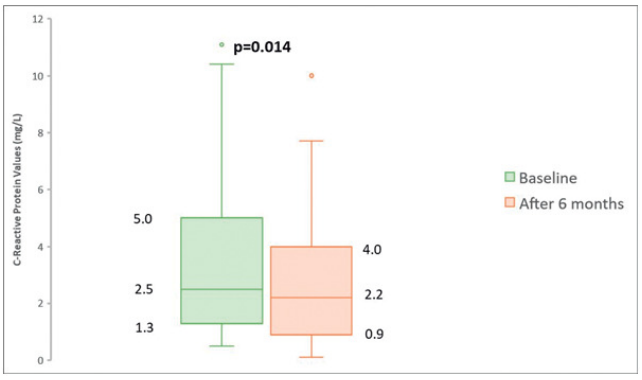
CO 53. C-REACTIVE PROTEIN REDUCTION WITH SACUBITRIL-VALSARTAN TREATMENT IN HEART FAILURE PATIENTS

Ana Rita Teixeira, António Valentim Gonçalves, Tiago Pereira da Silva, Ana Galrinho, Pedro Rio, Luísa Moura Branco, Rui M. Soares, Rita Ilhão Moreira, Bárbara Teixeira, Sofia Jacinto, Rui Cruz Ferreira

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

Introduction: C-Reactive Protein (CRP) has emerged as an accessible measured product of inflammation. Whether systemic inflammation, a common feature of Heart Failure (HF), can be reduced by HF treatments in not well established. Sacubitril/Valsartan had prognosis benefit demonstrated in the PARADIGM-HF trial and was able to reduce proinflammatory cytokines in preclinical animal studies. However, no human studies evaluated if the benefits of this therapy are mediated by anti-inflammatory effects too. The aim of this study was to prospectively compare CRP values before and six months after Sacubitril-Valsartan therapy.
Methods: Prospective evaluation of chronic HF patients with left ventricular ejection fraction ≤ 40% despite optimized standard of care therapy, in which Sacubitril/Valsartan therapy was started and no additional HF treatment was expected to change. Clinical, laboratorial (including CRP values), electrocardiographic, transthoracic echocardiography and cardiopulmonary exercise test (CPET) data were gathered in the week before starting Sacubitril/Valsartan therapy and six months thereafter.
Results: There were 42 patients with a mean age of 59 ± 11 years, of which 35 completed the six months of follow-up, since 2 patients died and 5 discontinued treatment for adverse events. Patients with baseline CRP values above the median (> 2.5 mg/L) had a significantly higher percentage of New York Heart Association class ≥ III (65% vs. 33%, p = 0.028) and a reduced exercise time in CPET (361 ± 297 vs. 575 ± 265 seconds, p = 0.034). After 6 months of Sacubitril-Valsartan therapy, 24 (69%) patients had an improvement in CRP values with a significantly reduction as compared to baseline (median 2.5 mg/L (Interquartile range (IQR) 1.3-5.0) vs. 2.2 mg/L (IQR 0.9-4.0), p = 0.014 in the Wilcoxon test). In the group of 17 (49%) patients with at least 25% improvement in CRP values with Sacubitril/Valsartan

therapy, the benefit of several clinical, CPET and echocardiographic parameters were not significantly different from the benefit of patients with no improvement or an improvement inferior to 25% in CRP values.



Conclusions: Sacubitril/Valsartan therapy was able to reduce CRP values in a chronic HF population. Whether this reduction was only a consequence of clinical improvement with Sacubitril/Valsartan or an anti-inflammatory effect is also present should be further evaluated.

CO 52. PREDICTING OBSTRUCTIVE CORONARY ARTERY DISEASE IN HEART FAILURE-A PRACTICAL CLINICAL SCORE

Francisco Albuquerque, Afonso Félix Oliveira, Pedro de Araújo Gonçalves, Rui Campante Teles, Manuel de Sousa Almeida, Mariana Gonçalves, Pedro M. Lopes, Gonçalo J.L. Cunha, João Presume, Daniel Matos, Sérgio Madeira, João Brito, Luís Raposo, Henrique Mesquita Gabriel, Miguel Mendes

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

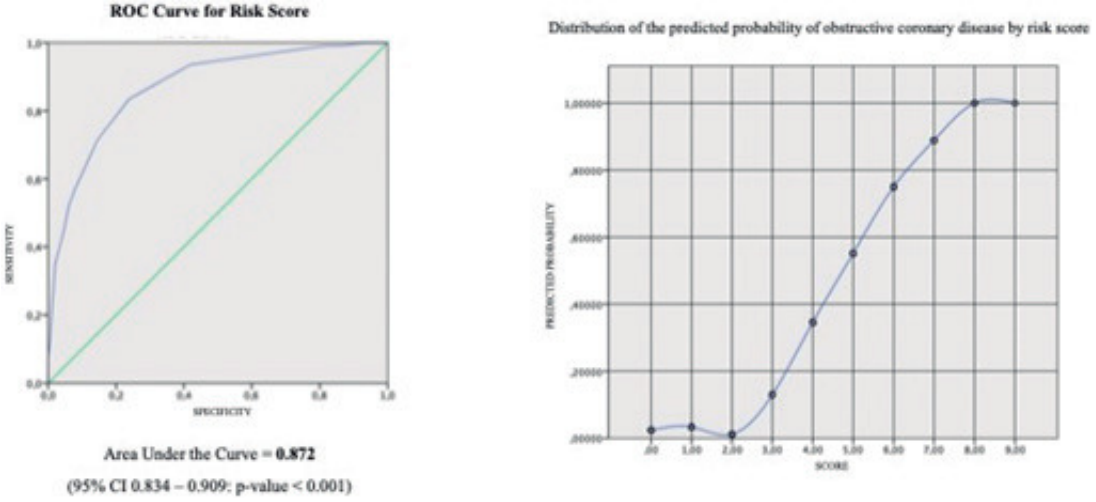
Introduction: Coronary artery disease (CAD) remains the most common etiology of heart failure with reduced ejection fraction (HFrEF). However, controversy exists whether invasive coronary angiography (ICA) should be initially used to exclude CAD in patients presenting with de novo heart failure. The aim of our study was to develop a clinical score to quantify the risk of obstructive CAD in these patients.
Methods: Cross-sectional observational study of 22,383 consecutive patients undergoing elective ICA in one academic center, between January 2005 and December 2019. Predefined exclusion criteria were applied to derive a total cohort of 452 patients with HFrEF without known CAD. Independent predictors for obstructive CAD were identified. Using multivariate logistic regression of designated variables, a risk score was developed. The accuracy and discriminative power of the predictive model were assessed.
Results: 109 patients (24.1%) presented obstructive CAD. Six independent predictors were identified and included in the score: male sex (2 points), diabetes mellitus (1 point), dyslipidemia (1 point), smoking (1 point), peripheral artery disease (1 point) and regional wall motion abnormalities (3 points). Patients with a score ≤ 3 had less than 15% of predicted probability of obstructive CAD. Our score showed good discriminative power (C-statistic 0.872; 95%CI 0.834-0.909: p-value < 0.001) and calibration (p-value from the goodness-of-fit test of 0.333).
Conclusions: A simple clinical score showed the ability to predict the risk of obstructive CAD in patients presenting HFrEF and may guide the clinician selecting the most appropriate diagnostic modality for the evaluation of obstructive CAD in this patient population.

CO 54. DO ALPHA-ADRENERGIC BLOCKERS REALLY INCREASE THE RISK OF POOR CARDIOVASCULAR OUTCOMES? AN ACROSS-THE-BOARD META-ANALYSIS

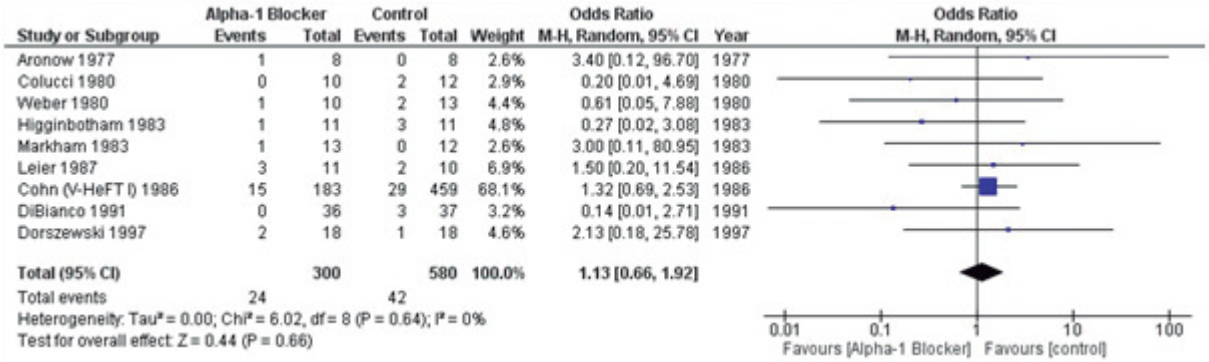
José Pedro Sousa[1], Diogo Mendonça[2], Rogério Teixeira[3], Lino Gonçalves[3]

[1]Centro Hospitalar e Universitário de Coimbra, EPE/Hospital Geral. [2]Faculdade de Medicina da Universidade de Coimbra. [3]Centro Hospitalar e Universitário de Coimbra/Hospitais da Universidade de Coimbra.

Introduction: Due to presumed neurohormonal activation and fluid retention, alpha-adrenergic blockers (ABs) are avoided in the setting of heart disease, namely heart failure (HF) with reduced ejection fraction (HFrEF). However, this contraindication is mainly supported by ancient studies, having recently been challenged by newer ones.
Objectives: To perform a comprehensive meta-analysis aimed at ascertaining the extent to which ABs influence cardiovascular (CV) outcomes.
Methods: We systematically searched MEDLINE, Cochrane Central Register of Controlled Trials and Web of Science for both prospective and retrospective studies, published until November 29th 2020, addressing the impact of ABs on acute heart failure (AHF), acute coronary syndrome (ACS), CV and all-cause mortality rate, as well as on left ventricular ejection fraction (LVEF) and exercise tolerance, by means of exercise duration. Both randomized controlled trials (RCTs) and studies specifically addressing HF patients were further investigated separately. Odds ratios (ORs) and mean differences (MDs) were pooled using traditional meta-analytic techniques, under a random-effects model.
Results: 15 RCTs, 4 non-randomized prospective and 2 retrospective studies, encompassing 32,851, 19,374 and 71,600 patients, respectively, were deemed eligible. 14 studies, including 72,558 patients, comprised only chronic HF patients. 62,299 were allocated to AB. There were 25,998 AHF events, 1,325 ACSs, 954 CV and 33,566 all-cause deaths. ABs were,



CO 52 Figure



CO 54 Figure

indeed, found to increase AHF risk (OR 1.78, 95%CI 1.46-2.16, i² 2%), although displaying no significant effect on ACS, CV and all-cause mortality rates (OR 1.02, 95%CI 0.91-1.15, i² 0%; OR 0.95, 95%CI 0.47-1.91, i² 17%; OR 1.1, 95%CI 0.84-1.43, i² 17%, respectively). When only HF patients were evaluated, ABs revealed themselves neutral towards AHF, ACS, CV and all-cause mortality events (OR 1.13, 95%CI 0.66-1.192, i² 0%; OR 0.49, 95%CI 0.1-2.47, i² 0%; OR 0.7, 95%CI 0.21-2.31, i² 21%; OR 1.09, 95%CI 0.53-2.23, i² 17%, respectively). As for HFrEF patients, ABs exerted a similarly inconsequential effect on AHF odds (OR 1.01, 95%CI 0.5-2.05, i² 6%). LVEF was not significantly influenced by ABs and exercise tolerance was even higher in those under this drug class (MD 139.16, 95%CI 65.52-212.8, i² 26%).

Conclusions: ABs do seem to increase AHF odds, even though at the cost of those at lower risk, thus contradicting current guidelines. Other major CV outcomes appear unchanged.

CO 55. PREDICTORS OF MAXIMAL DOSE TITRATION OF SACUBITRIL-VALSARTAN

Ana Beatriz Garcia[1], Ana Margarida Martins[2], Catarina Oliveira[2], Joana Brito[2], Beatriz Silva[2], Pedro Alves da Silva[2], Sara Couto Pereira[2], Pedro Silvério António[2], Nelson Cunha[2], Tiago Rodrigues[2], Joana Rigueira[2], João Agostinho[2], Nuno Lousada[2], Fausto J. Pinto[2], Dulce Brito[2]

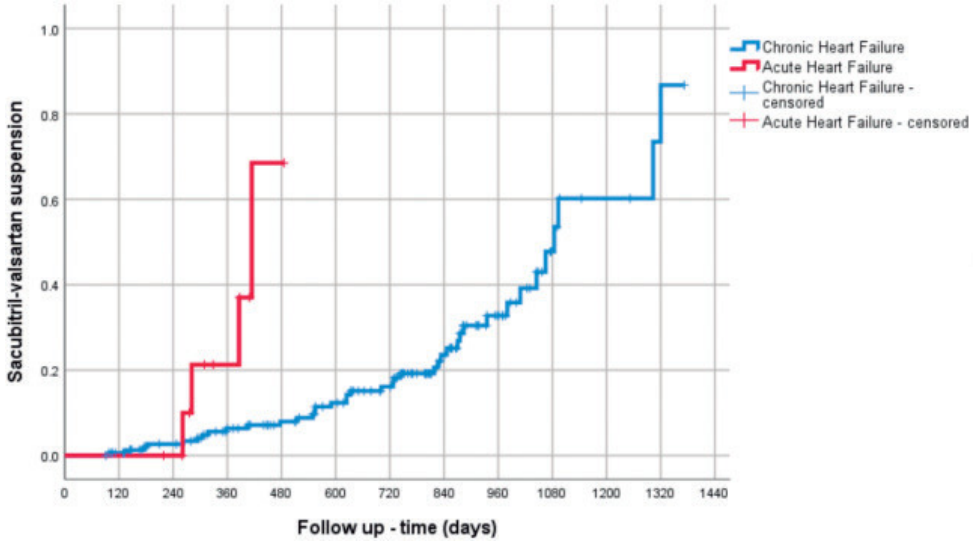
[1]Centro Hospitalar de Lisboa Norte, EPE/Hospital de Santa Maria. [2]Serviço de Cardiologia, Departamento Coração e Vasos, Centro Hospitalar Universitário Lisboa Norte, CAML, CCUL, Faculdade de Medicina, Universidade de Lisboa.

Introduction: Sacubitril-valsartan S/V demonstrated a reduction in all-cause mortality and heart failure (HF) admissions in patients (pts) with reduced ejection fraction (HFrEF). However, achievement the same doses used on clinical trials can be difficult in real world practice. Little information is available on predicting which pts will achieve higher S/V doses.

Objectives: To identify predictors of sacubitril/valsartan titration to the maximal dose.

Methods: Retrospective single-center study of consecutive pts with HFrEF followed at an Ambulatory Heart Failure Clinic. Baseline and follow-up clinical characteristics and biomarker profiles were collected. Univariate and multivariate analyses were used to find predictors of achieving the S/V maximal dose (97/103 mmHg bid).

Results: One hundred seventy-two pts were included, 80% (n = 137) males, mean age 67 ± 12 years, mostly with ischemic heart disease (55%) or dilated cardiomyopathy (36%) and in NYHA functional class II (71%). The mean left ventricular ejection fraction was 28 ± 7%. The mean follow-up time was 632 ± 313 days. Sixty-three patients (37%) achieved maximal dose of S/V, but only 26% (n = 44) maintained that dose. Younger age (OR 0.97; p = 0.030), acute "de novo" HF (OR 7.14; p < 0.001) and higher NYHA functional class (OR 1.92; p = 0.036) was associated with achieving the maximal dose. On multivariate analyses, after adjusting for age, functional class, eGFR, systolic blood pressure, previous dose of angiotensin receptor blockers or angiotensin converting enzyme inhibitors, and acute "de novo" HF was found to be the only independent predictor of attaining maximal dose of S/V (OR = 7.1, 95%IC 2.12- 23.04 p < 0.001). Dose reduction was needed in 36 patients (21%). Symptomatic hypotension was the most common reason to reduce the dose (15%; n = 18) and to completely withdraw S/V (10%; n = 12). The other reasons that led to dose reduction were acutely decompensated



CO 55 Figure

HF, worsening renal function, cough and economic insufficiency (3.3%, 2.4%, 2.4% and 1.6%, respectively). Hyperkalemia led to dose reduction in 1 pt and no S/V withdrawal was due to this adverse effect.
Conclusions: Sacubitril-valsartan was well tolerated and uptitration to the maximal dose of sacubitril/valsartan was possible in up to 37% of a real-world HFrEF cohort. Initiation sacubitril/valsartan during acute "de novo" Heart Failure phase independently predicts maximal dose achieving. Consequently, this study suggests that patients may attain higher benefit on initiating sacubitril/valsartan early after symptoms presentation.

Sábado, 01 Maio de 2021 | 16H45-18H00

Sala Virtual 2 | CO 11- Síncope

CO 59. FRONT-LOADED HEAD-UP TILT TABLE TESTING FOR THE DIAGNOSIS OF REFLEX SYNCOPE

Catarina de Oliveira, Helena da Fonseca, Sérgio Laranjo, Pedro Silva Cunha, Madalena Coutinho Cruz, Bruno Valente, Guilherme Portugal, Rui Cruz Ferreira, Mário Martins Oliveira

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

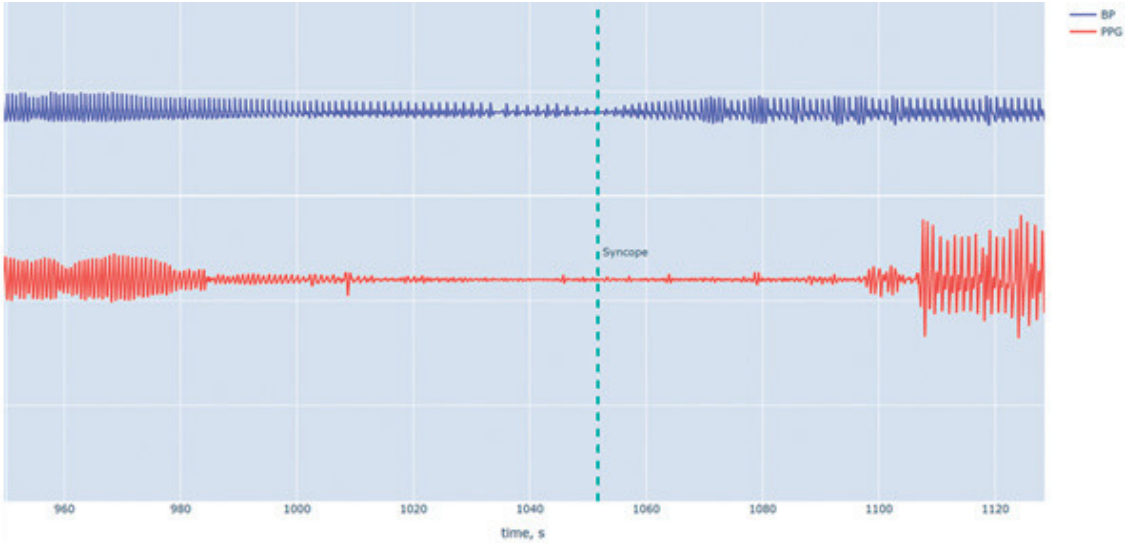
Introduction: Head-up tilt testing (HUT) is commonly used for the diagnosis of reflex syncope, with various protocols applied in the last two decades. Currently, it is a labour intensive and time-consuming method, particularly in the present COVID-19 pandemic. The front-loaded (FL) protocol has been suggested as a rapid alternative to conventional "passive" protocol option, with the potential to provide a higher diagnostic. Our aim was to compare the clinical, hemodynamic and autonomic results of the FL HUT and the modified Italian protocol (IP) in patients (P) with reflex syncope.
Methods: 165 consecutive P with unexplained recurrent syncope were submitted to HUT from September 2019 to December 2020. The modified IP was applied in 88 P (53%), and 77 P (47%) were assigned to the FL protocol. Briefly, in the IP, there was a supine stabilization phase of 20 min, followed by a 20 min passive phase at 70 degrees tilt angle and a provocation phase of further 20 min (after 500 μg sublingual nitroglycerin [NTG]). In the FL the supine phase was of 10 min, followed by administration of 500 μg NTG and 20 min at a tilt angle of 70 degrees. Positive responses were classified according to the modified Vasovagal Syncope International Study (VASIS) classification. All P were continuously monitored for blood pressure, ECG, stroke volume (SV), cardiac output (CO), total peripheral resistance (TPR) and autonomic variables using a TaskForce monitor (CNSystems, Graz, Austria).
Results: In both protocols, P were divided in 2 groups according to NTG response: "fainters" (HUT[+]) and "non fainters"(HUT[-]). In the IP 73% (n = 64) were fainters (23% type 1, 9% type 2A, 16% type 2B, 52% type 3). In comparison, in FL 45% (n = 35) fainted (14% type 1, 9% type 2A, 20% type 2B, 57% type 3). After NTG the hemodynamic and autonomic responses were similar for both protocols: SV, CO and TPR decreased progressively, together with HR increase, but with statistical significance only for HUT[+]. Moreover, BP was stable during a short period, after which a progressive and significant decrease was observed till syncope. In HUT[-], BP, despite slightly lower, was not significantly different from the values of the drug-free period. HUT[+] had a significant rise of sympathetic activity, followed by a continuous steep decrease (to levels below drug-free period) towards syncope; whereas HUT[-] showed a mild, yet significant, increase in sympathetic activity. Baroreflex sensitivity decreased after NTG in all P, but significance was found only for HUT[+].
Conclusions: The FL protocol proved to be an effective, faster, alternative for HUT. The mechanisms underlying the protocol are similar between different protocols. This fact supports the benefit of its use, namely during pandemic, where contacts with patients should be reduced to the essential minimum.

CO 62. PREDICTING REFLEX SYNCOPE BASED ON PLETHYSMOGRAPHY: A NEW WEARABLE DEVICE DEVELOPMENT AND PRELIMINARY RESULTS

Guilherme Lourenço[1], Sérgio Laranjo[1], Lourenço Rodrigues[2], André Lourenço[3], Helena Fonseca[1], Catarina Oliveira[1], Pedro Cunha[1], Mário Oliveira[1]

[1]Centro Hospitalar de Lisboa Central, EPE/Hospital de Santa Marta. [2]ISEL e CardioID. [3]CardioID.

Introduction: Recurrent reflex syncope (RSync) is a common clinical condition with a major impact on patients' life. The underlying mechanism is a transient global cerebral hypoperfusion accompanied by rapid blood pressure (BP) drop. Isometric counterpressure maneuvers (legs/arms) induce BP increase during the phase of impending syncope, avoiding or delaying losing consciousness. Therefore, detecting the onset of syncope mechanism as early as possible it is of major importance, particularly in patients (P) without prodromes.



CO 62 Figure

Objectives: To develop an innovative wearable, efficient and reliable device with the ability to anticipate the RSync.
Methods: P with recurrent syncope referred for head-up tilt testing (HUT) were monitored using a continuous non-invasive arterial BP system (TaskForce Monitor, CNSystems, Graz, Austria), complemented with the synchronized acquisition of plethysmography (PPG) signals using an innovative wearable device. The device used in this experiment is based on the Maxim platform - a wrist band PPG sensor with 3 integrated wavelengths. It uses two sensors with green LEDs, one red and a fourth infrared one to guarantee the required robustness, as well as a 3-axis accelerometer sensor. It allows monitoring of instantaneous heart rate and oxygen saturation, but also the extraction of the raw sensor data, enabling the analysis conducted in this study. The continuous BP signal was synchronized with the PPG by extracting the intervals between systolic peaks and finding the delay on PPG that minimized the quadratic difference between the tachogram time series. Synchronization was further refined by the human verification of the initial estimate. From the aligned signals, a segment of 120 sec was extracted from the basal period, as well as the 120 sec prior to the syncopal event.
Results: Ten P with HUT-induced RSync (1 cardioinhibitory, 5 mixed-type and 4 vasodepressor) were enrolled in this proof of concept study. By computing the areas in each segment, normalized by the amplitude of the basal pulses in each signal, a consistent and significant reduction of the PPG amplitude and wave patterns was found between pre-syncopal and basal periods, starting, at average, 60 sec before syncope, preceding the systolic BP, stroke volume and cardiac output changes.
Conclusions: Predicting RSync is feasible by monitoring PPG amplitude and morphology changes along the time. This new approach may have a relevant impact in the future management of RSync.

CO 58. QUALITY OF LIFE IN REFLEX SYNCOPE PATIENTS: BENEFITS OF A SYSTEMATIC EDUCATIONAL PREVENTION PROGRAM

Helena da Fonseca, Catarina de Oliveira, Sérgio Laranjo, Pedro Silva Cunha, Madalena Coutinho Cruz, Bruno Valente, Guilherme Portugal, Rui Cruz Ferreira, Mário Martins Oliveira

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

Introduction: Syncope is a common clinical condition with a major impact on patients' quality of life (QOL). QOL measurement scales have a useful role in the management of this common situation and play an important role in its treatment. Education, lifestyle measures, adequate hydration, salt intake and counter-pressure manoeuvres are well established for the treatment of reflex syncope.
Objectives: Assess a 3-month evolution of a prevention educational measures program in patients (P) with recurrent reflex syncope through the application of a specific questionnaire of Impact of Syncope in Quality of Life (ISQL) in a syncope unit (US).
Methods: ISQL was applied to all P referred to head-up tilt testing (HUT) from May to October 2020. After HUT P received an educational program to avoid syncope recurrence. Three months after HUT, a new ISQL application was done and educational measures sessions repeated.
Results: We studied 49 P (51% women, median age of 56.7 years). Syncope recurrence was noticed in 16% (n = 8), with a mean recurrence of a single episode. When asked for adherence to preventive measures 96% answered "yes". However, in the questionnaire, only 20% adopted all non-pharmacological recommendations. The median ISQL before HUT was 44.2 ± 11.9, and 3-months after 50.53 ± 8.9 ($p < 0.05$). ISQL item about "fright of fainting" has shown a decrease in 51% of the P and the "emotional confusion created by fainting" had a drop of 12%.
Conclusions: A systematic educational program in recurrent reflex syncope appears to be effective reducing syncopal recurrence rate and improving QOL.

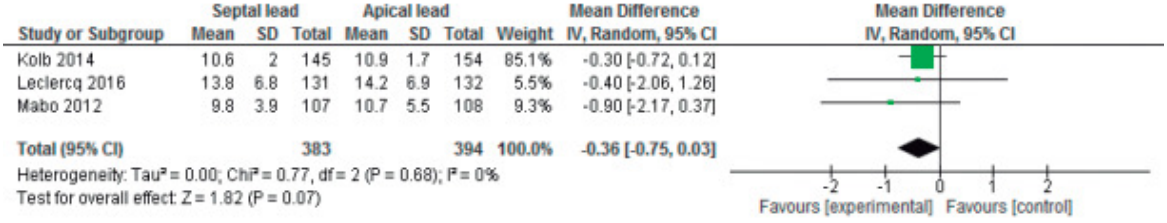
CO 57. SEPTAL VS. APICAL CARDIOVERTER-DEFIBRILLATOR RIGHT VENTRICLE ELECTRODE PLACEMENT-A SYSTEMATIC REVIEW ON LONG-TERM FOLLOW-UP

Hélder Santos[1], Mariana Santos[2], Inês Almeida[2], Paula Sofia Paula[2], Margarida Figueiredo[2], Guilherme Portugal[3], Bruno Valente[3], Pedro Cunha[3], Micaela Neto[2], Lurdes Almeida[2], Mário Oliveira[3]

[1]Centro Hospitalar Barreiro/Montijo, EPE/Hospital do Montijo. [2]Centro Hospitalar Barreiro/Montijo, EPE/Hospital Nossa Senhora do Rosário. [3]Centro Hospitalar de Lisboa Central, EPE/Hospital de Santa Marta.

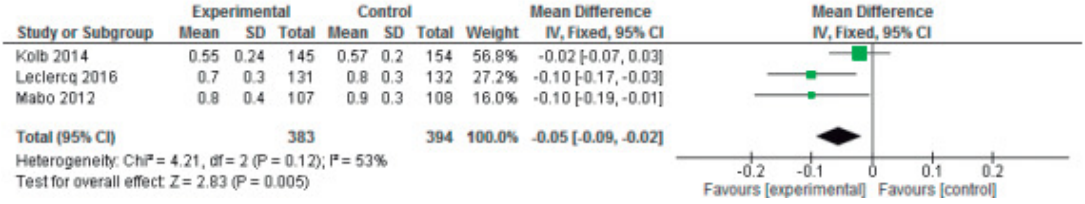
Introduction: The optimal right ventricular (RV) defibrillator lead placement is still a debatable matter. We attempt to performed a systemic review to evaluate whether septal and apical placement had significant differences in the implantation parameters and during follow-up.
Objectives: Review the evidence regarding the efficacy and safety of apical and septal RV defibrillator lead placement.
Methods: A systemic search on MEDLINE and PUBMED databases with the terms "septal pacing", "apical pacing" "septal defibrillation" and "apical defibrillation". A total of 309 results was identified and subsequently selected after a serious analysis, just comparisons with long-term follow up was included. Comparisons between apical and septal placement were performed regarding R-wave amplitude, pacing threshold at a pulse width of 0.5 ms, pacing and shock lead impedance, left ventricular ejection fraction (LVEF), left ventricular end-diastolic diameter (LVEDD) and lead complications.
Results: A total of 6 studies with > 1 year follow-up comprising 2180 patients was included in the analysis. The studies were performed with different techniques, analyses and goals, and presented heterogeneous results. Mean age was 64.5 years, 76.9% were male, with a median LVEF of 27.8%, NYHA class of 2.65, ischemic etiologic in 51.1% and a mean follow-up period of 26.5 months. Apical lead placement was performed in 1399 patients while the septal lead placement was established in 772 patients. No differences regarding the lead performance on apical and septal placement were detected regarding the R-wave (MD -0.36, CI -0.75 - +0.03, $p = 0.68$, $I^2 = 0\%$) (reported in 3 studies, graph 1) and lead impedance (MD -23.83, CI -51.36 - +3.69, $p = 0.003$, $I^2 = 82\%$) (reported in 3 studies, graph 2). Pacing threshold showed values in favour of a septal defibrillator lead implantation (MD -0.05, CI -0.09 - -0.02, $p = 0.12$, $I^2 = 53\%$) (reported in 3 studies, graph 3). Regarding echocardiography parameters during the follow-up period, LVEF (MD -0.83, CI -3.05 - +1.38, $p = 0.10$, $I^2 = 57\%$) (reported in 3 studies, graph 4) and LVEDD (MD -0.51, CI -2.13 - +1.10, $p = 0.20$, $I^2 = 38\%$) (reported in 3 studies, graph 5) were not significant influenced by the defibrillator lead placement. Lead complications rate causing lead replacement was not significant different between the lead placement (MD 1.25, CI 0.53-2.94, $p = 0.71$, $I^2 = 0\%$) (reported in 3 studies, graph 6).

Graph 1: R wave parameters between the septal vs apical defibrillator lead placement.



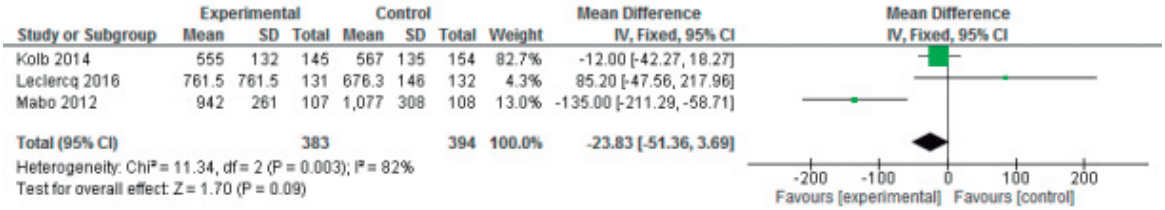
CO 57 Figure 1

Graph 2: Pacing threshold at 0.5 ms between the septal vs apical defibrillator lead placement.



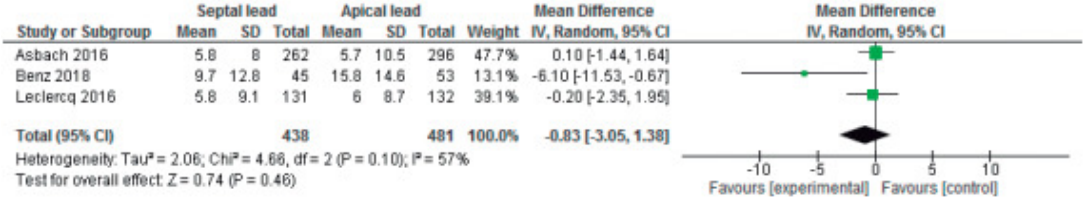
CO 57 Figure 2

Graph 3: Lead impedance between the septal vs apical defibrillator lead placement.



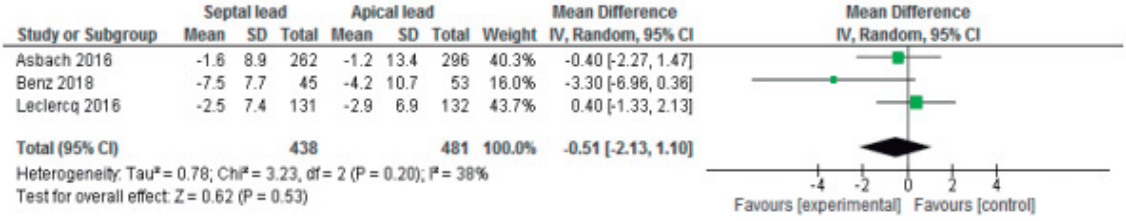
CO 57 Figure 3

Graph 4: LVEF variation with a follow up between the septal vs apical defibrillator lead placement.



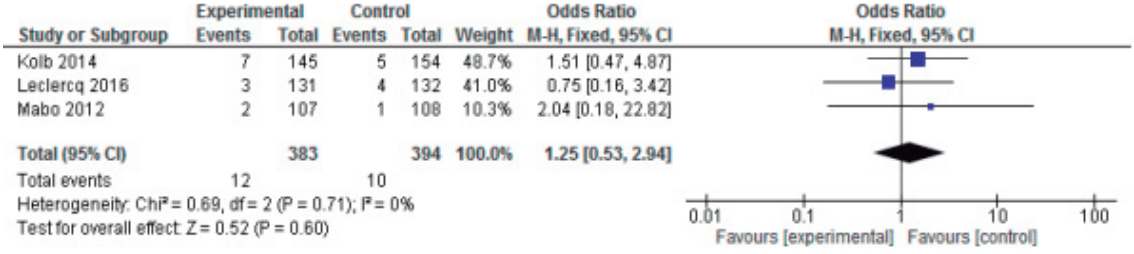
CO 57 Figure 4

Graph 5: LVEDD variation with a follow up between the septal vs apical defibrillator lead placement.



CO 57 Figure 5

Graph 6: Lead complications between the septal vs apical defibrillator lead placement.



CO 57 Figure 6

Conclusions: Among patients receiving a defibrillator lead, only pacing threshold showed results in favour of septal lead placement. The comparison between apical and septal RV location did not affect significantly other lead parameters, lead performance or echocardiography results during the long-term follow-up. Therefore, potential risks and benefits of RV defibrillator placement should be carefully weighed.

CO 60. LONG-TERM OUTCOMES IN PATIENTS WITH POTENTIAL REVERSIBLE CAUSES OF BRADYCARDIA

Mariana Passos[1], Inês Fialho[1], Joana Lima Lopes[2], Daniel Faria[1], João Baltazar[2], Marco Beringuilho[1], Hilaryano Ferreira[2], Carlos Morais[1], João Bicho Augusto[1]

[1]Hospital Amadora Sintra. [2]Hospital Prof. Doutor Fernando Fonseca.

Introduction: Hyperkalemia and negative chronotropic drugs are well known causes of reversible bradycardia. Their synergic combination may result in BRASH syndrome (Bradycardia, Renal failure, Atrioventricular blockade, Shock, and Hyperkalemia), a consequence of the vicious cycle between bradycardia, renal failure and worsening hyperkalemia, leading ultimately to multiorgan dysfunction. In potentially reversible bradycardia, drug discontinuation or metabolic correction is recommended before permanent pacemaker (PPM) implantation.
Objectives: To determine the long-term prognosis in patients with potentially reversible symptomatic bradycardia.
Methods: We retrospectively reviewed 176 patients who presented to the emergency department with symptomatic bradycardia, between January 2015 and August 2016. Patients without any reversible cause of bradycardia were excluded. Participants were stratified into three groups according to the reversible causes of bradycardia: patients with hyperkalemia, with or without acute renal injury (ARI) (group 1); patients taking negative chronotropic drugs, with or without ARI (group 2); patients with BRASH syndrome (combination of hyperkalemia and negative chronotropic drugs, with or without ARI) (group 3). The primary endpoint was PPM implantation after discharge. Secondary endpoints included: bradycardia-related rehospitalization, heart failure (HF) hospitalization, all-cause mortality and a composite of all the previous endpoints.
Results: A total of 105 patients were included (52.4% female; mean age 79.8 ± 8.6 years). Group 1 was comprised by 15 patients (14.3%), group 2 by 69 patients (65.7%) and group 3 by 21 patients (20%, figure 1A). The incidence of each event is presented in figure 1B. During a mean follow-up of 3.2 ± 2.1 years, PPM was implanted in 60 patients (57.1%)-51 during hospital stay (85%) and 9 after discharge (15%). Across all groups, approximately 50% of the patients needed PPM implantation at some point, without significant differences between groups (p = 0.508). Group 3 had the lowest need of in-hospital PPM (38.1%) but the highest bradycardia-related readmissions (9.5%). Nevertheless, post-discharge PPM implantation was still higher in group 1 (33.3%), followed by group 3 (22.2%). There were no significant differences in the post-discharge PPM implantation rate between groups (p = 0.76). In groups 1 and 3 the composite endpoint (73.3% and 76.2%, respectively) was significantly more frequent than in group 2 (44.9%, p = 0.046 and p = 0.012, respectively).
Conclusions: Nearly half of the patients with an episode of reversible bradycardia needed a PPM at some point. Given the advanced age of most patients with bradycardia secondary to metabolic derangement and/or drug toxicity, it is possible that this unveils underlying conduction system disease, which is likely to recur without PPM implantation.

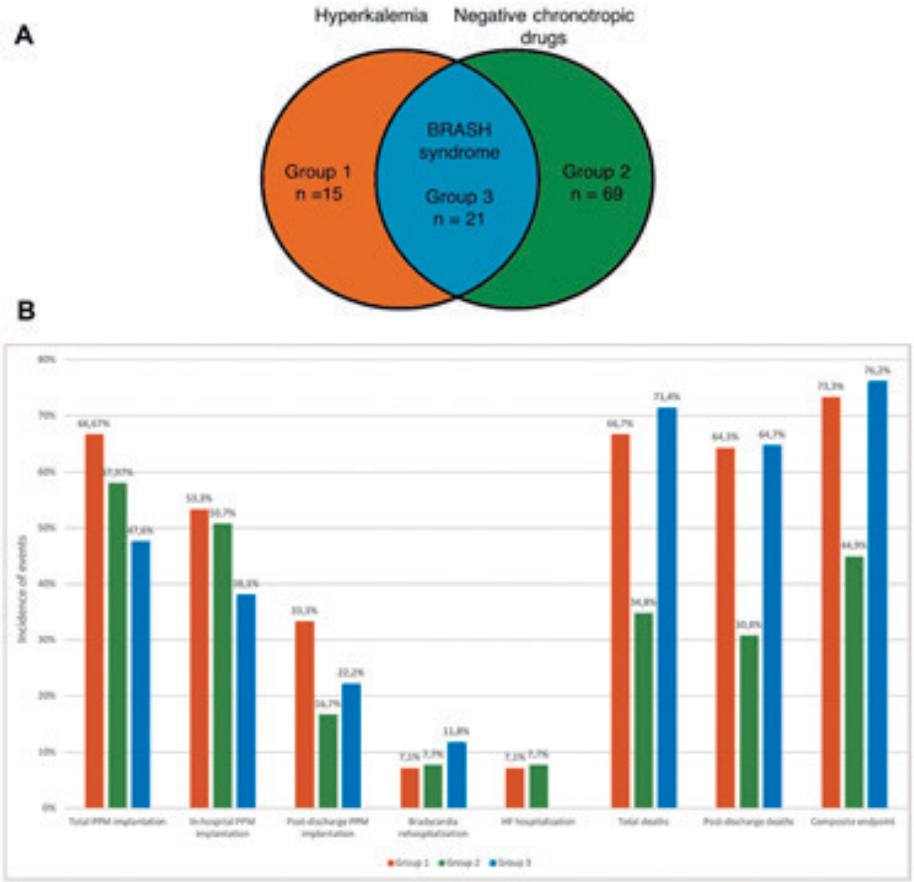


Figure 1) **A:** Study groups distribution. **B:** Proportion of events across all groups.

CO 60 Figure

CO 61. ATRIOVENTRICULAR SYNCHRONOUS PACING USING A LEADLESS VENTRICULAR PACEMAKER: SINGLE CENTRE EXPERIENCE

Pedro M. Lopes, Diogo Cavaco, João Carmo, Pedro Carmo, Francisco M. Costa, Pedro Galvão Santos, Francisco B. Morgado, Sérgio Fartouce, Isabel Santos, Gustavo R. Rodrigues, Daniel N. Matos, Miguel Mendes, Pedro Adragão

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

Introduction: Despite many advantages, leadless pacemakers are currently only capable of single-chamber ventricular pacing. More recently it was developed a new software to detect atrial contraction using a 3-axis accelerometer enabling AV synchronous pacing.
Objectives: To evaluate the feasibility of AV synchronous pacing in leadless pacemaker.
Methods: This is a prospective single centre registry enrolling 11 consecutive patients with AV block referred to leadless pacemaker Micra™ with AV synchronous algorithm (VDD). Baseline, procedural and follow-up data were collected. The last segment of cardiac activity in accelerometer signal (A4) which corresponds to atrial contraction was measured in amplitude. Atrioventricular synchrony (AVS) was measured during 30 minutes of rest (Holter monitor) in patients with complete or high-degree AV block and was defined as a P wave visible on surface ECG followed by a ventricular event < 300 ms.
Results: The mean age was 78 ± 10 years and 73% were male. Complete or high-degree AV block was present in 5 patients, whereas 6 patients had predominantly intrinsic conduction. The mean pacing threshold during implantation was 0.71 ± 0.34 V @ 0.24 ms. No major complications were reported. The mean follow up was 118 ± 76 days. The mean pacing threshold during follow-up was 0.84 ± 0.63 V @ 0.24 ms. The mean A4 amplitude was 1.7 ± 1.9 m/s. The average AM-VP measured in office was 74% in patients with complete or high-degree AV block. After programming, the average AVS in complete or high-degree AV block measured with Holter monitor was 93%. No patient showed sinus disease.
Conclusions: Leadless pacemaker with accelerometer-based atrial sensing is feasible and had a high AVS, similar to conventional VDD pacemakers with the advantages of leadless pacing.

Sábado, 01 Maio de 2021 | 15H00-16H15

Sala Virtual 3 | CO 12 - Cardiologia preventiva/reabilitação

CO 67. EXERCISE OSCILLATORY VENTILATION DISTURBANCES: FINDING ORDER AMONGST CHAOS

Gonçalo Lopes da Cunha, Bruno Rocha, Sérgio Maltês, Pedro Freitas, Francisco Gama, Maria João Andrade, Carlos Aguiar, Luís Moreno, Anaí Durazzo, Miguel Mendes

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

Introduction: Exercise Oscillatory Ventilation (EOV) during Cardiopulmonary Exercise Test (CPET) predicts prognosis in patients with Heart Failure (HF). In these patients, O_2 consumption (VO_2) oscillations have also been described, possibly secondary to circulatory delay. We hypothesize that in clinically meaningful EOV, cardiac output variation is mirrored by VO2 oscillation, which is then chronologically followed by a similar oscillation in minute ventilation (VE) (Figure 1). Accordingly, we aimed to assess whether this new definition surpassed that of classical EOV.
Methods: This is a single-centre cohort study of consecutive patients undergoing CPET from 2016-2018. Patients with LVEF >50% were excluded. CPET was performed on a treadmill to the limit of tolerance. Data was collected as a rolling average of 20 seconds and a composite VE/time and VO2/time plot was created. Classical EOV was defined as three or more regular oscillations of the VE graph with a minimal average amplitude of five litters. The addition of exercise VO2-to-VE peak-to-peak ventilation asynchrony (EVA) to the previous criteria fulfilled the new definition. The primary endpoint was a composite of time to all-cause death, heart transplantation or HF hospitalization.
Results: Overall, 177 patients were enrolled (mean age 58 ± 11 years, LVEF 34 ± 9%), of whom 35 had EOV and 17 had EVA. Compared to those without EVA, patients with EVA had markers of more severe HF (table I). During a median follow-up of 32 (21-42) months, 55 patients met the primary outcome (32 all-cause deaths, 15 heart transplants, 47 HF hospitalizations). In multivariate analysis, EVA was associated with a 2.5-fold increased risk of events (HR 2.489; 95%CI: 1.302-4.759; p = 0.006), adjusted for peak VO2, VE to CO_2 production ratio (VE/VCO_2 slope) and LVEF. EVA outperformed EOV in predicting the primary endpoint at 1 year, with a similar sensitivity and higher specificity (96.2 vs. 83.2%). The rate of events between the subgroup of patients without EVA was similar regardless of presence of EOV, contrasting with a higher rate in the EVA subgroup (figure 1).

	Total (n=177)	No EOV (n=142)	EOV without EVA (n=18)	EOV with EVA (n=17)	P-value
- Baseline Characteristics					
Age, mean ± SD (years)	58 ± 11	58 ± 12	61 ± 8	60 ± 8	0,601
Male sex, n (%)	134 (75,7)	109 (76,8)	12 (66,7)	13 (76,5)	0,641
NYHA Class I NYHA Class II NYHA Class III NYHA Class IV	34 (19,2) 77 (43,5) 65 (36,7) 1 (0,6)	32 (22,5) 64 (45,1) 45 (31,7) 1 (0,7)	2 (11,1) 10 (55,6) 6 (33,3) 0 (0,0)	0 (0) 3 (17,6) 14 (82,4) 0 (0,0)	0,004
BMI, mean ± SD (Kg/m^2)	26,9 ± 4,5	27,2 ± 4,5	26,0 ± 5	24,9 ± 3,7	0,095
- HF Characteristics					
Ischemic HF, n (%)	119 (67,2)	96 (67,6)	14 (77,8)	9 (52,9)	0,287
LVEF, mean ± SD (%)	34 ± 9	35 ± 9	36 ± 10	24 ± 6	<0,001
RV Dysfunction, n (%)	51 (29,0)	37 (26,2)	4 (22,2)	10 (58,8)	0,016
- CPET Characteristics					
pVO2, mean ± SD (mL/min)	17,8 ± 5,7	18,2 ± 5,9	18,8 ± 4,9	13,8 ± 2	0,007
ppVO2, mean ± SD (%)	0,7 ± 0,3	0,7 ± 0,3	0,8 ± 0,2	0,5 ± 0,1	0,036
VE / VCO2 Slope, mean ± SD	41,9 ± 12,6	40,3 ± 12,3	40,7 ± 6,4	56,2 ± 11,3	<0,001
RER, mean ± SD	1,1 ± 0,1	1,1 ± 0,1	1,1 ± 0,1	1,1 ± 0,2	0,663
- Laboratory Evaluation					
Creatinine, mean ± SD (mg/dL)	1,2 ± 0,9	1,2 ± 1	1,2 ± 0,6	1,3 ± 0,5	0,856
NTproBNP, mean ± SD (pg/mL)	2055 ± 3510	1927 ± 3570	933 ± 1579	4419 ± 3691	0,009
- Outcomes of interest					
All-cause death, n (%)	32 (18,1)	24 (16,9)	1 (5,6)	7 (41,2)	0,017
Heart transplant, n (%)	15 (8,5)	9 (6,3)	0 (0,0)	6 (35,3)	<0,001
Urgent heart transplant, n (%)	9 (60,0)	6 (66,7)	0 (0,0)	3 (50)	0,519
HF Hospitalization, n (%)	47 (26,6)	32 (22,5)	1 (5,6)	14 (82,4)	<0,001

Table I: Population Demographics.

BMI = Body Mass Index;
EOV = Exercise Oscillatory Ventilation;
EVA = exercise VO2-to-VE peak-to-peak ventilation asynchrony;
HF = Heart Failure;
HR = Heart Rate;
LVEF = Left Ventricular Ejection Fraction;
SD = Standard Deviation;
pVO_2 = peak oxygen uptake (mL/min);
$ppVO_2$ = peak oxygen uptake (% of predicted pVO_2);
RER = Respiratory Exchange Rate;

Figure 1

Conclusions: EVA is a strong predictor of hard outcomes in a broad population with HF. The new definition may outperform that of classical EOV. The incidence and prognostic value of EVA in the management algorithm and risk stratification of patients with HF is worth being further explored.

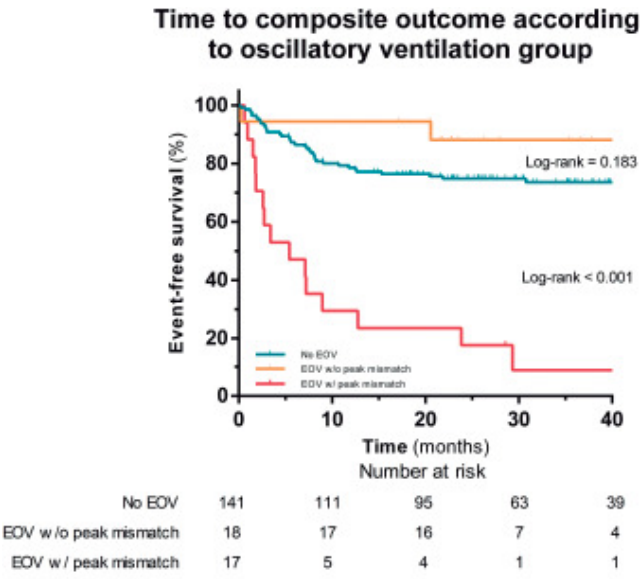


Figure 1: Kaplan-Meier curves for the primary endpoint in the subgroup of patients with EVA (EOV with peak mismatch) and EOV without EVA (EOV without peak mismatch).

Yellow Line = EOV without EVA
Blue Line = no EOV
Red Line = EVA

CO 67 Figure 2

Variables - Model	Univariate analysis			Multivariate analyses		
	HR	95% CI	p-value	HR	95% CI	p-value
pVO2, per 1mL/min	0.796	0.740-0.855	<0.001	0.870	0.791-0.956	0.004
VE/VCO2, per 1 unit	1.063	1.046-1.080	<0.001	1.027	1.004-1.049	0.019
LVEF, per 1%	0.899	0.870-1.080	<0.001	0.937	0.899-0.976	0.002
Presence of EVA	6.483	3.451-11.870	<0.001	2.489	1.302-4.759	0.006

Table II: Multivariate Model to predict the primary endpoint.

CO 67 Figure 3

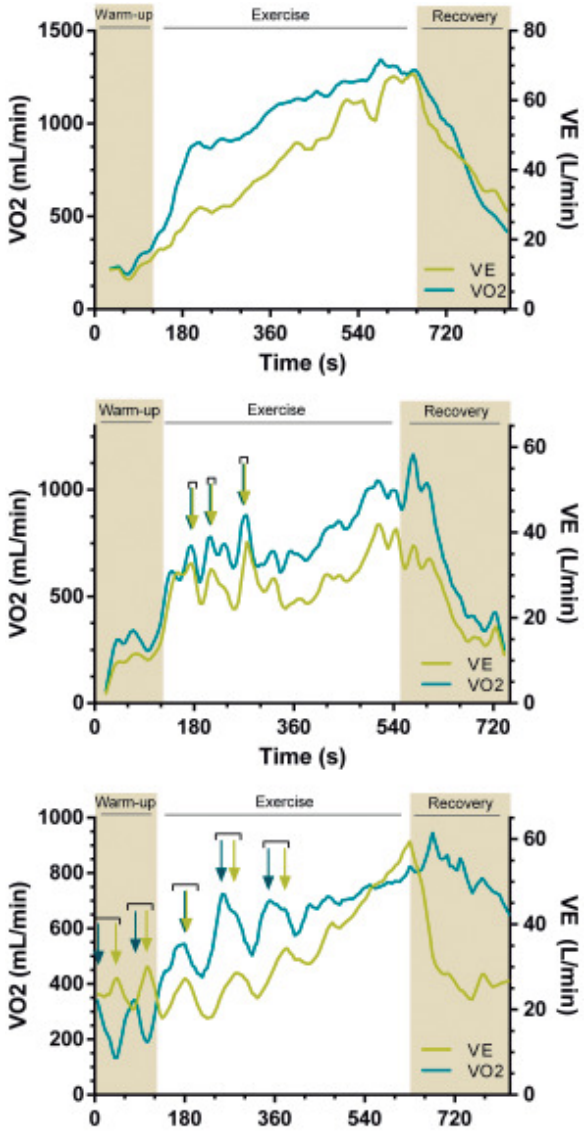


Figure 2: Illustrative CPET Data-Plot: (A) no EOV; (B) EOV without EVA; (C) EVA.

CO 67 Figure 4

CO 64. CARDIOPULMONARY EXERCISE TEST AND SUDDEN CARDIAC DEATH RISK IN HEART FAILURE WITH REDUCED EJECTION FRACTION PATIENTS

Sofia Jacinto, João Reis, Alexandra Castelo, Pedro Brás, Rita Ilhão Moreira, Tiago Pereira Silva, Ana Timóteo, Rui Soares, Bárbara Teixeira, Rita Teixeira, Rui Cruz Ferreira

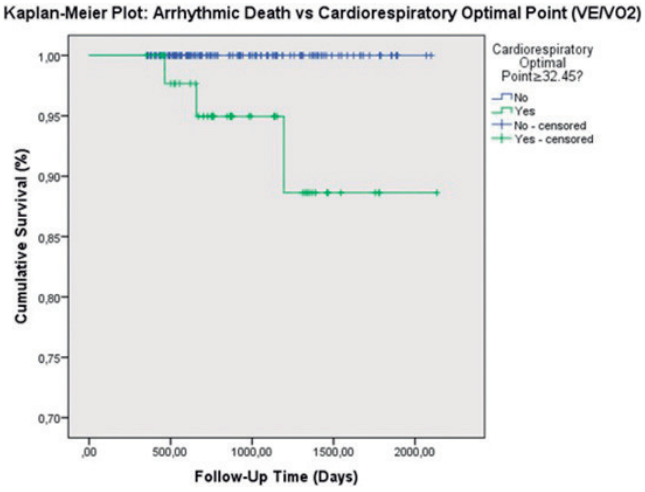
Centro Hospitalar de Lisboa Central, EPE/Hospital de Santa Marta.

Introduction and objectives: Several variables obtained from cardiopulmonary exercise testing (CPET) are strong predictors of overall mortality in chronic heart failure (CHF) patients (pts). However, despite the fact that up to 50% of CHF patients die from sudden cardiac death (SCD), it is unknown whether any of these variables predict SCD. Our aim is to determine the ability of CPET-derived variables of predicting SCD in pts with CHF.

Methods: Retrospective evaluation of adult pts with HFrEF submitted to cardiopulmonary exercise test in a tertiary centre. Patients were followed up for at least 1 year for the primary endpoint of SCD. Pts that died from pump failure or other causes were excluded from analysis. Cox univariate and multivariate regression analysis were used to determine predictors of SCD. The predictive power of several CPET parameters was analysed (area under the curve - AUC). ROC curves were compared using the Hanley and McNeil test.

Results: CPET was performed in 487 HF pts, of which 72 pts that died from pump failure or other causes were excluded. 21 pts met the primary endpoint during a mean follow-up of 91.4 ± 67 months. These pts presented a higher prevalence of chronic kidney disease (57.9% vs 31.1%, p = 0.015), a lower mean natremia (138.4 vs 136.1, p < 0.001), were more symptomatic (42.9% were in NYHA Class III-IV as opposed to 23.6% in the survivors group) and had a lower heart failure survival score (8.19% vs 8.71%, p = 0.030) and LVEF (23.4% vs 30.5%, p < 0.001) compared to subjects who didn't experience arrhythmic deaths. Interestingly there was no difference in age (58.9 vs 55.5, p = 0.226) nor in the prevalence of atrial fibrillation (p = 0.293) or ischemic cardiomiopathy (p = 0.282). There was no statistically significant difference in the peak oxygen consumption (pVO2 - 16.5 vs 18.6, p = 0.074). Several CPET parameters were predictors of SCD, but the one with the

highest predictive value was the cardiopulmonary optimal point (VE/VO2), which was significantly higher than the one of pVO2 (AUC of 0.883 vs 0.599, p = 0.048). A VE/VO2 cut-off of 32.45 had a 100% sensitivity and 75% specificity for the occurrence of SCD, with pts above this value presenting a significantly higher incidence of SCD (log rank p = 0.006). Both natremia (HR 0.86, 0.75-0.98, p = 0.026) and LVEF (HR 0.91. 0.86-0.97, p = 0.002) were independent predictors of SCD. Beta blockers use was associated with a protective effect regarding SCD.



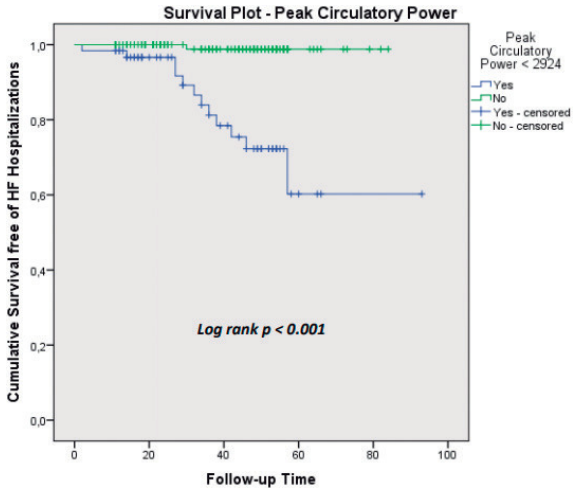
Conclusions: VE/VO2 has a high predictive value for SCD in patients with CHF and might be an additional tool for prioritization of antiarrhythmic strategies.

CO 66. PEAK CIRCULATORY POWER IS A STRONG PROGNOSTIC FACTOR IN PATIENTS UNDERGOING CARDIAC REHABILITATION

Bárbara Lacerda Teixeira, João Reis, Alexandra Castelo, Pedro Rio, Sofia Silva, Rita Teixeira, Sofia Jacinto, Rui Cruz Ferreira

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

Introduction: Peak circulatory power (PCP - peak oxygen uptake × peak systolic blood pressure) is and has been used for the clinical evaluation of patients with heart failure, coronary artery disease and idiopathic pulmonary arterial hypertension, being a strong prognostic factor in these populations.
Objectives: To characterize the population of the cardiac rehabilitation (CR) appointment that performed CEPT, evaluate PCP as a predictor of events and determine the best cut off for our population.
Methods: Retrospective analysis of CR appointment patients who performed CEPT between 2014 and 2017 in a single tertiary center. Epidemiological, clinical, laboratory, echo and CEPT-related data were retrieved. We then determined predictors of PCP and established the appropriate Cut Off for our population and compared the occurrence of events - composite endpoint of mortality/hospitalization due to heart failure (MH) - according to it.
Results: 207 P (83.6% men) were included, with a mean age of 57 years and a mean follow-up time of 36 months. The Ps presented a mean LVEF of 53.7% (14-83%). The majority (87.9%) was referred for CR with ischemic cardiopathy (AMI or stable or unstable coronary disease), 9.2% with heart failure and 9.2% with valvulopathy. 6.9% P died from any cause, 33.8% had an hospitalization (78.6% from a cardiovascular reason) and 7.3% presented MH. Mean PCP was 3,702.5 ± 1,974.2 mmHg.ml.kg^{-1}min^{-1} (249-23,180) and in Ps with heart failure was 1,989 as opposed to 3,858 in Ps without heart failure. A lower PCP was associated with an age > 65 years (p < 0.001), female sex (p = 0.02), diabetes (p = 0.005), previous acute coronary syndrome (p = 0.021), LVEF < 35% (p < 0.001), a higher basal BNP value (CC = 0.287, p < 0.001), higher VE/VCO2 slope (CC = -0.298, p < 0.001) and a more negative basal global longitudinal strain (CC = 0.353, p < 0.001). Ps with a peak VO2 < 14 ml/min/kg also presented a lower PCP (a peak VO2< 14 ml/min/kg). Values of PCP below a cut-off of 2,924 predict the composite endpoint of MH (HR 28.1, IC [3.66-216.29], p = 0.001), with these Ps presenting a 40 months survival of 75.4% comparing to 98.8% in Ps with PCP values above the aforementioned cut-off (log-rank p < 0.001). However, that cut-off didn't correlate with all cause hospitalization, need for further coronary revascularization or cardiac device.



Conclusions: PCP was predictor of cardiac events in our population, with Ps with a PCP value< 2,924 presenting a statistically significant lower survival.

CO 68. HOME-BASED CARDIAC REHABILITATION - THE REAL BARRIERS OF PROGRAMS AT DISTANCE

Ana Margarida Martins[1], Inês Aguiar-Ricardo[1], Nelson Cunha[1], Tiago Rodrigues[1], Pedro Silvério António[1], Sara Couto Pereira[1], Joana Brito[1], Pedro Alves da Silva[1], Beatriz Valente Silva[1], Beatriz Garcia[1], Catarina Oliveira[1], Rita Pinto[1], Madalena Lemos Pires[1], Olga Santos[1], Paula Sousa[1], Fausto J. Pinto[1], Ana Abreu[1]

[1]Serviço de Cardiologia, Departamento Coração e Vasos, Centro Hospitalar Universitário Lisboa Norte, CAML, CCUL, Faculdade de Medicina, Universidade de Lisboa.

Introduction: Despite established benefits of cardiac rehabilitation (CR), it remains significantly underutilized. Home-based CR (CR-HB) programs should offer the same core CR components as Centre-based programs (CR-CB) but several aspects need to be adapted, communication and supervision involves several important issues. Although CR-HB has been successfully deployed and is a valuable alternative to CR-CB, there is less structured experience with these programs and further studies are needed to understand which patients (pts) are indicated to this type of program.
Objectives: To investigate patient-perceived facilitators and barriers to CR-HB.
Methods: Prospective cohort study of pts who were participating in a CR-CB program and accepted to participate in a CR-HB program after CR-CB closure due to COVID-19. The CR-HB consisted in a multidisciplinary digital program, including pt risk evaluation and regular assessment, exercise, educational and psychological sessions. The online exercise training sessions consisted of recorded videos and real time online supervised exercise sessions. It was recommended to do each session 3 times per week, during 60 min. A pictorial exercise training guidebook was available to all pts including instructions regarding safety, clothing and warm-up, and a detailed illustrated description of each exercise sessions. Also, for questions or difficulties regarding the exercises, an e-mail and telephone was provided. Once a month, real time CR exercise sessions through a device with internet access was provided.
Results: 116 cardiovascular disease (CVD) pts (62.6 ± 8.9 years, 95 males) who were attending a face-to-face CR program were included in a CR-HB

program. The majority of the pts had coronary artery disease (89%) and 5% valvular disease. Regarding risk factors, obesity was the most common (75%) followed by hypertension (60%), family history (42%), dyslipidaemia (38%), diabetes (18%), and smoking (13%). 47% of the participants did at least 1 online exercise training session (ETS) per week: 58% did 2-3 times per week, 27% once per week and 15% more than 4 times per week. Participants who did less than 1 ETS per week reported as cause: lack of motivation to train alone (38%), preference of a different mode of exercise training in the exterior space (26%), other reasons (19%), technology barrier such as impossibility to stream online videos (11%), fear of performing exercise without supervision (4%), and limited space at home to perform the exercise training sessions (4%).
Conclusions: Our study based on real-life results of a CR-HB program shows a sub-optimal rate of participation in exercise sessions mainly for the lack of motivation to exercise alone or preference for walking/jogging in exterior space. The knowledge of the CR-HB program barriers will facilitate to find out strategies to increase the participation rate and to select the best candidates.

CO 63. PREDICTIVE ABILITY OF CARDIOPULMONARY EXERCISE TEST PARAMETERS IN HEART FAILURE PATIENTS WITH CARDIAC RESYNCHRONIZATION THERAPY

João Pedro Reis, António Gonçalves, Pedro Brás, Rita Moreira, Pedro Rio, Tiago Pereira da Silva, Ana Teresa Timóteo, Rui Soares, Rui Ferreira

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

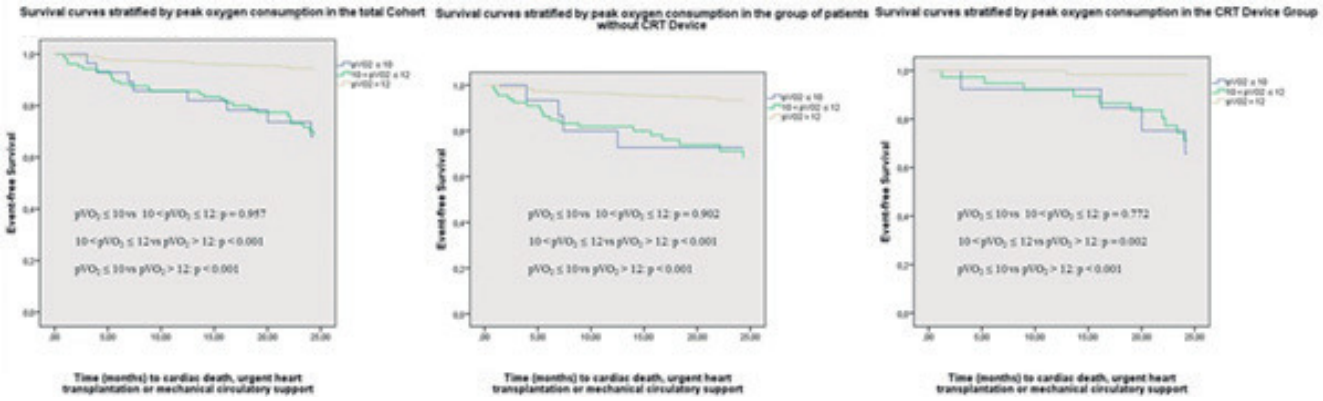
Introduction: There is evidence suggesting that a peak oxygen uptake (pVO_2) cut-off of 10 ml/kg/min provides a more precise risk stratification in Cardiac Resynchronization Therapy (CRT) patients. Our aim was to compare the prognostic power of several cardiopulmonary exercise testing (CPET) parameters in patients with CRT and assess the discriminative ability of the guideline-recommended pVO_2 cut-off values.
Methods: Prospective evaluation of consecutive heart failure (HF) patients with left ventricular ejection fraction ≤ 40%. The primary endpoint was a composite of cardiac death and urgent heart transplantation (HT) in the first 24 follow-up months and was analyzed by several CPET parameters for the highest area under the curve (AUC) in the CRT group. A survival analysis was performed to evaluate the risk stratification provided by several different cut-offs.
Results: A total of 450 HF patients, of which 114 had a CRT device. These patients had a higher baseline risk profile, but there was no difference regarding the primary outcome (13.2% vs 11.6%, p = 0.660). End-tidal carbon dioxide pressure at the anaerobic threshold ($P_{ET}CO_{2AT}$) had the highest AUC value, which was significantly higher than that of pVO_2 in the CRT group (0.951 vs 0.778, p = 0.046). The currently recommended pVO_2 cut-off provided accurate risk stratification in this setting (p < 0.001), and the suggested cut-off value of 10 ml/min/kg did not improve risk discrimination in device patients (p = 0.772).
Conclusions: $P_{ET}CO_{2AT}$ outperforms pVO_2's prognostic power for adverse events in CRT patients. The current guideline-recommended pVO_2 cut-off can precisely risk-stratify this population.

CO 65. ESTIMATING PVO2 AND PROGNOSIS THROUGH CARDIAC EXERCISE STRESS TEST IN A HEART FAILURE POPULATION

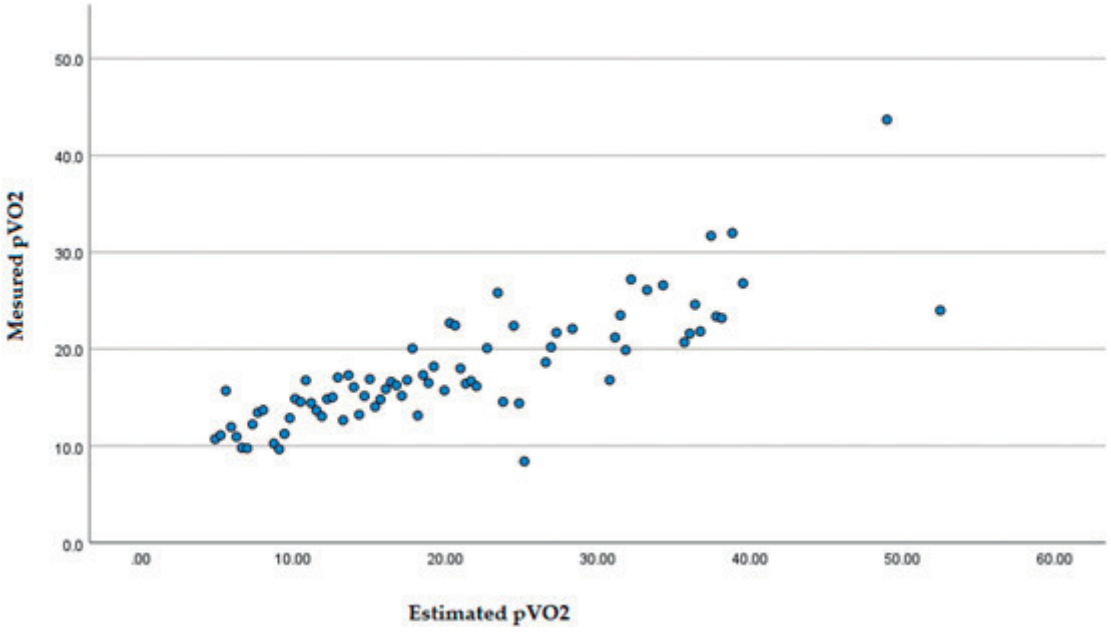
José Lopes de Almeida, J. Milner, J. Rosa, R. Coutinho, M. Ferreira, L. Gonçalves

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

Introduction: Compared with the cardiac exercise stress test, more commonly used to assess the presence of ischemia, the cardiopulmonary exercise test has the advantage of providing expired gas analysis. According to current guidelines, cardiopulmonary exercise testing should be considered to stratify the risk of adverse events and to provide measures of survival improvement in heart failure populations. However, cardiac exercise stress test is more readily available and widespread than cardiopulmonary exercise testing. We aimed to compare prognostic information given by estimated pVO2-which can be obtained from cardiac exercise stress test-and real measured pVO2-which requires cardiopulmonary exercise test-in a heart failure population.
Methods: We conducted a retrospective analysis of 214 patients with HF underwent cardiac exercise stress test and accessed their 5 year survival. Non-urgent transplanted (UNOS Status 2) patients were censored alive on the date of the transplant. During the cardiopulmonary exercise test, cardiac exercise stress test data simultaneously collected. Based on protocol stage achieved, estimated METs were used to calculate estimated pVO2 (pVO2 = estimated METs × 3.5). Estimated and real pVO2 were correlated using Pearson correlation and the age-adjusted prognostic power of each was determined using Cox proportional hazards analysis.
Results: 164 patients were male (77%) and the mean age of the population was 56 ± 10 years. 78 (36%) patients had an ischemic etiology. Within 5 years from testing, 46 patients died (21.5%) and 55 patients (26%) were transplanted. Naughton modified (n = 165) was the most commonly used protocol, followed by Naughton (n = 39) and Bruce (n = 10). Estimated pVO2 and measured pVO2 correlated significantly (R = 0.66, p < 0.01) (Figure). Both estimated (HR = 0.91, 95%CI 0.86-0.95, p < 0.01) and measured pVO2 (HR = 0.86, 95%CI 0.80-0.91, p < 0.01) strongly predicted prognosis in this population.
Conclusions: Estimated pVO2 correlated with measured pVO2 and strongly predicted prognosis in this heart failure population. Because it can be obtained from conventional cardiac exercise testing, it may become an alternative prognostic tool to cardiopulmonary testing.



CO 63 Figure



CO 65 Figure

Sábado, 01 Maio de 2021 | 16H45-17H45

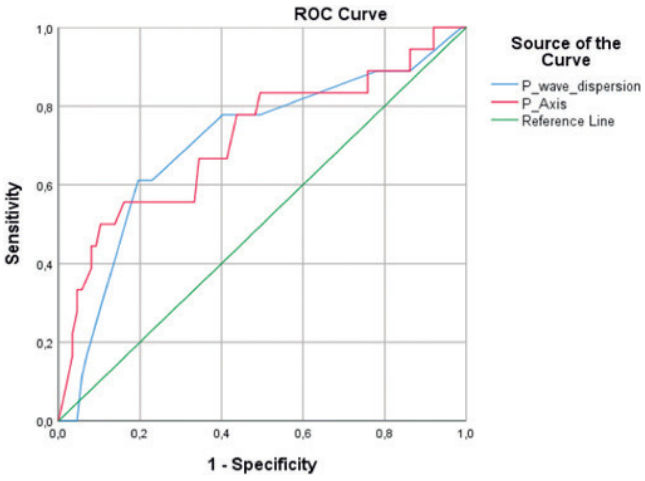
Sala Virtual 1 | CO 13 - Atrial fibrillation

CO 72. ELECTROCARDIOGRAPHIC MARKERS OF INCIDENT ATRIAL FIBRILLATION IN PATIENTS WITH CRYPTOGENIC STROKE

Sara Couto Pereira[1], Arminda Veiga[2], José Ferro[1], Fausto J. Pinto[2], Catarina Fonseca[1], Ana G. Almeida[2]

[1]Centro Hospitalar de Lisboa Norte, EPE/Hospital de Santa Maria. [2]Serviço de Cardiologia, Departamento Coração e Vasos, Centro Hospitalar Universitário Lisboa Norte, CAML, CCUL, Faculdade de Medicina, Universidade de Lisboa.

Introduction: Prolonged screening of AF in patients (pts) with cryptogenic stroke is recommended and electrocardiographic markers of atrial remodeling, like p-wave dispersion, have been described in literature. Electrocardiographic changes in pts with cryptogenic stroke to predict AF in the follow up are not well-established.
Objectives: To identify ECG predictors of AF in a subset of pts with cryptogenic stroke.
Methods: Prospective single-center study that included consecutive pts admitted with cryptogenic stroke. A surface 12-lead ECG was performed at admission, recorded at 25 mm/second and 10 mV/cm with commercially available imaging system. P-wave analysis of maximum (P max) and minimum (P min) duration, p-wave dispersion (PWD, defined as the difference between the P max and P min, being abnormal if > 40 msec) and amplitude were evaluated by a two independent operator. P-wave axis was determined by an automated mode available in the equipment. ROC curve was analyzed to determine the optimal cut-off values.
Results: We enrolled 105 pts (55.2% males), with mean age of 68.18 ± 8.83 years, 79% had hypertension, 18.1% had diabetes, 44.8% with dyslipidemia, 21% current smokers. During follow up period, 18 pts (17.1%) developed AF. We found that only PWD (AUC 0.706, IC95%: 0.564-0.848, p = 0.006) and P-wave axis (AUC 0.715, IC95%: 0.870-0.860, p = 0.004) were strong predictors of AF (Figure). PWD cut-off of 47.50 presented a sensitivity of 77.8% and specificity of 59.8% and P-wave axis cut off value of 75.50 had a specificity of 95.4%. Age (p = 0.032) and current smoking (p = 0.014) were associated with occurrence of AF during the follow up.



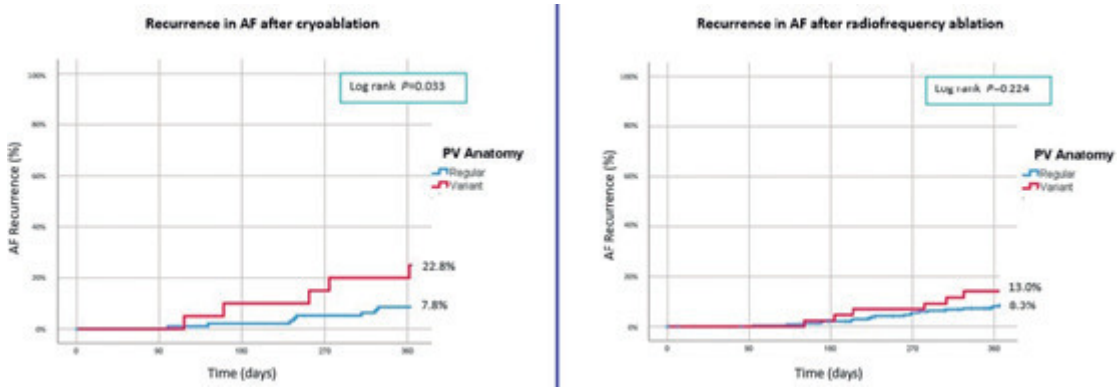
Conclusions: PWD and P-wave axis predicted incident AF in this subset of pts with cryptogenic stroke. The ECG may be a toll to identify pts at risk of developing AF, although larger studies are needed to confirm these results.

CO 69. IMPACT OF PULMONARY VEINS ANATOMY ON OUTCOME OF CRYOABLATION OR RADIOFREQUENCY CATHETER ABLATION FOR ATRIAL FIBRILLATION

Gualter Santos Silva, Pedro Ribeiro Queirós, Mariana Ribeiro da Silva, Rafael Teixeira, João Almeida, Paulo Fonseca, Marco Oliveira, Helena Gonçalves, João Primo, Ricardo Fontes-Carvalho

Centro Hospitalar de Vila Nova de Gaia/Espinho.

Introduction: Pulmonary vein isolation is the cornerstone of interventional treatment of atrial fibrillation (AF). Pulmonary veins frequently display anatomic variants. If this influences the recurrence of AF after catheter ablation is still a matter of debate.



CO 69 Figure

Objectives: Our aim was to determine if pulmonary vein anatomy variants influences the recurrence of AF after catheter ablation with radiofrequency or cryoablation.
Methods: Retrospective analysis of patients with paroxysmal or persistent atrial fibrillation who underwent pulmonary vein isolation by radiofrequency (RF) or cryoablation (CA) in a single center between January 2017 and September 2019. All patients underwent computed tomography before AF ablation. Within each treatment group (RF or CA), patients were stratified according to their PV anatomy in: regular (2 left PVs and 2 right PVs) or variant (left common trunk, right common trunk, bilateral common trunk, right intermediate branch or other). The primary end-point was 1-year recurrence of AF. Recurrence was defined as electrical documented AF.
Results: A total of 425 patients (RF = 300 and CA = 125), aged 56.6 ± 11.7 years, 277 men (65.0%) were enrolled. The majority of patients had paroxysmal AF (n = 343, 81.5%). Mean CHA_2DS_2-VASc score was 1.12 ± 1.28. Regular PV anatomy was identified in 357 patients (84.0%), a left common trunk in 53 patients (12.5%), a bilateral common trunk in 5 patients (1.2%), a right intermediate branch in 3 patients (0.7%) and other mixed variants in 7 patients (1.6%). There were no significant differences in the baseline clinical and echocardiographic characteristics between groups. At 1-year follow-up, patients with atypical PV anatomy had more AF recurrence (regular 8.1% vs variant 16.2%; p = 0.037). Analyzing according to the ablation technique there was no difference in AF recurrence between PV anatomy groups in patients submitted to radiofrequency (regular 8.3% vs variant 13.0%; p = 0.252). On the other hand, in cryoablation group, patients with PV anatomic variant had significantly higher rates of 1-year AF recurrence (regular 7.8% vs variant 22.8%; p = 0.033).
Conclusions: The presence of atypical PVs anatomy seems to be associated with higher rates of AF recurrence at 1-year in patients undergoing cryoablation. Further prospective studies are needed to confirm the PV anatomy impact in the success of the procedure and if this needs to be accounted in the choice of ablation technique.

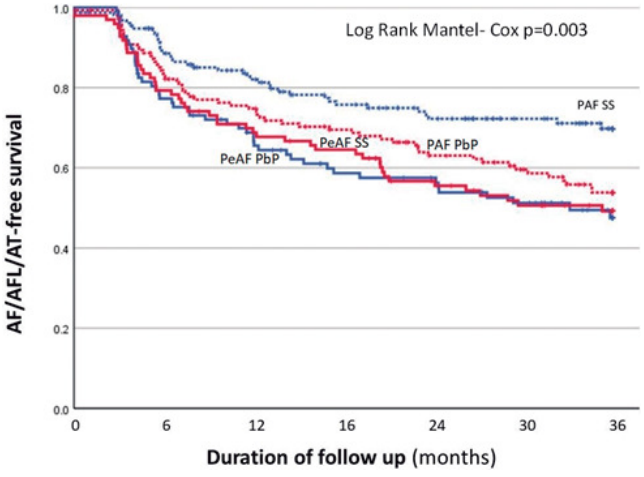
CO 70. SINGLE-SHOT COMPARED TO POINT-BY-POINT ATRIAL FIBRILLATION ABLATION SUCCESS

Rita Caldeira da Rocha[1], Rita Carvalho[2], Mafalda Carrington[1], Afonso Ferreira[3], Maria Brito[3], Gustavo Silva[3], Nuno Cortez Dias[3], Luís Carpinteiro[3], Fausto Pinto[3], João de Sousa[3]

[1]Hospital do Espírito Santo, EPE, Évora. [2]Centro Hospitalar de Leiria/ Hospital de Santo André. [3]Centro Hospitalar de Lisboa Norte, EPE/Hospital de Santa Maria.

Introduction: Pulmonary vein electrical isolation is the cornerstone in atrial fibrillation (AF) ablation. The two widely used approaches are point-by-point radiofrequency application or single-shot therapy. Catheter AF ablation is effective in restoring and maintaining sinus rhythm. However, efficacy is limited by a high rate of AF recurrence, after an initially successful procedure.

Objectives: To evaluate AF initial ablation successfulness using single-shot techniques and compare them to the conventional procedure (point-by-point using irrigated- tip ablation catheter).
Methods: We analyzed, from a single center, all patients submitted to an index AF ablation procedure and its successfulness. The last was defined as AF, atrial tachycardia or flutter recurrence (with a duration superior to 30 seconds) event-free survival, determined by Holter and/or event recorder. These exams were performed at 6 and 12months and then annually, until 5 years after the procedure.
Results: From November 2004 to November 2020, 821patients were submitted to a first AF ablation (male patients 67.2% (N = 552), mean age of 59 ± 12years old). Paroxysmal AF (PAF) was present in 62.9% (N = 516), short-duration persistent AF in 21.8% (N = 179) and long-standing persistent in 15.3% (N = 126). Ablation techniques were irrigated tip catheter point-by-point (PbP) ablation in 266 patients (32.4%) and single-shot (SS) techniques in the remaining 555 (67.6%), including PVAC in 294 (35.8%), balloon cryo-ablation in 225 (27.4%) and nMARQ in 36 (4.4%). Globally, AF ablation had a one-year success rate of 72.5%, and 56.2% at 3 years. A significant difference between AF type was found: arrhythmic recurrence risk was 58% higher in persistent AF (PeAF) (HR 1.58; 95%IC 1.22-2.04; p < 0.001). In patients presenting with PAF, success was significantly higher in those submitted to SS technique (HR: 0.69; 95%CI 0.47-0.90; p = 0.046), while those with PeAF had similar results.



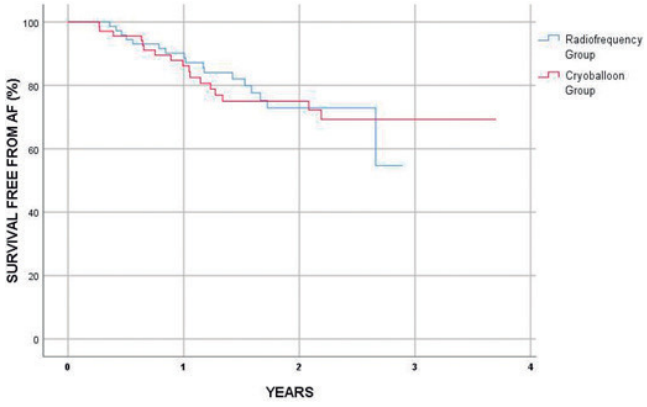
Conclusions: In this single center analysis almost three-quarters of AF patients had achieved one-year event-free survival, and more than a half reached long-term freedom from atrial arrhythmia. Patients with paroxysmal atrial fibrillation submitted to single-shot procedure had a higher success-rate. Moreover, our study confirmed previous data regarding a lower success rate in PeAF linking AF classification to the ablation outcome.

CO 71. CRYOBALLOON VERSUS RADIOFREQUENCY GUIDED BY ABLATION INDEX FOR ATRIAL FIBRILLATION ABLATION: A RETROSPECTIVE PROPENSITY-MATCHED STUDY

Pedro Ribeiro Queirós, Gualter Silva, Mariana Silva, João Almeida, Paulo Fonseca, Diogo Ferreira, Fábio Nunes, Mariana Brandão, Rafael Teixeira, Marco Oliveira, Helena Gonçalves, Nuno Dias Ferreira, João Primo, Ricardo Fontes-Carvalho

Centro Hospitalar de Vila Nova de Gaia/Espinho.

Introduction: Radiofrequency (RF) and cryoballoon (CB) ablation are established techniques for the treatment of atrial fibrillation (AF). Randomized trials comparing them show similar success; however, studies comparing CB with RF guided by ablation index (AI) are lacking.
Objectives: To compare treatment success of CB with RF guided by AI, in patients with paroxysmal or persistent AF undergoing their first ablation procedure.
Methods: Patients undergoing AF ablation between 2017 and 2019 were retrospectively analyzed. Primary success outcome was freedom from recurrence (defined as any episode of AF, atrial flutter or atrial tachycardia lasting > 30 seconds and occurring after 91 days from ablation, or need for antiarrhythmic drugs (AAD), cardioversion or redo procedure). Secondary end-point was a composite of adverse cardiovascular (CV) outcomes (stroke/TIA, emergency room visit for AF, hospitalization for AF or CV death). Analysis was done before and after propensity score matching.
Results: A total of 316 patients were included. Mean age was 56.9 ± 11.7 years. Sixty-two percent were male (n = 196). Paroxysmal AF was present in 80.7% (n = 255), with no difference between groups. RF was used in 57.9% (n = 183) and CB in 42.1% (n = 133), with isolation of all pulmonary veins accomplished in 95.9% (n = 302), without differences between groups. Mean CHA_2DS_2-VASc score was 1.5 ± 1.3, being higher in the RF group (1.7 ± 1.3 vs 1.2 ± 1.1; p = 0.03); these patients were also older (mean age 58.1 ± 12.0 vs. 55.17 ± 11.0 years; p = 0.07), more likely to be in AF at ablation (26.7% vs. 16.5%; p = 0.006), have chronic kidney disease (40.2% vs. 23.2%; p = 0.002), anaemia (11.8% vs. 2.7%; p < 0.001), moderate/severe mitral disease (17.5% vs. 7.4%; p = 0.012) or history of atrial flutter (17.7% vs. 3.1%; p < 0.001). The CB group had longer history of AF (3.8 ± 3.5 vs. 3.0 ± 2.9 years; p = 0.041), received treatment with AAD more often (60.9% vs. 55.9%; p = 0.049) and had longer follow-up time (889 ± 397 vs. 601 ± 239 days; p < 0.001). Mean freedom from recurrence showed no significant differences between groups (1106 days for CB vs. 889 days for RF; p = 0.793), and recurrence rates were also similar (27.8% for CB vs. 23.5% for RF; p = 0.291); however, CB patients were more likely to need a redo procedure (38.3% vs. 17.4%; p = 0.025). There were no differences in the composite of adverse events or in individual outcomes. Propensity score matching was done, and 154 patients were matched 1:1 for each treatment group. Survival free from recurrence showed no differences (1,060 days for CB vs. 864 days for RF; p = 0.912), and neither did the recurrence rate. CB patients with recurrence were still more likely to need a redo procedure (37.9% vs. 11.1%; p = 0.021).



Conclusions: RF and CB result in similar survival free from AF and AF recurrence; however, recurrence in CB seems more significant, leading to higher rates of redo procedures.

CO 73. IS BALLOON CRYOABLATION EFFECTIVE IN COMMON PULMONARY TRUNK?

Pedro Silvério António[1], Tiago Rodrigues[2], Joana Brito[2], Nelson Cunha[2], Sara Couto Pereira[2], Pedro Alves da Silva[2], Beatriz Valente Silva[2], Catarina Oliveira[2], Beatriz Garcia[2], Ana Margarida Martins[2], Patrícia Teixeira[2], Gustavo Lima da Silva[2], Nuno Cortez-Dias[2], Luís Carpinteiro[2], Fausto J. Pinto[2], João de Sousa[2]

[1]Centro Hospitalar de Lisboa Norte, EPE/Hospital de Santa Maria. [2]Serviço de Cardiologia, Departamento Coração e Vasos, Centro Hospitalar Universitário Lisboa Norte, CAML, CCUL, Faculdade de Medicina, Universidade de Lisboa.

Introduction: Common pulmonary trunk (CPT) accounts for the most frequent pulmonary vein anatomical variation. The most frequent technique used for pulmonary vein isolation (PVI) is point-by-point radiofrequency, using cryoablation (CB) is still debatable. Some few studies have shown the feasibility and safety of CB in CPT atrial fibrillation (AF) patients (pts), most of them performed angio-CT prior to ablation.
Objectives: To analyzed AF pts with and without CPT submitted to CB in regarding of success rate and safety.
Methods: Single-center retrospective study of consecutive AF pts refractory to antiarrhythmics submitted to CB between 2017 and 2020. Before the procedure auriculography was performed in all pts to verify variations in pulmonary veins, however the procedure was not modify regarding the presence of CPT. Clinical records were analyzed to determine baseline characteristics, success rate and complications. Monitoring was performed with a 7-day event loop recorder at 3, 6 and 12 months and annually from the 2nd year. Success was defined by recurrence of AF (duration > 30 seconds). Kaplan Meier survival curves were used to estimate the risk of events and the groups were compared using Chi-square and Mann-Whitney analysis.
Results: A total of 232 pts (60 ± 12 years, 68% males) underwent CB. 29 pts had CPT (28 - common left pulmonary trunk and 2 - common right pulmonary trunk). Baseline characteristics were similar between groups, except for CHA_2DS_2VASc score and prior cerebrovascular disease history which were higher in CPT pts (3 ± 2 vs 2 ± 2, p = 0.001; 24.1% vs 6.8%, p = 0.007, respectively). The mean baseline CHA_2DS_2VASc was 2 ± 2 and the median post-CB follow-up was 135 (IQ 32-249) days. Both the 1 and 3 year arrhythmic reccurrence after AF ablation was not significantly different when comparing CPT and non CPT group with a 3 year success rate of 95.8% in pts with CPV against 86.5% in pts without CPT (p = 0.299). There was no difference between groups (p = 0.296; p = 0.164, respectively) regarding the time of the procedure, radiation dose and rate of complications.

	CPV group	No CPV group	p
1 year Success rate	1 (4.4%)	21 (11.9%)	0.299
3 year Success rate	1 (4.4%)	21 (11.9%)	0.39
Time of procedure	91.6 ± 23.3min	100.7 ± 35.9min	0.296
Radiation dose	13.7 ± 6.7 Gy	15.8 ± 8.2 Gy	0,164
Rate of complications	2 (6.8%)	10 (4.9%)	0.636

Conclusions: In our experience, balloon cryoablation for PVI is a safe and successful procedure in patients with CPT anatomical variation.

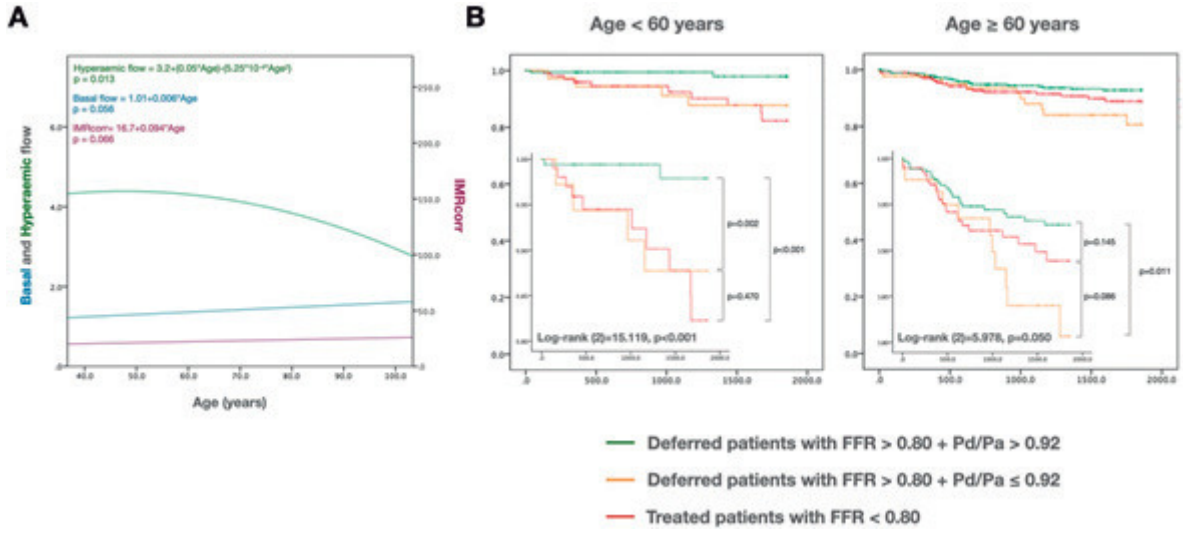
Sábado, 01 Maio de 2021 | 10H30-11H30

Sala Virtual 3 | CO 14 - Doença coronária

CO 74. PHYSIOLOGICAL CHANGES ASSOCIATED TO AGEING IN THE CORONARY CIRCULATION AND ITS RELEVANCE FOR HYPERAEMIC AND NON-HYPERAEMIC INDICES OF STENOSIS RELEVANCE

Daniel Candeias Faria

Hospital Prof. Doutor Fernando Fonseca.



CO 74 Figure

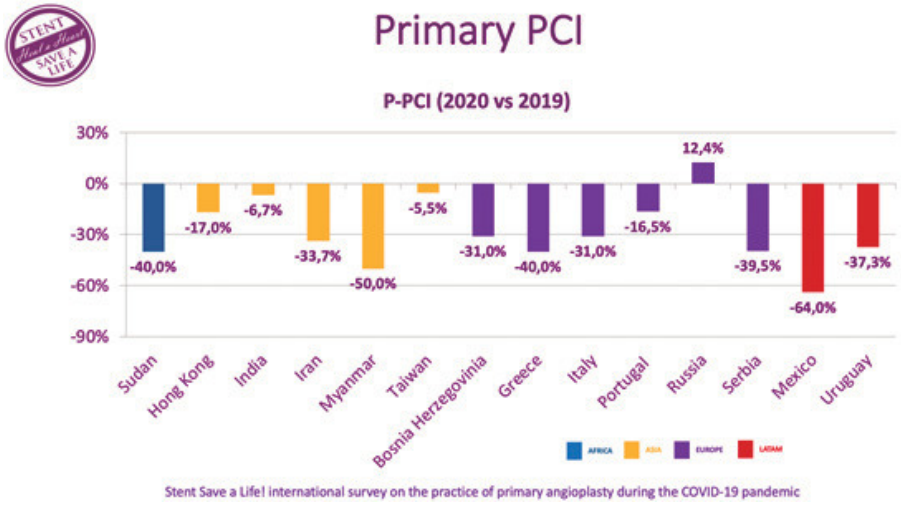
Introduction: The clinical impact of age-dependent coronary physiology changes regarding FFR, resting Pd/Pa and microcirculatory function in patients with coronary artery disease remains unclear.
Objectives: We aimed to investigate the modifications in coronary physiology associated to ageing, paying attention to its impact on hyperemic and non-hyperaemic indices of stenosis relevance.
Methods: We performed a pooled patient-level analysis of three prospective international studies, including 1,134 patients (1,328 vessels) with coronary stenoses interrogated with pressure and flow (thermodilution) guidewires. The age dependent correlations of hyperemic- and non-hyperemic translesional pressure ratio (fractional flow reserve [FFR] and Pd/Pa, respectively) and microcirculation function indices (coronary flow reserve [CFR] and microcirculatory resistance [IMR]) were calculated. Patients were stratified into age related groups, and the respective prevalences of FFR and basal Pd/Pa concordance and discordance were calculated and compared. Patient evolution over a 5 year period was assessed in different age groups, paying attention to vessel oriented patient ocutomes [VOCO], comprised of cardiac death, target vessel related myocardial infarction and target vessel revascularization.
Results: Age correlated positively with FFR (r = 0.08, 95%CI: 0.03 to 0.13, p = 0.005), but not with Pd/Pa (r = -0.03, 95%CI:-0.09 to 0.02, p = 0.242). CFR correlated negatively with age (r = -0.15, 95%CI: -0.21 to -0.10, p < 0.001) due to a significant decrease in maximal hyperaemic flow in older patients, without a significant increase in baseline flow or resistance - Figure A. Older patients with FFR-guided deferred-PCI with abnormal resting Pd/Pa (≤ 0.92) had significantly more VOCO (HR 2.10, 95%CI: 1.15 to 4.36, p = 0.048) - Figure B. This finding was in line with the impact of microvascular dysfunction as assessed by CFR ≤ 2.00 (HR 2.46, 95%CI: 1.23 to 4.96, p = 0.011).
Conclusions: Ageing is associated with marked decrease in microcirculatory function, as assessed with CFR and other indices. In older patients in whom PCI is deferred on the grounds of FFR values, both CFR and Pd/Pa have an incremental value in predicting future VOCO.

CO 75. STENT-SAVE A LIFE INTERNATIONAL SURVEY ON THE PRACTICE OF PRIMARY CORONARY ANGIOPLASTY DURING THE COVID-19 PANDEMIC

Hélder Pereira[1], Christoph Naber[2], Sandrine Wallace[3], Tóth Gabor[4], Jan Piek[5], Investigadores Iniciativa Global Stent Save a Life[6]

[1]Hospital Garcia de Orta, EPE. [2]Geschaeftsfuehrer - Amtsgericht Essen. [3]Stent Save a Life . [4]Medical University of Graz. [5]Amsterdam UMC, University of Amsterdam, Heart Center. [6]Stent Save a Life-Global.

Objectives: To evaluate the impact of the COVID-19 pandemic on patient admissions with acute coronary syndromes (ACS) and primary coronary angioplasty (PPCI) in countries participating in the Stent-Save a Life (SSL) global initiative.
Methods and results: We conducted a multicenter, observational survey to collect data on patient admissions for ACS, STEMI and PPCI in the SSL participating countries throughout a period during the COVID-19 outbreak



CO 75 Figure

(March and April 2020) compared with the equivalent period in 2019. From the 32 member countries of the SSL global initiative, 17 accepted to participate in the survey (3 from Africa, 5 from Asia, 6 from Europe and 3 from Latin America (LATAM)). We observed a global reduction of 27.5% and 20.0% in admissions with ACS and STEMI respectively. The decrease in PPCI was 26.7% (Figure). This trend was observed in all countries except for two. In these two countries, the pandemic peaked later than in the other countries.
Conclusions: This survey shows that the COVID-19 outbreak was associated with a significant reduction of hospital admissions for ACS and STEMI as well as a reduction of PPCI, which can be explained by both patient and system-related factors.

CO 77. FEASIBILITY OF VIRTUAL FRACTIONAL FLOW RESERVE DERIVED FROM CORONARY ANGIOGRAPHY AND ITS CORRELATION WITH INVASIVE FUNCTIONAL ASSESSMENT

Tânia Mano, Vera Ferreira, Rúben Ramos, Eunice Oliveira, Ana Santana, João Melo, Cristina Fundinho, André Grazina, Sofia Jacinto, Rita Teixeira, Duarte Cacela, Rui Cruz Ferreira

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

Introduction: Invasive functional assessment (iFA) of coronary artery disease (CAD) needs expensive devices, has potential procedure-related complications and is still underutilized. Virtual Fractional Flow Reserve (vFFR) derived from invasive coronary angiography (ICA) has the potential to overcome these limitations. We aim to investigate the feasibility of vFFR analysis and its correlation with iFA (iFR, RFR or FFR).
Methods: Retrospective analysis of consecutive patients (pts) who underwent iFA in a tertiary center between 2019 and 2020. vFFR was calculated using a dedicated software (CAAS Workstation 8.4) based on standard non-hyperaemic coronary angiograms acquired in ≥ 2 different projections, by operators blinded to iFA results. Diagnostic performance and accuracy of vFFR were evaluated. vFFR was considered positive when < 0.80. FFR < 0.8 and iFR/RFR < 0.90 were classified as positive according to current clinical standards.
Results: Out of 113 coronary arteries of 102 pts, vFFR was successfully analysed in 106 (94%). Reasons for vFFR analysis failure were: vessel projection overlap (48%), < 2 angiographic projections (28%) and table movement while acquisition (24%). From 106 coronary arteries of 95 pts with analysable vFFR (78% male, mean age 67.8 ± 9.7 years), 90 (85%) showed agreement with the respective iFA result. The vFFR predicted which lesions were physiologically significant and which were not with accuracy, sensitivity, specificity, positive and negative predictive values of 73%, 73%, 83%, 53%, and 92% respectively. The mean difference between vFFR and iFA were -0.0484 ± 0.096 and Pearson's correlation coefficient was 0.533 (p < 0.001). The ROC area under the curve was 0.839 (0.751-0.928, p < 0.001).
Conclusions: FFR were feasible in 94% of cases analysed retrospectively. As compared to gold-standard iFA, vFFR had an overall moderate accuracy in detecting ischemia-producing lesions and a negative predictive value > 90%. vFFR has the potential to substantially simplify physiological coronary lesion assessment and thus improve its current uptake.

CO 78. IMPACT OF COVID 19 PANDEMIC IN ACUTE CORONARY SYNDROME ADMISSIONS AND MANAGEMENT

Bruno Miranda Castilho, Ana Rita Veiga, Ana Rita Moura, Mariana Saraiva, Nuno Craveiro, Ana Filipa Damásio, Kevin Domingues, Vítor Martins

Hospital Distrital de Santarém, EPE.

Introduction: COVID-19 has been declared a pandemic on 11 March 2020 and it is placing an enormous burden on the Portuguese healthcare system. Recent international studies suggest that this epidemic had a vast deleterious effect on the management of acute coronary syndromes (ACS) resulting in significant reduction of ACS admissions and an increase in complication rates and mortality. The aim of this study is to investigate the impact of the pandemic on the number of admissions, management and outcomes of ACS.

Table1. Characteristics of ACS admissions during COVID 19 pandemic *versus* 2019

Variable	Total Population n.º (%) n= 227 (100%)	March to December 2019 n.º(%) n= 143 (63%)	March to December 2020 n.º(%) n=84 (37%)	p value
Demographic				
Mean Age (years) ±SD	67.8±12.7	69.3±12.2	65.1±13.1	**0.02**
Male (%)	163 (71.8%)	100 (70%)	63 (75%)	0.25
Acute Coronary Syndromes				
Total ACS	227	143	84	
STEMI (%)	78 (34.4%)	49 (34.2%)	29 (34.5%)	0.54
Time to ECG since admission to the ED (minutes)*	23.3±15.4	19.4±10.7	26.7 ± 18.9	**0.02**
LVEF <50% at admission (%)*	108 (48.6%)	71 (50.7%)	37 (45.1%)	0.49
Killip class > 1 (%)	25 (11%)	15 (10.5%)	10 (11.8%)	0,451
Complications during the admission (Sustained ventricular tachycardia, inotropic therapy; mechanical ventilation; cardiac arrest) (%)	37(16.3%)	22 (15.4%)	15 (17.9%)	0,39
Mortality (%)	10 (4.4%)	7 (4.9%)	3 (3.6%)	0,28

*missing values

CO 78 Figure

Methods: Retrospective analysis of patients admitted due to ACS between 1 March and 31 December of 2019 and in the same period of 2020 (COVID 19 pandemic), in a district hospital. The two groups were compared according to the number of admissions, type of ACS, time from admission to first ECG in patients presenting to the emergency department (ED) with chest pain, Killip class and LVEF (left ventricular ejection fraction) on admission, complications during the admission (sustained ventricular tachycardia, cardiac arrest, need of inotropic therapy and mechanical ventilation) and mortality.
Results: A total of 227 patients were included, predominantly men (71.8%) and with a mean age of 67.8 ± 12.7 years. During the period of 2020 there was a significant decrease (41%) in the number of admissions due to ACS (84 versus 143 in 2019). The proportion of ST elevation myocardial infarction (STEMI) was similar (34.2% in 2019 versus 34.5% in 2020, p = 0.54). Time to ECG since admission to the ED, in patients presenting with chest pain, was significantly higher in 2020 (26.7 ± 18.9 versus 19.4 ± 10.7 minutes, p = 0.02). The proportion of reduced LVEF (< 50%) on admission was slightly (but not significantly) lower in the 2020 group (45.1% vs 50.7%, p = 0.49). The probability of evolution in Killip > 1 was similar on both groups (11.8% vs 10.5%, p = 0.45), such as the rate of complications (sustained ventricular tachycardia, inotropic therapy; mechanical ventilation; cardiac arrest), (17.9 % in 2020 vs 15.4% in 2019, p = 0.39). In-hospital mortality was slightly lower in 2020, without statistical significance (3.6 vs 4.9%, p = 0.28).
Conclusions: Our results are in trend with international studies that suggest a significant decrease in ACS admissions during the COVID 19 pandemic and a more problematic management of these patients (particularly in the ED), in this case reflected by the significantly increased time to first ECG in the period of 2020. However, the rate of complications, Killip class, LVEF at admission and mortality rates were not significantly different, suggesting that patients did not present with more severe disease and that, despite the challenges associated with the pandemic, hospitals managed to provide adequate patient care. Studies of out-of-hospital mortality are needed to clarify the impact of ACS mortality in this setting.

CO 76. IMPELLA FOR CARDIOGENIC SHOCK AND HIGH-RISK PERCUTANEOUS CORONARY INTERVENTION: A SINGLE-CENTER EXPERIENCE

Mariana S. Brandão, Pedro Gonçalves Teixeira, Pedro Ribeiro Queirós, Mariana Ribeiro Silva, Gualter Santos Silva, Diogo Santos Ferreira, João Gonçalves Almeida, Gustavo Pires-Morais, Marisa Passos Silva, Marta Ponte, Adelaide Dias, Alberto Rodrigues, Pedro Braga, Daniel Caeiro, Ricardo Fontes-Carvalho

Centro Hospitalar de Vila Nova de Gaia/Espinho.

Introduction: The Impella is a percutaneous ventricular assist device that unloads the left ventricle by ejecting blood to the aorta. Its use in cases of cardiogenic shock (CS) and high-risk percutaneous coronary intervention (HR-PCI) is increasing.
Objectives: To report clinical outcomes with the Impella device in the settings of CS and HR-PCI.
Methods: Single-center retrospective study including consecutive patients (2007-2019) implanted with Impella for CS treatment or hemodynamic support of HR-PCI.
Results: 22 patients were included: 12 were treated for CS and 10 underwent Impella-supported PCI. Impella 2.5 (7) and Impella CP (15) were used. In the CS group (75.9% male, mean age 50.4 ± 18.9, median duration of support 19 ± 24 hours), CS etiologies were myocardial infarction (41.7%), acute myocarditis (25.0%) and acute decompensated heart failure (33.3%). All patients presented with multiorgan dysfunction and were in stage D or E of the SCAI classification of CS. Most patients (83.3%) had severe left ventricular (LV) dysfunction and half also had right ventricular impairment. In 5 cases, combined support of Impella and venoarterial extracorporeal membrane oxygenation (ECMO) was used: in 2 patients, Impella was implanted for LV venting; 3 patients needed escalation to ECMO due to refractory CS. Hemolysis was the most frequent device-related complication (63.7%). Three patients had BARC type 3 vascular complications. Three patients were transferred to a transplantation center, but none survived to transplant. In-hospital, cumulative 30-day and 1-year mortality were 58.3%, 66.6% and 83.3%, respectively. In the HR-PCI group (all male, mean age 73.7 ± 9.1 years, 50% diabetic, mean left ventricular ejection fraction 39.4 ± 13.6) all patients had multivessel, highly complex, disease (mean baseline SYNTAX I score 44.1 ± 13.7); six had a last remaining conduit. All patients were considered ineligible for surgery by the Heart Team. Half of the patients underwent PCI in the setting of an acute coronary syndrome. Median number of vessels treated was 2 ± 1. Seven patients underwent unprotected left main PCI. Impella was immediately explanted after PCI in all cases. There were no intraprocedural or device-related deaths. In-hospital and 30-day mortality were 10%; 1-year cumulative mortality was 30% (all deaths were of cardiovascular causes).
Conclusions: In the CS group, in-hospital and 30-day outcomes were poor, in line with the existing evidence, illustrating the severity, complexity and heterogeneity of this clinical scenario. Acceptable rates of major device-related complications were observed. In the HR-PCI cohort, the use of Impella to provide hemodynamic support was feasible and safe. Long-term results express the severity of the underlying disease and the patients' complexity. With the expanding use of the device, tools to identify the most suitable candidates for Impella support are warranted.

Domingo, 02 Maio de 2021 | 09H00-10H15

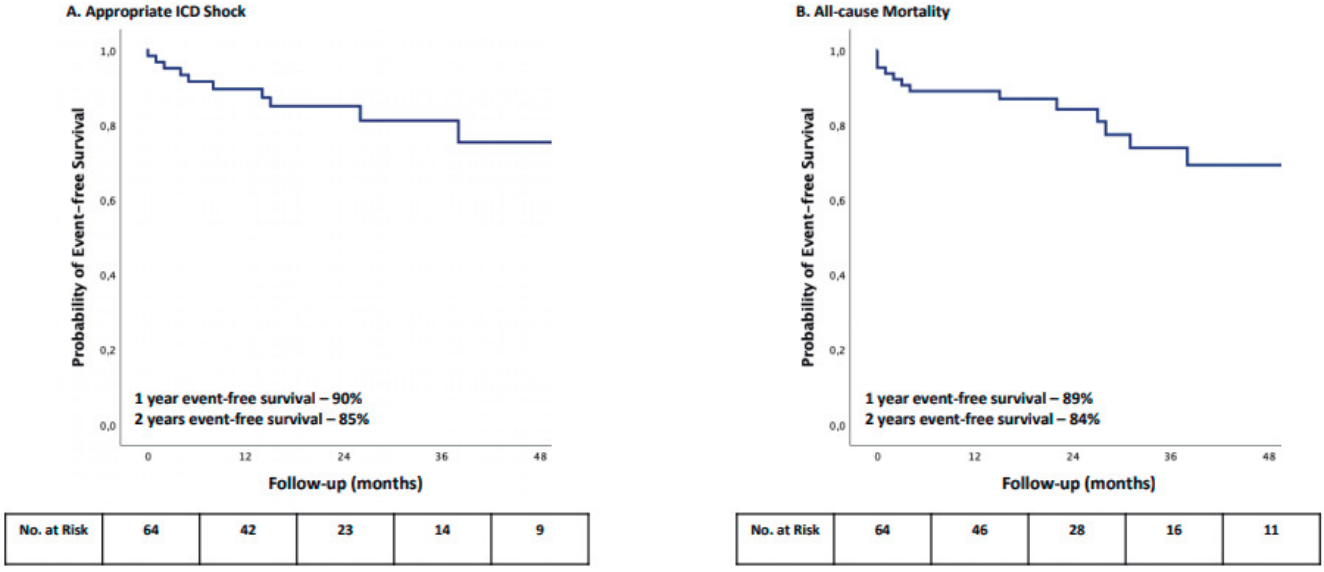
Sala Virtual 2 | CO 16 - Morte Súbita

CO 83. LONG-TERM OUTCOME OF VENTRICULAR TACHYCARDIA CATHETER ABLATION IN ISCHEMIC HEART DISEASE PATIENTS USING A HIGH-DENSITY MAPPING SUBSTRATE-BASED APPROACH: A PROSPECTIVE COHORT STUDY

Tiago Graça Rodrigues[1], Gustavo Lima da Silva[2], Afonso Nunes-Ferreira[2], Nelson Cunha[2], Pedro Silvério António[2], Sara Pereira[2], Joana Brito[2], Pedro Alves da Silva[2], Beatriz Valente Silva[2], Ana Bernardes[2], Luís Carpinteiro[2], Nuno Cortez-Dias[2], Fausto J. Pinto[2], João de Sousa[2]

[1]Centro Hospitalar de Lisboa Norte, EPE/Hospital de Santa Maria. [2]Serviço de Cardiologia, Departamento Coração e Vasos, Centro Hospitalar Universitário Lisboa Norte, CAML, CCUL, Faculdade de Medicina, Universidade de Lisboa.

Introduction and objectives: Radiofrequency catheter ablation (RCA) for ventricular tachycardia (VT) in patients with ischemic heart disease (IHD) is associated with a reduced risk of VT storm and implantable cardioverter defibrillator (ICD) shocks.
Objectives: to report the long-term outcome after a single RCA procedure for VT in patients with IHD using a high-density substrate-based approach.
Methods: We conducted a prospective, observational, single-centre and single-arm study involving patients with IHD, referred for RCA procedure for VT using high-density mapping catheters. Substrate mapping was performed in all patients. Procedural endpoints were VT noninducibility and local abnormal ventricular activities (LAVAs) elimination. The primary end point was survival free from appropriate ICD shocks and secondary end points included VT storm and all-cause mortality.
Results: Sixty-four consecutive patients were included (68 ± 9 years, 95% male, mean ejection fraction 33 ± 11% , 39% VT storms, and 69% appropriate ICD shocks). LAVAs were identified in all patients and VT inducibility was found in 83%. LAVAs elimination and noninducibility were achieved in 93.8% and 60%, respectively. After a mean follow-up of 25 ± 18 months, 90% and 85% of patients are free from appropriate ICD shocks at 1 and 2 years, respectively. The proportion of patients experiencing VT storm decreased from 39% to 1.6%. Overall survival was 89% and 84% at 1 and 2 years, respectively.
Conclusions: RCA of VT in IHD using a high-density mapping substrate-based approach resulted in a long-term steady freedom of ICD shocks and VT storm.



CO 83 Figure

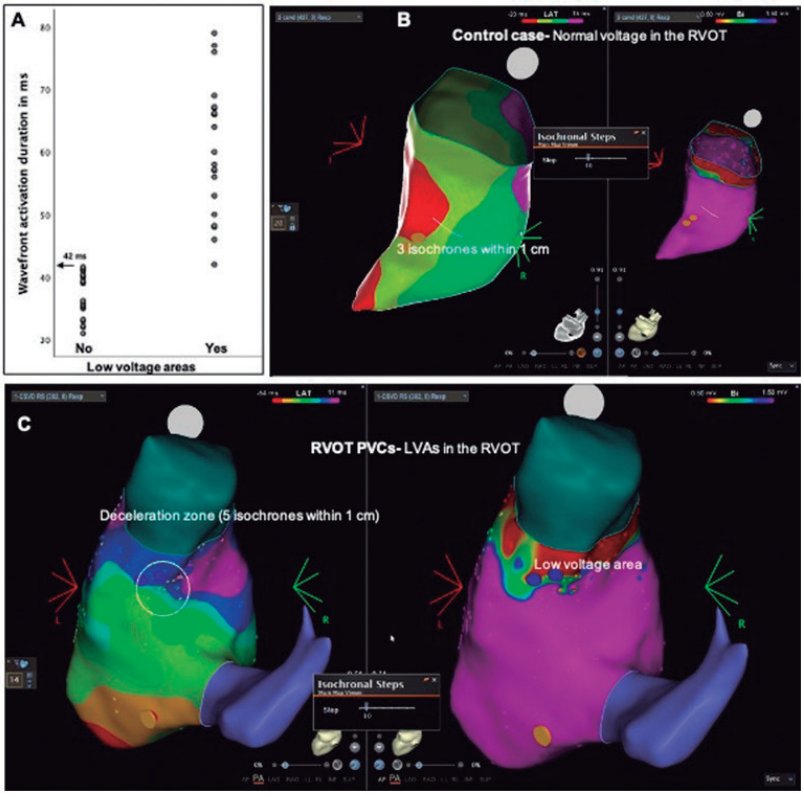
CO 80. ASSESSMENT OF WAVEFRONT PROPAGATION SPEED ON THE RIGHT VENTRICULAR OUTFLOW TRACT: DECELERATION ZONES ASSOCIATED WITH THE PRESENCE OF LOW VOLTAGE AREAS

Leonor Parreira[1], Pedro Carmo[2], Dinis Mesquita[1], Rita Marinheiro[1], Alexandra Gonçalves[1], Catalin Marinescu[2], Lia Marques[1], José Farinha[1], Ana Esteves[1], Pedro Amador[1], Artur Lopes[1], Marta Fonseca[1], Diogo Cavaco[2], Pedro Galvão Santos[2], Pedro Adragao[2]

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

Introduction and objectives: Activation wavefront is rapid and uniform in normal myocardium. Fibrosis is associated with deceleration zones (DZ) and late activated zones. The presence of low voltage areas (LVAs) in the right ventricular outflow tract (RVOT) of patients with premature ventricular contractions (PVCs) from this origin has been described previously. The aim of this study was to evaluate in sinus rhythm, the RVOT endocardial activation duration (EAD) and the presence of DZs, in patients with PVCs and in controls.

Methods: Consecutive patients with frequent (> 10,000/24h) idiopathic PVCs with inferior axis subjected to 3D electroanatomical mapping and ablation and had an activation and voltage map of the RVOT performed in sinus



CO 80 Figure

rhythm. A control group of patients without PVCs that underwent ablation of supraventricular arrhythmias was also studied. Patients with structural heart disease, previous ablation or conduction disease were excluded. The RVOT EAD was measured as the time interval between the earliest and the latest activated region. Also evaluated the number of 10 ms isochrones throughout the RVOT and the maximal number of 10 ms isochrones within 1 cm, and a DZ was defined as a zone with>3 isochrones within 1 cm radius. Low voltage areas (LVA) were defined as areas with local electrogram amplitude < 1.5 mV.

Results: We studied 42 patients, 29 in the PVC group and 13 control subjects. The two groups did not differ in relation to age, gender and number of points in the map. The site of origin of the PVCs was the RVOT in 23 patients and the LVOT in 6. EAD and number of 10 ms isochrones in the RVOT were significantly higher in the PVC group, respectively 56 (41-66) ms vs 39 (35-41) ms, p = 0.001 and 5 (4-6) vs 4 (4-4), p = 0.037. Presence of LVAs and DZs were more frequent in the PVC group, respectively 21 (72%) vs 0 (0%), p < 0.0001 and 20 (69%) vs 0 (0%), p < 0.0001. LVAs were more frequent in PVCs from the RVOT than from the LVOT (83% vs 33%, p = 0.033). Patients with LVA had longer EAD 60 (52-67) vs 36 (34-40) ms, p < 0.0001 (Figure A) and more DZ than patients without LVA 95% vs 0%, p < 0.0001 (Figure B and C).

Conclusions: The velocity of the wavefront propagation was slower and DZs were more frequently present in patients with PVCs and were associated with the presence of LVAs.

CO 82. LONG QT SYNDROME-EXPERIENCE FROM A PORTUGUESE CENTER

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Introduction: Congenital long QT syndrome (LQTS) is a hereditary disease characterized by prolonged QTc interval and risk of ventricular tachycardia (VT), which may lead to syncope, cardiac arrest, or sudden cardiac death (SCD) in young people.

Objectives: To report the experience and the incidence of significant arrythmias in patients with congenital LQTS in an inherited primary arrhythmic syndrome center from a Portuguese tertiary hospital.

Methods: Consecutive patients with LQTS were prospectively recruited from 1997 to 2021. Clinical data and 12-lead ECG were registered. Genetic screening was performed using DNA targeted sequencing for a panel which included KCNQ1 (LQTS 1), KCNH2 (LQTS 2), SCN5A (LQTS 3) and KCNE1 (LQTS 5). During follow-up, we registered significant clinical events such as SCD, as well as symptomatic and asymptomatic arrhythmic events.

Results: We enrolled a total of 15 patients affected by LQTS, among which there were 9 (67%) index-cases, 9 (60%) were females and the mean age at diagnosis was 44 ± 16 years-old. In this cohort, we only found an associated congenital abnormality in 1 patient who had Andersen-Tawil syndrome (ATS) with periodic paralysis. The Schwartz score indicated high probability of clinical diagnosis (≥ 3.5) in 12 patients, intermediate probability in 1 (1.5-3) and low probability in 2 (≤ 1). Regarding ECG abnormalities, 11 (73%) patients had a QT≥ 480 milliseconds, and only 3 had notched T wave in 3 leads at diagnosis. Nine (60%) patients were symptomatic at diagnosis, among whom 7 (47) had a history of previous syncope (only 2 with stress) and 5 (33%) presented with torsade de pointes and/or aborted SCD. A family history of unexplained SCD below 30 years-old and/or definite LQTS was found in 9 (60%) of them. Genetic screening was performed in 14 (93%), of whom 11 (79%) had a disease-causing mutation in KCNH2 and the patient with ATS had a mutation in KCNJ2 (LQTS 7). In the remaining 2 patients we found no mutations in the 4 sequenced genes. During a median follow-up of 4 [3.5-12.7] years, all patients had a beta-blocker prescribed and 6 (40%) received an implantable cardiac defibrillator (ICD), 2 due to aborted SCD at diagnosis and the other 4 for syncope recurrence, documented VT and/or QTc>500ms despite beta-blocker therapy. During follow-up, arrhythmic events were present in 6 (40%) patients (Table), including one SCD. The incidence rate of significant arrhythmic events was 0.06%/year.

Conclusions: The KCNH2 was the most prevalent mutation in this Portuguese cohort. Care of congenital LQTS patients in an inherited primary arrhythmic syndrome center was associated with a low incidence of significant clinical events (0.06%/year).

Type of LQTS (mutated gene)	Schwarz score for clinical diagnosis	Torsade de pointes/aborted SCD at diagnosis	Follow-up (in years)	Events during follow-up	ICD implantation
LQT2 (KCNH2)	3.5	No	3.9	No	No
LQT2 (KCNH2)	7	Yes	7.2	No	Yes
LQT2 (KCNH2)	4	No	21.1	Unexplained syncope	Yes
LQT2 (KCNH2)	4	No	18.0	No	No
LQT2 (KCNH2)	4.5	No	3.7	No	No
LQT2 (KCNH2)	1	No	3.5	No	Yes
LQT2 (KCNH2)	5.5	No	4.0	No	No
LQT2 (KCNH2)	4.5	No	12.7	Sudden cardiac death	No
LQT2 (KCNH2)	1.5	No	1.7	No	No
LQT2 (KCNH2)	5.5	No	3.4	Unexplained syncope + documented NSVT	Yes
LQT2 (KCNH2)	8.5	Yes	11.2	Appropriate ICD therapies	Yes
LQTS7 (KCNJ2)	0	No	3.0	Documented NSVT	Programmed
No mutations found	5	Yes (with a metabolic and iatrogenic component)	4.0	No	No
No mutations found	6	Yes	6.0	Appropriate ICD therapies	Yes
No genetic screening performed	7	Yes (initial diagnosis in 1997)	23.2	No	No

CO 82 Figure

CO 81. CATHETER ABLATION SUPPORTED BY EXTRACORPOREAL MEMBRANE OXYGENATION - LAST RESORT TREATMENT OF ARRHYTHMIC STORM?

Catarina Costa, Ana Filipa Amador, João Calvão, Gonçalo Pestana, Ana Lebreiro, Ricardo Pinto, Tânia Proença, Miguel Carvalho, Teresa Pinho, Ana Rita Ferreira, Roberto Roncon-Albuquerque, Luís Adão, Filipe Macedo

Centro Hospitalar de S. João, EPE.

Introduction: Arrhythmic storm (AS) is associated with high mortality, even with best medical care and hemodynamic support. If medical therapeutic failure, electrophysiological mapping and ablation are potential lifesaving therapies. Venoarterial extracorporeal membrane oxygenation (VA-ECMO) provides temporary mechanical circulatory support, and can be used as a salvage intervention in patients with cardiogenic shock. Considering the seriousness of AS and the technical complexity involved, catheter ablation supported by VA-ECMO is infrequently performed. We sought to assess the safety and effectiveness of emergent catheter ablation procedures performed in patients on VA-ECMO at our hospital.
Methods: Retrospective study of all VT catheter ablation procedures performed with VA-ECMO support at a tertiary centre between 2016 and 2020. Follow-up data was obtained from review of electronical records.
Results: Five patients underwent 6 emergent VT ablation procedures due to AS. The median age was 62 years (range, 52) and 4 patients were men. Three patients had VT at admission, while 2 were admitted with an acute coronary syndrome and developed VT during the hospitalization. Four patients had ischemic heart disease, though only 1 had previous history of VT; the remaining patient presented no structural heart disease. Median left ventricle ejection fraction was 11% (range 30). All patients had incomplete response to amiodarone, lidocaine and overdrive pacing, before being proposed to catheter ablation. Four patients were on ECMO support before ablation, while 1 was cannulated during the procedure due to hemodynamic instability. Ablation was performed using a retrograde approach in 3 patients, and combined retrograde and transeptal access in 2; one patient had epicardial ablation after unsuccessful endovascular approach. Three patients had left ventricle substrate ablation and the remaining 2 of the right ventricle. No major complications were seen directly related to the procedures. The median length of stay in intensive care unit was 22 days (range 41 days). Weaning of VA-ECMO was accomplished in all patients. Two patient died during the same hospitalization (one due to uncontrolled arrhythmic events). At a median 23 months (range 31) of follow-up of the surviving patients, two had recurrence of VT but no one had return of AS.
Conclusions: In our sample VT ablation on VA-ECMO support was a safe procedure, with no immediate complications. However, as reported in the literature, a high mortality rate was observed both in-hospital and during follow-up, mostly related to advanced structural heart disease. Also, considerable VT recurrence rates were seen, but with no re-hospitalization. Our experience shows that catheter ablation is a life-saving procedure in otherwise uncontrollable AS, and allowed absolute success in weaning VA-ECMO.

CO 79. LONG TERM PROGNOSIS OF OUT-OF-HOSPITAL CARDIAC ARREST DUE TO IDIOPATHIC VENTRICULAR FIBRILLATION -A TERTIARY CENTER EXPERIENCE

Ricardo Alves Pinto, Tânia Proença[2], Miguel Martins Carvalho[2], Pedro Diogo Grilo[2], Carlos Xavier Resende[2], Sofia Torres[2], João Calvão[2], Ana Filipa Amador[2], Catarina Costa[2], Sílvia Oliveira[2], Gonçalo Pestana[2], Raquel Mota Garcia[2], Ana Lebreiro[2], Luís Adão[2], Filipe Macedo[2]

Centro Hospitalar de S. João, EPE. [2]Centro Hospitalar Universitário de São João.

Introduction: Sudden cardiac death (SCD) is an uncommon event in the absence of structural heart disease. However, ventricular fibrillation (VF) may occur in patients with unknown cardiac disease and a comprehensive work-up is needed to further improve diagnostic. Still, a significant and heterogenous group of patients remains labelled of Idiopathic VF and limited data is available regarding their natural history.
Objectives: The aim of this study was to evaluate the clinical outcomes of survivors of an aborted SCD due to idiopathic VF or pulseless ventricular tachycardia (pVT).
Methods: Patients who survived an idiopathic VF or pVT referred to a cardiac defibrillator (ICD) implantation at a tertiary center between 2005 and 2019 were included. Patients were followed for 1 to 15 years (median follow-up of 7 years). Clinical and device data were collected.
Results: A population of 29 patients, 59% male, with a median age of 50 years (age ranging from 18 to 76) at the time of the aborted SCD was studied. All patients implanted an ICD (69% single chamber, 24% dual chamber and 3% subcutaneous) at the index hospitalization. The initial rhythm was VF in 76% and pVT in 24%. In relation to the context of the arrhythmic event, 48.3% occurred during daily life activities, 13.8% after an emotional stress, 6.9% during efforts and a similar percentage occurred either in rest or asleep. Of note, 12.5% of patients had previous history of syncope and 12% had family history of SCD. Normal ECG was present in 83% of patients. As for the cardiovascular risk factors, 61.5% had hypertension, 19% dyslipidemia, 17% diabetes, 31% were smokers or previous smokers. Atrial fibrillation was present in 15% of patients. To exclude possible causes of VF, all patients were submitted to coronary angiogram and echocardiogram, 64% to genetic testing, 68% to cardiac magnetic resonance, 20% to electrophysiologic study, 12% to pharmacological provocative test and 4% were submitted to endomyocardial biopsy. At follow-up, an etiological diagnosis was established in 31% of patients: 3 events were attributed to coronary vasospasm, 3 to short coupled polymorphic VT, 1 patient had long QT syndrome, 1 had Brugada syndrome and in 1 patient an ANK2 mutation was identified. As for the clinical outcomes, 8% patients died (from non-arrhythmic causes), 31% patients received appropriate therapies and 19% had unappropriated shocks (of those 60% for sinus tachycardia and 40% for supraventricular tachycardia).
Conclusions: Etiologic diagnosis and prediction of recurrence of arrhythmic events in patients with idiopathic VF is challenging, even with a long-term follow-up and more sophisticated diagnostic evaluation. Idiopathic VF is a rare but serious condition with recurrence in about one third of patients. Although not free of complications, ICD remains the gold standard of treatment.

CO 84. VENTRICULAR TACHYCARDIA ABLATION IN NONISCHEMIC CARDIOMYOPATHY

Daniel Nascimento Matos, Diogo Cavaco, Pedro Carmo, Maria Salomé Carvalho, Gustavo Rodrigues, João Carmo, Pedro Galvão Santos, Francisco Costa, Miguel Mendes, Francisco Morgado, Pedro Adragão

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

Introduction: Catheter ablation outcomes for ventricular tachycardia (VT) in nonischemic cardiomyopathy (NICM) are suboptimal when compared to ischemic cardiomyopathy. We aimed to analyse the long-term efficacy and safety of percutaneous catheter ablation in this subset of patients.
Methods: Single-center observational retrospective registry including consecutive NICM patients who underwent catheter ablation for VT during a 10-year period. The efficacy endpoint was defined as VT-free survival after catheter ablation, while safety outcomes were defined by 30-days mortality and procedure-related complications. Independent predictors of VT recurrence were assessed by Cox regression.
Results: In a population of 68 patients, most were male (85%), mean left ventricular ejection fraction (LVEF) was 34 ± 12%, and mean age was 58 ± 15 years. All patients had an implantable cardioverter-defibrillator. Twenty-six (38%) patients underwent epicardial ablation (Table 1). Over a median follow-up of 3 years (IQR 1-8), 41% (n = 31) patients had VT recurrence and 28% died (n = 19). Multivariate survival analysis identified LVEF (HR = 0.98; 95%CI 0.92-0.99, p = 0.046) and VT storm at presentation (HR = 2.38; 95%CI 1.04-5.46, p = 0.041) as independent predictors of VT recurrence. The yearly rates of VT recurrence and overall mortality were 21%/year and 10%/year, respectively. No patients died at 30-days post-procedure, and mean hospital length of stay was 5 ± 6 days. The complication rate was 7% (n = 5, Table 1), mostly in patients undergoing epicardial ablation (4 vs 1 in endocardial ablation, p = 0.046).

Table 1: Baseline characteristics of the population

Baseline characteristics	Population (N=68)
Male sex – no. (%)	58 (85.3)
Age – mean ± SD	58 ± 15
HTN – no. (%)	39 (57.4)
Dyslipidemia – no. (%)	28 (41.2)
Diabetes mellitus type 2 – no. (%)	11 (16.2)
History of tobacco consumption – no. (%)	23 (33.8)
Atrial fibrillation – no. (%)	7 (10.2)
NYHA class III or IV – no. (%)	36 (52.9)
Chronic kidney disease – no. (%)	26 (38.3)
Beta-blocker – no. (%)	66 (97.1)
Amiodarone – no. (%)	60 (88.2)
LVEF (%) – mean ± SD	34 ± 12
RBBB-like VT morphology – no. (%)	47 (69.1)
Electrical storm at presentation – no. (%)	18 (26.5)
Epicardial ablation – no. (%)	26 (38.2)
Hospitalization duration (days) – mean ± SD	5 ± 6
Complications – no. (%)	5 (7.3)
Pericardial effusion – no. (%)	2 (2.9)
Right ventricle puncture – no. (%)	1 (1.5)
Vascular complication – no. (%)	1 (1.5)
Complete heart block – no. (%)	1 (1.5)

HTN=arterial hypertension; ICD=implantable cardioverter-defibrillator; LVEF=left ventricle ejection fraction; NYHA=New York Heart Association functional class; RBBB=right bundle brunch block; SD=standard deviation; VT=ventricular tachycardia.

Conclusions: LVEF and VT storm at presentation were independent predictors of VT recurrence in NICM patients after catheter ablation. While clinical outcomes can be improved with further technical and scientific development, a tailored endocardial/epicardial approach was safe, with low overall number of complications and no 30-days mortality.

Sexta-feira, 30 Abril de 2021 | 11H30-12H30

Sala Virtual 3 | CO 17 - Interventional Cardiology-TEP

CO 85. HYBRID THERAPEUTIC APPROACH WITH SPECIFIC DRUG THERAPY AND BALLOON PULMONARY ANGIOPLASTY IN PATIENTS WITH CHRONIC THROMBOEMBOLIC PULMONARY HYPERTENSION: EFFECTS ON PULMONARY ARTERIAL COMPLIANCE

Rita Calé, Ana Rita Pereira, Filipa Ferreira, Sofia Alegria, Débora Repolho, Pedro Santos, Sílvia Vitorino, Mariana Martinho, Daniel Sebaiti, Maria José Loureiro[2], Hélder Pereira

Hospital Garcia de Orta, EPE. [2]outro.

Introduction: Pulmonary arterial compliance (C_{PA}) is a measure of arterial distensibility and is directly related with right ventricular (RV) systolic overload and prognosis in pulmonary hypertension. The effects on C_{PA} of a hybrid therapeutic approach with pulmonary vasodilators and balloon pulmonary angioplasty (BPA) in patients (pts) with chronic thromboembolic pulmonary hypertension (CTEPH) remain unclear.
Objectives: To determine the effect on C_{PA} of a hybrid therapeutic approach with pulmonary vasodilators and BPA in CTEPH pts.
Methods: Prospective single-centre study that included all BPA sessions performed in CTEPH pts from 2017 to 2020. Right heart catheterization was performed at baseline before the start of pulmonary vasodilator therapy (N = 13), just before the first BPA session (N = 13) and at 6-months of follow-up (FUP) after the last BPA session (N = 10, as 3 pts did not complete the 6-months FUP). C_{PA} was calculated as stroke volume/pulmonary arterial pulse pressure [systolic pulmonary artery pressure (PAP)-diastolic PAP], normal values 3.8-12 ml/mmHg, poor prognostic values < 2.5 ml/mmHg as previously described (Ann Am Thorac Soc. 2016;13(2):276-84; Circulation. 2017;136:314-26).
Results: 69 BPA sessions were performed in 13 CTEPH pts: mean age 62.4 ± 14.9 years; 67% with inoperable disease. At baseline, mean value of C_{PA} was severely decreased (1.4 ± 0.8 ml/mmHg). 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 3 and selexipag in 1). The number of pulmonary vasodilators decreased from 1.4 ± 1.0 before BPA to 1.2 ± 0.7 at FUP (p = 0.082). Mean number of BPA sessions was 5.3 ± 1.8 per pt (min 2-max 8) and mean number of total vascular segments treated 9.9 ± 2.3 per pt (min 6-max 15). BPA alone was associated with a significant reduction of diastolic PAP (23.8 ± 7.6 versus 15.5 ± 6.0 mmHg, p = 0.039) and a tendency to reduction of mean pulmonary vascular resistance (PVR of 5.3 ± 3.1 versus 3.0 ± 1.4, p = 0.056), but did not significantly increase C_{PA} (2.4 ± 1.1 versus 2.7 ± 1.0 ml/mmHg, p = 0.564). However, a BPA strategy on top of pulmonary vasodilator therapy further improved mean PAP (45.1 ± 11.4 versus 25.1 ± 6.6 mmHg, p = 0.002), PVR (10.2 ± 4.5 versus 3.0 ± 1.4 mmHg, p = 0.001) and C_{PA} (1.4 ± 0.8 versus 2.7 ± 1.0 ml/mmHg, p = 0.004) to values near normal at 6 months of follow-up (Table). An inversely significant correlation was found between decrease in PVR an increase in C_{PA} (r = -0.82, p = 0.004) leading to reduce in RV systolic overload.
Conclusions: BPA on top of pulmonary vasodilator therapy improves haemodynamic, including C_{PA}, having an overall and consistent significant benefit. These data also suggest that the hybrid therapeutic approach decreases RV systolic afterload in pts with inoperable CTEPH or residual/recurrent PH after surgery.

CO 86. INTRACARDIAC ECHOCARDIOGRAPHY-GUIDED LEFT ATRIAL APPENDAGE OCCLUSION: DESCRIPTIVE ANALYSIS

André Grazina, António Fiarresga, Ruben Ramos, Lídia de Sousa, Duarte Cacela, Luís Bernardes, José Viegas, Luísa Moura Branco, Ana Galrinho, Rui Cruz Ferreira

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Table. Changes of hemodynamic data before and after vasodilator therapy and BPA

Variables	Baseline (Before drug therapy)	BPA (Before 1st session and after drug therapy)	Follow-up (6-months after last BPA session)	p-value (Paired t test)		
				Baseline vs BPA (N=13)	BPA vs Follow-up (N=10)	Baseline vs Follow-up (N=10)
Mean PAP (mmHg)	45.1±11.4	35.8±12.2	25.1±6.6	<0.001	0.063	0.002
Systolic PAP (mmHg)	74.4±21.4	56.2±19.0	42.1±14.4	0.001	0.117	0.003
Diastolic PAP (mmHg)	27.0±9.0	23.8±7.6	15.5±6.0	0.069	0.039	0.025
Right atrial pressure (mmHg)	7.5±4.5	6.4±3.6	6.4±2.8	0.268	0.264	0.941
Cardiac Index (L/min/m2)	2.4±0.6	2.8±0.6	2.9±1.0	0.052	0.776	0.169
PVR (wood unit)	10.2±4.5	5.3±3.1	3.0±1.4	<0.001	0.056	0.001
Pulmonary pulse pressure (mmHg)	47.4±17.2	32.5±14.3	26.6±11.9	0.006	0.315	0.002
Stroke volume (ml)	57.7±22.2	64.0±13.7	65.4±19.0	0.206	0.601	0.498
C_{PA} (ml/mmHg)	1.4±0.8	2.4±1.1	2.7±1.0	0.001	0.564	0.004

BPA – balloon pulmonary angioplasty; C_{PA}- Pulmonary arterial compliance; PAP – pulmonar artery pressure; PVR – pulmonar vascular resistance

CO 85 Figure

Introduction: Oral anticoagulants are the standard treatment for prevention of stroke in patients with atrial fibrillation (AF). However, some patients still have stroke despite anticoagulation or have contraindications to anticoagulation. The left atrial appendage occlusion (LAAO) is an option for those patients. The use of intracardiac echocardiography (ICE) instead of transesophageal echocardiography guiding LAAO procedures has increased, allowing to reduce the use of general anesthesia.
Objectives: The aim of this study is to describe data regarding safety and efficacy in patients submitted to ICE-guided LAAO.
Methods: In a tertiary center, patients submitted to ICE-guided LAAO were identified. Information regarding baseline characteristics, procedure technical success, complications, hospitalization and follow-up data was noted retrospectively. The registered stroke and bleeding rates were compared with predicted rates using CHA2DS2-VASc and HAS-BLED scores, respectively.
Results: 45 patients underwent ICE-guided LAAO, mean age 75.9 ± 10.3 years old, 66.7%. Permanent AF was present in 68.9% (n = 31), with average CHA2DS2-VASc and HAS-BLED scores of 4.0 ± 1.4 and 3.6 ± 1.1, respectively (predicting a stroke risk of 4.0% per year and a major bleeding risk of 8.7% per year). The LAAO indication was previous major bleeding in 62.2% (n = 28), high bleeding risk in 26.7% (n = 12) and embolic events despite therapeutic anticoagulation in 11.1% (n = 5). The LAAO devices were implanted successfully in 96% of the patients (n = 43). It was noted a complication rate of 8.8% (n = 4), perforation in 4.4% (n = 2), device embolization in 4.4% (n = 2, one of them leading to cardiac arrest and death) and no major vascular complications occurred. No other procedure-related deaths occurred. The average duration of hospitalization after the procedure was 5.7 days. All patients were followed-up for a mean period of 19.0 months. During that period, another death (2.2%) occurred with a non-cardiac cause and the re-hospitalization rate was 26.7% (n = 12), 11.1% (n = 5) for cardiac causes. During the same period, 1 stroke (2.2%) and 6 major bleeding (13.3%) occurred-yearly rates of 1.4% and 8.4%, respectively. The stroke rate is markedly inferior to predicted by the score and the major bleeding is slightly inferior to predicted.
Conclusions: This study provides data about the safety and mainly about the efficacy of the LAAO guided by ICE in patients with high hemorrhagic and embolic risk.

CO 88. ONE-YEAR FOLLOW-UP OF CONTINUOUS ASPIRATION MECHANICAL THROMBECTOMY FOR THE MANAGEMENT OF INTERMEDIATE-HIGH AND HIGH-RISK PULMONARY EMBOLISM: WHAT IS THE LINE BETWEEN UTILITY AND FUTILITY?

Ana Rita Pereira, Rita Calé, Filipa Ferreira, Mariana Martinho, Sofia Alegria, Gonçalo Jácome Morgado, Cristina Martins, Melanie Ferreira, Ana Gomes, Tiago Judas, Filipe Gonzalez, Corinna Lohmann, Débora Repolho, Pedro Santos, Ernesto Pereira, Maria José Loureiro, Hélder Pereira

Hospital Garcia de Orta, EPE.

Introduction: Percutaneous catheter-directed treatments have emerged at the last decade for the management of acute high- or intermediate-high-risk pulmonary embolism (PE). Good short-term efficacy and safety have been published, but there are limited data regarding medium- to long-term outcomes. We aimed to evaluate 1-year all-cause mortality of acute high- and intermediate-high-risk PE patients (pts) treated with continuous aspiration mechanical thrombectomy.
Methods: Twenty-nine consecutive pts with acute central PE (mean age 67.2 ± 14.4 years; 72.4% female; 24.1% active cancer; Charlson comorbidity index 4.5 ± 2.1; 82.8% in class>III of original PESI score; 44.8% high-risk PE) were treated with the Indigo Mechanical Thrombectomy System (Penumbra, Inc) between 03/2018 and 03/2020. Clinical success was defined as improvement in hemodynamic and/or oxygenation parameters or pulmonary hypertension or right heart strain at 48 hours after intervention plus survival to hospital discharge. Data regarding severe adverse events potentially related to the procedure, in-hospital and 1-year all-cause mortality were collected.
Results: Clinical success was 75.9% with a significant improvement in mean paO2/fiO2 ratio (+77.1 ± 103.2; p < 0.01), shock index (-0.4 ± 0.4, p < 0.01), need for aminergic support (-75.0%, p < 0.01), right ventricular function (66.6%, p < 0.01) and systolic pulmonary arterial pressure (-10.2 ± 11.5 mmHg, p < 0.01) at 48 hours after procedure. In-hospital survival rate was 82.8% but severe adverse events potentially related to the procedure occurred in 3 pts (10.3%). One-year follow-up was completed in 93.1% of cases and all-cause mortality rate was 34.5% (n = 10 of which half occurred during the index hospital stay). Higher scores of Charlson comorbidity index (5.8 ± 1.9 vs 3.7 ± 1.9, p = 0.01) and de novo atrial fibrillation at admission (40% vs 0%, p < 0.01) were associated with higher 1-year all-cause mortality occurrence and were identified as 2 independent risk predictors by multivariate Cox regression. Kaplan-Meier curves confirmed its significant influence in 1-year survival free of adverse event (Figure). Time among diagnosis and percutaneous treatment (p = 0.99), PESI score (p = 0.24) and other clinical, haemodynamic and echocardiographic features did not influence mortality and suggest similarity of the PE severity at baseline. Technical characteristics were also not associated with mortality.
Conclusions: Aspiration thrombectomy for acute high- and intermediate-high-risk PE was feasible with a high clinical success rate. One-year all-cause mortality was elevated and predicted by high comorbidity index and de novo atrial fibrillation at admission. This data support the national expansion of this new PE treatment, but probably and as similar to other invasive techniques, we need to take into account comorbidities and avoid futility in multimorbidity pts.

CO 89. CONTRAST-INDUCED NEPHROPATHY AFTER STAGED BALLOON PULMONARY ANGIOPLASTY: LOWER RISK COMPARED WITH PERCUTANEOUS CORONARY INTERVENTION

Ana Rita F. Pereira, Rita Calé, Filipa Ferreira, Sofia Alegria, Daniel Sebaiti, Mariana Martinho, Débora Repolho, Pedro Santos, Sílvia Vitorino, Maria José Loureiro, Hélder Pereira

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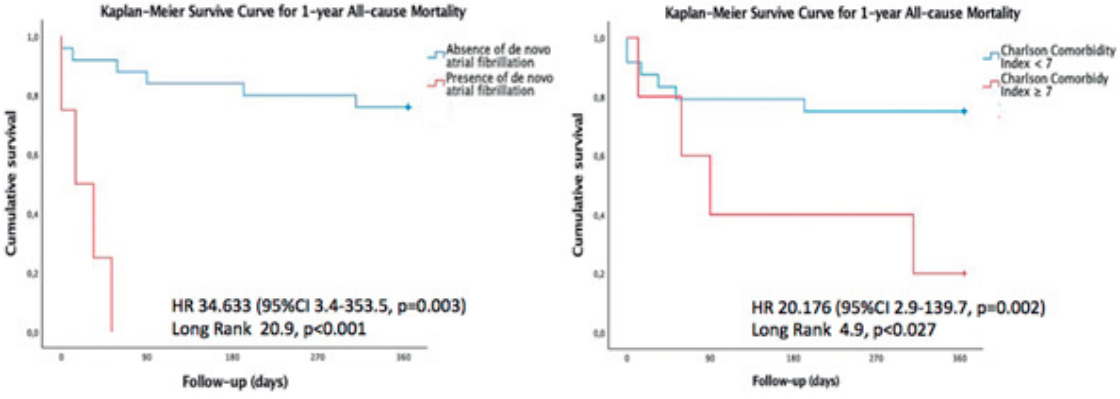
Introduction: The risk of contrast-induced nephropathy (CIN) after left-sided cardiac procedures is reported as 10-15%. When the ratio of total contrast volume in ml to glomerular filtration rate (GFR) in mL/min (ratio V/



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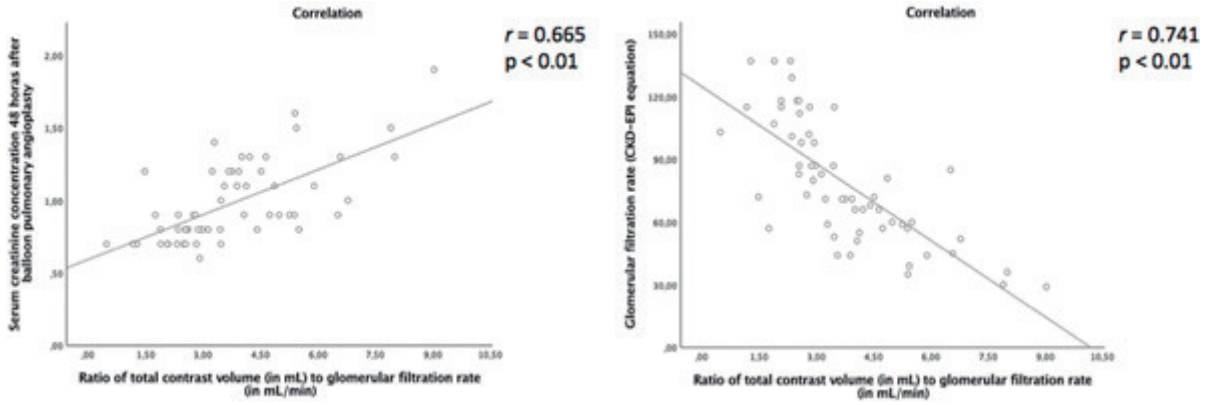


CO 89 Figure

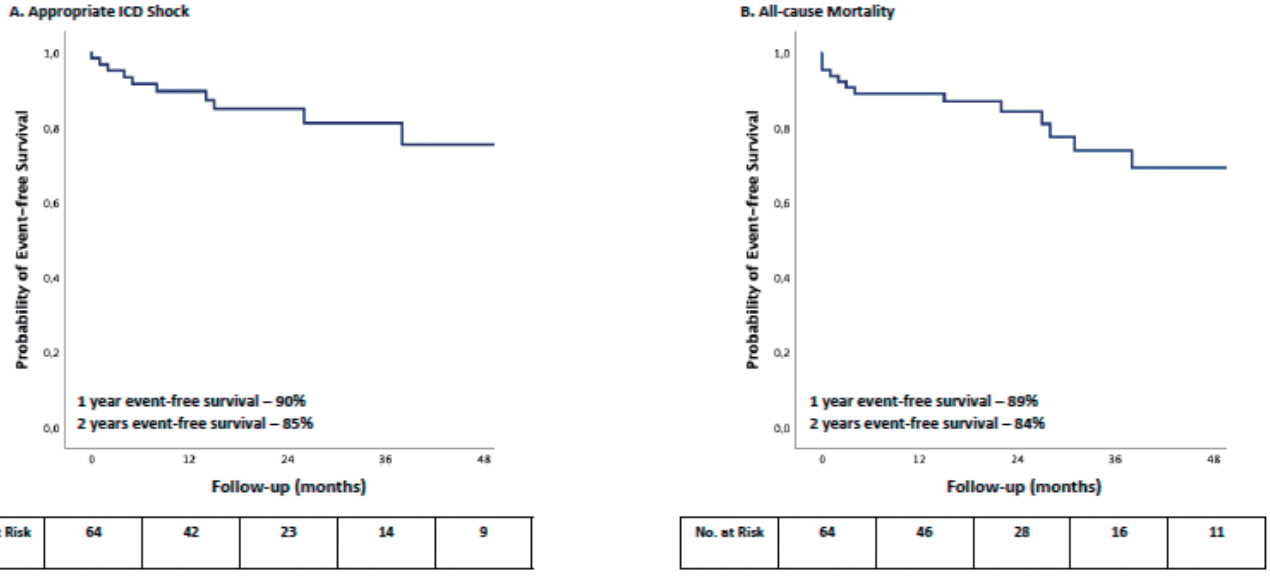
GFR) exceeds 3.7 in percutaneous coronary intervention, the risk increases significantly. However, there are few reports regarding the risk of CIN in patients (pts) with right-sided cardiac interventions such as balloon pulmonary angioplasty (BPA) and ratio V/GFR is not validated for use in this procedures.
Objectives: To assess the prevalence of CIN in pts with chronic thromboembolic pulmonary disease with or without hypertension (CTEPH/CTED) undergoing BPA.
Methods: Prospective single-centre study that included all BPA sessions performed from 2017 to 2020. Serum creatinine concentration (SC) was measured and the GFR was estimated using the Chronic Kidney Disease Epidemiology Collaboration equation (CKD-EPI) before and 48 hours after each BPA procedure and 6 months after BPA treatment completion. CIN was defined as an increase of at least 25% and/or 0.5 mg/dL in SC from the baseline value within 48h of contrast administration.
Results: 76 consecutive BPA sessions were performed in 15 CTEPH/CTED pts: mean age 63.2 ± 14.0 years, 60% female, 86.7% CTEPH, mean of 5.3 ± 1.9 sessions per patient with 4.3 ± 1.9 vessels dilated per session. Mean value of GFR before BPA program was 73.5 ± 26.3 mL/min. All the procedures were performed using low-osmolality contrast agent with a 1:1 dilution ratio with normal saline solution. Pts received 273.0 ± 73.0 mL of contrast per session with a ratio V/GFR 3.7 ± 1.7 mL. SC and GFR did not change significantly within 48h after BPA (+3.1%, p = 0.07 and -3.0%, p = 0.13, respectively). Ratio V/GFR > 3.7 occurred in 44.3% of cases, but CIN occurred in only 5.3% with an increase in SC < 0.5 mg/dL but at least < 25% in 3 cases (+33% in mean) and > 0.5 mg/dL in 1 case. None of the pts required renal replacement therapy. Higher SC and lower GFR 48h after BPA were significantly correlated with greater ratio V/GFR during procedure (r = 0.75, p < 0.01 and r = -0.74, p < 0.01, respectively)-see figure. But neither higher values of ratio V/GFR (OR 1.43; 95%CI 0.84-2.41; p = 0.19) nor V/GFR > 3.7 (OR 1.28; 95%CI 0.17-9.6; p = 0.81) predicted CIN. GFR before procedure did not influence the contrast volume administered (p = 0.901) and the number of vessels (p = 0.63) treated by session (p = 0.45). At 6 months follow-up, there was a trend for SC (-15%, p = 0.43) and GFR (+16%, p = 0.34) improvement in pts with impaired renal function at baseline (GFR< 60 mL/min).
Conclusions: These findings suggested that the occurrence of CIN after BPA was low, raising the hypothesis that the influence of contrast agent on renal function could differ between left- and right-sided cardiac interventions. Although the ratio V/GFR may be correlated with the risk of nephropathy, it is necessary to find a new cut-off to predict CIN in BPA pts.

CO 87. VALIDAÇÃO DO SCORE SPESI NUMA POPULAÇÃO DE UM HOSPITAL PORTUGUÊS

Joana Duarte Albuquerque, Margarida I. Nascimento, André Rosa Alexandre, Bernardo Duque Neves, Daniel Ferreira, Sérgio Garção Baptista, Alexandra Bayão Horta

Hospital da Luz Lisboa.

Introdução: O sPESI (simplified Pulmonary Embolism Severity Index) é um score de risco utilizado para prever a mortalidade a 30 dias nos doentes com tromboembolismo pulmonar (TEP), identificando doentes de baixo risco candidatos a alta precoce ou tratamento em ambulatório.



CO 87 Figura

Objectivos: Validação do score sPESI numa população de um hospital português e avaliação dos doentes com sPESI de 0.
Métodos: Estudo observacional retrospectivo com base na consulta dos processos eletrónicos dos doentes internados num hospital português entre Janeiro de 2007 e Dezembro de 2018, com diagnóstico inaugural de TEP documentado em Angio-TC torácica ou cintigrafia de ventilação-perfusão. Excluíram-se crianças e grávidas. Foi calculado o sPESI para cada doente e comparada a taxa de mortalidade aos 180 dias, tromboembolismo recorrente e hemorragia *major* entre doentes com sPESI de 0 e superior a 0. A análise estatística foi realizada com recurso ao software STATA 15.1.
Resultados: Foram incluídos 405 doentes, 53,3% do sexo feminino, com uma mediana de idade de 67 anos. 70,4% (n = 285) dos doentes tinham sPESI > 0, dos quais 27,4% (n = 111) apresentavam história de insuficiência cardíaca ou doença pulmonar e 23,5% (n = 95) doença oncológica. A mediana de dias de internamento foi seis dias (IIQ 4-10). A taxa de mortalidade aos 180 dias foi de 5,7% (n = 23). O score de sPESI associou-se a maior mortalidade (OR 2,14, IC95% 1,53-2,99), demonstrando boa capacidade discriminatória nesta população (AUC 0,84). História de neoplasia foi o item do sPESI que mostrou maior associação a mortalidade aos 180 dias (OR 2,66; IC95% 1,64-3,68). A mortalidade foi de 0% no grupo com sPESI = 0. A taxa de recorrência aos 180 dias foi de 0,25% (n = 1). Verificou-se hemorragia *major* aos 30 dias em 2,75% (n = 11), tendo todos sPESI > 0.
Conclusões: O score de sPESI é uma ferramenta simples e fácil de utilizar no dia-a-dia, que demonstrou na nossa população um bom poder discriminativo para prever mortalidade aos 180 dias. Doentes com sPESI de 0 têm bom prognóstico, o que reforça a segurança no tratamento destes doentes em ambulatório.

Domingo, 02 Maio de 2021 | 15H45-17H00

Estúdio 3 SPC Porto | CO 18 - Cardiopatias Congénitas

CO 95. DETERMINANTS OF ADVERSE RESPONSE TO EXERCISE IN TREATED AORTIC COARCTATION PATIENTS

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Introduction: Aortic coarctation is associated with several sequelae after treatment, including abnormal responses to exercise. We investigated determinants of adverse outcomes on exercise testing.

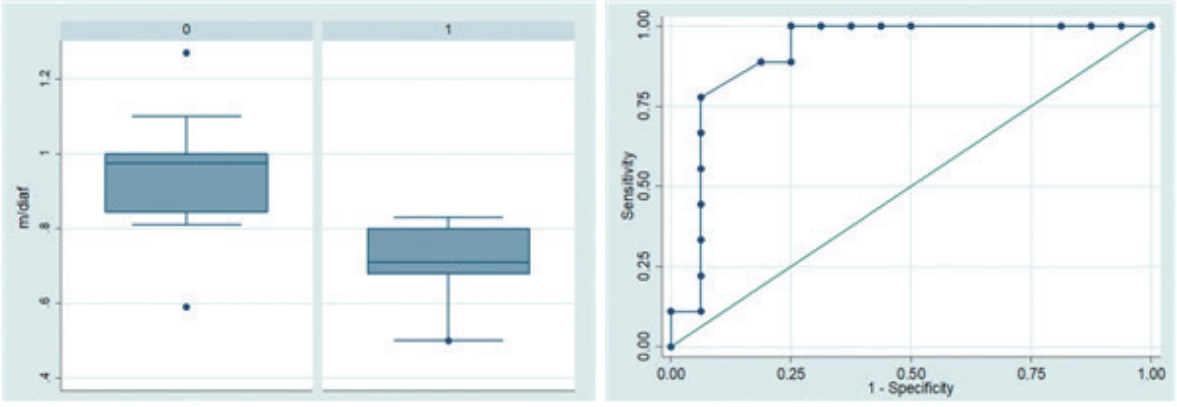
Methods: Asymptomatic patients with successfully treated aortic coarctation (residual isthmic Doppler gradient ≤ 20 mmHg) or with borderline gradient (>20 ≤ 25 mmHg) were prospectively evaluated with exercise testing and exercise echocardiography. Age at evaluation ranged from 8-40 years (mean 20.6). Exclusion criteria included other significant anomalies. Exercise was performed on a treadmill with a Bruce protocol. Isthmic Doppler gradient and flow pattern was assessed within 30 seconds of peak exercise. Adverse exercise outcome was defined by a composite endpoint consisting of exercise hypertension, isthmic diastolic flow on peak exercise Doppler, or ischemic changes. Clinical, physiological and morphological (MR) data were correlated with exercise test results. Statistical analysis was performed with Stata v13. For binomial variables chi-squared tests were used, for continuous variables we used t-test or Wilcoxon rank sum test. Multivariable logistic regression models were built, and the best models chosen using ROC curves.
Results: Forty-one patients were evaluated. Twelve (29%) reached the endpoint, which did not correlate with age, sex, BMI, type of treatment, or indexed LV mass. The endpoint was strongly associated ($p < 0.01$) with higher baseline office systolic BP (mean 140.0 mmHg (95%CI 131.3-148.7) vs. 120.7 mmHg (115.2-126.2) for those not reaching the endpoint); with a borderline isthmic Doppler gradient at rest; with a higher Doppler gradient at peak exercise (mean 47.2 mmHg (37.2-57.2) vs. 30.8 mmHg (26.0-35.6)); and with a lower cardiac MR ratio of narrowest diameter of aortic arch/aortic diameter at diaphragm level (0.71 (0.64-0.79) vs. 0.94 (0.86-1.03)). Multivariable logistic regression, after adjusting for confounders, showed that the ratio of narrowest aortic arch segment diameter/aortic diameter at the diaphragm was the single best predictor of adverse exercise outcome ($p < 0.01$, AUC = 0.9167) with an optimal cut-off point of 0.87.
Left: ratio of narrowest diameter of aortic arch/diameter of the aorta at diaphragm level (m/diaf) plotted against abnormal response to exercise (0 = no, 1 = yes)*. Right: ROC curve for m/diaf against abnormal response to exercise (AUC=0.9167). * - abnormal response to exercise = composite endpoint: hypertensive response, isthmic diastolic flow on exercise, significant ST-T changes.
Conclusions: Treated aortic coarctation patients have a high prevalence of abnormal exercise responses. Persistent aortic hypoplasia determined by a ratio of narrowest aortic arch segment/aorta at the diaphragm < 0.87 by MR was found to be the best predictor of adverse outcomes during exercise.

CO 91. NON-VITAMIN K ANTAGONIST ORAL ANTICOAGULANTS IN ADULT CONGENITAL HEART DISEASE: A SINGLE CENTER STUDY

Pedro Garcia Brás, Tânia Mano, Tiago Rito, Alexandra Castelo, Vera Ferreira, Ana Agapito, Rui Cruz Ferreira, Lídia Sousa

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

Introduction: Adults with congenital heart disease (ACHD) are at an increased risk for thromboembolic events and atrial arrhythmias are common in this population. Novel oral anticoagulants (NOACs) prescription is increasing, however data on efficacy and safety in ACHD is unclear,



CO 95 Figure

particularly in patients (P) with complex CHD. The aim of the study was to review the use of NOACs in various types of ACHD and assess its safety and efficacy.

Methods: Evaluation of consecutive ACHD P started on NOAC therapy from 2014 to 2020. P were followed-up for bleeding or thromboembolic events and mortality. CHA_2DS_2-VASc and HASBLED scores were calculated and risk factors for bleeding were identified.

Results: 93 ACHD P were included, mean age 52 ± 15 years, 58% male, 44% with complex CHD (3.2% with Fontan circulation), with diagnosis of: 22.2% atrial septal defect, 20% tetralogy of Fallot, 11.1% transposition of the great arteries, 10% Ebstein's anomaly, 8.9% ventricular septal defect, 7.8% pulmonary stenosis, 5.6% patent ductus arteriosus, 4.4% AV septal defect, 3.4% univentricular heart, 3.4% coarctation of aorta, 2.2% supra-aortic stenosis and 1% with Uhl disease. Most P were anticoagulated with rivaroxaban (43%), followed by edoxaban (24%), apixaban (20%), and dabigatran (13%). The indications for anticoagulation were: atrial arrhythmias (81%), pulmonary embolism (PE) (6.3%), atrial thrombi (4.3%), thromboprophylaxis in Fontan circulation (3.2%), deep vein thrombosis (3.2%) and stroke (2%). 66% of P had a CHA_2DS_2-VASc score ≥ 2 and 82% HASBLED score ≤ 2. In a mean follow-up of 41 ± 21 months (400.4 patient-years), there were embolic events in 2P (1 splenic infarction and 1 PE) albeit both were in the context of oral anticoagulation interruption. The cardiovascular mortality was 2% and allcause mortality 5%, however with no relation to thrombosis or bleeding events. 6 P (6.5%) suffered a minor and 3 P (3.2%) suffered a major bleeding, a median time of 12 (IQR 15) months after starting NOAC therapy. The annual risk for bleeding was 2.2%/patient/year. P with bleeding events showed no significant difference regarding age (55 ± 16 vs 52 ± 15 years, p = 0.587), gender (13% female vs 5.1% male, p = 0.295) or CHD type (p = 0.582). 8.6% of P required dose reduction, mostly for bleeding (3.2%) or renal impairment (2.2%). Renal disease was a strong risk factor for major bleeding (HR 14.6 [95%CI 1.23-73.6], p = 0.033 and multivariate analysis showed that an increased HASBLED score was an independent predictor of minor (adjusted HR 3.44 [95%CI 1.13-10.52], p = 0.030) and major (adjusted HR 5.29 [95%CI 1.14-24.45], p = 0.033) bleeding complications.

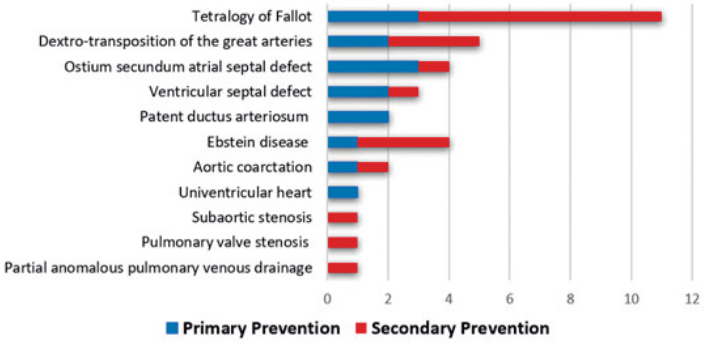
Conclusions: Anticoagulation with NOACs is a safe and effective option for selected ACHD P, although bleeding complications were not negligible, particularly in P with renal disease. Larger scale research studies are required, especially regarding complex CHD such as P with Fontan circulation.

CO 90. IMPLANTABLE CARDIOVERTER DEFIBRILLATORS IN ADULT CONGENITAL HEART DISEASE: LONG-TERM FOLLOW-UP OF THERAPIES, COMPLICATIONS AND CLINICAL EVENTS

Vera Ferreira, Madalena Coutinho Cruz, Guilherme Portugal, Pedro Silva Cunha, Bruno Valente, Sérgio Laranjo, Tânia Mano, Manuel Brás, Pedro Garcia Brás, Alexandra Castelo, André Grazina, Rui Cruz Ferreira, Lídia Sousa, Mário Oliveira

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

Introduction: Adults with congenital heart disease (ACHD) at increased risk for sudden cardiac death (SCD) often undergo implantable cardioverter



ICD		
ICD indications		
Primary prevention		16 (47.1%)
Secondary Prevention		18 (52.9%)
Monomorphic VT		14
Ventricular fibrillation		2
Polymorphic VT		2
Time to ICD after first cardiac surgery, years (median, IQR)		21.8 (10.7-36.3)
Device-related complications		
Pocket reintervention		2 (5.9%)
Lead replacement due to dysfunction		2 (5.9%)
System extraction due to pocket infection		2 (5.9%)
Inappropriate therapies		7 (20.6%)
Sinus tachycardia		1
Atrial flutter/fibrillation		3
Other supraventricular tachycardia		3
ICD therapies		18 (52.9%)
Antitachycardia pacing (ATP)		1 (2.9%)
Shock		6 (17.6%)
ATP + shock		10 (29.4%)
Time to first therapy, months (median, IQR)		25.3 (13.7-52.9)
Ventricular fibrillation		3 (8.8%)
Ventricular tachycardia		12 (38.2%)
Events	**Incidence (n, %)**	**Annual rate (%)**
Death/transplant/hospitalization for HF	16 (47.1%)	10.5
Death	10 (29.4%)	6.5
Transplant	3 (8.8%)	2.0
Hospitalization	20 (62.5%)	13.9
Hospitalization for heart failure	13 (40.6%)	9.0
Hospitalization for arrhythmia	11 (34.4%)	7.6

CO 90 Figure

defibrillator (ICD) implantation at young ages. Data evaluating the long-term outcomes of ICD in this population remain scarce. We aimed to characterize the population with ACHD and an ICD.
Methods: Consecutive ACHD submitted to an ICD implantation in a single tertiary center were evaluated. Data on baseline clinical features, heart defect, indication for ICD, type of device, ICD-related complication and therapies and mortality during follow-up were collected.
Results: A total of 34 patients (P) were evaluated. Median age at implant was 39.3 years (interquartile range [IQR] 29-5-53.6) and median left ventricular ejection fraction (LVEF) was 43.5% (IQR 28.0-53.3). The most common heart defect was tetralogy of Fallot (11P; 32.3%), followed by dextro-transposition of the great arteries, ostium secundum atrial septal defect (ASD) and ventricular septal defect (Figure 1). All P were submitted to surgical correction (median age at surgery 12.5 years [IQR 3.0-29.1]). Sixteen P underwent ICD implantation for primary prevention of SCD, owing to complex cardiopathy and ventricular dysfunction, and 18P due to spontaneous ventricular tachyarrhythmias. The implantable devices were a single-chamber ICD in 55.9%, a double-chamber ICD in 17.6%, a subcutaneous ICD in 20.6% and a CRT-D in 5.9%. During a median follow-up of 4.5 years (IQR 2.1-8.8), 52.9% of the P received appropriate ICD therapies, corresponding to 37.5% and 66.7% of primary and secondary prevention P, respectively. Median time to first arrhythmic event was 25.3 months (IQR 13.7-52.9). Six P (17.6%) suffered ICD-related complications and 20.6% received inappropriate therapies due to supraventricular tachyarrhythmias. During follow-up, 8.8% were submitted to heart transplant and 29.4% died (Table 1). ICD therapies were associated with a composite of death, cardiac transplantation and hospital admission (OR 5.0, 95%CI 1.0-24.3).
Conclusions: ACHD with ICD experience high rate of appropriate therapies, including those implanted for primary prevention. The long-term burden of ICD-related complications and inappropriate shocks underlines the need for careful risk stratification and close monitoring. The increased survival of this population justifies collecting data on long-term outcomes to improve its care.

CO 93. CAUSES OF DEATH IN ADULT CONGENITAL HEART DISEASE

José Viegas, Tânia Branco Mano, Bárbara Teixeira, Sofia Jacinto, Rita Teixeira, Tiago Rito, Ana Agapito, Fátima Pinto, Lídia de Sousa, Rui Cruz Ferreira

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

Introduction: Mortality in adults with congenital heart disease (CHD) is known to be increased. Despite a significant raise in life expectancy over the last decades, it remains lower than for the general population. We aimed to analyse the circumstances of death and mortality patterns in adults with CHD (ACHD).
Methods: Retrospective analysis of adult patients (pts) with CHD followed in one terciary care center who died between 1980 and December 2020. Data relating to the cardiac diagnosis, comorbidities, interventions, complications and causes of death were evaluated.
Results: 251 pts were included, 51% male, median age of death 41 (28). Most of the deceased patients had severe CHD (n = 135), and 8% (n = 21) had a congenital syndrome. Regarding causes of death, 166 pts (66%) died CHD-related, 24 pts (9%) died non-CHD related, and in 61 pts (24%) no information regarding the cause of death was available (Figure 1). The most common cause of CHD-related death was progressive heart failure (n = 67, 40%), followed by sudden cardiac death (n = 53, 32%). As expected, the age of death in pts with severe CHDs was lower than pts with mild or moderate CHD, yet no association was found between the complexity of the defect and the cause of death. Mortality patterns according to individual CHD are identified in Figure 2.
Conclusions: The vast majority of ACHD pts die from CHD-related causes, with heart failure and sudden cardiac death being the leading causes of death. Variations in mortality patterns can be found according to individual CHD.

CO 92. TRENDS IN MORTALITY OF ADULT CONGENITAL HEART DISEASE PATIENTS IN THE LAST FOUR DECADES

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

Introduction: Medical, surgical, and technological advances over the past decades increased the life expectancy of congenital heart disease (CHD) patients (pts), with > 90% reaching adulthood. Nonetheless, mortality for adults with CHD (ACHD) is still higher than for the general population. We aim to analyse trends in mortality and causes of death of ACHD.
Methods: Retrospective analysis of pts followed in an ACHD outpatient clinic, in one tertiary center, who died between 1980 and December 2020. Data relating to the cardiac diagnosis, symptoms, interventions, comorbidities, and causes of death were analysed.
Results: During a median follow-up of 8.9 years (IQR 2.2-17), 251 pts of 3,725 (6.7%) died during the study period: 127 males (51%), mean age at death 44.9 ± 18.1 years, 54% with severe CHD. The majority of these deaths were

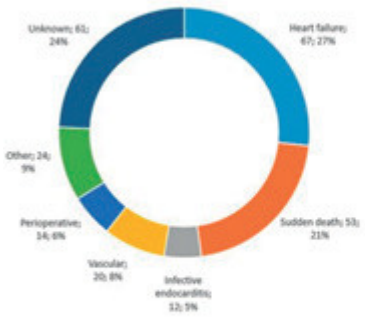


Fig. 1. Causes of death

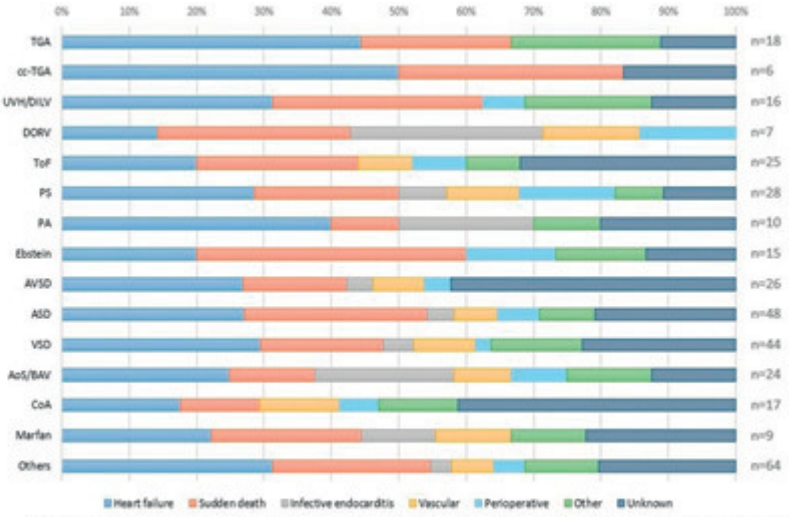


Fig. 2. Causes of death by underlying defect. cc-TGA, congenitally corrected transposition of the great arteries; PA, pulmonary atresia associated with ventricular septal defect; UVH/DILV, univentricular heart/double inlet left ventricle; AVSD, atrioventricular septal defect; ToF, tetralogy of Fallot; ASD, atrial septal defect; DORV, double outlet right ventricle; AoS/BAV, aortic stenosis/bicuspid aortic valve; PS, pulmonary stenosis; TGA, transposition of the great arteries; CoA, aortic coarctation; VSD, ventricular septal defect; Ebstein, Ebstein's anomaly; Marfan, Marfan syndrome.

CO 93 Figure

CHD-related (171 pts-68.1%) with no statistically significant differences over the years vs non-cardiovascular death (Table 1). However, a paradigm shift was noticed: in the first years the main cardiac cause was sudden-death that was replaced by heart failure in the last decade. Also, the mean age at death increased over the years (33 ± 14.9 years until 2000 vs 52.3 ± 17 years after the year 2010, p < 0.001) as the number of implantable devices (4 vs 20, p = 0.05).

Table 1. Characteristics of Adult Congenital Heart Disease patients who died during the study period, according to time.

	Years 1980-2000	Years 2001-2010	Years 2011-2020
Patients (N)	57	96	98
Male gender (%)	30 (53%)	50 (52%)	46 (47%)
Age (mean), years	33±14.9	42.8±17.8	52.3±17
Follow-up (median), years	5.6	10.8	16.5
Classification			
Mild	5 (9%)	8 (8%)	6 (6%)
Moderate	23 (40%)	29 (30%)	44 (45%)
Severe	29 (51%)	59 (60%)	48 (49%)
Previous surgery	31 (54%)	36 (38%)	52 (53%)
Mean number of interventions	1.4	1.5	1.6
Causes of death			
Cardiovascular	45 (79%)	61 (64%)	69 (70%)
Non-cardiovascular	2 (4%)	7 (7%)	14 (14%)
Unknow cause	10 (17%)	28 (29%)	15 (15%)
Cardiovascular death			
Sudden death	15 (26%)	25 (26%)	18 (17%)
Heart failure	13 (23%)	21 (22%)	35 (36%)
Infective endocarditis	3 (5%)	4 (4%)	5 (5%)
Perioperative	5 (9%)	4 (4%)	4 (4%)
others	9 (16%)	7 (7%)	7 (7%)
Implantable device			
Pacemaker	3	9	12
ICD	1	3	7
CRT	0	0	1

ICD – Implantable Cardioverter Defibrillator; CRT – Cardiac Resynchronization Therapy

Conclusions: Causes of death of ACHD patients are in the majority still CHD-related. However, in the last decade, according to the increase in life expectancy, heart failure became the leading cause of death.

CO 94. ARRHYTHMIA ABLATION IN CONGENITAL HEART DISEASE PATIENTS-A SINGLE CENTRE RETROSPECTIVE STUDY

Guilherme Lourenço, Sérgio Laranjo, Ana Sofia Delgado, Conceição Trigo, Fátima F. Pinto, Rui Ferreira, Mário Oliveira

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

Introduction: Arrhythmias are an important cause of morbidity and mortality in congenital heart disease (CHD) patients. They can be treated by ablation during electrophysiological studies, but are usually complex cases, due to the anatomical variation (pre and post-surgery) and presence of structural disease and scar tissue.
Methods: Retrospective review of ablation cases in CHD patients in a single centre from 2001 to 2020. Data on demographics, CHD group, arrhythmia mechanism, treatment outcomes (immediate and long term), and complications was collected.
Results: 53 patients were identified (51% male), who had a total of 77 procedures. Median age at first procedure was 29.8 years (min 0.7, max 65.8). The most prevalent CHD group was right obstructions (25 pts, 47.2%), followed by septal defects (13 pts, 24.5%), left obstructions (4 pts, 7.5%), tricuspid valve malformations (4 pts, 7.5%), functionally univentricular heart post-Fontan operation (4 pts, 7.5%), post-transposition of the great arteries post-Senning operation (2 pts, 3.8%) and Truncus arteriosus (1 pt, 1.9%). The median number of surgeries was 1 (min 0, max 4), and 12 pts (22.6%) underwent at least one palliative surgery. On the first procedure arrhythmias found were right atrial macroreentrant taquicardia (23 pts, 43.4%), right atrial focal tachycardia (4 pts, 7.5%), left atrial focal tachycardia (1 pt, 1.9%), atrial fibrillation (4 pts, 7.5%), accessory pathway-mediated atrioventricular (AV) reentrant tachycardia (7 pts, 13.2%), AV nodal reentrant tachycardia (4 pts, 7.5%), right ventricular focal tachycardia (3 pts, 5.7%), right ventricular macroreentrant tachycardia (4 pts, 7.5%), presence of substrate for right ventricular macroreentrant tachycardia without clinical manifestations (1 pt, 1.9%), and non-specified atrial tachycardia (2 pts, 3.8%). On first procedure complete success was achieved in 81.1% of patients, partial success occurred in 3.8% and empirical treatment was performed in 1.9% (1 pt); palliative treatment (AV node ablation) was performed in 3.8%; procedure failure occurred in 7.5%. Recurrence of (any) arrhythmia occurred in 39.6%, but of these 28.6% were of a different mechanism. 18 patients had at least one repeat procedure, and on the first repeat procedure complete success was achieved in 72.2%.
Conclusions: CHD patients present a challenging population, but on our series it was possible to treat their arrhythmias, even though multiple procedures were frequently necessary.

Domingo, 02 Maio de 2021 | 10H30-11H45

Sala Virtual 3 | CO 19 - Hipertensão Pulmonar

CO 101. COMPARISON OF 2-YEARS FOLLOW-UP OF OPTIMAL MEDICAL THERAPY VERSUS BALLOON PULMONARY ANGIOPLASTY FOR INOPERABLE CHRONIC THROMBOEMBOLIC PULMONARY HYPERTENSION: IS IT NOW TIME TO WITHDRAWAL OF ISOLATED MEDICAL THERAPY?

Ana Rita Pereira, Rita Calé, Filipa Ferreira, Sofia Alegria, Daniel Sebaiti, Mariana Martinho, Débora Repolho, Pedro Santos, Sílvia Vitorino, Maria José Loureiro, Hélder Pereira

Hospital Garcia de Orta, EPE.

Introduction: Balloon pulmonary angioplasty (BPA) has emerged as a therapeutic option for chronic thromboembolic pulmonary hypertension (CTEPH) patients (pts) considered ineligible for pulmonary endarterectomy (PEA). The initial publications of the worldwide work-groups showed good short-term outcomes for the technique, but there are limited data regarding medium-term outcomes and its comparison with optimal medical treatment (OMT).
Objectives: To compare the medium-term outcomes of OMT versus (vs) BPA in inoperable CTEPH.
Methods: Retrospective single-centre study of consecutive pts with CTEPH followed in a referral centre for Pulmonary Hypertension. Selected those pts considered ineligible for PEA and followed at least 2-years. Comparison between OMT alone [maximum tolerated doses of pulmonary vasodilator drugs (PVD), as indicated] versus BPA (pts who completed the program with or without OMT). Endpoint was a composite of all-cause death and unplanned right heart failure admission at 2-year.
Results: From 62 pts, 19 pts were included (11 pts were excluded due to recent diagnosis; 32 were submitted to EAP): mean age 65.0 ± 15.3 years, 89.5% female. At diagnosis, all pts had functional limitation and elevated serum NTproBNP (median value 1,255.0 pg/mL). Mean pulmonary arterial pressure (mPAP) was 46.2 ± 9.3 mmHg and pulmonary vascular resistance (PVR) 15.3 ± 8.3 Wood units (WU). Concerning treatment, 12 pts (63.2%) underwent OMT alone. These pts had higher NTproBNP levels (2,670.0 vs 538.0 pg/mL, p < 0.01) and PVR (19.7 ± 7.6 vs 9.7 ± 5.4 WU, p = 0.01)

A

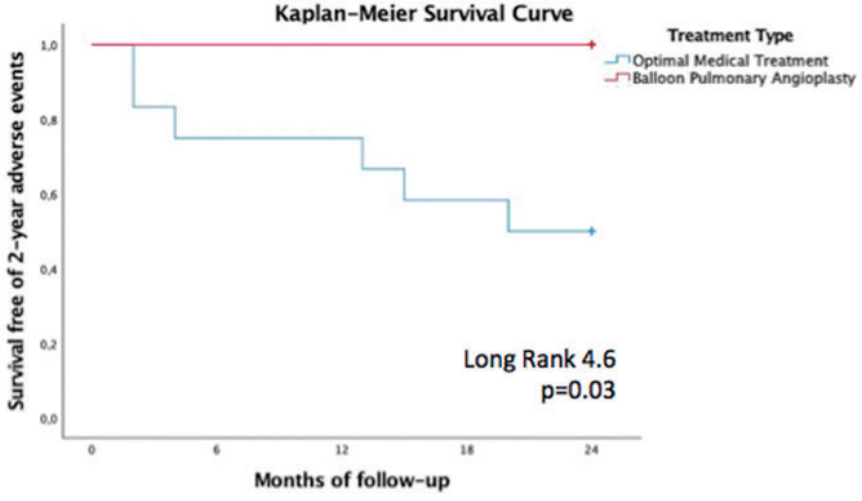
Table. Comparison of 2-years follow-up of optimal medical therapy (OMT) versus balloon pulmonary angioplasty (BPA) for inoperable chronic thromboembolic pulmonary hypertension

Variables*	Baseline			2-year follow-up			Baseline vs. 2-year follow-up	
	OMT (n=12)	BPA (n=7)	p-value†	OMT (n=12)	BPA (n=7)	p-value†	OMT (n=12)	BPA (n=7)
Clinical characteristics								
Age (years)	63.2 ± 18.3	68.1 ± 8.3	p = 0.42					
Female Gender (*n*, %)	12 (100%)	4 (57.1%)	p = 0.12					
Limited functional class(*n*, %)*	12 (100%)	312.0	p = 0.04	10 (83.3%)	0	p < 0.01	p = 0.99	p < 0.01
6MWT (m)	225.3	538.0	p = 0.19	284.2	430.0	p = 0.01	p = 0.33	p = 0.20
NT-proBNP (pg/mL)	2670.0		p < 0.01	2004.0	132.0	p < 0.01	p = 0.33	p = 0.06
Haemodynamics features								
Mean PAP (mmHg)	47.5 ± 2.6	44.4 ± 14.6	p = 0.60	46.5 ± 6.6	25.1 ± 6.7	p < 0.01	p = 0.92	p = 0.01
Mean RAP (mmHg)	9.6 ± 3.8	6.4 ± 4.0	p = 0.14	10.0 ± 7.2	5.7 ± 2.4	p = 0.17	p = 0.77	p = 0.61
PVR (uWood)	19.7 ± 7.6	9.7 ± 5.4	p = 0.01	13.3 ± 6.8	2.9 ± 0.8	p = 0.05	p = 0.23	p = 0.01
Cardiac output (L/min)	2.9 ± 1.0	4.4 ± 1.1	p = 0.01	3.7 ± 0.5	5.0 ± 1.3	p = 0.09	p = 0.38	p = 0.21
Cardiac index (L/min/m²)	1.6 ± 0.3	2.4 ± 0.5	p < 0.01	2.2 ± 0.3	2.6 ± 0.5	p = 0.12	p = 0.12	p = 0.36
SvO_2 (%)	58.8 ± 12.5	69.3 ± 12.6	p = 0.16	66.1 ± 2.8	70.4 ± 4.7	p = 0.19	p = 0.99	p = 0.28
Echocardiographic features								
RV dysfunction (*n*, %)	6 (50%)	3 (42.9%)	p = 0.64	5 (41.7%)	0	p = 0.02	p = 0.08	p < 0.01

* Functional Classification according World Health Organization: I – without limitation of physical activity; II – slight limitation of physical activity; III – marked limitation of physical activity; IV – inability to carry out any physical activity without symptoms.
# Continuous variables are expressed as mean-± standard deviation with exception of NT-proBNP and 6MWT expressed as median

† After adjustment by Cox regression, no difference in baseline or follow-up features besides treatment influenced the outcome
BPA – Balloon Pulmonary Angioplasty; OMT – Optimal Medical Treatment; NT-proBNP – N-terminal pro-brain natriuretic peptide; PAP – Pulmonary Artery Pressure; PVR – Pulmonary Vascular Resistance; RAP – Right atrial pressure; RA – Right atrial; RV – Right ventricular; 6MWT – Six-minute walking test; SvO_2 – Mixed venous oxygen saturation.

B



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and lower CI (1.6 ± 0.3 vs 2.4 ± 0.5 L/min/m², p < 0.01) at baseline; the remaining basal features didn't differ among groups (Figure-A). At 2-year follow-up, 71.4% of pts submitted to BPA were under PVD with a mean of 1 ± 0.8 drugs per patient and no difference compared to OMT group (83.3%, 1.7 ± 0.9 drugs per patient), although oxygen therapy was higher in medical group (50% vs 0%, p = 0.04). A significant overall improvement was observed in BPA group (Table-A): all pts were in functional class I (p < 0.01), no one had right ventricular (RV) dysfunction (p < 0.01) and mPAP decreased to 25.1 ± 6.7 mmHg (p = 0.01) and RVP to 2.9 ± 0.8 WU (p = 0.01). Inversely, no change was observed in pts under OMT alone (p>0.05 in all, Table-A). Endpoint rate was 31.6% with all adverse events occurring in the OMT group (50% vs 0%, p = 0.04). After adjustment by Cox regression, no difference in baseline or follow-up features besides treatment influenced the outcome. Kaplan-Meier analysis (Figure-B) confirmed significant benefit of BPA in 2-year outcome occurrence (long rank 4.6, p = 0.03).

Conclusions: BPA strategy seems to improve medium-term functional capacity, RV function and haemodynamics and decrease oxygen therapy dependence in inoperable CTEPH. Pts under OMT alone have a poor prognosis. These data encourage the development and implementation of the technique for inoperable CTEPH.

CO 99. A COMPARATIVE ANALYSIS OF THE DIAGNOSTIC PERFORMANCES OF FOUR CLINICAL PROBABILITY MODELS TO RULE OUT PULMONARY EMBOLISM

Beatriz Silva [1], Cláudia Jorge[2], Joana Rigueira[2], Tiago Rodrigues[2], Miguel Nobre Menezes[2], Rui Plácido[2], Nelson Cunha[2], Pedro Silvério António[2], Sara Couto Pereira[2], Joana Brito[2], Pedro Alves da Silva[2], Margarida Martins[2], Beatriz Garcia[2], Catarina Oliveira[2], Inês Aguiar Ricardo[2], Fausto J. Pinto[2]

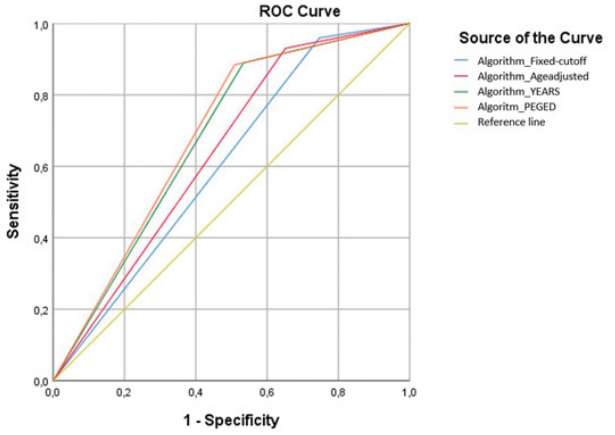
[1]Centro Hospitalar de Lisboa Norte, EPE/Hospital de Santa Maria. [2]Serviço de Cardiologia, Departamento Coração e Vasos, Centro Hospitalar Universitário Lisboa Norte, CAML, CCUL, Faculdade de Medicina, Universidade de Lisboa.

Introduction: Ruling out pulmonary embolism (PE) through a combination of clinical assessment and Ddimer is crucial to avoid excessive computed tomography pulmonary angiography (CTPA), and different algorithms should be considered as an alternative to the fixed cutoff to achieve that goal.
Objectives: To compare sensitivity, specificity, and reduction in CTPA requests of 4 algorithms to rule out PE: fixed Ddimer cutoff, age-adjusted, YEARS and PEGeD.

Methods: Retrospective study of consecutive outpatients who presented to the emergency department and underwent CTPA for PE suspicion from April 2019 to May 2020. The clinical-decision algorithms were retrospectively applied. In fixed and age-adjusted cut-off, high probability patients are directly selected for CTPA. In fixed cutoff, low to moderate probability patients undergo CTPA if Ddimer ≥ 500 μg/L. In age-adjusted cutoff, low to moderate probability patients perform CTPA if Ddimer ≥ 500μg/L in patients who are 50 years of age or younger, and if Ddimer level was more than 10 times the patient's age in patients who are older than 50 years. YEARS includes 3 items (signs of deep vein thrombosis, haemoptysis and whether PE is the most likely diagnosis): patients without any YEARS items and Ddimer ≥ 1000ng/mL or with ≥ 1 items and Ddimer 500 ng/mL perform CTPA. In the PEGeD, patients with high clinical probability or with intermediate and Ddimers >500μg/L or low probability and Ddimer >1,000 μg/L are selected for CTPA.
Results: We selected 571 patients and PE was confirmed by CTPA in 172 patients. Compared with a fixed Ddimer cutoff, age-adjusted was associated with a significant increase of specificity (p < 0.001), correctly avoiding 38 CTPAs, without losing sensitivity. YEARS and PEGED resulted in a marked increase in specificity, compared to the fixed cutoff, but with impairment of sensitivity (p < 0.001). PEGeD had the worst sensitivity, associated with 13 more false negatives (FN) than the fixed cutoff. Despite the lack of difference between PEGed and YEARS strategies regarding sensitivity, PEGED had significantly higher specificity (p < 0.001) and allowed to correctly avoid a higher number of CTPA (95 vs 85), compared to the fixed cutoff. Results are summarized in table 1 and the AUC for each algorithm is shown in the figure.

	AUC	Sensitivity (%)	Specificity (%)	Correctly avoid CTPAs (n)	False negatives (n)
Fixed cutoff	0.61 (p<0.001)	96	25	101	7
Age-adjusted	0.64 (p<0.001)	93	35	139	12
YEARS	0.68 (p<0.001)	89	47	186	19
PEGeD	0.68 (p<0.001)	88	49	196	20

Table 1 –Performance of each diagnostic algorithm



Conclusions: Compared to fixed d-dimer cutoff, all algorithms were associated with increased specificity. The age-adjusted cutoff was the only that was not associated with a significant decrease in sensitivity when compared to fixed cutoff, allowing to safely reduce the need to perform CTPA.

CO 100. COMPLICATIONS OF BALLOON PULMONARY ANGIOPLASTY FOR CHRONIC THROMBOEMBOLIC PULMONARY DISEASE ACCORDING THE CLASSIFICATION PROPOSED BY THE 6TH WORLD SYMPOSIUM ON PULMONARY HYPERTENSION

Ana Rita Pereira, Rita Calé, Filipa Ferreira, Sofia Alegria, Débora Repolho, Pedro Santos, Sílvia Vitorino, Mariana Martinho, Daniel Sebaiti, Maria José Loureiro, Hélder Pereira

Hospital Garcia de Orta, EPE.

Introduction: Balloon pulmonary angioplasty (BPA) is a complex procedure and not risk free. In an attempt to standardize reports of BPA complications in the several centers, a classification of complications was proposed by the task force on chronic thromboembolic hypertension (CTEPH) in the 6th World Symposium on Pulmonary Hypertension (WSPH).
Objectives: To determine the prevalence of BPA complications according to the classification of 6th WSPH and to identify its predictors.
Methods: Detailed procedural and technical aspects were collected for consecutive patients (pts) with inoperable, residual/recurrent chronic thromboembolic disease, undergoing BPA at a single institution from December/2017 to December/2020. Per procedure logistic regression analysis was used to evaluate the predictive variables for complications.
Results: A total of 76 BPA sessions in 15 pts were performed (mean age 63.2 ± 14.0 years; 60.0% women; 86.7% CTEPH). Mean pulmonary artery pressure and pulmonary vascular resistance before the first BPA session were 33.1 ± 13.3 mmHg and 4.8 ± 3.2 woods unit, respectively (73.3% of pts under vasodilator therapy). Femoral access was used for all pts. Mean vessels treated per procedure were 4.3 ± 1.9 (324 vessels in total). Webs, subtotal occlusions, ring-like stenosis and total occlusions were noted in 215 (66.4%), 58 (17.9%), 31 (9.6%) and 20 (6.2%) treated vessels, respectively. We performed 21 pressure-wire-guided sessions (27.6%). Intravascular imaging was used in 6 procedures (7.9%). Average time of fluoroscopy was 60.3 ± 14.0 minutes and volume of contrast 273.0 ± 73.0 mL per session. Procedure-related adverse events occurred in 25.0% of the interventions (27.6% in the first two years vs 16.7% in the last two). Pulmonary artery vascular injuries were noted in 6 BPA vessels (7.9% per procedure and 1.9% per treated vessel): haemoptysis in all, but perforation was only detected angiographically in 3 of them (balloon inflation was performed for 2 distal perforations, and 1 perforation sealed without any intervention). Vascular dissection in distal lesions occurred in 4 cases (5.3%) with no need of transcatheter or surgical procedures. We had 3 lung injuries, all grade 2. None of the pts required oral intubation or mechanical ventilation. Extra-pulmonary complications were illustrated in table. Importantly, there was no peri-procedural death. The occurrence of vascular or lung injuries was 0% in pressure-wire-guided BPA versus 14.5% in non-guided (p = 0.098). Multivariate analysis revealed that age (OR 1.05; CI 1.01-1.10; p = 0.030) was the only independent predictor of complications.

Table. Balloon pulmonary angioplasty complications according the 6th World Symposium on Pulmonary Hypertension

During the procedure	*n* (%)	*After the procedure*	*n* (%)
Vascular injury with hemoptysis	6 (7.9%)	Lung injury	3 (3.9%)
Vascular dissection	4 (5.3%)	Contrast nephropathy	4 (5.3%)
Allergic reaction to contrast	0	Access site complications	1 (1.3%)
Adverse reaction to local anesthesia	1 (1.3%)	Radiation injury	0

Conclusions: In our experience, BPA can be safely performed in inoperable, residual or recurrent CTEPH or CTED pts, with 25% minor procedural-related complications but no major adverse event. Age was the strongest factor related to the occurrence of complications.

CO 96. IMPROVING RISK STRATIFCATION OF PULMONARY HYPERTENSION PATIENTS

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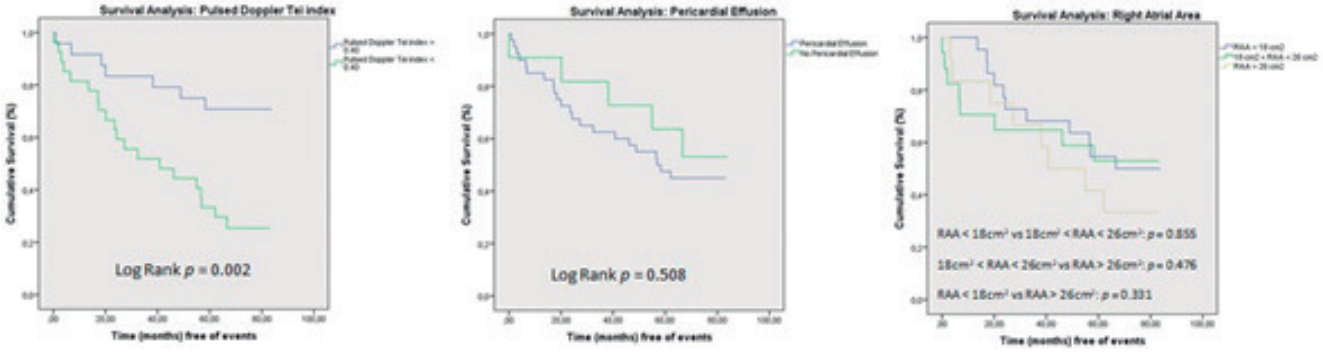
[1]Centro Hospitalar de Lisboa Central, EPE/Hospital de Santa Marta.
[2]Hospital de Cascais.

Introduction: According to the 2016 ESC/ERS Guidelines on Pulmonary Hypertension (PH), the right atrial area (RAA) and the presence of a pericardial effusion (PE) are the two main echocardiographic prognostic markers in PH patients (pts). Our aim was to assess the predictive ability of these two parameters.
Methods: Pts with PH were prospectively studied and several clinical/demographic/echocardiographic were retrieved as well as data from six-



CO 96 Figure

minute walk test (6MWT) and brain natriuretic peptide (BNP). All-cause mortality was analyzed by PE, RAA and other echocardiographic parameters for positive (PPV) and negative predictive value (NPV) to detect if the current guideline recommended cut-offs can precisely stratify risk in this setting. A survival analysis was performed to evaluate risk stratification (RS) provided by several different cut-offs.

Results: A total of 51 PH pts (mean age 54 ± 46 years, 33.3% male, baseline BNP of 342.4 ± 439.9 pg/mL, mean 6MWT distance of 360.3 ± 109.2 meters and baseline pulmonary artery systolic pressure of 78 ± 26mmHg), of which 64.7% had Group I PH (GI) and 35.3% presented chronic thromboembolic pulmonary hypertension. There were no significant differences between these two groups, however pts in GI were significantly younger (p = 0.001), achieved a lower 6MWT distance (p = 0.038) and had worse values of right ventricular strain (p = 0.040). 27 pts (52.9%) died during a mean follow-up of 52 months, with no differences between groups (p = 0.756). The presence of a PE had a low NPV and PPV for the primary endpoint (45.0% and 45.5%, respectively), aswell as the guideline recommended cut-offs for RAA (18cm^2: NPV - 50.0% and PPV-55.2%; 26cm^2: NPV - 51.3% and PPV-66.7%). A Pulsed Doppler Tei index (TI_p) cut-off of 0.40 had a higher NPV (70.8%) and PPV (74.1%). By Kaplan-Meier analysis, neither the presence of PE (log rank p = 0.508) nor the recommended RAA cut-offs provided accurate risk discrimination (log rank p > 0.05 for all). Pts below a TI_p cut-off of 0.40 presented a significantly lower survival during follow-up (log rank p = 0.002).

Conclusions: The currently recommended echocardiographic prognostic markers cannot precisely discriminate risk in PH pts. Markers of Right Ventricular Dysfunction may improve RS in this population.

CO 98. REPERFUSION IN HIGH-RISK ACUTE PULMONARY EMBOLISM: CAN THE PESI SCORE PREDICT OUTCOMES?

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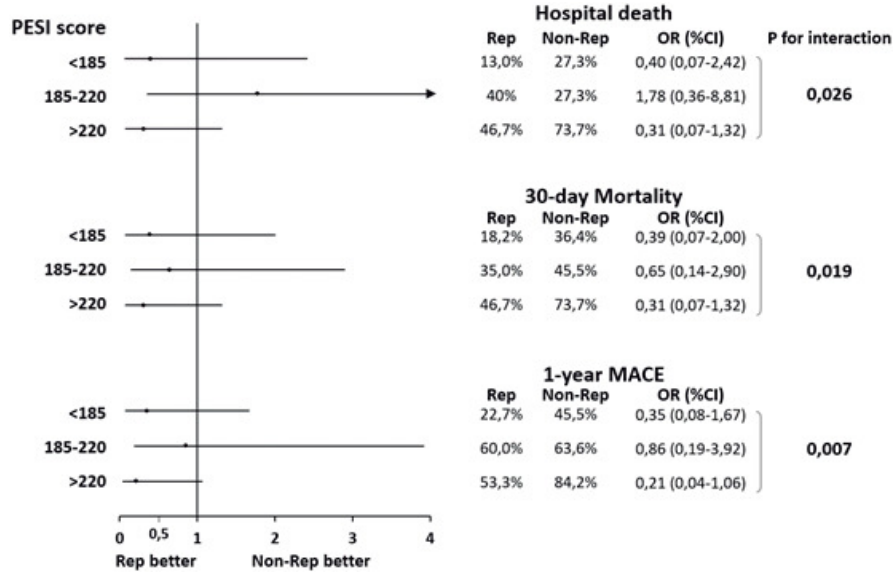
Hospital Garcia de Orta, EPE.

Introduction: Acute pulmonary embolism (PE) is one of the leading causes of cardiovascular death worldwide. Haemodynamic (HD) instability defines high risk (HR) of early mortality and reperfusion treatment is the standard of care for rapid relieve of right ventricle (RV) overload in these situations. The impact of reperfusion in long-term outcomes is not well established. The PE Severity Index (PESI) score is used to stratify the risk of early death in HD stable patients (pts) and was not validated to predict outcomes in HR-PE.

Objectives: Estimate the prognostic performance of the PESI score in HR-PE and study its possible interaction in acute and long-term outcomes of reperfusion in HR-PE pts.

Methods: Retrospective single-centre study of consecutive HR-PE pts, defined by the 2019 ESC guidelines criteria, between 2008-2018. Logistic regression analysis was performed to test for an interaction between tertiles of the PESI score and reperfusion in early-mortality (during hospitalization and at 30 days) as well as 1-year MACE (a composite of cardiovascular mortality, PE recurrence or chronic thromboembolic pulmonary hypertension).

Results: Of a total of 1,955 PE pts, 102 fulfilled the inclusion criteria (72.5% pts initially presented with HD instability with the remaining developing



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HR-PE after hospital admission). Mean age was 68 ± 15 years and 60% were females. In-hospital and 30-day mortality were 39.6% and 43.0%, respectively. At one-year follow-up, MACE was 55.0%. Mean PESI at the time of HR-PE diagnosis was 200 ± 39 and showed significant differences for in-hospital mortality (189 ± 38 vs 217 ± 34; OR 1.02, 95%CI 1.00-1.03, p < 0.001), 30-day mortality (191 ± 38 vs 214 ± 36; OR 1.02, 95%CI 1.00-1.03m p = 0.004) and 1y-MACE (186 ± 41 vs 214 ± 32; OR 1.02, 95%CI 1.01-1.03, p < 0.001). Total reperfusion rate was 57.8% and was also associated with lower in-hospital mortality (OR 0.45, 95%CI 0.20-1.02; p = 0.057), 30-day mortality (OR 0.35, 95%CI 0.15-0.80; p = 0.012) and 1y-MACE (OR 0.35, 95%CI 0.15-0.80; p = 0.014). The benefit of reperfusion was significantly influenced by the PESI score categorized by tertiles (Figure).
Conclusions: Although the PESI score stratifies HD stable pts, in this population it was able to predict cardiovascular outcomes in HR-PE pts. Furthermore, it showed a significant interaction with the prognostic impact of reperfusion in early and late cardiovascular outcomes.

CO 97. COMPARISON OF RISK SCORES CALCULATORS IN PATIENTS NEWLY DIAGNOSED WITH PULMONARY ARTERIAL HYPERTENSION

Bárbara Ferreira, Filipa Ferreira, Sofia Alegria, Débora Repolho, Ana Rita Pereira, João Grade Santos, Alexandra Briosa, Mariana Martinho, Ana Marques, Daniel Sebaiti, Ana Francisco, Otília Simões, Hélder Pereira

Hospital Garcia de Orta, EPE.

Introduction: Pulmonary arterial hypertension (PAH) is a chronic, progressive, and incurable disease with significant morbidity and mortality. Comprehensive and accurate risk prediction is essential to make individualized treatment decisions and optimizing outcomes in PAH usually with multiparametric scores. The ESC/ERS risk stratification table is simple to approach. However, often patients have variables that fall into different risk categories at the same time point, limiting its "real-world" applicability. FPHN, COMPERA and REVEAL are multiparametric tools validated for risk stratification.
Objectives: To better understand risk status determination in our PAH population and compare different risk score calculators.
Methods: Retrospective longitudinal study that included all patients with group I pulmonary hypertension (PAH). Uncorrected complex congenital heart disease and Eisenmenger physiology were excluded. Baseline data were collected to calculate patient risk using COMPERA, FPHN and REVEAL tools. Follow-up adverse events were registered and included parenteric prostanoid therapy, referral for lung transplant and death.
Results: The cohort comprised 67 patients (70% female, mean age at diagnosis 48 ± 17). Baseline characteristics: WHO Functional class I/II -28.4%, III-56.7% and IV-14.9%; 6-min walk distance 395 ± 125 m, cardiac index 2.26 ± 0.61, mean PVR 11.83 WoodsU. Using FPHN, COMPERA and REVEAL scores respectively, patients at low risk were 4.8%, 24% and 33%, at intermediate risk were 15.9%, 60% and 35% and at high-risk were 79.4%, 16% and 31%. There was a slight agreement between the 3 scores (kappa value 0.125, p = 0.034). FPHN overestimated the risk compared to other scores. With an average follow-up of 5 years 26 patients died (mortality 36%). The Kaplan-Meier survival estimates (Figure) show that the REVEAL score provided better characterization of the risk of adverse events than either COMPERA or FPHN.
Conclusions: REVEAL score was the best risk stratification tool to identify survival without adverse events in our patients with pulmonary arterial hypertension. COMPERA could also identify patients at risk. FPHN overestimated risk and had no discriminative power to risk stratification.

Sábado, 01 Maio de 2021 | 15H00-16H00

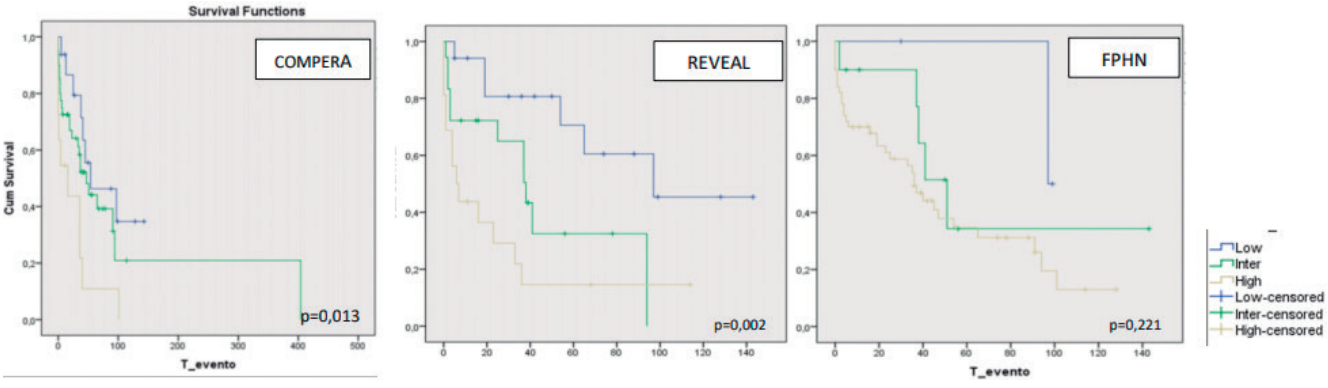
Sala Virtual 2 | CO 20 - Imagem na IC e Dç Coronária

CO 102. TEMPORAL CHARACTERIZATION OF VENTRICULAR FUNCTION AND DEFORMATION AFTER TAKOTSUBO SYNDROME USING CARDIOVASCULAR MAGENTIC RESONANCE IMAGING

Carla Marques Pires, Rita Morais Passos, Paulo Medeiros, Cátia Oliveira, Rui Flores, Fernando Mané, Rodrigo Silva, Isabel Campos, Nuno Antunes, Catarina Vieira, Sandro Queirós, Vítor Hugo Pereira

Hospital de Braga.

Introduction: The time course of ventricular recovery in Takotsubo Syndrome (TS) patients (pts) is still not well characterized. Quantification of myocardial deformation using Cardiovascular Magnetic Resonance Feature-Tracking (CMR-FT) may be a useful method to better characterize ventricular recovery during TS.
Objectives: To assess the time course of ventricular function using CMR-FT myocardial strain in patients (pts) with an episode of TS.
Methods: We performed a single-center, retrospective cohort study including 130 pts admitted with TS over a 10-year period. From this cohort, 39 (30%) pts were selected and age and sex-matched with 16 healthy controls for a comparative analysis of myocardial strain using CMR-FT. TS pts were divided in 3 homogeneous subgroups according to the time from index-event and the CMR acquisition: Group 1(G1): < 8 days; Group 2(G2): 8 to 30 days; Group 3 (G3): > 30 days. One operator blinded for the study group performed the analysis. Left ventricle (LV) radial strain (RS), longitudinal strain (LS) and right ventricle (RV) LS were quantified.
Results: The mean age of TS group was 66 years and 90% were female. The median ejection fraction (EF) at admission was 38%; 82% displayed an apical ballooning (AB) pattern. Around 19% had at least 1 in-hospital complication and 1.5% died during hospitalization. A significant increase use of CMR was observed over the years (p = 0.001). Myocardial deformation analysis showed



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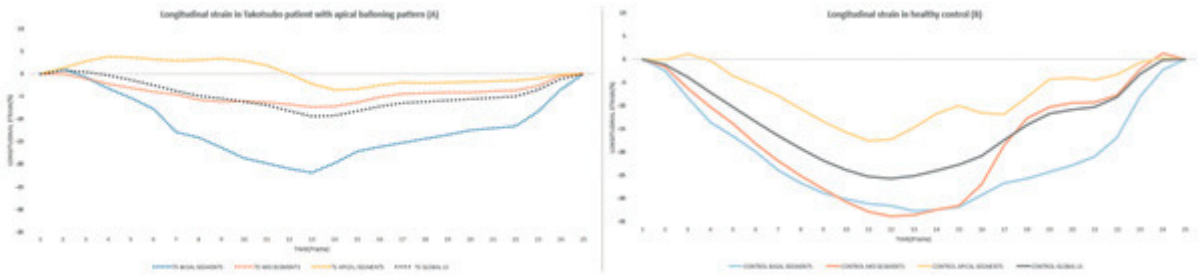

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a significant group interaction for LV LS and RS. Specifically, the global values of G1 LV LS and RS were significantly decreased when compared with G3 (LS: -15 vs -20%; p = 0.002; RS: 40 vs 61%; p < 0.001) and controls (LS: -15 vs -22%; p < 0.001; RS: 40 vs 70; p < 0.001). There were no significant differences in the RV LS across groups.The CMR-quantified EF was significantly decreased in G1 when compared with G3 (52 vs 64%; p < 0.003) and controls (52 vs 64%; p < 0.001). Differences between G1 and G2 were found in LV RS (LS: 40 vs 57%; p < 0.001) and EF (52 vs 62%; p < 0.001). No differences were observed for any parameters between G3 and controls. This study showed that global LV LS (r = -0.6, p < 0.001) and RS (r = 0.7, p < 0.001) had a significant correlation with the CMR-quantified EF. A comparison between the different patterns of TS was also performed (Figure). Pts with AB pattern in G1 displayed lower global RS (p = 0.014), although there were no differences regarding global LS. As expected, in the AB group the reduction in myocardial strain was limited to the apical segments. Despite not being significantly different across groups RV LS was the only CMR-derived predictor of complications during follow-up (OR = 1.17; p = 0.026).
Conclusions: This study revealed that after an episode of TS myocardial function quantified either by EF or CMR-FT strain fully recovers between the 8th and 30th day of the event. RV strain was a predictor of complications during follow-up.

CO 106. MYOCARDITIS DIAGNOSIS BY CMR: WHAT CAN CONFUSE INITIAL DIAGNOSIS?

Isabel Martins Cruz, Ana Neto, Inês Oliveira, Bruno Bragança, Rui Pontes dos Santos, Aurora Andrade

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

Introduction: Myocardial infarction (MI) with non-obstructive coronary arteries (MINOCA) is a "working diagnosis" with multiple underlying aetiologies and pathogenic mechanisms. Failure to identify the underlying cause may result in inappropriate therapy in these patients. Acute myocarditis is a commonly-encountered cause of myocardial injury and is the most common finding in cardiac magnetic resonance (CMR) imaging studies.
Objectives: Characterize a cohort of pts with myocarditis confirmed by CMR and identify clinically relevant features that led to different presumptive diagnostics.
Methods: Unicentric, retrospective analysis of pts with myocarditis diagnosis who underwent CMR between 1/2013 and 9/2019. Clinical, analytical, ECG, imagiological features and follow-up (FUP) - cardiovascular (CV) events (CVE) and mortality - were analysed. Pts were divided according to presumptive diagnosis before CMR: myocarditis (G1), MINOCA (G2) or other (G3).
Results: Out of the 781 CMR studies evaluated 88 pts had (previous history of or acute) myocarditis (11.3%). 57 pts were female (64.8%); mean age 37.7 ± 14.7 years (y). Time to CMR was 1.7 ± 9 months. Regarding CMR data: mean ejection fraction was 58.4 ± 8.4%, mean LV mass was 68.8 ± 14.1 g. 4 pts (4.6%) had wall motion abnormalities (WMA) and 80 pts (93.0%) had late gadolinium enhancement (LGE). As for affected walls, the most affected was lateral wall (57pts, 59.8%). The majority of pts presented with ST segment elevation (47 pts; 53.4%). According to the initial presumptive diagnosis: G1 had 49 pts (55.7%), G2 had 37 pts (42.0%) and G3 had 2 pts (2.3%). We excluded G3 for the subsequent analysis. G2 pts were older (44.1 ± 14.6y vs G1 32.2 ± 12.8y, p < 0.001). There were no differences concerning time to CMR, LGE and pericardic effusion presence, neither regarding cardiovascular risk factors. G2 had higher presentation with T wave inversion (p = 0.031) and presence of WMA evaluated by echo at admission (p = 0.089). G1 had higher C-reactive protein (CRP) maximum values during hospitalization (77.6 ± 64 mg/dL vs G2 49.4 ± 48.8, p = 0.029). G2 had more CV events at FUP (G1 2.0 vs G2 16.2%, p = 0.017).
Conclusions: In our cohort, 56% of pts were correctly diagnosed from the beginning. They were younger, had higher CRP values and presented less frequently with WMA on initial echo evaluation. G2 pts had more CV events at FUP. Notwithstanding, there were no significant differences regarding CMR features, cardiovascular risk factors nor mortality.

CO 104. THE ROLE OF CARDIAC MAGNETIC RESONANCE IN MINOCA DIAGNOSIS

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Hospital do Espírito Santo, EPE, Évora.

Introduction: Absence of obstructive coronary disease does not imply absence of acute myocardial infarction (AMI). Hence, it can be designated as Myocardial Infarction with Non-obstructive Coronary Arteries (MINOCA). Performing Cardiac Magnetic Resonance (CMR) can be essential for establishing a final diagnosis, according to the presence and pattern of late gadolinium enhancement (LGE).
Objectives: The aim of this study is to evaluate the diagnostic and prognostic impact of CMR in patients with a possible diagnosis of MINOCA.
Methods: A 7-year prospective study, which included all patients proposed to CMR with a presumptive diagnosis of MINOCA due to acute chest pain, troponin raise and absence of angiographically significant coronary disease (luminal stenosis of >50%). All patients performed functional, anatomical evaluation and LGE assessment. We analysed clinical characteristics, electrocardiographic presentation, echocardiographic and invasive coronary angiography results. A presumptive diagnosis was elaborated after invasive coronary angiography and comparison was made with the definitive one after CMR.
Results: A total of 96 patients were included, 50% were male, with a mean age of 48 ± 20 years old. Clinical history of hypertension was observed in 51.0% patients, 35.4% had dyslipidaemia, 7.3% with diabetes, obesity was present in 22.9% of patients and smoking habits in 30.2%. At admission, 44.8% had ST segment elevation, so emergent invasive coronary angiography was performed. The mean highest troponin I was 7.34 ± 9.18 ng/mL. Late gadolinium enhancement was observed in 53 (55.2%) of patients. After CMR realization a final diagnosis of MINOCA was made in only 8 patients (8.4%) and in 51 patients (53.1%) CMR evaluation allowed a diagnosis modification, with impact on patients' management and prognosis. A definitive diagnosis of myocarditis was seen in 46.9% (n = 45) of cases, of Takotsubo's myocardiopathy in 13.5% (n = 13), and hypertrophic cardiomyopathy in 3.1% (n = 3). In 27 (28.1%) of patients, late gadolinium enhancement was not found. This diagnosis adjustment had an impact on treatment in 34.4% (n = 33).
Conclusions: CMR is a pivotal technique on MINOCA patients' management. Our study portrayed the importance of performing CMR, allowing initial diagnosis modification in half of the cases, with important therapeutic in

one third of patients and prognostic implications, related to diagnosis and target treatment adverse effects.

CO 105. ECHOCARDIOGRAPHIC DETERMINATION OF LVEF IN PATIENTS WITH A POOR ACOUSTIC WINDOW

José Lopes de Almeida[1], J. Almeida[2], S. Martinho[1], A. Freitas[1], C. Ferreira[1], J. Rosa[1], G. Campos[1], R. Martins[1], M. Ferreira[1], L. Gonçalves[1]

[1]Centro Hospitalar e Universitário de Coimbra/Hospitais da Universidade de Coimbra. [2]Faculdade de Ciências e Tecnologias da UC.

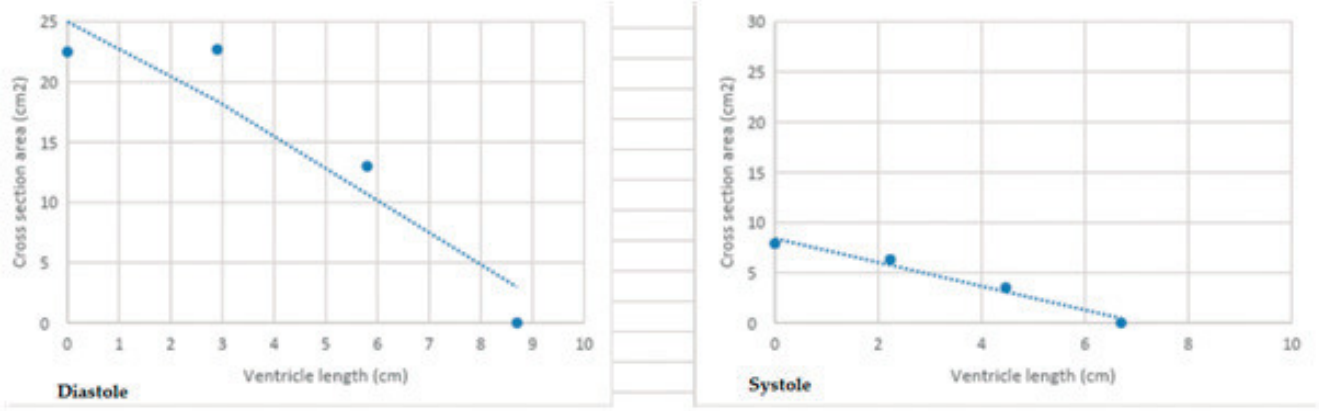
Introduction: Left ventricular ejection fraction (LVEF) is the most commonly used clinical measure of left ventricular systolic function. The Simpson method is the currently recommended 2D method to assess LVEF by expert committee consensus. This method requires tracings of the blood-tissue interface in the apical four- and two-chamber views. However, in several patients, it is not possible to acquire all the classic echocardiographic views, and this is especially true in critically ill patients. We propose a new method of LVEF estimation using information from parasternal or subcostal views, for those patients in which the Simpson method cannot be applied.
Methods: We created a method that estimates LVEF based on systolic and diastolic basal, mid and apical short axis areas and ventricle length, acquired in parasternal or subcostal views. We retrospectively applied our method to 20 patients who had an echocardiogram followed by a cardiac magnetic resonance (cMRI), and compared LVEF calculated between cMRI and echocardiogram. cMRI LVEF was estimated based on Simpson disk summation method using short-axis cine steady-state free precession images. Echocardiogram LVEF was estimated with both the standard method-Simpson method-and the proposed method.
Results: Our population had an average age of 64 (± 12) years and 35% of female patients. 6 patients had no significant cardiac structural disease, 4 patients had coronary heart disease, 4 patients had familiar hypertrophic myocardiopathy, 2 patients had cardiac amyloidosis, 1 patient had an atrial septal defect, 1 patient had cardiac sarcoidosis, 1 patient had dilated familiar cardiomyopathy and 1 patient had acute myocarditis. LVEF calculated through the proposed method showed a significant correlation with LEVF calculated with the Simpson echocardiographic method (R = 0.83, 0.61-0.93, p < 0.01). Both our new method (R = 0.65, 0.28-0.85, p < 0.01) and the Simpson echocardiographic method (R = 0.70, 0.37-0.87, p < 0.01) correlated moderately with LVEF calculated by cMRI, which is in accordance with previous literature.
Conclusions: We show the proof-of-concept of a new method for estimating LVEF by 2D echocardiogram that does not require measurements in the apical views. After validation, this method may become an alternative for estimating LVEF, especially for patients with more challenging acoustic windows where it is not possible to acquire the classic 2D echocardiographic views.

CO 103. FALSE POSITIVE RESULTS ON DOBUTAMINE STRESS ECHOCARDIOGRAPHY: A NEW MARKER OF RISK FOR ISCHEMIC EVENTS

Lisa Maria Ferraz[1], Tiago Costa[2], Ana Faustino[1], Pedro Carvalho[1], Diana Carvalho[1], Adriana Pacheco[1], Jesus Viana[1], Ana Neves[1]

[1]Centro Hospitalar do Baixo Vouga/Hospital Infante D. Pedro, EPE. [2]Universidade de Aveiro.

Introduction: Although dobutamine stress echocardiography (SE) has a high specificity, there is still a subset of patients (P) with false positive tests (FP) and their prognosis remains unclear.
Objectives: To identify the clinical and echocardiographic predictors of FP on SE and to evaluate the prognostic impact of FP on SE.
Methods: Retrospective study of 355 consecutive adult P who underwent SE for ischemia assessment over a one-year period: 134 (37.7%) women, 70.3 ± 0.57 years, body surface area (ASC) 1.85 ± 0.01 cm^2. Demographics, risk factors, clinical and laboratorial parameters and SE variables were evaluated. A FP result was defined as a positive SE for ischemia in the absence of ≥ 50% coronary artery (CA) lesion in a major artery of the corresponding coronary territory on subsequent angiography. P were divided into 2 groups regarding the presence (FP+) or the absence (FP0: 15.5% true positives, 79.7% true negatives, 0.3% false negatives) of a FP result on SE and a comparative analysis was performed in order to characterize the groups and identify potential predictors of FP results. P were followed for 2 years to assess acute myocardial infarction (AMI), hospitalization for acute heart failure (HF) and mortality (M).
Results: The FP rate was 4.5% (16P). Comparing to F0, P in group FP+ were younger (65.1 ± 2.4 vs 70.5 ± 0.6 years; p = 0.045), baseline wall motion abnormalities were more frequent (75.0% vs 41.6%; p = 0.009), had higher mean blood pressure values at rest (99.3 ± 5.4 vs 82.0 ± 1.3 mmHg; p = 0.004) and at peak stage (140.3 ± 5.6 vs 102.8 ± 2.3 mmHg; p < 0.001) and more often hypertensive response (37.5% vs 7.1%; p < 0.001). There were no significant differences regarding previous CA disease, medication or complete left bundle branch block. By multivariate analysis, only mean blood pressure values at rest (OR 0.01; 95%CI 0.005-0.02; p = 0.003) and at peak stage (OR 0.02; 95%CI 0.000-0.004; p = 0.003) were independent predictors of FP. During follow-up was observed: AMI (FP+: 12.5% vs FP0: 1.8%, p = 0.046), HF (FP+: 6.3% vs FP0: 11.5%, p = 0.44) and M (FP+: 6.3% vs FP0: 6.2%, p = 0.65). After adjustment for age, sex and comorbidities, there were no differences between the groups regarding HF (p = 0.45) and M (p = 0.77), but the group FP+ maintained a higher rate of AMI (OR 0.21; 95%CI 0.065-0.354; p = 0.005).
Conclusions: A FP result on SE is associated with higher mean blood pressure values during the test and with higher rates of AMI during follow-up. This result on SE should therefore be faced as a risk marker for ischemic events and can identify P that may benefit from aggressive risk factor control and careful clinical follow-up.



CO 105 Figure

Domingo, 02 Maio de 2021 | 10H30-11H45

Sala Virtual 2 | CO 23 - Dispositivos

CO 123. HOW TO PREDICT MORTALITY IN PATIENTS UNDERGOING ICD IMPLANTATION-IS CREATININE THE NEW AGE?

Mafalda Carrington[1], Pedro Silvério António[2], Sara Couto Pereira[2], Joana Brito[2], Afonso Nunes-Ferreira[2], Rafael Santos[2], Igor Santos[2], Ivo Marcos[2], Lénia Coelho[2], Fausto J. Pinto[2], João de Sousa[2], Pedro Marques[2]

[1]Hospital do Espírito Santo, EPE, Évora. [2]Centro Hospitalar de Lisboa Norte, EPE/Hospital de Santa Maria.

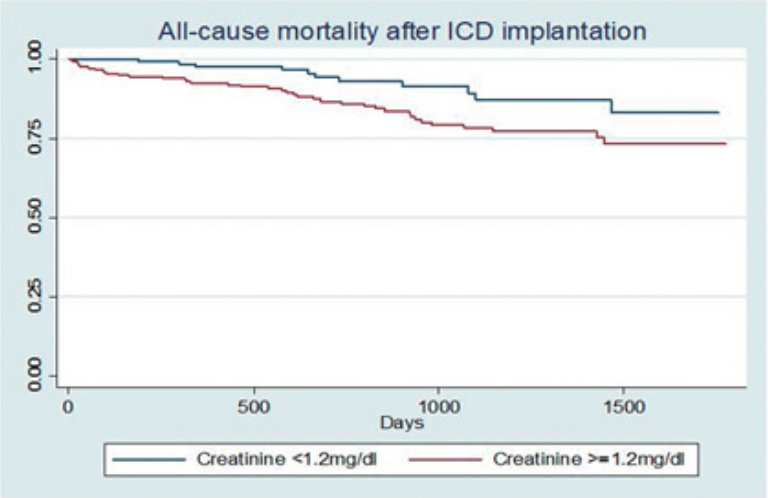
Introduction: Implantable Cardioverter Defibrillators (ICD) may be indicated in patients with ischaemic (i-CMP) or dilated noni-CMP with low ejection fraction (EF) and in selected patients with other CMP and channelopathies. ICDs have been shown to reduce overall mortality comparing to medical therapy and they may be implanted for secondary prevention of sudden cardiac death (SCD) or for primary prevention. ICD therapy is not recommended in patients who do not have a reasonable expectation of survival for at least 1 year, although specific recommendations regarding clinical or functional status evaluation are lacking.

Objectives: To identify predictors of all-cause mortality in patients who implanted an ICD.

Methods: Prospective single-center study of patients who implanted ICD between 2015 and 2019. Clinical characteristics were evaluated at baseline and mortality was assessed using the national registry of citizens. We performed univariate and multivariate analysis to compare clinical characteristics of patients who died and who survived using the Cox regression and Kaplan-Meier methods. For the predictor creatinine levels, we assessed the discrimination power and defined the best cut-off using the area under the ROC curve (AUC) method.

Results: From 2015-2019, 414 ICDs were implanted (81% male, 62 ± 12 years-old), and 50(13%) of the patients died after a median follow-up of 23 [11-41] months. Patients who died during the follow-up were older (67 ± 9 vs 61 ± 12,p = 0.002), had more diabetes (48% vs 33%,p = 0.033) and a higher creatinine level (1.23 [0.84-1.86] vs 1.00 [0.84-1.22], p < 0.001). The remaining comorbidities were similar between both groups (Figure). Patients who died had more frequently an ICD implanted after a complication associated with a previous device or as a pacemaker upgrade (6% vs 2%, p = 0.030). They also had a higher frequency of i-CMP (82% vs 56%, p = 0.002) and of EF ≤ 50% (96% vs 82%, p = 0.040). The best cut-off value of creatinine to predict mortality with a sensitivity of 65% and a specificity of 72% was 1.2 mg/dl (AUC 0.650; 95%CI 0.53-0.77). After adjusting for diabetes, i-CMP, EF≤ 50% and upgrade/re-implantation after complication, we found that age (HR1.033; 95%CI 1.00-1.06, p = 0.041) and creatinine ≥ 1.2 mg/dl (HR

	Died (n=50)	Survived (n=348)	HR (CI95%)	p-value
Basal clinical characteristics				
Male gender, n(%)	41 (82%)	279 (80%)	1.057 (0.51-2.18)	0.881
Age, mean ± standard deviation	67 ± 9	61 ± 12	**1.043 (1.02-1.07)**	**0.002**
NYHA class ≥II, n(%)	22 (47%)	124 (42%)	1.117 (0.63-1.98)	0.706
Creatinine, median[inter-quartile range]	1.23[0.84-1.86]	1.00[0.84-1.22]	**1.452 (1.20-1.76)**	**<0.001**
Comorbidities				
Atrial fibrillation, n(%)	11 (22%)	72 (21%)	0.919 (0.47-1.80)	0.806
Hypertension, n(%)	43 (86%)	243 (73%)	1.870 (0.84-4.16)	0.125
Diabetes mellitus, n(%)	24 (48%)	112 (33%)	**1.831 (1.05-3.19)**	**0.033**
Dislipidemia, n(%)	37 (74%)	196 (59%)	1.731 (0.92-3.26)	0.089
Smoker or ex-smoker, n(%)	25 (50%)	163 (49%)	0.994 (0.57-1.73)	0.984
Ablation of atrial fibrillation or flutter or ventricular tachycardia, n(%)	1 (2%)	38 (11%)	0.151 (0.02-1.09)	0.061
ICD indication criteria				
Ischaemic CMP, n(%)	41 (82%)	196 (56%)	**3.113 (1.51-6.41)**	**0.002**
Dilated non-iCMP, n(%)	8 (16%)	94 (27%)	0.515 (0.24-1.10)	0.085
Other CMP or channalopathies, n(%)	1 (2%)	58 (17%)	**0.130 (0.02-0.94)**	**0.043**
Secondary prevention, n(%)	19 (38%)	114 (33%)	1.210 (0.68-2.14)	0.513
Left ventricle EF ≤50%, n(%)	48 (96%)	285 (82%)	**4.389 (1.07-18.06)**	**0.040**
ICD re-implantation after complication/ pacemaker upgrade, n(%)	3 (6%)	7 (2%)	**3.682 (1.14-11.94)**	**0.030**
Need for device surgical revision during follow-up, n(%)	3 (6%)	18 (5%)	1.233 (0.38-3.97)	0.725



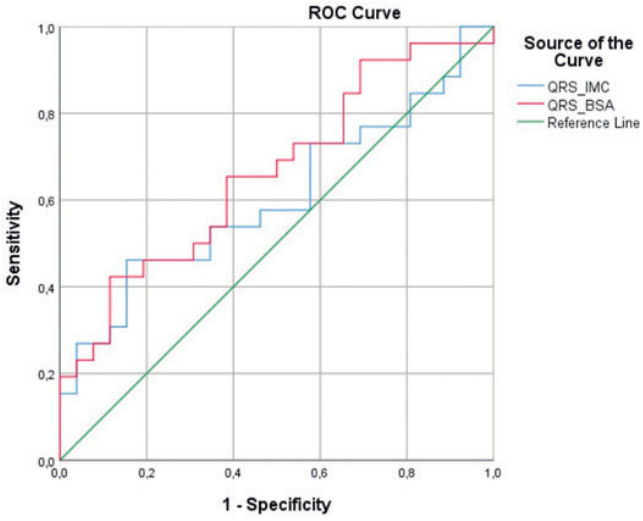
2.134; 95%CI 1.09-4.19, p = 0.028) were independent predictors of all-cause mortality (Figure).
Conclusions: In our cohort of patients who underwent ICD implantation for primary or secondary SCD prevention, the all-cause mortality over a median follow-up period of 23 [11-41] months was 13%. We found that in addition to age, a baseline creatinine level ≥ 1.2 mg/dl increases by 2-fold mortality in patients who undergo ICD implantation. Decisions regarding ICD candidacy should not be based on age alone but should also consider creatinine factor that predisposes to mortality despite defibrillator implantation.

CO 122. COULD QRS DURATION ADJUSTED TO BMI AND BSA PREDICT CARDIAC RESYNCHRONIZATION THERAPY RESPONSE?

Beatriz Silva [1], Tiago Rodrigues[2], Nelson Cunha[2], Pedro Silvério António[2], Sara Couto Pereira[2], Pedro Alves da Silva[2], Joana Brito[2], Margarida Martins[2], Catarina Oliveira[2], Beatriz Garcia[2], Afonso Ferreira[2], Fausto J. Pinto[2], João de Sousa[2], Pedro Marques[2]

[1]Centro Hospitalar de Lisboa Norte, EPE/Hospital de Santa Maria. [2]Serviço de Cardiologia, Departamento Coração e Vasos, Centro Hospitalar Universitário Lisboa Norte, CAML, CCUL, Faculdade de Medicina, Universidade de Lisboa.

Introduction: Current Guidelines established a class I indication for Cardiac Resynchronization Therapy (CRT) implantation in symptomatic heart failure patients with QRS duration greater than 150 ms and complete left branch block. It is known that QRS duration is influenced by weight and height, but it remains unclear if the adjustment of the QRS to these parameters can help to better select patients who respond to CRT.
Objectives: To analyze if the QRS adjusted to body mass index (BMI) and body surface area (BSA) could predict CRT response in patients with QRS < 160 ms.
Methods: Single-centre retrospective study of consecutive patients with QRS < 160 ms submitted to CRT implantation between 2016 and 2019. A total of 53 CRT recipients were analyzed to assess response to CRT at 12 months of implantation based on echocardiographic criteria (responders defined as: increase of ejection fraction ≥ 10% or left ventricle end-systolic volume reduction ≥ 15%). Baseline QRS duration was adjusted to BMI (QRS/BMI) and BSA (QRS/BSA) to create and compare the best QRS index to predict CRT response, compared to non-adjusted QRS. The results were obtained using the Mann-Whitney test and linear regression. The best cut-off for QRS/IMC and QRS/BSA index was defined using the area under the ROC curve (AUC). The significance between AUC was calculated using NCSS software.
Results: Fifty-three patients were included (72% males, mean age 72.1 ± 9.8 years), of which 26 patients (49%) responded to CRT. The mean QRS/BSA index was higher in CRT responders compared to non-responders (82.56 ± 2.74 versus 75.34 ± 1.70, p = 0.04). There was a positive linear correlation between QRS/BSA index and response to CRT (r = 0.302, p = 0.03). QRS/BSA index of 64.32 was the best cut-off to predict CRT response (AUC 0.66, sensitivity 96%, specificity 85%, p = 0.044). Regarding the QRS/IMC index, there was no difference between CRT responders and non-responders (5.82 ± 0.25 and 5.29 ± 0.12, p = 0.194). The best QRS/IMC cut-off to predict CRT response was 4.34 (AUC 0.61, sensitivity 96%, specificity 85%, p = 0.194). The difference between AUC of QRS/BSA and QRS/IMC index was statistically significant (p = 0.04).



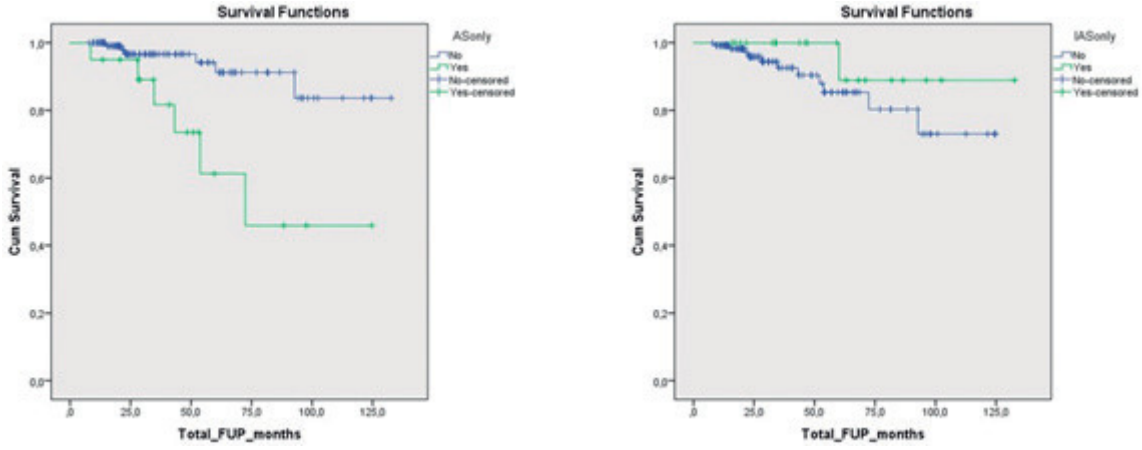
Conclusions: Indexing the QRS to the BSA improves patient selection for CRT implantation and this index should be considered as a novel indicator to predict the response to CRT. There is still need further studies to validate this data.

CO 119. WHAT IS THE MORTALITY IMPACT OF SUBCUTANEOUS IMPLANTABLE CARDIOVERTER-DEFIBRILLATOR INAPPROPRIATE SHOCKS?

Luís Resendes de Oliveira[1], Diogo Cavaco[2], Gustavo Rodrigues[2], Daniel Matos[2], Maria Salomé Carvalho[2], João Carmo[2], Pedro Galvão Santos[2], Francisco Costa[2], Pedro Carmo[2], Isabel Santos[2], Francisco Morgado[2], Miguel Mendes[2], Pedro Adragão[2]

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

Introduction: Previous studies have shown an adverse prognosis for patients with transvenous implantable cardioverter-defibrillators (ICD) who receive both appropriate and inappropriate shocks. There is a paucity of data regarding the prognosis of inappropriate shocks in patients with a subcutaneous ICD (S-ICD).



CO 119 Figure

Objectives: To assess and characterize S-ICD inappropriate (IAS) and appropriate shocks (AS) and their impact on mortality.
Methods: Single center observational registry of 162 consecutive patients who underwent S-ICD implantation for primary and secondary prevention between November 2009 and September 2020. Only follow-up data of at least 6 months was analysed to identify predictors of both IAS and AS and their mortality impact.
Results: A total of 144 patients were included in the analysis. Mean age was 42.2 ± 16.6 years and 75% of the patients were male. One hundred and four patients (72.2%) implanted the S-ICD in primary prevention. The most common etiology was ischemic cardiomyopathy (22.9%) followed by hypertrophic cardiomyopathy (18.8%) and dilated idiopathic cardiomyopathy (14.6%). During a mean follow-up of 42.3 ± 29.9 months a total of 48 patients (33.3%) experienced at least one S-ICD shock. Twenty-nine (20.1%) patients received AS due to VT/VF and 31 patients (21.5%) received IAS. Eighteen (58.1%) of the IAS were due to oversensing/noise/discrimination errors and the remaining due to supraventricular tachycardia. Overall, patients with AS (HR 4.93, 95%CI 1.58-15.36, p = 0.006) and higher number of total AS (HR 1.10, 95%CI 1.00-1.20, p = 0.044) were associated with higher mortality during follow-up. S-ICD IAS therapy did not affect overall mortality (HR 1.71, 95%CI 0.21-14.0, p = 0.616).
Conclusions: In our sample of patients with S-ICD, receiving an IAS, in contrast to AS, did not correlate with a worse prognosis. Larger studies are needed to confirm this hypothesis and to explain these findings.

CO 121. HEART FAILURE HOSPITALIZATION AND SURVIVAL AFTER CARDIAC RESYNCHRONIZATION THERAPY IN ELDERLY POPULATION

Ricardo Costa, André Frias, Andreia Campinas, Maria João Sousa, Vítor Lagarto, Mário Santos, Hipólito Reis, Severo Torres

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

Introduction: The benefits of cardiac resynchronization therapy (CRT) in patients with heart failure (HF) with reduced ejection fraction are well known. However, the elderly population was not well represented in previous studies. We aimed to compare the clinical improvement, incidence of HF hospitalization and survival of patients with ≥ 75 years submitted to CRT with those with < 75 years.
Methods: We retrospectively studied consecutive patients with HF, left ventricular ejection fraction (LVEF) ≤ 35%, New York Heart Association (NYHA) functional class ≥ II and QRS ≥ 130 milliseconds submitted to CRT at a tertiary hospital between January 2002 and March 2016. Clinical and outcome data were retrieved by review of the patient's records.
Results: Of 264 patients (69 ± 10 years, 67% male), 33% had ≥ 75 years at the time of CRT procedure. Aetiology was ischaemic in 43% of individuals. Median LVEF before CRT was 28% (23-29). Patients with ≥ 75 years had higher prevalence of hypertension (78% versus 65%, p = 0.03) and they are more frequently in NYHA class ≥ III before CRT (89% versus 78%, p = 0.02). They were also less likely to be on betablocker (67% versus 82%, p = 0.03). Implantation of CRT-defibrillator was lower in the older group (32% versus 71%, p < 0.001). During a median follow-up of 36 (16-74) months, all-cause death was 34%, higher in patients with ≥ 75 years (44% versus 28%, p = 0.008). Incidence of worsening HF requiring hospitalization was 19%. Comparing to baseline, improvement of NYHA class after CRT was more common in the older group (85% versus 66%, p = 0.001) and NYHA class ≥ III was less frequent (10% versus 22%, p = 0.01). Mean LVEF during follow-up was 35% (11), a mean improvement of 8% (11) comparing to the baseline, without significant difference between groups. Improvement of quality life after CRT was referred in 78% of patients, similar in both groups. Biventricular pacing percentage was 99% (97-100). In multivariate analysis, age ≥ 75 years was not an independent predictor of all-cause death (HR 1.7, 95%CI 0.9-3.3, p = 0.08) nor HF hospitalization (HR 0.9, 95%CI 0.4-2.0, p = 0.88).
Conclusions: In our cohort, despite patients with ≥ 75 years had higher mortality rate, it was not identified as an independent predictor of death nor HF hospitalization. In fact, LVEF increased as younger patients and their functional class improved even more.

CO 120. OUTCOMES AND PREDICTORS OF CLINICAL RESPONSE AFTER UPGRADE TO RESYNCHRONIZATION THERAPY

Mariana S. Brandão[1], João Gonçalves Almeida[1], Paulo Fonseca[1], Joel Monteiro[2], Filipa Rosas[1], Elisabeth Santos[1], José Ribeiro[1], Marco Oliveira[1], Helena Gonçalves[1], João Primo[1], Ricardo Fontes-Carvalho[1]

[1]Centro Hospitalar de Vila Nova de Gaia/Espinho. [2]Centro Hospitalar do Tâmega e Sousa, EPE/Hospital Padre Américo, Vale do Sousa.

Introduction: Upgrade to resynchronization therapy (CRT) is common practice in Europe. However, patient selection remains a challenge. Data regarding predictors of response to upgrade is currently lacking.
Objectives: To identify predictors of clinical response after upgrade to CRT.
Methods: Single-center retrospective study of consecutive patients submitted to upgrade to CRT (2007-2018). Patients underwent clinical and echocardiographic (echo) evaluation at baseline, 6-months and 1-year. Major adverse cardiac events (MACE) included hospitalization for heart failure (HF) or all-cause mortality. Clinical response was defined as New York Heart Association (NYHA) class improvement without MACE in the 1st year of follow-up (FU). Left ventricle end-systolic volume reduction of >15% designated echo response. Multivariate logistic regression was performed to identify predictors of clinical response to CRT.
Results: Fifty-six patients submitted to upgrade to CRT (80.4% male, mean age 70.0 ± 9.6 years) were included; 43 patients (78.2%) previously had a pacemaker and 12 (21.8%) had a defibrillator device. Most patients had non-ischemic HF (67.9%), with a mean baseline left ventricle (LV) ejection fraction of 27.9 ± 6.4%. Indications for upgrade were mainly pacemaker dependency or pacing-induced LV dysfunction (76.6%) and de novo left bundle branch block (23.4%). Thirty-one (59.3%) patients were clinical responders. MACE occurred in 37.5% of patients; 28.6% were hospitalized for HF and 13% died during the 1st year of FU. Clinical responders had a lower rate of atrial fibrillation (AF) (46.9% vs. 53.1%, p = .025) and a higher rate of pacemaker rhythm prior to upgrade (80.6% vs 47.6%, p = .013). Among responders, the previous device was more frequently a pacemaker (87.5% vs 61.9%, p = .029), and the new device a CRT-P (81.2% vs 54.5%, p = .035). HF etiology did not differ between responders and non-responders. Multivariate analysis identified absence of AF (odds ratio [OR] 4.4, 95% confidence interval [CI] 1.1-17.6, p = .037), CRT-P (OR 5.7, 95%CI 1.3-25.8, p = .022) and quadripolar lead implant (OR 3.8, 95%CI 1.3-25.8, p = .024) as predictors of clinical response in upgraded patients.
Conclusions: In this cohort, absence of AF, implantation of CRT-P and use of a quadripolar lead predicted clinical response to upgrade to CRT. Larger studies are warranted to tailor selection of patients for upgrade procedures.

CO 124. PREDICTORS OF VENTRICULAR ARRYTHMIAS AND MORTALITY AFTER IMPLANTATION OF PRIMARY PREVENTION ANTITACHYCARDIA DEVICES

Isabel Gonçalves Machado Cardoso, João Pedro Reis, Luísa Moura Branco, Pedro Rio, Ana Galrinho, André Monteiro, Ana Lousinha, Bruno Valente, Pedro Silva Cunha, Mário Oliveira, Rui Ferreira

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

Introduction: Patients (pts) with reduced left ventricular (LV) systolic function have high risk of sudden cardiac death and benefit from implantable cardioverter-defibrillators (ICDs/CRT-Ds). However, the risk for arrhythmic events and device therapies is extremely heterogeneous in this population, so more accurate tools for risk stratification are required.
Objectives: To assess predictors of mortality and arrhythmic events in pts receiving primary prevention ICDs/CRTs.
Methods: Retrospective analysis of 150 pts submitted to primary prevention ICD/CRT-D implantation with remote monitoring between 2014-2018. Demographic, clinical and echocardiographic data from implantation and follow-up period were retrieved. Arrhythmic events and device therapies were retrieved from remote monitoring and clinic visits. Univariate analysis was performed followed by a multivariate Cox analysis to evaluate predictors of events. p < 0.05 were considered significant.

Results: 150 pts, 80.7% male, with a mean age of 64.30 ± 12.9 years (Y) and a mean follow-up (FU) time of 38 ± 15 months. 66% of pts implanted an ICD. 52.0% of pts presented with an ischemic cardiomyopathy and 41.3% had atrial fibrillation. 35.3% had chronic kidney disease (GFR< 60 mL/min) and 24.0% were diabetic. Mean BNP value of 449.6 ± 631.3 pg/mL and mean peak VO2 of 15.3 mL/kg/min. Mean LV ejection fraction (LVEF) during FU of 35.9 ± 12.1% and a mean average global longitudinal strain (GLS) of -8.7 ± 5.5%. 63 pts (42.0%) suffered a ventricular arrhythmia, mostly non-sustained ventricular tachycardia, of which 47.6% received appropriate therapies. Mortality rate of 13.3% during follow-up (20 pts). Baseline diabetes (p = 0.040) and post-procedural pulmonary artery systolic pressure (PASP) (p = 0.002) were independent predictors of overall mortality in the follow-up. Male gender (p = 0.041), baseline diabetes (p = 0.011) and atrial fibrillation (p = 0.038) were associated with ventricular events. In patients with CRT-D, a percentage of biventricular pacing superior to 95% was found to be protective against ventricular arrhythmias. Interestingly despite being associated with a higher overall mortality (p = 0.028), a reduced LVEF wasn't related to the arrhythmic burden of our population, neither the GLS nor the LV mechanical dispersion were predictors of ventricular arrhythmias.
Conclusions: Baseline diabetes and PASP were independent predictors of mortality in our population of ICD/CRT-D pts implanted in primary prevention setting. An increased percentage of biventricular pacing was associated to improved clinical outcomes in patients receiving cardiac resynchronization therapy. Identification of predictors of events in this population can help individualize its management.

Domingo, 02 Maio de 2021 | 15H15-16H30

Sala Virtual 1 | CO 21 - Miocardiopatias

CO 107. CORONARY MICROVASCULAR DYSFUNCTION, MYOCARDIAL FIBROSIS AND IMPAIRED MYOCARDIAL DEFORMATION ARE ASSOCIATED WITH SUPRAVENTRICULAR AND VENTRICULAR ARRHYTHMIC EVENTS IN HYPERTROPHIC CARDIOMYOPATHY

Silvia Aguiar Rosa[1], Boban Thomas[2], António Fiarresga[1], Ana Luísa Papoila[3], Marta Alves[3], Inês Cruz[4], Ricardo Pereira[5], Gonçalo Branco[5], Luis Baquero[5], Rui Cruz Ferreira[1], Miguel Mota Carmo[3], Luís Rocha Lopes[6]

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Introduction: Coronary microvascular dysfunction (CMD) and fibrosis are two important pathophysiological features in hypertrophic cardiomyopathy (HCM) and have prognostic relevance.
Objectives: To assess the impact of CMD and fibrosis on arrhythmic events in HCM patients (P).
Methods: The study prospectively enrolled HCM P without obstructive epicardial coronary artery disease, who underwent stress cardiovascular magnetic resonance (CMR). CMD was assessed by perfusion imaging. The myocardium was divided into 32 subsegments (16 AHA segments subdivided into an endocardial and epicardial layer, excluding segment 17) and the ischemic burden was calculated as the number of involved subsegments, assigning 3% of myocardium to each subsegment. Fibrosis was assessed by native T1, extracellular volume (ECV) and LGE. Three-dimensional longitudinal, circumferential and radial strains were analysed. Atrial fibrillation/flutter (AF/AFL) and non-sustained ventricular tachycardia (NSVT) were documented by 12 lead electrocardiogram and 24 hours Holter monitoring. Mixed effects regression models were used and a level of significance $\alpha = 0.100$ was considered.
Results: 75P, 47 (62.7%) male, age 54.6 ± 14.8 years. 24 P (32.0%) had obstructive HCM, maximal wall thickness (MWT) was 20.1 ± 4.6 mm, left ventricular (LV) mass 97.2 ± 30.5 g/m², LV ejection fraction 71.6 ± 8.3%, ischemic burden 22.5 ± 16.0% of LV. For each unit increased in ischemia (%of LV), there was an increase of 4% in the odds of AF/AFL. Impaired circumferential strain was also associated with AF/AFL (Table). For each unit increased in LGE (% of LV mass), there was an increase of 9.6% in the odds of NSVT. Non obstructive HCM and better radial strain were protective factors for NSVT. There was no relationship between ischemia and NSVT (Table).

Multivariable logistic regression for factors related with arrhythmic events

	OR	95% confidence interval	p-value
AF/AFL			
Ischemia (% of LV)	1.040	1.002 to 1.080	0.039
Circumferential strain (%)	1.282	1.069 to 1.538	0.007
NSVT			
LGE (% of LV)	1.096	1.004 to 1.197	0.041
Non obstructive HCM	0.196	0.052 to 0.733	0.015
Radial strain (%)	0.924	0.855 to 1.000	0.049

Conclusions: CMD and consequent ischemia, myocardial fibrosis and impaired myocardial deformation were associated with arrhythmic events in HCM.

CO 109. INDEX OF MICROCIRCULATORY RESISTANCE IN THE ASSESSMENT OF CORONARY MICROVASCULAR DYSFUNCTION IN HYPERTROPHIC CARDIOMYOPATHY

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Introduction: Coronary microvascular dysfunction (CMD) constitutes one of the most important pathophysiological features in hypertrophic cardiomyopathy (HCM) and may lead to recurrent ischemia, cardiomyocyte death and myocardial fibrosis. The index of microcirculatory resistance (IMR) constitutes an invasive method to evaluate the coronary microcirculation.
Objectives: a) To evaluate CMD in HCM by IMR and coronary flow reserve (CFR), complemented with the detection of perfusion defects by stress cardiovascular magnetic resonance (CMR); b) to investigate the relationship between CMD and myocardial fibrosis.
Methods: Prospective study. HCM adult patients without epicardial coronary artery disease underwent cardiac catheterization for the assessment of CMD by IMR (normal cut off value ≤ 22.0) and coronary flow reserve (CFR)(normal cut off value ≥ 2). Cardiovascular magnetic resonance (CMR) was performed to assess the ischemic burden by perfusion imaging during regadenoson-induced hyperemia, and the extent of myocardial fibrosis was assessed by late gadolinium enhancement (LGE), native T1 mapping and extracellular volume (ECV).
Results: Fourteen patients with a mean age of 62.8 ± 6.2 years, 8 (57.1%) males, 9 (64.3%) of whom had obstructive HCM. In the overall population, Pd was 68.8 ± 18.8 mmHg, T_{mnRest} 0.61 ± 0.25s, $T_{mnHyper}$ 0.32 ± 0.10s, CFR 1.93 ± 0.69 and IMR was 21.4 ± 6.3U. Among the 4 patients with an IMR >22.0, all had non-obstructive HCM and 2 had angina. Among the 10 patients with an IMR ≤ 22, 1 had non-obstructive HCM, 6 patients complained of angina. CFR< 2 was reported in 8 patients (57%). Concordance between IMR and CFR (both normal or both abnormal) was verified in 6 patients (43%). All patients except one, due to claustrophobia, underwent CMR. Stress CMR demonstrated perfusion defects in 12 out of 13 patients (92%), with an ischemic burden between 3 and 54% of LV. Among the 4 patients with IMR > 22.0, perfusion defects were found in 2 of the 3 patients who underwent stress CMR. In the overall sample, ECV was increased in 5 patients (36%) (normal ECV values 25 ± 3%). Increased

ECV (> 28%) was documented in 2 of the patients with IMR > 22 patients and in 3 of the patients with IMR ≤ 22.0.LGE was found in all patients with a range between 3.4 to 39.8% of LV mass. LGE was >15% in 2 of the patients with IMR > 22 and in 4 with IMR≤ 22.0.
Conclusions: IMR detected CMD in a significant proportion of HCM patients. IMR has the potential to become a useful tool for microcirculation assessment in HCM patients.

CO 108. CORONARY MICROVASCULAR DYSFUNCTION IS ASSOCIATED WITH TISSUE CHANGES AND MYOCARDIAL DEFORMATION IMPAIRMENT IN HYPERTROPHIC CARDIOMYOPATHY-A MAGNETIC RESONANCE IMAGING STUDY

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Introduction: Fibrosis and impairment of left ventricular (LV) performance are associated with worse prognosis in hypertrophic cardiomyopathy (HCM).
Objectives: a) To assess the role of coronary microvascular dysfunction (CMD) in promoting edema and fibrosis in HCM; b) to evaluate the impact of CMD on LV myocardial deformation in HCM.
Methods: This prospective study enrolled patients (P) with HCM without obstructive epicardial coronary artery disease. Each patient underwent cardiovascular magnetic resonance (CMR), including parametric mapping, perfusion imaging during regadenoson-induced hyperemia, late gadolinium enhancement (LGE) and three-dimensional longitudinal, circumferential and radial strains analysis. CMD was assessed by perfusion imaging. The myocardium was divided into 32 subsegments (16 AHA segments subdivided into an endocardial and epicardial layer, excluding segment 17) and the ischemic burden was calculated as the number of involved subsegments, assigning 3% of myocardium to each subsegment. Myocardial fibrosis was assessed by native T1, extracellular volume (ECV) and LGE. T2 was used to evaluate edema. Linear regression models were used. A level of significance $\alpha = 0.05$ was used, although p-values < 0.100 were still considered in the multivariable analyses.
Results: 75P, 47 (62.7%) males, mean age 54.6 (14.8) years. 24 P (32.0%) had obstructive HCM, mean maximal wall thickness (MWT) was 20.1 (4.6) mm, LV mass 97.2 (30.5) g/m², LV ejection fraction 71.6 (8.3)%, ischemic burden 22.5 (16.0)% of LV. Greater MWT was associated with more severe ischemia (β-estimate: 1.81, 95%CI: 1.07-2.55, p < 0.001). In the multivariable analysis, ischemia was related with native T1 and LGE (Table). Increased ischemic burden was associated with impaired longitudinal strain (β-estimate: 0.08, 95%CI: 0.01-0.14, p = 0.017). No relationship was found between ischemia and radial and circumferential strain.

Multivariable linear regression for factors related with tissue characteristics

	B-estimate	95% confidence interval	p-value
Native T1 (ms)			
Ischemia (% of LV)	1.227	0.833 to 1.622	< 0.001
Non obstructive HCM	-12.198	-26.430 to 2.034	0.092
ECV (%)			
Ischemia (% of LV)	0.001	0.000 to 0.001	0.054
Diabetes	0.026	-0.001 to 0.053	0.055
LGE (%of LV)			
Ischemia (% of LV)	0.002	0.094 to 0.309	< 0.001
Dyslipidemia	-3.215	-6.936 to 0.507	0.089
T2 (ms)			
Ischemia (% of LV)	0.028	-0.001 to 0.058	0.061
Non obstructive HCM	-1.294	-2.389 to -0.199	0.021
Dyslipidemia	1.521	0.484 to 2.558	0.005

Conclusions: CMD is associated with myocardial fibrosis and impaired myocardial deformation in HCM.

CO 112. LEFT VENTRICULAR NONCOMPACTION: THE IMPORTANCE OF IDENTIFYING HIGH-RISK PATIENTS WITHIN THE SCOPE OF LEFT VENTRICULAR HYPERTRABECULATION

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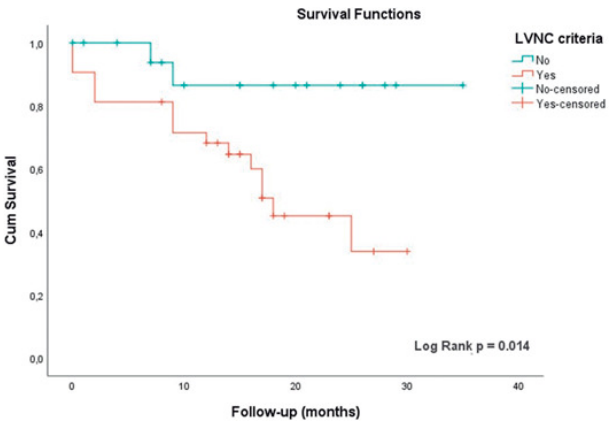
Introduction: Prominent left ventricular (LV) trabeculation is frequently encountered, however LV noncompaction (LVNC) criteria are not always fulfilled. The clinical and prognostic significance of these findings remains unclear.
Objectives: To characterize the patients (P) with echocardiographic suspicion of LVNC and to assess clinical outcomes.
Methods: Retrospective single-centre study that included all echocardiograms between January 2018 and June 2020 perceiving LV hypertrabeculation. The cohort underwent diagnostic assessment for LVNC by Chin and Jenni criteria. Baseline characteristics were evaluated. Composite endpoint of cardiovascular death, heart failure (HF) hospitalization, ventricular arrhythmias (VA) and nonfatal stroke was considered.
Results: 51P, 75% male, mean age 50 ± 18 years. 35P (69%) had associated heart conditions, of which 57% had other known cardiomyopathy (mainly dilated cardiomyopathy), 14% congenital, 26% ischemic and 3% valvular heart disease. 2P were in postpartum period and 1P was an athlete. Family history of cardiomyopathy was present in 8P (16%). 12P underwent genetic testing, with TTN and MYH7 mutations being the most frequently detected. Prior clinical HF was reported in 53%, previous stroke in 14%, and non-sustained and sustained VA in 24% and 4%, respectively. Mean NYHA classification was 1.8 ± 0.7, with 31% being asymptomatic. The prevalence of LVNC by Chin criteria was 31% and by Jenni criteria was 55%. 32P (63%) met at least one LVNC criteria. This group was younger (45 ± 18 vs 59 ± 15, p = 0.004), had higher NT-proBNP levels (3,644 ± 2,819 vs 389 ± 640, p = 0.048) and QRS fragmentation (59% vs 21%, p = 0.027). Significantly higher LV end-diastolic volume (84 (41) vs 64 (28) ml/m², p = 0.008) and end-systolic volume (51 (37) vs 35 (20) ml/m², p = 0.004), along with lower LV ejection fraction (39 ± 12 vs 49 ± 13%, p = 0.009) and global longitudinal strain (-11 ± 5 vs -17 ± 4%, p = 0.003) were noticed. P who met LVNC criteria also had higher number of affected LV segments (6.4 ± 1.8 vs 4.2 ± 1.6, p < 0.001). Over a mean follow-up of 18 ± 9 months, the incidence of composite endpoint was 35%. Univariate Cox analysis showed a significant association between the presence of LVNC criteria and adverse outcomes (HR: 5.108, 95%CI: 1.682-11.236, p = 0.030) (Figure).



Conclusions: LV hypertrabeculation can be encountered in a variety of clinical scenarios and often overlaps with other heart diseases. P satisfying criteria for LVNC had more impairment in LV performance and worse clinical outcomes.

CO 111. HYPERTROPHIC CARDIOMYOPATHY IN A PEDIATRIC POPULATION

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Introduction: Hypertrophic cardiomyopathy (HCM), defined by an increased left ventricle wall thickness not solely explained by abnormal loading conditions, represents a heterogeneous group of disorders with a diversity that is more apparent in childhood than any other age. It can result from mutations in sarcomeric protein-coding genes, metabolic or neuromuscular diseases, drugs or chromosomal/monogenic syndromes. It can be associated with myocardial dysfunction, thromboembolic events and arrhythmias and is the main cause of sudden death (SD) in children.
Objectives: To characterize the clinical evolution and outcome of the pediatric population with HCM followed in a tertiary hospital.
Methods: Retrospective review of patients' records for clinical history, underlying conditions, risk factors, genetic tests, family history and evolution.
Results: Forty patients were included, 55% male. First evaluation was at a median age of 6.7 years. Echocardiography was performed in all patients and cardiac magnetic resonance in 50%. The most common cause was sarcomeric mutation (52.5%) and 71.4% were familial. The HCM was part of a syndromic etiology (Noonan, Opitz-Frias, Arthrogryposis) in 25%, of a metabolic disorder in 12.5% (mitochondrial cytopathy, Congenital disorder of glycosylation and Pompe disease), of Friedreich ataxia in 2.5%, and drug-induced in 2.5%. One patient had no identifiable cause for HCM. Bicuspid aortic valve (2.5%) and dysrhythmia were seen in patients with sarcomeric HCM. The most frequently mutated genes were MYBPC3, MYH7, TNNT2, TNNI3, TPM1 and MYL3. One patient had a mutation related to left ventricular noncompaction. During follow-up, 72.5% of patients were under beta-blocker therapy, 15% required an implantable cardioverter-defibrillator, 5% had cardiac surgery and 2.5% had cardiac transplant. Five patients died: one SD with sarcomeric HCM, 4 with HCM phenocopies. Mortality was greater when diagnosis occurred in the first year of life.
Conclusions: HCM in children is a heterogeneous disease. The early diagnosis allows an adequate follow-up and identifies those at risk of adverse events. HCM associated to genetic syndromes or systemic diseases have poor prognosis. SD is rare. The clinical utility of defining the genotype in children with familial CMP exceeds that at other ages. Management of children requires special and individualized considerations. Genetic counselling is recommended and genetic and clinical screening of relatives should be offered.

CO 110. THREE-DIMENSIONAL MYOCARDIAL DEFORMATION PARAMETERS ARE ASSOCIATED WITH FUNCTIONAL CAPACITY ASSESSED BY CARDIOPULMONARY EXERCISE TESTING IN PATIENTS WITH HYPERTROPHIC CARDIOMYOPATHY

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Introduction: Myocardial deformation parameters, derived from three-dimensional (3D) speckle-tracking echocardiography (3DSTE) are useful tools to determine left ventricular (LV) systolic function, and are often abnormal before a decline in ejection fraction (EF).
Objectives: To study the correlation between systolic function evaluated by myocardial deformation parameters obtained by 3DSTE and functional capacity in patients with HCM.
Methods: HCM patients seen prospectively at outpatient cardiomyopathy clinic at a tertiary centre were included. Systolic function was assessed by strain measures-global longitudinal, circumferential and radial strain - obtain by 3DSTE, LVEF by 2D and 3D echocardiography were also assessed. Functional capacity was evaluated by CPET.
Results: Of 67 P with HCM (mean age 57 ± 14 years, 41 males), 38 P (56.7%) were in New York Heart Association (NYHA) functional class I, 24 (35.8%) in class II and 5 (7.5%) in class III. 46P (68.7%) had obstructive (HCM), with a maximum LV wall thickness (MWT) of 20 (7) mm. 3DSTE and CPET parameters are reported in the Table. 3D global radial strain showed correlation with pVO2 (rs = 0.336, p = 0.006), as well as absolute values of longitudinal strain (rs = 0.280, p = 0.024). No association was found between LVEF and pVO2. MWT did not correlate with 3DSTE strain measures.

Table 1 - 3DSTE and CPET parameters

3DSTE data	**Values**
LV ejection fraction (%)	61.8 ± 5.9
Indexed LV mass (g/m2)	97.4 ± 23.8
Global longitudinal strain (- %)	9 (5)
Global radial strain (%)	26 (18)
Global circumferential strain (-%)	12 ± 8
CPET data	**Values**
pVO2 (ml/kg/min)	21.01 ± 6.08
% of max predicted VO2 (%)	87 ± 21.7
VE/VCO2 slope	29 (5.3)
Time to AT (min)	6 (6.0)
VO2 in AT	14.27 ± 3.5
Optimal point of ventilation	24.1 ± 4.48
RER	1.03 ±0.09
Time of exercise was (min)	12.4 ± 4.3

Legend: peak oxygen consumption (pVO2), percentage of maximum predicted VO2 = % of max predicted VO2, anaerobic threshold=AT, respiratory exchange ratio=RER

Conclusions: Impaired myocardial deformation was associated with worse functional capacity assessed by peak oxygen consumption.

Sábado, 01 Maio de 2021 | 11H45-13.00

Sala Virtual 3 | CO 22- Insuficiencia cardíaca aguda

CO 113. PATIENTS ADMITTED WITH ACUTE HEART FAILURE AT AN INTENSIVE CARE DEPARTMENT OF A TERTIARY CARE HOSPITAL-CHARACTERIZATION OF PATIENTS SUBMITTED TO MECHANICAL CIRCULATORY SUPPORT

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Introduction: Heart failure (HF) is one of the major contemporary challenges. Its prognosis gets worse in the presence of exacerbations that require intensive care. In the last decades there has been a huge advance in techniques of mechanical circulatory support (MCS). Data regarding characterization and prognosis of critical acute heart failure (AHF) in the contemporary era in Portugal is lacking.
Objectives: to characterize the patients admitted with AHF and submitted to MCS in an ICU at a Portuguese tertiary care hospital.
Methods: Retrospective study of patients admitted at an ICU with the diagnosis of AHF and submitted to MCS between January and December of

2018 in a tertiary care hospital. Patients were analysed regarding clinical data, triggers and in-hospital and long-term prognosis.
Results: In the reported time frame there were 23 patients admitted for AHF submitted to MCS (9.6% of all AHF patients). They were predominantly men (69.6%), with a mean age of 50.7 ± 16.7 years old. The majority didn't have a previous HF diagnosis (78.3%). Mean ejection fraction at admission was 25.4 ± 15.8%; the majority presented with low peripheral perfusion (95.7%) and almost a quarter (21.7%) had sudden cardiac arrest at admission. Acute coronary syndrome (ACS) was the most common underlying trigger (34.8%). Venoarterial extracorporeal membrane oxygenation (VA-ECMO) was the most used type of MCS (73.9%), mainly as bridge to recovery (52.9%), with a mean duration of 12.0 ± 6.7 days. In this subgroup, myocarditis was the most common trigger (35.3%). Complications associated with this technique were observed in 46.2% of the cases with bleeding from puncture sites being the most common (23.1%; n = 3). Intra-aortic balloon pump was used in 56.5% of the patients, having ACS as the main trigger; there was the need to upgrade to VA-ECMO in about half of the patients (53.8%). There were associated complications in 15% of the cases. Impella was used in 13% of the patients (n = 2) for an average of 5.7 ± 0.6 days and always in simultaneous with VA-ECMO; one patient evolved with hematoma in the puncture site. About half (52.2%; n = 12) of the patients died during index hospitalization, with 2 casualties occurring in the first 24h. From those who survived, no one had a new hospitalization due to HF or death within 12 months after discharge.
Conclusions: This registry demonstrates that MCS in AHF is predominantly used in younger patients, with less comorbidities and with ACS and myocarditis having a relevant role as triggers. ECMO-VA is the preferred technique, and it is mostly applied in a strategy of bridge to recovery. In-hospital mortality is significant. However, in the surviving patients, the severity of the presentation at the index admission did not translate in long term outcome, with no reports of death or new re-hospitalization for AHF within 12 months. These findings support and give arguments to the use of these aggressive measures.

CO 114. DIURETIC RESPONSE IN ACUTE HEART FAILURE PATIENTS PREDICTS 30-DAY HOSPITALIZATION OR EMERGENCY DEPARTMENT VISIT

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Introduction: Loop diuretics are the basis of congestion relief in acute heart failure (AHF). HF patients often present a reduced maximum diuretic response. The assessment of diuretic response remains a clinical challenge and its prognostic value has not been confirmed yet.
Objectives: To evaluate the prognostic effect of diuretic response in AHF patients.
Methods: We conducted an unicentric retrospective study of consecutive AHF patients admitted on the Day Hospital between January 2017 and October 2019 to receive furosemide by continuous infusion (FCI) for symptom control. Patients with no diuresis registry, in New York Heart Association (NYHA) class I-II, or with a NT pro-BNP level less than 900 ng/dL were excluded. For each patient demographic variables, NYHA class, left ventricle ejection fraction, ambulatory therapy, and clinical and laboratory data were recorded. FCI and diuresis registry were performed for 6 hours. Diuretic response was evaluated through urinary output adjusted to 40 mg of furosemide and patient's weight. Primary endpoint was a composite of 30-day hospitalization or emergency department (ED) visit for AHF.
Results: A total of 111 episodes were included. The median age was 73 (68-82) years, 63.1% (n = 70) males. 80.2% of patients had HF with reduced ejection fraction (n = 89), being 98.2% in NYHA class III (n = 109) and 1.8% in class IV (n = 2). Most were chronically medicated with diuretics (n = 108, 97.3%). The median NT pro-BNP level was 5,213 (2,930-9,077) ng/dL. The median furosemide dose administrated was 200 (200-200) mg, the median diuresis was 240 (157-350) mL per 40 mg of furosemide. The primary endpoint occurred in 46.8% of patients (n = 52). Diuretic response was significantly lower in patients who presented the primary endpoint (2.4 mL vs 3.5 mL, 95%CI 7.5-114.3, p = 0.001), while NT-pro BNP level was not significantly different (p = 0.181). Diuretic response was an independent predictor of the primary endpoint (OR 0.684, 95%CI 0.535-0.875). The multivariate logistic regression model showed that diuretic response adjusted to age and serum creatinine performed even better as prognostic parameter (OR 0.594, 95%CI 0.415-0.850). This model yielded a good prognostic performance (AUC 0.789, 95%CI 0.686-0.910, p < 0.001).
Conclusions: Diuretic response has prognostic value in our HF patients. Urinary output adjusted to 40 mg of furosemide and weight is an independent predictor of 30-day hospitalization or ED visit for AHF.

CO 116. BAUN SCORE, A BETTER PREDICTIVE MODEL OF IN-HOSPITAL AND LONG-TERM OUTCOMES IN ACUTE HEART FAILURE?

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Introduction: Patients hospitalized due to acute heart failure (AHF) compose a heterogeneous population whose prognosis is difficult to forecast. Previously, BAUN score has proven to be able to accurately predict in-hospital mortality (IHM) in AHF. We aimed to evaluate BAUN score performance in the prediction of long-term outcomes in this population, comparing it to the recently validated Get With The Guidelines (GWTG) score.
Methods: A retrospective analysis of 1,052 patients admitted to a Cardiology ward due to AHF was performed. 268 patients were excluded due to data omission or therapy with sacubitril/valsartan. Using the variables systolic blood pressure, urea, brain natriuretic peptide and sodium at admission, BAUN score was calculated, ranging from 0-28 points. GWTG score was also calculated at the index event. ROC curve analysis was used to compare the predictive value of the two scores for IHM. Kaplan-Meyer and Cox-regression analysis were performed to evaluate BAUN score prediction ability for 24-month mortality (24-MM) and for the composite endpoint of 24-month rehospitalization or death (24-MH).
Results: Mean patient age was 77 (± 10) years; 51% were men. Mean left ventricle ejection fraction (EF) was 49% (± 16.4). An EF< 40% was present in 31% of patients. IHM, 24-MM and 24-HM were 6.5%, 17.1% and 57.8%, respectively. Mean BAUN score was 7 (± 5.64). Mean GWTG score was 49.7 (± 9.8). ROC curve analysis for IHM prediction revealed a better performance of the BAUN score (AUC: 0.738, p < 0.001) in comparison with GWTG score (AUC: 0.687, p < 0.001). Patients were stratified into subgroups according to BAUN risk score-very-high risk (≥ 22), high risk (16-21), intermediate risk (5-15) and low risk (< 5). Kaplan-Meyer analysis revealed a significant difference in 24-MM according to risk subgroup (very high: 35%, high: 26.7%, intermediate: 19.5%, low risk: 12.7%, χ^2 = 16.304, p = 0.001). When stratified by non-reduced or reduced EF (≥ 40% or < 40%), there was still a significant mortality difference in subgroups with reduced (p = 0.007) and borderline significant in patients with non-reduced EF (p = 0.05). Kaplan-Meyer analysis also revealed a significant difference between subgroup risk for 24-MH (51%; 63.8%; 63.3% and 75%, respectively, for low, intermediate, high and very-high risk, χ^2 = 21.237, p < 0.001). Cox regression analysis demonstrated that BAUN score independently predicts 24-MM (HR: 1.056, p = 0.043) and 24-MH (HR: 1.033, p = 0.048), even after adjustment for other prognostic markers, such as atrial fibrillation, coronary artery disease, previous myocardial infarction, age, EF and GWTG score.
Conclusions: BAUN outperforms GWTG score for IHM prediction in AHF. It also independently predicts 24-MM and 24-MH. Its use may identify patients with high risk of mortality/readmission, in need of specialized care, and those patients with low risk of death, who might be candidates for lenient surveillance.

CO 118. ENDOCAN - A POTENTIAL NEW BIOMARKER OF INFLAMMATION-DRIVEN "ENDOTHELITIS" IN HUMAN ACUTE HEART FAILURE AND CARDIOGENIC SHOCK

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Inflammation-driven "endothelitis" appears to contribute to acute heart failure (AHF). Endocan has recently emerged as a novel biomarker of endothelial dysfunction and inflammation. However, its role in human AHF has not been explored yet. This study aimed at evaluating the serum and urinary endocan profile in patients with AHF or with cardiogenic shock (CS). Furthermore, their correlation with biomarkers of inflammatory status, endothelial activation, cardiac dysfunction, systolic (SBP) and diastolic (DBP) blood pressure and prognostic scores was also analysed. This study was approved by the Health Ethics Committee of our hospital. Patients with the diagnosis of AHF (n = 23) or CS (n = 25) were included and blood samples were collected at days 1-2, 3-4 and 5-8. Blood donors were used as controls (n = 22). Endocan, myeloperoxidase (MPO), urinary isoprostanes (U-Isop) and IL-10 were determined by ELISA kits. Serum IL-6, tumour necrosis factor-α (TNF-α) and vascular cell adhesion molecule-1 (VCAM-1) were determined using multiplex immunoassays. C-reactive protein (CRP), differential leukocyte count, B-type natriuretic peptide (BNP), high-sensitivity troponin I (hs-trop I) were evaluated using automated analyzers. Prognostic scores (APACHE II, SAPS II), echocardiographic parameters, SBP and DBP were also evaluated. At admission, serum endocan was significantly higher in AHF and even higher in CS ($p < 0.001$ for linear trend). Urinary endocan values were significantly higher in CS patients ($p < 0.01$ vs controls). During hospitalization, there was no reduction in endocan values or in other inflammatory or endothelial biomarkers in both patients' groups. Within patients, serum endocan was inversely correlated with SBP and DBP and positively correlated with IL-6, IL-10, BNP, hs-trop I and with APACHE II and SAPS II scores. Urinary endocan was inversely correlated with lymphocytes and albumin and positively correlated with serum endocan, IL-6, IL-10, TNF-α, VCAM-1, MPO, U-Isop, hs-trop I and CRP. Furthermore, when patients were stratified according to echocardiographic ejection fraction (EF), serum endocan significantly increased in line with the degree of ejection fraction impairment (p for linear trend = 0.0089). Serum and urinary endocan are increased in AHF and CS patients and positively correlated with proinflammatory status and endothelial biomarkers. There is no reduction of their values during hospitalization which suggests that present hospital treatment is not sufficient to counteract inflammation-driven "endothelitis" which might contribute to the prognosis of acute heart failure. Additionally, serum endocan appears to be a potential novel biomarker in AHF since it is significantly associated with the deterioration of ventricular function, cardiac injury biomarkers and with prognostic scores.

Funded by FCT/FEDER (COMPETE, Portugal 2020), PTDC/MEC-CAR/32188/2017.

CO 117. THE C-REACTIVE PROTEIN/ALBUMIN RATIO AS A PREDICTOR OF MORTALITY IN PATIENTS WITH HEART FAILURE WITH REDUCED EJECTION FRACTION

Vanda Devesa Neto, Inês Fiuza Pires, Joana Correia, João Miguel Santos, Inês Almeida

Centro Hospitalar Tondela-Viseu, EPE/Hospital de São Teotónio, EPE.

Introduction: The C-reactive protein (CRP)/albumin (Alb) ratio has recently emerged as a marker for poor prognosis and mortality in critically ill patients. This is because CRP effectively reflects acute-phase inflammation while Alb may reflect malnutrition. However, there is limited evidence of the impact of this score in patients with Acute Heart Failure (HF).
Objectives: This study aimed to identify the association between CRP/alb ratio and 3-month (3MM), 6-month (6MM) and 12-month (12MM) mortality in patients with heart failure with reduced ejection fraction (HFrEF).
Methods: We conducted a retrospective study of 215 patients admitted for acute HF and diagnosed with HFrEF in a Cardiology Department. Baseline characteristics, laboratory findings and disease severity were analyzed. CRP and Alb were measured at admission and CRP/Alb ratio was calculated for every patient. Analysis of the receiver operating characteristic (ROC) curves were performed to evaluate CRP/Alb ratio predictive value for post-hospitalization mortality. Kaplan-Meyer survival plots were used to assess 3MM, 6MM and 12MM. The Mann-Whitney U was used for mean comparison between groups.
Results: Mean age was 74 ± 11 years; 69% were men. Mean LVEF was 29 ± 7%. Mean CRP and Alb values were 2.48 ± 0.2 and 3.95 ± 0.1. The cut-off point, with the most sensitivity (S) and specificity (E) obtained using the Youden index (IY = 0.04921), was 1.13 (S #i= 86% and E ≈ 43%). 15% had CRP/Alb ratio higher than 1.13 and 85% had CRP/Alb ratio lower than 1.13. There was no significant difference between groups in gender, age, cardiovascular risk factors, previous HF, chronic kidney disease, history of acute myocardial infarction and atrial fibrillation. At admission, there were no differences regarding hemodynamic profiles. During hospitalization, patients with higher CRP/Alb ratio had more frequently acute kidney injury, liver injury, higher brain natriuretic peptide (BNP) levels and were treated more frequently with inotropic. 3MM, 6MM and 12MM were 12%, 16% and 19%, respectively. Higher CRP/alb ratio was associated with higher 3MM (27.2 vs 7.7%; $p < 0.001$), 6MM (27.2 vs 11.5%; $p = 0.004$) and 12MM (30.3 vs 14.3%; $p < 0.001$). No difference was found between groups regarding hospitalization due to HF, during follow-up.
Conclusions: Higher CRP/alb ratio is associated with increased mortality in patients with HFrEF. CRP/Alb ratio may be a simple predictive model for short and medium-term mortality in HFrEF. Its use may help to identify patients with a poor prognosis and a need for closer follow-up.

CO 115. ACUTE HEART FAILURE: DOES MIDRANGE EJECTION FRACTION RESULT IN MIDRANGE PROGNOSIS?

João Borges Rosa, Gustavo M. Campos, Sofia Martinho, José Lopes de Almeida, Valdirene Gonçalves, Cátia Ferreira, André Azul Freitas, James Milner, João André Ferreira, Ana Vera Marinho, Patrícia M. Alves, Manuel Oliveira-Santos, Lino Gonçalves

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Introduction: Heart failure with midrange ejection fraction (HFmrEF) has recently been recognized and there is limited data regarding mortality outcomes compared to heart failure with reduced (HFrEF) and preserved (HFpEF) ejection fraction. We aimed to evaluate whether HFmrEF has a different prognosis after an acute heart failure (AHF) episode, in a real-world contemporaneous southern European population.
Methods: We retrospectively studied 1,026 patients admitted to our emergency department between November 2016 and December 2017 with discharge diagnosis of AHF. Median follow up was 5 months (IQR 3-11 months). Incidence of rehospitalization, cardiovascular (CV) and all-cause mortality were evaluated through multivariable logistic regression models and by Kaplan-Meyer survival curves.
Results: From all patients, 782 were categorized in HFrEF (34.1%), HFmrEF (19.4%) and HFpEF (46.4%). There was heterogeneity between groups. Compared to HFrEF, HFmrEF patients were older (80[74-84] vs. 76[67-82] years, $p < 0.001$), with lower prevalence of males (61.2% vs. 76.4%, $p = 0.004$) and coronary artery disease (CAD) (35.5% vs. 47.6%, $p = 0.024$), but higher rates of valvular heart disease (VHD) (48.0% vs. 29.6%, $p < 0.001$). Compared to HFpEF, HFmrEF subjects had higher prevalence of males (61.2% vs. 40.8%, $p < 0.001$) and CAD (35.5% vs. 13.2%, $p < 0.001$). At admission, patients with HFmrEF and HFrEF had similar serum creatinine e B-type natriuretic peptide values, but higher than the HFpEF group: 1.38 ± 0.7 vs. 1.45 ± 0.7 vs. 1.28 ± 0.8 mg/dL, $p = 0.019$ and 701 [385-1,191] vs. 1,000 [494-1,776] vs. 360 [214-717] pg/mL, $p < 0.001$, respectively. HFmrEF patients had higher rates of hospitalization (71.7% vs. 43.8%, $p < 0.001$), follow-up readmissions (27.6% vs. 18.7%, $p = 0.034$), CV (11.8% vs. 5.0%, $p = 0.025$) and all-cause mortality (25.7% vs. 14.9%, $p = 0.015$), compared to HFpEF; no differences comparatively to HFrEF. There was no difference between groups regarding the length of hospitalization (9 [5-15] vs. 8 [5-15] vs. 10 [6-17] days, $p = 0.302$). In multivariate logistic regression model adjusted for age, sex, SBP, CAD, VHD, creatinine, and BNP, HFmrEF increased the risk of CV (OR 2.9, 95%CI 1.2-6.7, $p = 0.016$) and all-cause mortality (OR 2.1, 95%CI 1.2-3.9, $p = 0.011$), but not follow-up readmissions (OR 1.7, 95%CI 0.9-2.9, $p = 0.059$). Kaplan-Meier estimates of CV, and all-cause mortality are shown in Figure 1.
Conclusions: HFmrEF have a similar short-term prognosis to HFrEF and worse than HFpEF, with more readmissions, CV and all-cause mortality, after an AHF episode. Whether this feature is valid in the long-term needs to be ascertained by other studies.

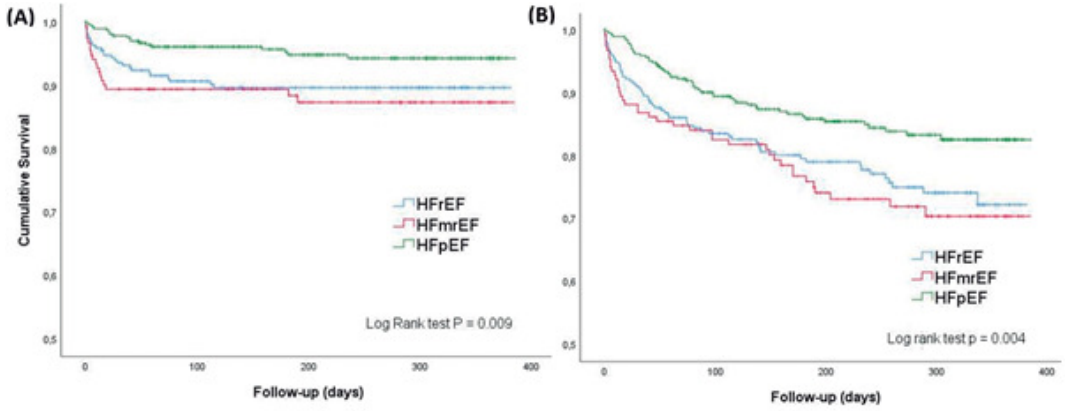


Figure 1. Kaplan Meier curves for CV (A) and all-cause (B) mortality, according to the ejection fraction group.

CO 115 Figure

Domingo, 02 Maio de 2021 | 09H00-10H00

Sala Virtual 3 | CO 24 - Interventional Cardiology - TAVI

CO 129. LOW RATE OF INVASIVE CORONARY ANGIOGRAPHY FOLLOWING TRANSCATHETER AORTIC VALVE IMPLANTATION: REAL-WORLD PROSPECTIVE COHORT FINDINGS

Rita Reis Santos, Mariana Gonçalves, Pedro de Araújo Gonçalves, Rui Campante Teles, Manuel de Sousa Almeida, Mariana Sousa Paiva, Afonso Félix de Oliveira, João Brito, Luís Raposo, Henrique Mesquita Gabriel, Tiago Nolasco, José Pedro Neves, Miguel Mendes

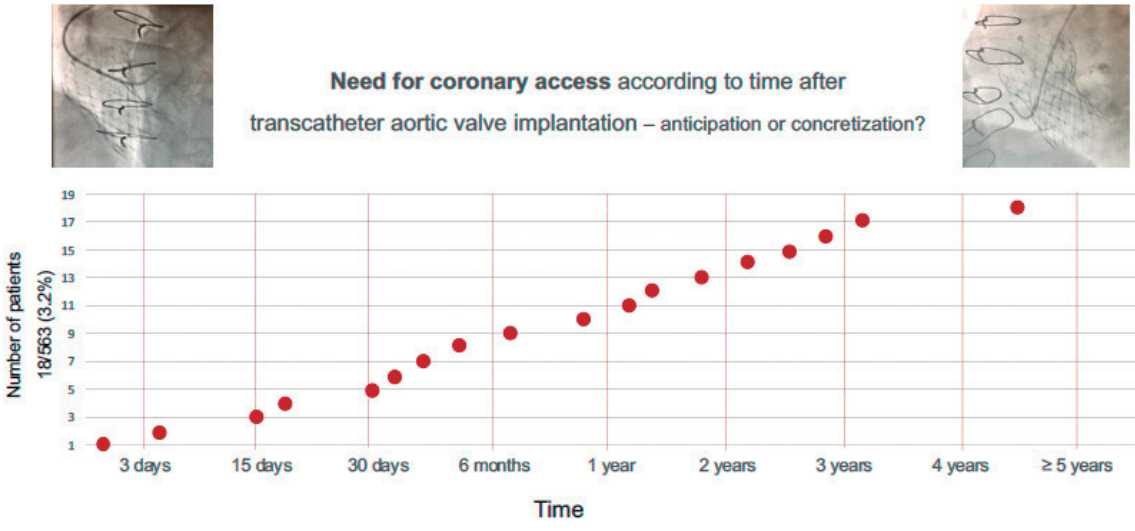
Centro Hospitalar de Lisboa Ocidental, EPE/Hospital de Santa Cruz.

Introduction: Coronary artery disease is prevalent among patients with severe aortic stenosis. Transcatheter aortic valve implantation (TAVI) procedures are increasing at a high rate. Revascularization strategies before TAVI differ and concerns about future coronary intervention influence strategy and device selection. Intraprocedural need for coronary access is a major concern and coronary ostial obstruction due to valve leaflets or calcium displacement can be as high as 0.8% and 3.5% when valve-in-valve procedures are accounted. With the increasing number of procedures, coronary access can become a challenge for interventional cardiology operators and so, real world data about the incidence of acute coronary events after TAVI, the need for coronary reassessment and success rate of consequential procedures should be shared.

Objectives: To evaluate the real need for coronary access after transcatheter aortic valve implantation (TAVI).

Methods and results: Prospective observational single center registry, including 563 consecutive patients that underwent TAVI between April 2008 and November 2018, with both self and balloon expandable valves in a tertiary European center. Mean age was 82.4 ± 6.9 years, 53.3% were female, 16% had previous history of CABG, 33% of previous PCI and 16.6% of MI. Twenty four percent of the patients were revascularized within one year before TAVI in preparation for the procedure. Median STS Score was 4.82 (IQ 2.84). In a median follow up of 24 months (IQ 21.5), 18 patients (3.2%) were identified as potentially in need for ICA: 9 (1.6%) in the setting of stable coronary artery disease and 9 (1.6%) for an acute coronary syndrome. A total of 11 PCI were performed in 9 patients, with a complete success rate of 63.6%. Procedures that were unsuccessful or partially unsuccessful were due to the inability to cross the stent or the drug eluting balloon through the valve struts or misplacement within the coronary artery due to lack of catheter's support.

Conclusions: In this population, a strategy of previous guideline guided revascularization before transcatheter aortic valve implantation (TAVI) was associated with a low rate of myocardial infarction and repeated need of coronary access, with a scattered distribution over time. Assuring future access to coronary arteries in patients at increased risk may depend on the revascularization strategy rather than device selection.



CO 129 Figure

CO 125. PERIPROCEDURAL AND SHORT-TERM STROKE AFTER TRANSCATHETER AORTIC VALVE IMPLANTATION-WHAT ARE THE OUTCOMES AND HOW CAN WE PREDICT IT?

Alexandra Castelo, André Grazina, Tiago Mendonça, Inês Rodrigues, Vera Vaz Ferreira, Pedro Garcia Brás, Rúben Ramos, António Fiarresga, Duarte Cacela, Rui Cruz Ferreira

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

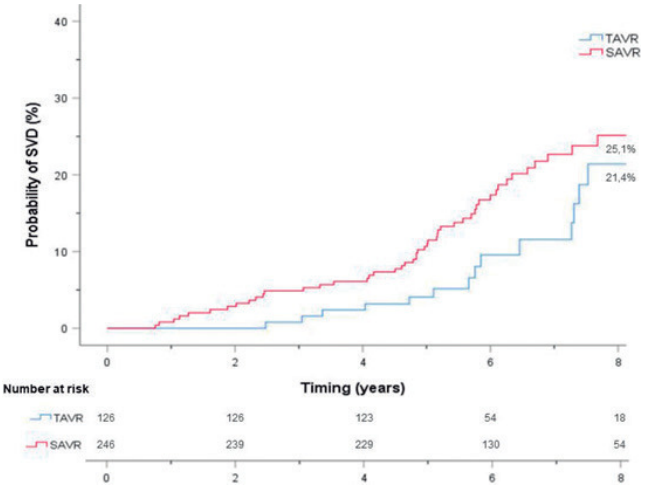
Introduction: Stroke is a known complication after transcatheter aortic valve implantation (TAVI). Although risk factors for its occurrence are being suggested, we still don't have clear tools to predict which patients will most probably have it and how to prevent it.
Objectives: To identify possible clinical and procedural predictors of early post-TAVI stroke.
Methods: Retrospective analysis of consecutive patients (P) submitted to TAVI between 2009 and 2020 in a tertiary center. Baseline characteristics, procedural information and stroke in first 30 days after TAVI were collected.
Results: A total of 494P (56.1% female) were included, with a mean age of 82 ± 6years (minimum 45 and maximum 95 years-old). The majority (98.4%) had at least one cardiovascular risk factor (83.2% hypertension, 67.6% dyslipidemia, 64% excess weight, 36.8% diabetes, 11.9% smoking). Half patients had chronic kidney disease, 34.8% atrial fibrillation, 16.4% peripheral artery disease, 15.4% porcelain aorta, and 12.3% a previous stroke. The procedure was done via transfemoral access in 460P (93.1%), subclavian artery in 16P (3.2%), transcava in 10P (2%) and transaortic in 7P (1.4%). Aortic valve pre-dilation was done in 35.6% and post-dilation in 31.2%. In the first 30 days after TAVI 19P (3.8%) had a stroke (11P with a major and 8P with a minor stroke). Patients with stroke had more hypertension (100% vs 82.4%, p = 0.045), higher BMI (29 vs 27, p = 0.039) and more frequently porcelain aorta (36.8% vs 15.5%, p = 0.014). They also tended to have more peripheral artery disease (31.6% vs 15.7%, p = 0.066). There weren't other differences in baseline characteristics between the two groups. Considering the aspects related to the procedure, post-dilation was the only predictor of events (58.8% vs 32%, p = 0.021). In a multivariable analysis including clinical and procedural predictors, porcelain aorta (p = 0.048, OR = 2.895) and post-dilation (p = 0.042, OR = 2.844) were the independent predictors. Stroke after TAVI was associated with longer hospital stay (36 vs 15 days, p < 0.001) and intensive care unit stay (12 vs 3 days, p < 0.001), higher intra-hospital mortality (14.8% vs 3.2%, p = 0.002), global 30-day mortality (12.1% vs 3.3%, p = 0.0011) and cardiovascular 30-day mortality (11.5% vs 3.4%, p = 0.038).
Conclusions: Periprocedural and 30-day stroke is a relatively uncommon but potentially devastating complication after TAVI. There are clinical and procedural characteristics that are associated with a higher risk and should be considered when selecting patients for treatment and strategies to prevent events.

CO 126. LONG TERM DURABILITY OF TRANSCATHETER AORTIC VALVE REPLACEMENT: OUTCOMES FROM A CONTEMPORARY COHORT FROM A TERTIARY REFERENCE CENTER AT 5-YEARS AND BEYOND

Gustavo Sá Mendes, Pedro M. Lopes, Rui Campante Teles, Pedro Araújo Gonçalves, Luís Raposo, João Abecasis, João Brito, Tiago Nolasco, Márcio Madeira, Afonso Oliveira Félix, Mariana Gonçalves, Miguel Mendes, Manuel de Sousa Almeida

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

Background and aim: Long-term data on the durability of transcatheter heart valves is scarce. This is of particular interest as indications expand to younger and lower surgical risk patients. We sought to assess the incidence of long-term structural valve dysfunction (SVD) and bioprosthetic valve failure (BVF) in a cohort of patients with TAVR who reached at least 5-year follow-up, as compared to surgical aortic valve replacement (SAVR), performed within the same time-frame at the same institution.
Methods and results: Consecutive patients with at least 5-year available follow-up, who underwent TAVR between November 2008 to December 2015 in a tertiary single center, were included. From a group of 246 patients undergoing TAVR, 126 had available follow-up data (age at implantation: 83.0 [77.8-87.0] years; EuroScore II: 4.54 [2.60-6.29]%; follow-up: 5.94 [5.06-7.67] years). First generation Corevalve® and Sapien® prosthesis were implanted in 56% and 38% patients, respectively. SVD and BVF were defined according to the new consensus statement from the EAPCI endorsed by the ESC and the EACTS. Mean transaortic pressure gradients decreased from 53.2 ± 1.3 mmHg (pre-TAVR) to 10.4 ± 0.4 mmHg (at discharge or up to one-year after TAVR, p < 0.001), and there was a small non-significant increase at the fifth-year and the last available follow-up (11.2 ± 0.6 mmHg; 14.7 ± 1.8 mmHg, respectively). Moderate and severe SVD were reported in 12 and 4 patients, respectively (8-year cumulative incidence function to SVD: 2.67%; 95%CI, 2.12-3.89). Of these 8 had BVF, 7 of them with hospitalization for acute heart failure. A total of 4 patients died and none required reintervention (redo TAVR or SAVR). BVF for non-SVD were observed in 4 patients (2 subclinic thrombosis successfully treated with anticoagulation and 2 paravalvular regurgitation due to endocarditis).As comparator, from a cohort of 587 patients submitted to biological SAVR, 247 (age 75.0 [70.0-79.0] years; EuroScore II 1.43 [1.06-2.17]%) had available long-term follow-up (6.89 [6.08-8.19] years). Moderate and severe SVD were reported in 42 and 3 patients, respectively (8-year cumulative incidence function to SVD: 3.13%; 95%CI, 2.45-4.21). These events were clinically relevant (BVF) in 19 of them: 8 performed TAVR valve-in-valve procedures and 3 redo SAVR. At the fifth-year of follow-up the incidence of SVD was not statistically different between TAVR (8%) and SAVR (15%), with a p for comparison of 0.137.



Conclusions: In our population of patients with symptomatic severe aortic stenosis treated with first-generation percutaneous bioprostheses, TAVR was associated with a low incidence of BVF and SVD at the long-term follow-up. These outcomes seem indistinct from those occurring in patients submitted to conventional SAVR.

CO 127. TRANSCAVAL TRANSCATHETER AORTIC VALVE IMPLANTATION: AN ALTERNATIVE

André Grazina[1], Alexandra Castelo[1], Duarte Cacela[1], Lino Patrício[2], António Fiarresga[1], Ruben Ramos[1], Tiago Mendonça [1], Inês Goncalves Rodrigues[1], Isabel Gonçalves Machado Cardoso[1], Rui Cruz Ferreira[1]

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[2]*Hospital do Espírito Santo, EPE, Évora.*

Introduction: Transfemoral access is widely accepted as the preferential route for transcatheter aortic valve implantation (TAVI). However, in some patients this is not possible because of severe peripheral artery disease. In such cases transcaval access (TCv) TAVI is an option.
Objectives: This analysis aims to describe the initial experience of TCv TAVI procedure in a tertiary center.
Methods: Retrospective descriptive analysis of the patients submitted to TCv TAVI in a single center. Baseline characteristics, procedure data and

1-year outcomes were noted according to the Valve Academic Research Consortium-2 (VARC-2).
Results: During the study period, 493 TAVI procedures were performed including 10 patients (mean age 77.9 y/o, 80% male) who underwent TCv TAVI. In the latter, average Euroscore II and STS score were 8.56 and 4.81, respectively, obstructive coronary artery disease was present in 50%, previous CABG in 30%, symptomatic peripheral artery disease in 50%, previous stroke in 50% and high frailty scores. VARC-2 procedure success rate was 100%. The average duration of hospitalization after TCv TAVI was 5.9 days (vs 10.4 in the overall TAVI population). In-hospital mortality was 20% (one patient with hemorrhagic shock after upper gastrointestinal bleeding and another with cardiac arrest of indeterminate cause). One-year mortality rate was 30% (one patient died in the first year of follow-up because of acute decompensated heart failure), which compares unfavorably with the 13% one-year mortality in the overall TAVI population. One non-disabling stroke was noted during hospitalization and none after discharge in the first year. One major vascular complication, with a stent implantation in the infra-renal abdominal aorta occurred during hospitalization. One pacemaker was implanted in the first year, none during the hospitalization. No peri-procedure or first year myocardial infarctions occurred. No prosthetic dysfunction, endocarditis or thrombosis occurred in the first year. There was significant symptomatic improvement at one-year follow-up (average NYHA class of 1.5 vs 2.7 preprocedural).
Conclusions: This analysis describes real-world and initial experience with TCv TAVI in high and very high-risk patients. In selected patients with high-risk femoral access, transcaval TAVI may be a reasonable alternative.

CO 128. THE TIMING AND MECHANISM OF HIGH-GRADE AV BLOCK POST-TAVI: KNOWING YOUR ENEMY

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

Introduction: Complete atrioventricular block (AVB) requiring permanent pacemaker implantation (PPMI) is still a major limitation of transcatheter aortic valve implantation (TAVI) procedures. Although right-bundle branch block (RBBB), membranous septum (MS) length and self-expandable prosthesis are recognizable risk factors, their predictability to PPMI is far from satisfactory. While some patients (pts) develop persistent intra-procedure high-grade AVB (H-AVB), others present much later with severe bradycardia. This study aims to describe and compare the characteristics of pts who develop AVB during or after TAVI.
Methods: Single centre prospective registry of 506 consecutive pts submitted to TAVI with no previous pacemaker between 2017 and 2020. Post-procedure PPMI (up to 30 days after discharge) was studied and divided into two groups according to the development of persistent intra-procedure H-AVB (Group A) or post-procedure H-AVB (Group B). Baseline ECG, computed tomography and TAVI-related characteristics were analyzed.
Results: A total of 88 pts (17.3%), aging 83 ± 6 years, 36.4% male, underwent post-TAVI PPMI (6 after discharge). Previous conduction disturbances were present in 50 (56.8%) pts and 25 (28.4%) had RBBB. 83% were submitted to self-expandable TAVI. 42 (47.7%) pts had persistent intra-procedure H-AVB (Group A) whereas 52.3% had post-procedure H-AVB (Group B). In pts with persistent intra-procedure H-AVB previous RBBB was significantly more frequent (45.2%, n = 19) when compared to pts with post-procedure H-AVB (13%, n = 6; p = 0.001). Contrarily, AF and previous left-bundle branch block (LBBB) were more likely in Group B. No difference in valvular calcification, MS length, prosthesis type or implantation technique was noted (table). In the group with post-procedure H-AVB, 21.7% had transient AVB during TAVI and all developed de novo LBBB or first-degree AVB post-TAVI. Among these, 33 (71.7%) pts developed delayed H-AVB (> 48h post-procedure) while the remaining presented earlier.
Conclusions: In pts with PPMI post-TAVI, those with persistent intra-procedure H-AVB had higher rates of previous RBBB, while those with post-procedure H-AVB frequently had a normal baseline ECG. Anatomical and procedural characteristics did not differ between groups. Further studies are needed to confirm these results.

	All cohort (n=88)	Persistent intra-procedure H-AVB (n=42)	No persistent intra-procedure H-AVB (n=46)	*p-value*
Baseline electrocardiogram				
Atrial fibrillation	21 (23.9%)	5 (11.9%)	16 (34.8%)	0.012
First degree AVB	16 (18.2%)	11 (25.6%)	5 (14.3%)	0.219
RBBB	25 (28.4%)	19 (45.2%)	6 (13.0%)	0.001
LBBB	7 (7.7%)	0	7 (15.6%)	0.015
PR interval, ms	181±38	173±31	187±42	0.140
QRS interval, ms	119±27	124±28	116±27	0.225
CT-scan features				
Aortic valve calcium score, AU	2642 (1930-3790)	2607 (1959-3196)	2717 (1925-4307)	0.372
MS length, mm	6.34 (5.77-7.22)	6.65 (5.65-7.22)	6.08 (5.92-6.82)	0.749
Procedure-related				
Self-expandable TAVI	73 (83%)	34 (81%)	39 (84.8%)	0.978
Pre-dilatation	38 (43.2%)	21 (50%)	17 (37%)	0.217
Post-dilation	30 (34.1%)	17 (40.5%)	13 (28.3%)	0.227
Reposition	28 (31.8%)	17 (40.5%)	11 (23.9%)	0.096
Oversizing (% by annulus perimeter)	17±1.1%	15±1.1%	18±1.1%	0.267
Days to PPMI	3 (1-5)	1 (1-2)	5 (3-6)	-

Table 1- Characteristics of pts who implanted permanent pacemaker after TAVI (up to 30 days after discharge).
*Continuous variables are described as mean±standard deviation or median (interquartile range). Categorical variables are described as n (%)

CO 128 Figure

Sexta-feira, Abril 30, Estúdio 3 SPC Porto, 09:00h - 10:15h

Estúdio 3 SPC Porto | Prémio Jovem Investigador

CO 144. LOOKING BEYOND LEFT VENTRICULAR EJECTION FRACTION - A NEW MULTIPARAMETRIC CMR SCORE TO REFINE THE PROGNOSTIC ASSESSMENT OF HF PATIENTS

Gonçalo Lopes da Cunha, Bruno Rocha, João Adriano Sousa, Sérgio Maltês, Catarina Brizido, Christopher Strong, Sara Guerreiro, João Abecasis, Maria João Andrade, Carlos Aguiar, Carla Saraiva, Pedro Freitas, Miguel Mendes, António Ferreira

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

	OVERALL POPULATION (N=436)	WITHOUT EVENTS (N=349)	WITH EVENTS (N=87)	P-VALUE
MALE GENDER	324 (74,3%)	256 (73,4%)	68 (78,2%)	0,358
AGE	64±12	63±12	65±13	0,158
CMR IN INPATIENT SETTING	106 (24,3%)	81 (23,2%)	25 (28,7%)	0,282
HF ETIOLOGY				
ISCHEMIC	232 (53,2%)	189 (54,2%)	43 (49,4%)	0,694
DILATED CARDIOMIOPATHY	135 (31%)	106 (30,4%)	29 (33,3%)	
VALVE DISEASE	16 (3,7%)	11 (3,2%)	5 (5,7%)	
OTHER	52 (11,9%)	42 (12,0%)	10 (11,5%)	
HYPERTENSION	267 (61,5%)	213 (61,4%)	54 (62,1%)	0,906
DIABETES MELLITUS	111 (25,6%)	87 (25,1%)	24 (27,6%)	0,631
PREVIOUS MI	215 (49,4%)	171 (49,1%)	44 (50,6%)	0,811
AF/A FLUTTER	114 (26,3%)	86 (24,8%)	28 (32,2%)	0,161
CABG	49 (11,3%)	35 (10,1%)	14 (16,1%)	0,113
CURRENT SMOKING	82 (18,9%)	71 (20,5%)	11 (12,6%)	0,096
ICD	10 (2,3%)	5 (1,4%)	5 (5,7%)	0,017
ASPIRIN	189 (43,8%)	155 (44,9%)	34 (39,1%)	0,326
IP2Y12	123 (28,5%)	100 (29%)	23 (26,4%)	0,638
ACEI	282 (65,3%)	229 (66,4%)	53 (60,9%)	0,339
ARB	72 (16,7%)	58 (16,8%)	14 (16,1%)	0,872
MRA	178 (41,2%)	139 (40,3%)	39 (44,8%)	0,442
ARNI	39 (9%)	29 (8,4%)	10 (11,5%)	0,369
BETA-BLOCKERS	354 (81,9%)	287 (83,2%)	67 (77%)	0,181
ORAL ANTICOAGULATION	153 (35,4%)	119 (34,5%)	34 (39,1%)	0,424
IVABRADINE	18 (4,2%)	11 (3,2%)	7 (8%)	0,043
DIGOXINE	19 (4,4%)	16 (4,6%)	3 (3,4%)	0,629
FUROSEMIDE	198 (45,8%)	139 (40,3%)	59 (67,8%)	
STATIN	285 (66%)	236 (68,4%)	49 (56,3%)	0,034
NYHA CLASS				
I	176 (40,6%)	158 (45,7%)	18 (20,7%)	<0,001
II	187 (43,2%)	151 (43,6%)	36 (41,4%)	
III	60 (13,9%)	34 (9,8%)	26 (29,9%)	
IV	10 (2,3%)	3 (0,9%)	7 (8%)	
LVEDVI	122 (94 to 166,5)	118 (92 to 161)	144 (105 to 186)	0,013
LVESVI	80 (56 to 121)	75,5 (55 to 116,5)	101 (65 to 136)	0,003
LVEF	33,7±9,7	34,7±9,2	29,7±10,4	<0,001
LUNG WATER DENSITY*	16,9 (13,6 to 20,8)	16,6 (13,4 to 20,1)	19,6 (15,2 to 25,3)	<0,001
MEAN PECTORALIS MAJOR AREA	16,47±6,42	16,5 (12 to 20,5)	14 (11 to 18,5)	0,001
SERUM CREATININE*	1,02 (0,83 to 1,29)	1,01 (0,82 to 1,24)	1,1 (0,85 to 1,5)	0,003
EGFR (MDRD)	74,9±26,9	76,9±25,7	66,9±30,2	0,006
NT-PROBNP*	1030 (407,5 to 2789,5)	800 (341 to 2000)	2765 (1049 to 5931)	<0,001

Table 1 – Baseline Demographics. * non normal distribution

ACEi = angiotensin converter enzyme inhibitor,
AF = Atrial Fibrillation
ARB = angiotensin receptor blocker
CABG = coronary artery bypass graft;
LVEDVi = Left Ventricular End-diastolic volume index
eGFR = estimated glomerular filtration rate;
LVESVi = Left Ventricular End-systolic volume index;
ICD = Implantable cardioverter defibrillator;
LVEF = Left ventricular ejection fraction;
MI = myocardial infarction;
MRA = Mineralocorticoid receptor antagonist.

Figure 1

Figure 1- Measurement of pectoralis major area and lung water density

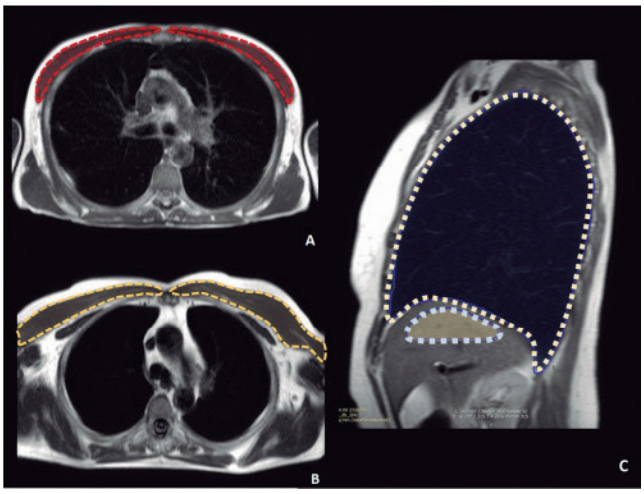

Figure 2

Figure 2 – CMR-HF score

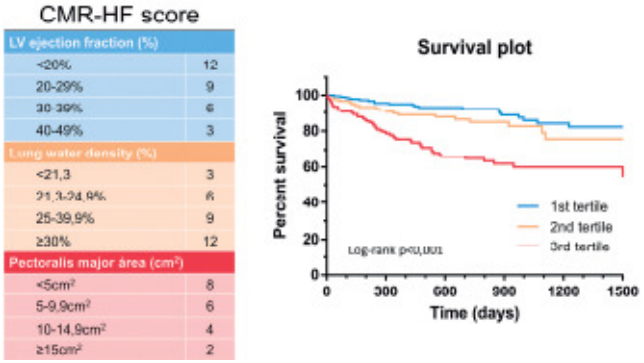

Figure 3

Introduction: Cardiac magnetic resonance (CMR) is recommended in Heart Failure (HF) to assess myocardial structure and function. Recently, the quantification of pulmonary congestion and skeletal muscle mass using CMR have been shown to predict adverse events in HF, but a tool integrating this information is currently unavailable. The purpose of this study was to develop and test a new multiparametric CMR-derived score.
Methods: We conducted a single-center retrospective study of consecutive HF patients with left ventricular ejection fraction (LVEF) (Figure 1-A, B) - and LWD was defined as the lung-to-liver signal ratio multiplied by 0.7, as previously described. Both parameters were measured in standard HASTE images (Figure 1-C). The primary endpoint was a composite of all-cause death or HF hospitalization. Using the Cox regression Hazard Ratios of designated variables, a risk score was developed.
Results: Overall, 436 patients were included (Table). During a median follow-up of 27 (17-37) months, 43 (9.9%) patients died and 57 (13.2%) had at least one hospitalization for HF. LVEF, LWD and PMM were independent predictors of the primary endpoint and were included in the CMR-HF score (Figure 2). The annual rate of events increased from 4.7 to 7.5 and 20.0% from lowest to highest tertile of the score. Roughly half of the events (54%) occurred in patients in the highest tertile of the CMR-HF score. In multivariate analysis, the new score independently predicted the primary endpoint (HR per 5 points: 1.54; 95%CI: 1.21-1.97).
Conclusions: This novel multidimensional CMR-HF score, combining easily obtainable data on left ventricular pump failure, lung congestion and muscular wasting, is a promising tool identifying HF patients with an LVEF.

CO 143. CAN GENE-GENE INTERACTION BETTER PREDICT THE CORONARY DISEASE RISK?

Flávio Mendonça[1], Isabel Mendonça[2], Marina Santos[2], Margarida Temtem[2], Adriano Sousa[2], Ana Célia Sousa[2], Eva Henriques[2], Mariana Rodrigues[2], Sónia Freitas[2], Sofia Borges[2], Graça Guerra[2], António Drumond[1], Roberto Palma dos Reis[3]

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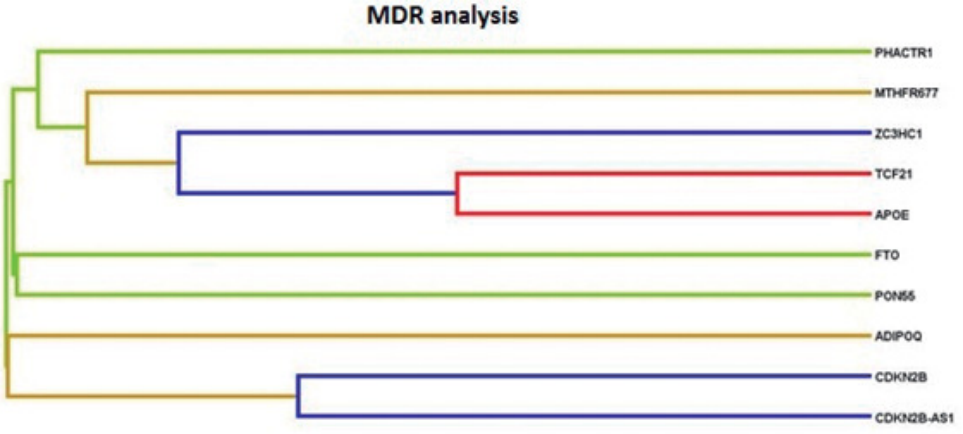
Introduction: Multiple genetic variants have been identified in GWAS associated with Coronary Artery Disease (CAD). New computational and statistical methods emerged beyond logistic regression to better analyze the gene-gene interaction.
Objectives: Study the best gene-gene interaction model and predictor of CAD, using new data mining methods such as Multifactor Dimensionality Reduction (MDR).
Methods: We included 3,139 participants (mean age 53.2 ± 7.8 years, 78.1% male), namely 1.723 coronary patients documented by angiography with one or more epicardial stenoses > 75% and 1.416 controls adjusted with cases for age and gender. Taqman SNP genotyping (Applied Biosystems) was used, and then a gene-to-gene analysis was performed between 33 variants associated with CAD. MDR was applied to obtain the best genetic predictor model for CAD by using the 12 most significant variants.
Results: In the one-gene model, the MDR projected the TCF21 gene polymorphism as the most significant genetic risk factor for CAD. The model with two genes demonstrated synergistic interaction between the TCF21 and APOE variants. The genetic bivariate model of TCF21 and APOE was the best predictive model with an OR of 1.48 (95%CI: 1.28-1.70; p < 0.0001) and with good cross-validation (10/10), with no evidence of overfitting model. The accuracy of the best G-G predictor model of CAD was 0.55. A reasonable sensitivity (60%) and specificity (50%) were obtained from this model.
Conclusions: In our population, the interaction between the genetic variants TCF21 (cell axis) and APOE (lipid axis) showed a consistent CAD association and could be a new marker for CAD prediction. An in-depth investigation of this interaction may lead to the identification of new persons with low conventional but high genetic risk for CAD, as well as to create new therapeutic targets in these patients.

CO 141. METFORMIN IMPROVES DIASTOLIC DYSFUNCTION OF NON-DIABETIC PATIENTS WITH METABOLIC SYNDROME: THE MET-DIME RANDOMIZED TRIAL

Diogo Santos Ferreira[1], Ricardo Ladeiras-Lopes[1], Francisco Sampaio[1], Sara Leite[2], Eduardo Vilela[1], Adelino Leite-Moreira[3], Nuno Bettencourt[4], Vasco Gama[1], Pedro Braga[1], Ricardo Fontes-Carvalho[1]

[1]Centro Hospitalar de Vila Nova de Gaia/Espinho. [2]USF Anta. [3]Faculdade de Medicina da Universidade do Porto. [4].

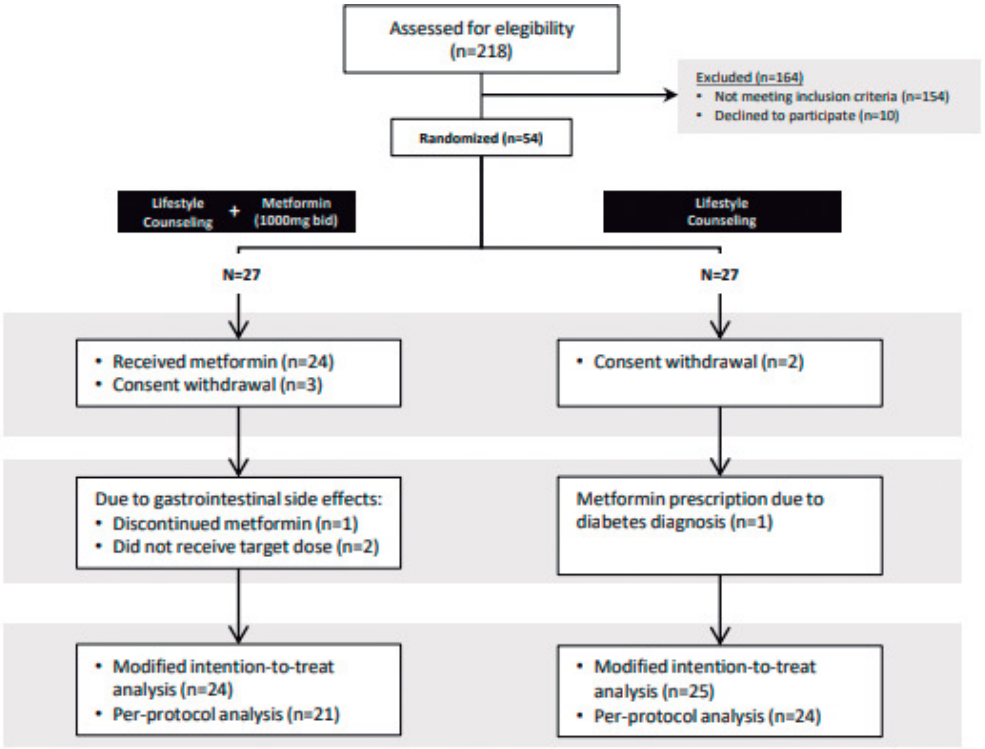
Introduction: Metabolic syndrome (MetS) is a cluster of cardiovascular risk factors, including abdominal obesity, dyslipidaemia, arterial hypertension and abnormal glucose homeostasis, which occur together more frequently than by chance. Diastolic dysfunction (DD) is one of the most frequent manifestations of subclinical cardiac involvement of MetS, ultimately leading to heart failure with preserved ejection fraction. Metformin's new potential therapeutic actions include prevention of cardiac remodeling and fibrosis, and thus we aimed to evaluate if it improves diastolic function (DF) in non-diabetic patients with MetS.
Methods: A prospective, randomized, open-label, blinded-endpoint trial was conducted over 24 months. Fifty-four non-diabetic adults with MetS and DD (defined as mean e'< 10.2cm/s or < 7.2 cm/s for individuals 40-59 and 60-65 years old, respectively) were randomized to lifestyle counseling (control arm) or lifestyle counseling plus metformin (intervention arm) on a target dose of 1,000 mg bid (Figure). The primary endpoint was the change in mean e' velocity, assessed at 6, 12 and 24 months. Secondary endpoints included improvements in insulin resistance (HOMA-IR), functional capacity (peak oxygen uptake – VO_2) and QoL (SF-36 score). Linear mixed effects modelling was used for longitudinal data analysis based on modified intention-to-treat (mITT) and per-protocol (PP) approaches.
Results: Forty-nine patients (mean age = 51.8 ± 6.4; 55% males) were included in the mITT analysis. Metformin use, on top of lifestyle counseling, led to an increase in mean e' velocity during follow-up (Figure), with results at 24 months of +0.67 ± 1.90 cm/s (vs. -0.33 ± 1.50 cm/s in the control group, p = 0.056), which reached statistical significance in PP analysis (+0.80 ± 1.99 cm/s vs. -0.37 ± 1.52 cm/s, p = 0.039). In a random intercept linear mixed model adjusting for age, gender, treatment with drugs targeting the renin-angiotensin-aldosterone axis, presence of heart failure and baseline degree of DD, both mITT and PP analysis showed a statistically significant improvement of

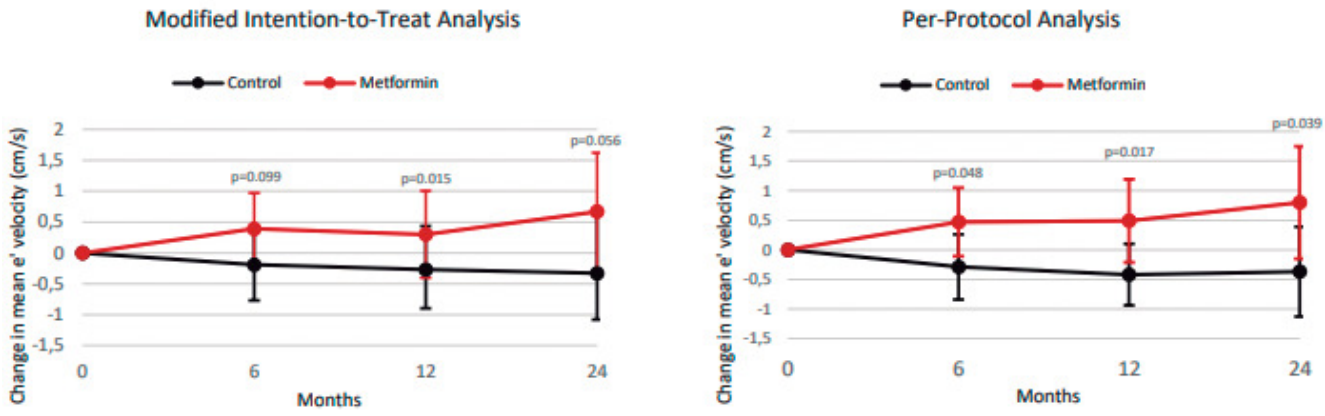


Models	Training accuracy	Testing accuracy	Cross validation consistency	P value	Odds ratio (95% CI)
TCF21	0.53	0.52	9/10	0.001	1.260 (1.094 – 1.452)
TCF21; APOE	**0.55**	**0.55**	**10/10**	**<0.0001**	**1.477 (1.282 – 1.702)**
TCF21; CDKN2B; APOE	0.56	0.54	5/10	<0.0001	1.577 (1.369 – 1.817)

Best interaction models through Multifactor dimensionality reduction (MDR). CI – Confidence interval; Statistically significant for p<0.05.

CO 143 Figure





CO 141 Figure

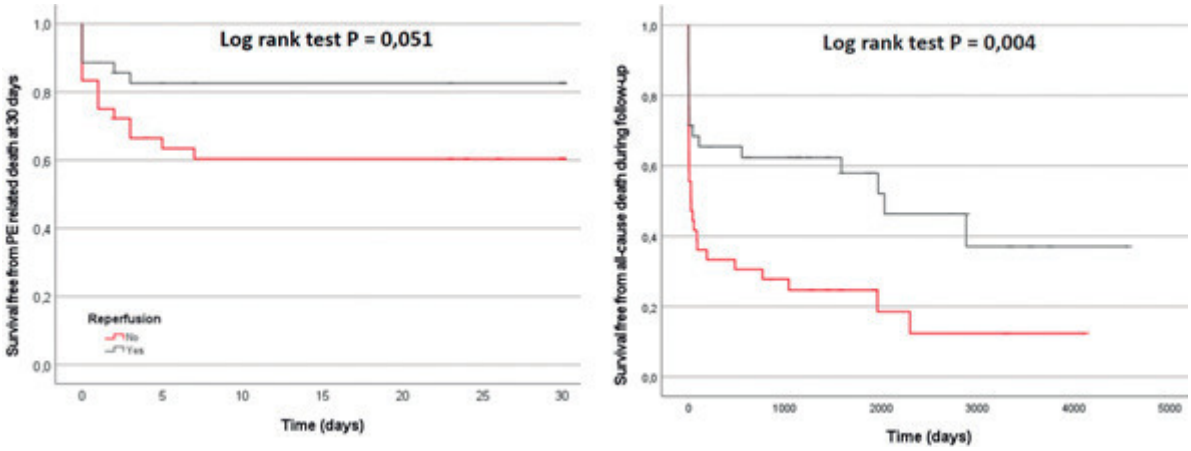
DF with metformin over time (β-coefficient = 0.28, standard error (SE) = 0.13, p = 0.034, and β-coefficient = 0.35, SE = 0.14, p = 0.011, respectively). This effect was independent of the observed reduction in insulin resistance. There were no differences regarding peak VO_2 nor SF-36 score.
Conclusions: Treatment with metformin of non-diabetic MetS patients with DD, on top of lifestyle counseling, was associated with improved diastolic function.

CO 142. HIGH-RISK ACUTE PULMONARY EMBOLISM IN A PORTUGUESE CENTRE: ARE WE DOING ENOUGH?

Mariana Martinho, Rita Calé, Sofia Alegria, Filipa Ferreira, Maria José Loureiro, Tiago Judas, Melanie Ferreira, Ana Oliveira Gomes, Francisca Delerue, Hélder Pereira

Hospital Garcia de Orta, EPE.

Introduction: For high-risk acute Pulmonary Embolism patients (HR-PE pts), reperfusion treatment is imperative to improve mortality. Although systemic thrombolysis (ST) is generally an appropriate first-line therapy, several population-based studies report its underuse. Data on epidemiology, management and outcomes of HR-PE in Portugal is scarce.
Objectives: Estimate the reperfusion rate in HR-PE pts, the reasons for non-reperfusion (NR) and how it influences outcomes.
Methods: Retrospective single-centre registry of consecutive HR-PE pts between 2008-2018, defined by the 2019 ESC guidelines criteria. Independent predictors for NR were assessed by multivariate logistic regression. The cumulative incidence of PE-related mortality at 30 days was calculated according to the Kaplan-Meier method and differences stratified by reperfusion were assessed using the log-rank test.
Results: Of a total of 1,955 pts admitted with acute PE, 74 (3.8%) had HD instability at admission (mean age 68 ± 15 years). The majority of pts (68.5%) came from the emergency department while the remaining 31.5% were already hospitalized for other reasons. The total reperfusion rate



CO 142 Figure

was 50% - 35 pts were submitted to systemic thrombolysis, 1pt to first-line percutaneous embolectomy and 1pt to rescue endovascular treatment. Age was an independent predictor of NR (63 ± 17 vs 73 ± 12, p = 0.02) with > 75 years representing 15 times the risk of non-treatment (OR 15.5, 95%CI 3.23-74.25, p < 0.001). Absolute contraindication for thrombolysis was present in 29.7% (22 pts), with recent major surgery (13 pts) and recent cerebral event (8pts) as the most common reasons. The presence of an absolute contraindication for systemic thrombolysis was also an independent predictor of NR (66.7% vs 13.6%; OR 13.3, 95%CI 2.51-70.65, p = 0.002). Being hospitalized was associated with the presence of absolute contraindications for thrombolysis (68.2% vs 14.0%, p < 0.001) and was also an independent predictor of NR (38% vs 77.3%; OR 8.49, 95%CI 1.56-46.11, p = 0.013). PE-related death at 30 days was 28.4% (21pts), which was significantly lower in the reperfusion group (17.1% vs 38.9%, p = 0.042). At a mean follow-up of 2.5 ± 3.3 years, survival rate was 33.8% (Figure).
Conclusions: Low reperfusion rate due to contraindications for thrombolysis was associated with high PE-related mortality. This data suggests that it is necessary to implement interventional alternative strategies, at a national level, to improve outcomes.

CO 146. CORONARY COLLATERALS GRADING IN CHRONIC TOTAL OCCLUSIONS: IS IT ENOUGH TO PRESUME ISCHEMIA AND VIABILITY?

Gustavo M. Campos, Luís Leite, Rodolfo Silva, Andreia Gomes, Elisabete Jorge, Lino Gonçalves, Maria João Ferreira

Centro Hospitalar e Universitário de Coimbra.

Introduction: The establishment of well-developed collateral in Chronic Total Occlusions (CTO) was assumed to prevent ischemia, but some studies stated that in majority the collateral function during increased blood flow demand in viable myocardium is predominantly insufficient. Current guidelines recommend CTO revascularization in patients with symptoms and/or marked ischemic burden. PET-CT is able to detect both myocardial ischemia and viability with high accuracy.
Objectives: To analyze the association between the presence of ischemia and viable myocardium as evaluated by 13N-NH3/FDG PET-CT and collateral development on coronary angiography.
Methods: Prospective, observational study including patients with a CTO who underwent 13N-NH3/FDG PET-CT between 2017 and 2020. Well developed (WD) collaterals were defined as a concomitant Rentrop grade 3 and Werner collateral connection score 2 or 3. A 17-segment LV model was used for interpretation of the PET study, and segments were graded for myocardial perfusion using a visual, semi-quantitative scale. The Summed Stress Score (SSS) and the Summed Rest Score (SRS) were obtained by adding the individual segment scores from the CTO vascular territory on the stress and rest perfusion studies; the Ischemia Score (Summed Difference Score - SDS) was calculated as the difference between SSS and SRS. The Viability Score was analyzed as the difference between SRS and the FDG score. The CTO territory was considered "viable" based on the established threshold of ≥ 50% FDG uptake compared with remote myocardium.
Results: We recruited 59 patients (median age 62 [57-71]), most frequent CTO arteries were the right coronary (44.1%) and the left descending artery (45.8%). Mean J-CTO Score was 1.4 ± 1.0. WD collaterals were present in 31 (52.5%) patients. WD collaterals were more prevalent in right coronary artery CTOs (67.8% vs. 21.4%, p < 0.001). No differences were found in the Ischemia and Viability scores (ischemia score in WD was 5.1 ± 3.3 vs. 5.3 ± 2.9 [p = 0.943] and viability score in WD was 2.2 ± 2.0 vs. 2.2 ± 2.1 [p = 0.883]). Poor-developed collateral CTO patients had numerically worse perfusion scores, but viability was present in 72.2%.
Conclusions: Angiographic evaluation of CTO collateral function seems to have a poor association with myocardial perfusion and metabolism, so it should not be used as an assumption of the ischemic burden and viability. Myocardial viability was present in the majority of patients with poorly developed collaterals.

CO 145. NOT A COLD SUCCESS - EFFICACY OF CRYOABLATION

Beatriz Silva, Tiago Rodrigues, Nelson Cunha, Pedro Silvério António, Sara Couto Pereira, Pedro Alves da Silva, Joana Brito, Catarina Oliveira, Beatriz Garcia, Margarida Martins, Afonso Ferreira, Nuno Cortez-Dias, Fausto J. Pinto, João de Sousa

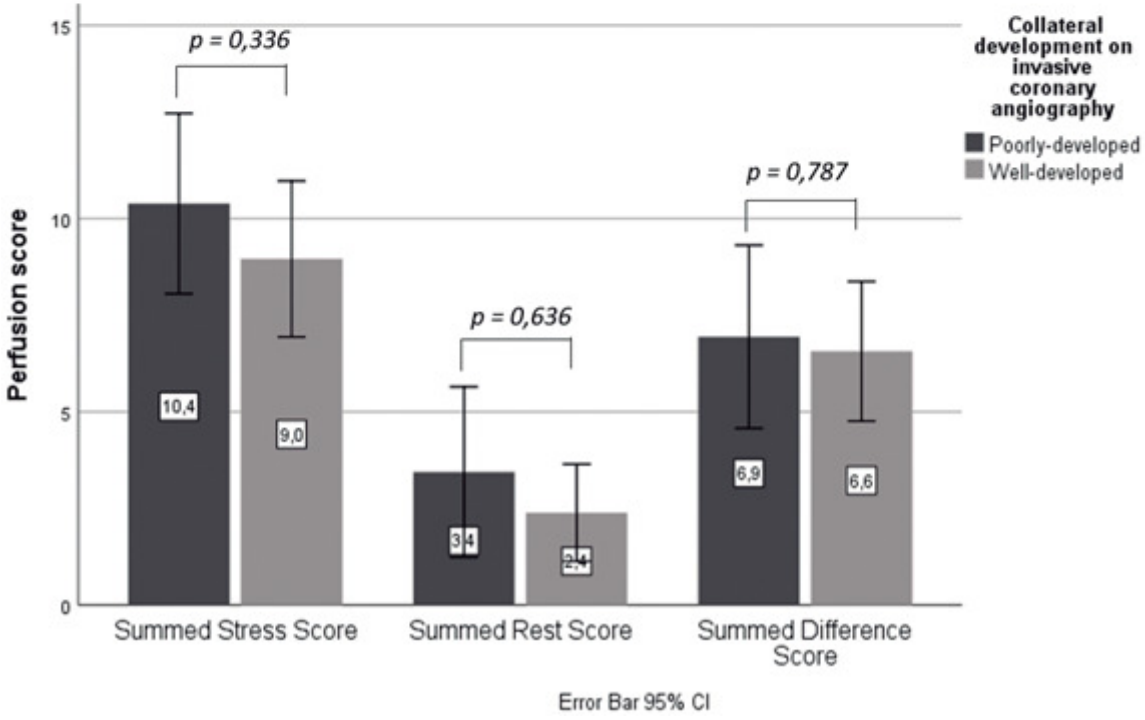
Centro Hospitalar de Lisboa Norte, EPE/Hospital de Santa Maria.

Introduction: Atrial fibrillation (AF) is the most common supraventricular arrhythmia with a considerable burden in healthcare. Evidence supporting rhythm control is growing and cryoablation has been gaining ground over traditional point-to-point (PtP) ablation procedures. Predictors of relapse after cryoablation are not completely established.
Objectives: To evaluate the efficacy of cryoablation and determine factors that might explain the risk of relapse.
Methods: Single centre prospective study evaluating AF patients (pts) refractory to antiarrhythmic therapy who performed the first AF ablation procedure. The ablation strategy consisted of pulmonary vein isolation (PVI), complemented with ablation of the cavo-tricuspid isthmus in patients with a history of concomitant flutter. Pts were monitored with Holter/7-day event loop recorders (3, 6, 12 months and annually up to 5 years). Success was assessed from the 90th day after ablation, with the absence of recurrences of any sustained atrial arrhythmias (> 30 sec). Cox regression and Kaplan-Meier survival were used to compare the success of ablation.
Results: We analyzed 232 pts submitted to cryoablation (68.1% male, 59.57 ± 12.39 years old) with a mean follow-up 927.9 ± 847.3 days. Hypertension was present in 65.9% pts, 15.5% had structural cardiomyopathy and 24.8% had a history of obstructive sleep apnea (OSA). Mean CHADsVAsc was 2 and mean left atrium indexed volume was 41.02 ± 2.67 mL^2. The success rate at one

Table 1. Baseline clinical and angiographic characteristics

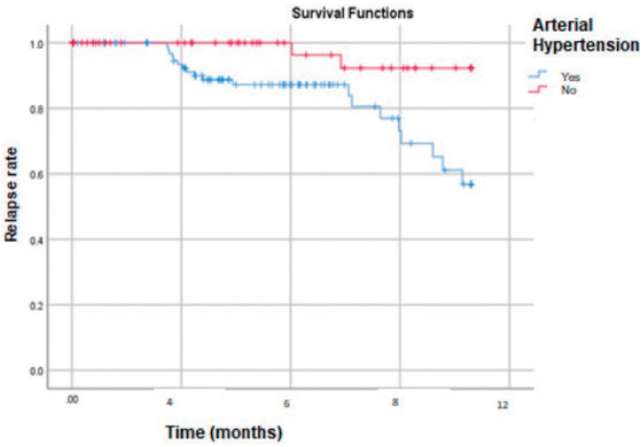
	All patients (n = 59)	Well-developed collaterals (n = 31)	Poorly-developed collaterals (n = 28)	p value
Age	62 [57-71]	60 [56-71]	63 [58-71]	0.654
Clinical characteristics				
Hypertension, medically treated	50 (84.7)	26 (83.9)	24 (85.7)	0.844
Dyslipidemia, medically treated	56 (94.9)	29 (93.5)	27 (96.4)	0.615
Diabetes mellitus. medically treated	28 (47.5)	15 (48.4)	13 (46.4)	0.880
Chronic Kidney disease	11 (18.6)	2 (6.5)	9 (32.1)	0.011
Smoking history				0.433
Current smoker	15 (25.4)	9 (29.0)	6 (21.4)	
Former smoker	21 (35.6)	13 (41.9)	8 (28.6)	
Previous myocardial infarction	26 (44.1)	15 (48.4)	11 (39.3)	0.482
Left Ventricular ejection fraction	46 [31-55]	46 [32-56]	45 [31-54]	0.833
Angiographic characteristics				
Multivessel disease	24 (40.7)	10 (32.3)	14 (77.8)	0.166
CTO vessel				
LAD	26 (44.0)	9 (29.0)	17 (60.7)	0.014
LCX	6 (10.2)	1 (3.2)	5 (17.9)	0.063
RCA	27 (45.8)	21 (67.8)	6 (21.4)	< 0.001
CTO characteristics				
Ostial occlusion	9 (15.3)	4 (12.9)	5 (17.9)	0.597
Intra-stent occlusion	12 (20.3)	5 (16.1)	7 (25)	0.398
Blunt entry	25 (42.4)	12 (38.7)	13 (46.4)	0.549
Calcification	25 (42.4)	13 (41.9)	12 (42.9)	0.943
Tortuosity	3 (5.1)	3 (9.7)	0	0.091
Length (> 20 mm)	28 (47.5)	15 (48.4)	13 (46.4)	0.880
J-CTO score	1.39 ± 1.1	1.42 ± 1.0	1.36 ± 1.1	0.746

Values are expressed as mean ± SD, median [IQ], or numbers (%)



CO 146 Figure

year and three years were 89.6% and 87.6%, respectively. Twenty-one patients had supraventricular arrhythmia relapse after one year and 25 after three years of follow-up. In those who underwent additional REDO procedures, the success rate rose to 95.5% and only 9 patients had relapsed after one year. After the procedure, 30.2% patients suspended anti-arrhythmic drugs, and it is noteworthy that it was not a factor contributing to relapse. In the general population, hypertension was linked to increased risk of relapse (p = 0.043), though other factors, such as diabetes, obesity or OSA, did not seem to increase the risk. A group sub-analysis to determine the risk of relapse showed that CHADsVASc score, age, sex and left atrium indexed volume were non-predictors of supraventricular arrhythmia relapse rate.



Conclusions: Our analysis showed that cryoablation is an effective procedure with very high rates of success after one and three years. Regarding the risk of relapse, hypertension was identified as increasing the risk, unlike other factors, supporting the importance of cardiovascular risk factors control after the procedure.

Sexta-feira, 30 Abril de 2021 | 14H45-16H00

Estúdio 1 SPC Lisboa | Prémio Machado Macedo/CO 15- Cardiac Surgery

CO 148. OFF-PUMP VERSUS ON-PUMP CORONARY ARTERY BYPASS GRAFTING IN MULTI-VESSEL CORONARY ARTERY DISEASE: A PROPENSITY SCORE-MATCHED ANALYSIS OF SAFETY AND LONG-TERM RESULTS

Rui J. Cerqueira[1], Francisca Saraiva[2], Ana F. Ferreira[2], Raquel Moreira[2], Mário J. Amorim[3], António S. Barros[2], Paulo Pinho[3], André P. Lourenço[3], Adelino Leite-Moreira[2]

[1]Centro Hospitalar de S. João, EPE. [2]Faculdade de Medicina da Universidade do Porto. [3]Centro Hospitalar Universitário de São João.

Introduction: The role and the indications for using off-pump coronary artery bypass surgery (OPCAB), instead of the traditional on-pump (ONCAB), is still to be addressed.
Objectives: To describe our centre experience and to compare 15-years survival and early safety outcomes between OPCAB and ONCAB.
Methods: Single-centre retrospective cohort including 9-years of isolated first CABG (2005-2013). Multi-vessel disease with at least 2 surgical grafts patients were considered and the first 50 surgeries of each surgeon with each technique were excluded to account for the learning curve effect. Emergent surgeries and on-pump beating heart procedures were also excluded. A propensity-score matching (PSM) analysis was performed to balance groups and both survival and early outcomes comparison was done within the matched cohort using Kaplan-Meier or Cox stratified and paired tests, respectively. The median follow-up was 9 years, maximum 15 years.
Results: From 3,012 multi-vessel patients with at least 2 surgical grafts, 2,503 were included at the main analysis: 1,487 ONCAB and 1016 OPCAB. ONCAB patients presented more frequently 3-vessels disease and left ventricular dysfunction, but received similar number of grafts than OPCAB, who in turn, received more frequently multiple arterial grafts. The surgical completeness of revascularization (CR) was similar, but hybrid procedures were more frequent in OPCAB raising CR rate in this group. After PSM (646 pairs), both groups were similar regarding pre and peri-operative characteristics. The long-term survival was similar (HR stratified by pair: 1.02 (0.81-1.30), but OPCAB evidenced benefits at early term results including bleeding, postoperative atrial fibrillation and stroke incidence.
Conclusions: At our centre, OPCAB performed by experienced surgeons provides rates of complete revascularization and long-term survival similar to ONCAB. In-hospital results favoured OPCAB.

CO 147. MULTIPLE VERSUS SINGLE ARTERIAL GRAFTING IN THE ELDERLY: A META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS AND PROPENSITY SCORE STUDIES

Rui J. Cerqueira[1], Francisca Saraiva[2], Raquel Moreira[2], Jennifer Mancio[3], António S. Barros[2], André P. Lourenço[4], Adelino Leite-Moreira[2]

[1]Centro Hospitalar de S. João, EPE. [2]Faculdade de Medicina da Universidade do Porto. [3]St Bartholomew's Hospital/Reino Unido. [4]Centro Hospitalar Universitário de São João.

Introduction: The benefit of total arterial revascularization versus the use of venous grafts in addition to an arterial conduit is still controversial in coronary artery bypass grafting (CABG) surgery, especially in high-risk subgroups due to lack of evidence, namely in the elderly.
Objectives: We conducted a meta-analysis of randomized controlled trials (RCTs), and propensity score (PS) studies comparing survival and early results of elderly patients who underwent coronary artery bypass grafting (CABG) with multiple (MAG) *versus* single arterial grafting (SAG).
Methods: MEDLINE, Web of Science, and Cochrane Library were used to find relevant literature (1960-April 2020). Survival at a follow-up ≥ 1 year and early outcomes were evaluated. Outcomes were collected through hazard ratio (HR) and their variance, frequencies from the matched sample, or adjusted odds ratios. Random effect models were used to compute combined statistical measures and 95% confidence intervals (CI) through generic inverse variance method (time-to-event) or Mantel-Haenszel method (binary events).
Results: Eleven PS cohorts and 2 RCTs comprising > 20,000 patients (> 6,800 MAG and > 13,200 SAG) were included in this meta-analysis. Overall, MAG was associated with lower long-term mortality (pooled HR: 0.80, 95%CI: 0.72-0.88, p < 0.01) at no expense of higher risk of early mortality (pooled OR: 0.81, 95%CI: 0.57-1.15, p = 0.24), but a propensity for MAG being associated with increased risk of sternal wound complications (SWC) was found (OR MAG BIMA: 1.42, 95%CI: 0.98-2.06, p = 0.07).
Conclusions: Advanced age should not limit MAG's use considering its long-term survival benefits, even within the elderly. However, the tendency for higher rates of SWC with MAG calls for a careful selection of patients to this challenging technique.

CO 150. A META-ANALYSIS OF RANDOMIZED CONTROLLED STUDIES COMPARING OFF-PUMP VS ON-PUMP CABG IN THE ELDERLY

Rui J. Machado, Francisca A. Saraiva, Patrícia Sousa, Rui J. Cerqueira, Jennifer Mancio, António S. Barros, André P. Lourenço, Adelino f. Leite-Moreira

Faculdade de Medicina da Universidade do Porto.

Introduction and objectives: Aging and the increasing demand for less invasive open heart surgical procedures have augmented interest in off-

pump CABG as an option in elderly patients. We performed a meta-analysis of randomized clinical trials (RCTs) to investigate the benefits of off-pump CABG (OPCAB) over on-pump CABG (ONCAB) in short and mid-term results among patients older than 60.
Methods: MEDLINE, ISI Web of Science and Cochrane Library were used to find relevant literature (1960-2020). RCTs of OPCAB vs ONCAB within elderly patients (or at least with an elderly subgroup analysis) and that reported mortality either early or during follow-up were included. Myocardial infarction, stroke, repeat revascularization and renal failure were also evaluated, if available. Time-to-event outcomes were collected through hazard ratio (HR) along with their variance and the early endpoints using frequencies or odds ratio (OR). Random effect models were used to compute statistical combined measures and 95% confidence intervals (CI).
Results: We included 9 RCTs, performing a total of 7.046 elderly patients: 3.528 OPCAB and 3.518 ONCAB, 51% being males. Five trials reported mortality during follow-up (6 months (2 studies) to 5.3 years). OPCAB did not impact follow-up mortality (pooled HR: 1.08, 95%CI: 0.86-1.34, p = 0.52). Regarding early results, OPCAB showed similar 30-days mortality (2.3% vs 2.6% in OPCAB vs ONCAB patients, respectively, 6 studies pooled OR: 0.89, 95%CI: 0.61-1.29, p = 0.53); early myocardial infarction (3.1% vs 3.0% in OPCAB vs ONCAB patients, respectively, 6 studies pooled OR: 0.99, 95%CI: 0.67-1.46, p = 0.95); and renal failure (2.6% vs 3.4% in OPCAB vs ONCAB, 5 studies pooled OR: 0.77, 95%CI: 0.53-1.11, p = 0.16). The early need for repeat revascularization was significantly higher in OPCAB (1.3% vs 0.4% in OPCAB vs ONCAB, 2 studies pooled OR: 2.58, 95%CI: 1.16-5.75, p = 0.02). Of note, OPCAB had a higher risk of incomplete revascularization (34% vs 29% in OPCAB vs ONCAB, respectively, pooled OR in both trials included in repeat revascularization result: 1.24, 95%CI: 1.06-1.45, p < 0.01). On the other side, OPCAB had a non-significant lower risk of early stroke (1.9% vs 2.7% in OPCAB vs ONCAB patients, respectively, 7 studies pooled OR: 0.72, 95%CI: 0.42-1.05, p = 0.09).
Conclusions: Pooling data from RCTs in elderly patients showed that OPCAB and ONCAB provide similar mid-term results. Concerning early outcomes, OPCAB was associated with a higher risk of early repeat revascularization. Further studies with larger elderly samples are needed to establish the better surgical strategy for these patients.

CO 151. HEART SURGERY WAITING LIST MANAGEMENT IN AN ULTRA-PERIPHERAL REGION – EXPERIENCE OF A CENTER IN PORTUGAL

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Introduction: Heart surgery is becoming increasingly necessary and the geographic distance from large surgery centers may raise difficulties and limitations to patient referral.
Objectives: To characterize a cohort of patients with indication for heart surgery. To assess referral motives and waiting times for these patients, regarding surgery priority, in an ultra-peripheral region in Portugal.
Methods: Retrospective analysis of 420 patients waiting for heart surgery between January 2016 and September 2020. Criteria for surgery priority selection were based on the official recommendations from Sociedade Portuguesa de Cirurgia Cardio-Torácica e Vascular and Sociedade Portuguesa de Cardiologia.
Results: Out of 420 patients waiting for heart surgery, mean age was 64.8 ± 10.7 years and 74.3% were male. According to body mass index assessment 37.3% of patients were overweight and 39.1% were obese (degrees 1.2 or 3) and this was a determinant parameter for acceptance by some surgery centers. Most patients (48.3%) were referred and accepted in a surgery center of Portugal's Southern region and about a third (33.8%) in the Center region. Regarding clinical condition, 49.0% of patients had coronary heart disease requiring Coronary Artery Bypass Grafting (CABG), 44.7% had aortic and/or mitral valvular disease, 1.0% acute aortic syndrome or ascending aorta aneurism, 1.9% infective endocarditis and the remaining 3.4% had other indications for heart surgery. High priority patients (10.2%) that awaited hospital transference had a mean waiting time of 14.81 ± 9.86 days, most (79.0%) requiring CABG. Patients considered prioritary or elective presented a mean waiting time of 195.7 ± 127.1 days and the three main motives for referral were CABG (41.0%), followed by aortic valve surgery (35.7%) and mitral valve surgery (7.38%). Waiting list mortality was 2.1%.
Conclusions: Due to geographic location particularities, the absence of Heart Surgery in the Region and the inexistence of an established protocol of referral for these patients, heart surgery waiting list management becomes of major importance.

CO 149. PHYSIOLOGIC OR ANGIOGRAPHY GUIDED CORONARY ARTERY BYPASS GRAFTING: A META-ANALYSIS

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Introduction: While invasive coronary angiography is considered the *gold standard* for the diagnosis of coronary artery disease (CAD) involving the epicardial coronary vessels, coronary physiology-guided revascularization represents contemporary *gold-standard* practice for the invasive management of patients with intermediate CAD. Nevertheless, the long-term results of assessing the severity of stenosis through physiology compared to the angiogram as the guide to bypass surgery (CABG) are still uncertain. This meta-analysis aims to assess the clinical outcomes of a physiology guided CABG compared to angiography-guided CABG.
Objectives: We sought to determine if outcomes differ between a physiology guided CABG compared to angiography-guided CABG.
Methods: We searched Medline, EMBASE, and the Cochrane Library. The last date for this search was June 2020, and all preceding studies were included in the search. We conducted a pooled risk-ratio meta-analysis for 4 main outcomes: all cause death, myocardial infarction (MI), target vessel revascularization (TVR) and major adverse cardiovascular events (MACE). p-value < 0.05 was considered statistically significant. Heterogeneity was assessed with Cochran's Q score and quantified by I2 index.
Results: We identified 5 studies that included a total of 1114 patients. A pooled meta-analysis showed no significant difference between a physiologic guided strategy and an angiography guided strategy in MI (risk ratio [RR] = 0.72; 95%CI, 0.39-1.33; I2 = 0%; p = 0.65), TVR (RR = 1.25; 95%CI = 0.73-2.13; I2 = 0%; p = 0.52), or MACE (RR = 0.81; 95%CI = 0.62-1.07; I2 = 0%; p = 1). Physiologic guided strategy has 0.63 times the risk of all cause death compared to angiography guided strategy (RR = 0.63; 95%CI = 0.42-0.96; I2 = 0%; p = 0.55).
Conclusions: This meta-analysis demonstrates a reduction in all cause death when a physiologic guided CABG strategy was used. Nevertheless, the short follow-up, small sample size of the included studies and the non-discrimination of the causes of death can largely justify these conclusions. Studies with an extended follow-up observation are needed to more robustly draw definitive conclusions.

CO 152. IMPACTO AMBIENTAL DA SUBSTITUIÇÃO CIRÚRGICA DA VÁLVULA AÓRTICA

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Introdução: A necessidade da prestação de cuidados de saúde provoca um impacto ambiental muito significativo. Estima-se que cerca de 5% dos gases de estufa do nosso País sejam devidos a estes cuidados (Health Care Without Harm, 2019).
Métodos: Avaliámos o impacto ambiental provocado pela cirurgia de substituição da válvula aórtica em cinco intervenções cirúrgicas de

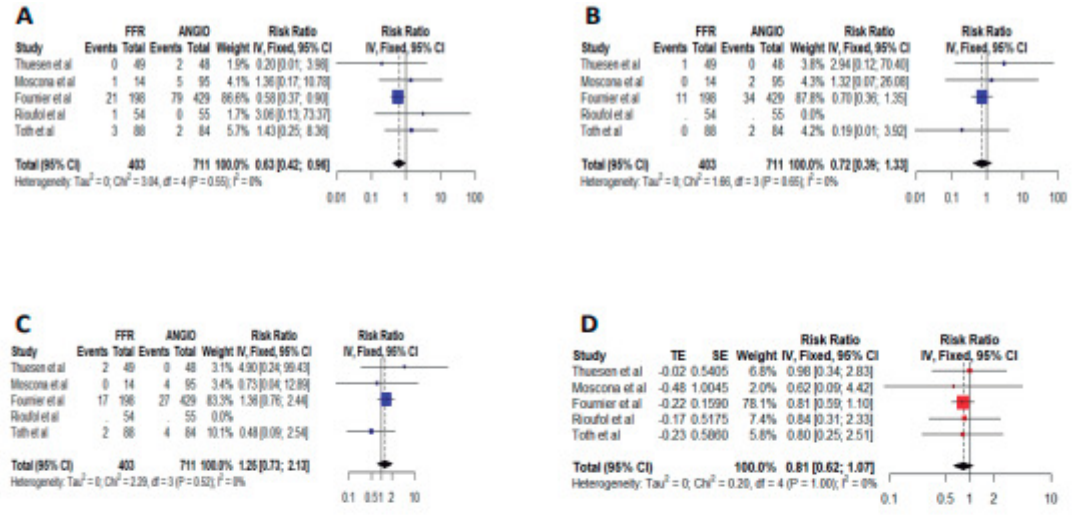

Figure 1. Forest plot of the pooled risk ratio for the outcomes: (A) all cause death; (B) MI; (C) TVR; (D) MACE. The sizes of data markers indicate the weight of the study.

CI: confidence interval; MI: myocardial infarction; TVR: target vessel revascularization

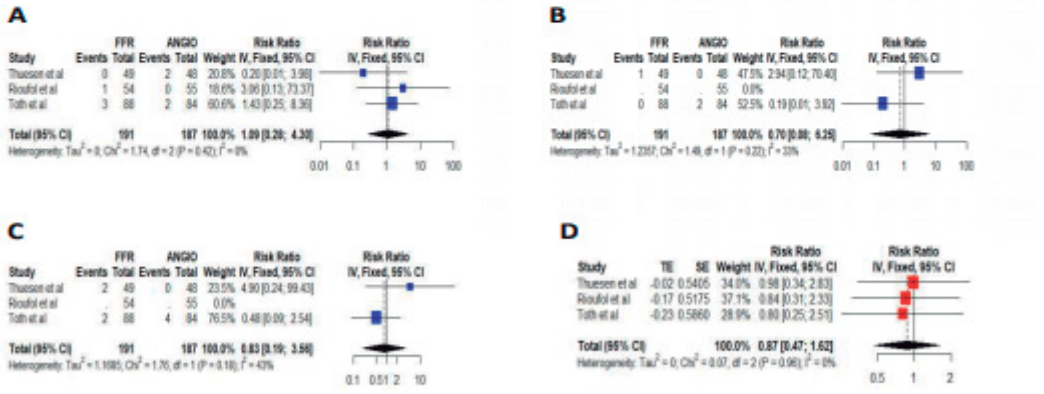

Figure 2. Forest plot of the pooled risk ratio for the outcomes when only RCT's were included: (A) all cause death; (B) MI; (C) TVR; (D) MACE. The sizes of data markers indicate the weight of the study.

CI: confidence interval; MI: myocardial infarction; TVR: target vessel revascularization

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substituição isolada da válvula aórtica. Fazemos esta avaliação através dum registo *bottom-up* de todos os consumíveis utilizados bem como dos gastos energéticos da iluminação, equipamentos anestésicos e de cirurgia, e dos consumos AVAC (aquecimento, ventilação, ar condicionado) A energia consumida foi convertida em equivalentes de emissão atmosférica de CO_2 (fator de conversão 0.144 kg.CO_2/kWh para eletricidade, Despacho no.15793-D/2013). Os consumiveis geraram desperdícios que foram pesados seletivamente, segundo a codificação oficial.

Resultados: A média dos consumos energéticos foi de 11,55 kWh na iluminação, de 19,18 kWh nos equipamentos anestésicos, de 49,39 kWh nos equipamentos cirúrgicos e de 33,80 kWh nos equipamentos AVAC. Estes consumos geraram emissões atmosférica de 5,8/4,5/3,8/4,3/8,3 kg CO2, respetivamente, sendo a média de 5,3 kg. Todos os outros consumíveis geraram lixos. O total dos resíduos foi em média de 25 kg por cirurgia, sendo 1,9 kg tipo I e II (resíduos urbanos), 2,4 kg tipo I e II (plástico), 19,5 kg tipo III (resíduos contaminados), e 1,3 Kg tipo IV (resíduos perigosos) Os resíduos tipo III, representaram 78% do total dos desperdícios. Estes resíduos requerem tratamento específico, incineração, e a sua remoção tem um custo significativo.

Conclusões: A cirurgia da válvula aórtica tem um impacto ambiental significativo, quer na emissão atmosférica de CO_2, quer na quantidade de lixos que provoca. Estes dados devem ser avaliados por cada equipa para reduzir de forma significativa, o seu impacto ambiental, quer na redução do consumo energético, quer na diminuição da quantidade dos desperdícios. As medidas que forem tomadas nunca devem comprometer a qualidade dos procedimentos sabendo que as melhorias induzem tambem poupança financeira significativa.