quences and detection of late gadolinium enhancement (LGE) which was used as a marker of early myocardial involvement.

Results: Six (14%) patients had LGE, mainly involving apical, mid-basal inter-ventricular and basal segments. The presence of LGE was significantly higher in the group who had electrocardiographic abnormalities (29% vs. 4%, p < 0.05). Of these 6 patients, 3 had regional wall motion abnormalities (2 with isolated apical dyskinesis and 1 with lateral hypokinesis). Only one patient showed oedema on STIR sequences suggestive of active inflammatory activity. With CMR as the method of reference, the ECG had a sensitivity of 83% and a negative predictive value of 96% to detect CCM.

Conclusion: ECG proves to be a useful, inexpensive and globally available tool for the screening of CCM in asymptomatic patients but with proven myocardial involvement in the CRM.

P119 | BEDSIDE
Predictors of outcome in takotsubo cardiomyopathy. A multicenter study
N. Marques1, O. Azvedo1, I. Cruz2, B. Picarica3, R. Lima3, J. Amado1, V. Pereira1, L. Lopes4,1, Faro Hospital E.P.E., Faro, Portugal; 2Alto Ave Hospital Center, EPE, Guimaraes, Portugal; 3Hospital Garcia de Orta, Department of Cardiology, Almada, Portugal; 4Hospital Espírito Santo, Évora, Portugal; 5Hospital de Santa Luzia Viana do Castelo, Viana do Castelo, Portugal

Introduction: Takotsubo cardiomyopathy (TC) is characterized by a transient left ventricular (LV) dysfunction. The predictors of prognosis in TC are not yet fully established.

Purpose: To identify predictors of outcome in patients (P) diagnosed with TC.

Methods: A multicenter study involving 5 hospital centers that included all patients diagnosed with TC in the last 10 years. We assessed demographic data, precipitating factors and clinical presentation, trying to establish the predictors of in-hospital and post-discharge outcomes.

Results: We included 67 P diagnosed with TC. During hospitalization (5.9±4.2 days) the following complications occurred: heart failure (29.9%), cardiogenic shock (14.9%), atrial fibrillation (9%), complete atrioventricular block (4.5%), acute pulmonary edema (3%), stroke/TIA (3%), LV thrombus (1.5%) and death (1.5%). The following variables were identified as predictors of in-hospital complications: (i) LV dysfunction complete atrioventricular block were angiographic predictors (p=0.047), syncope at presentation (p=0.043) and ST segment elevation on the admission EKG was identified as a predictor of acute pulmonary edema (p=0.011); (ii) LV dysfunction was an independent predictor of heart failure (p=0.011) and stroke/TIA (p=0.049); (iv) Male gender was an independent predictor of stroke/TIA (p=0.048) and death (p=0.002); (v) Other predictors of death were diabetes mellitus (p=0.024) and chronic renal failure (p=0.025).

Over a follow-up of 32±28 months, the following events occurred: TC recurrence (4.5%), stroke/TIA (4.5%) and death (1.5%).

The following variables were identified as predictors of complications during follow-up: (i) ST segment depression on admission EKG was a predictor of TC recurrence (p=0.016); (ii) Predictors of stroke/TIA were chronic renal failure (p=0.016) and absence of ST depression on admission EKG (p=0.016); (iii) Chronic renal failure was a predictor of death (p=0.009).

Conclusion: TC has a high rate of complications in the acute phase, but a low rate of complications during follow-up. TC, mainly a disease of females, carries a worse in-hospital prognosis in males. Male gender is a predictor of in-hospital stroke/TIA and death. Diabetes and chronic renal failure were also predictors of in-hospital death and chronic renal failure continues to be the risk factor of death and a predictor of stroke during follow-up. The admission EKG may have a prognostic role in-hospital death and chronic renal failure continues to be a predictor of death and stroke/TIA and death. Diabetes and chronic renal failure were also predictors of death and stroke/TIA and death. The admission EKG may have a prognostic role.

P1201 | BENCH
Follow-up of patients with genotype-positive-phenotype negative hypertrophic cardiomyopathy
P.A. Vriesendorp1, A.F.L. Schnik1, M.A. Van Slegtenhorst2, M.W. Wessels2, F.J. Ten Cate1, M. Michels1, 1Erasmus Medical Center, Thoraxcenter, Department of Cardiology, Rotterdam, Netherlands; 2Erasmus Medical Center, Department of Clinical Genetics, Rotterdam, Netherlands

Purpose: The purpose of this study was to assess the natural course of patients with genotype-positive, left ventricular hypertrophy negative (Gv/LVH) hypertrophic cardiomyopathy (HCM).

Methods: From 2006-2013, 12 patients without LVH (maximal wall thickness ≤ 15 mm) from a cohort of 327 HCM mutation carriers were identified through routine screening. In this group, 70 of Gv/LVH- patients (age 40±12 years, 55% women) had > 1 echocardiographic evaluation and were included in the study. Fifty-seven (81%) patients had mutations in cardiac myosin binding protein (MYBPC3). Structural characteristics, systolic function and diastolic function were assessed by 2D-echocardiography. Eight patients with diastolic dysfunction at baseline were excluded from further analysis.

Results: During 4±1.2 years (range 1.3-7.5 years) of follow-up, none of the patients developed LVH ≥ 15 mm and no cardiac events occurred. Twelve (19%) patients developed diastolic dysfunction at follow-up. In these patients left ventricular (LV) wall thickness, LV mass and left atrial (LA) volume were increased compared to patients without diastolic dysfunction (TABLE 1). Only in patients with diastolic dysfunction did wall thickness increase during follow up (> 1 mm vs. 0 mm, p = 0.049).

| Table 1 |
|----------------------------------|------------------|---------|
| Diastolic dysfunction            | No (n=50)        | Yes (n=12) |
| Ventricular septum (mm)          | 10±2             | 12±2     |
| LV posterior wall (mm)           | 9±2              | 10±2     |
| LV Mass (g)                      | 45±14            | 58±19    |
| Normalized LA volume (mm³/m²)    | 23±7             | 30±10    |
| MV flow rate (E) (m/s)           | 0.73±0.15        | 0.74±0.20 |
| MV flow rate (A) (m/s)           | 0.55±0.12        | 0.67±0.13 |
| E/I ratio                        | 1.53±0.36        | 2.02±0.52 |
| TDI E' septal (cm/s)             | 6.9±2.5          | 7.4±1.4  |
| E' septal (cm/s)                 | 5.0±2.2          | 10.0±5.4 |

LA, left atrial; LV, left ventricular; MV, mitral valve; TDI, tissue Doppler Imaging.

Conclusion: During 4 years of follow-up, Gv/LVH- patients had no progression of HCM. In patients who developed diastolic dysfunction there was a significant increase of LV wall thickness, LA volume and LV mass.

P1202 | BENCH
Iron overload does not potentiate doxorubicin induced cardiotoxicity in vivo in mice and in vitro in cardiomyocytes cell cultures
C. Guenancia1, N. Li1, E. Riga1, A. Habbout1, Y. Cotting1, L. Rochette1, C. Vergely1, 1University of Burgundy, Faculty of Medicine, LPPCE (IFR100), Dijon, France; 2University Hospital Center, Department of Cardiology, Dijon, France

Background: Doxorubicin (DOX), an anticancer anthracycline, is known to induce serious cardiotoxicity, which is believed to be mediated by oxidative stress and complex interactions with iron. However, the relations between iron metabolism and doxorubicin-induced cardiotoxicity remain a matter of controversy.

Methods: Firstly, we used an in vivo murine model of iron overloadation (IO) where male C57BL/6 mice received during 3 weeks (D0-D20) a daily dextran-iron injection. After 21 days (D21) a single dose of 6 mg/kg DOX. We evaluated cardiac function with echocardiography, myocardial gene expression, nitric-oxidative stress levels and iron status.

Secondly, the anti-proliferative activity of DOX, in combination with doxaran, was evaluated in vitro in cultures of cancerous cells (EMT6) or cardiomyocytes (H9c2).

Results: At D30, there was a significant decrease in left-ventricular ejection fraction (LVEF) in all groups of DOX-treated mice. In IO mice treated by DOX, the LVEF fall was not majored and there was no increase in atrial natriuretic peptide mRNA cardiac gene-expression. IO alone resulted in cardiac hypertrophy and up-regulation of b-myosin heavy-chain expression. In myocardial tissue, electron
spin resonance spectroscopy revealed an increase in nitro-oxidative stress in IO groups. While 1 μM of DOX induced a significant reduction of EMT-6 or H9c2 cells proliferation, dexametharon (125-1000 μg/mL) alone did not modify cell viability and did not impair DOX cytotoxicity. 

**Conclusions:** IO did not result in a significant increase in DOX cardiotoxicity neither in mice, nor in cardiomyocytes, and did not impair DOX capacity to inhibit cancerous cells proliferation.

### P1203 | SPOTLIGHT 2013

**Upregulation of neuropeptide Y in the cardiac sympathetic nerves causes stress (takotsubo) cardiomyopathy**

T. Ari, K. Kimura, H. Kanazawa, M. Munakata, H. Sukegawa, R. Tabei, M. Ieda, S. Yusa, K. Fukuda. Keio University School of Medicine, Cardiopulmonary Division, Tokyo, Japan

**Background:** Abrupt conditional changes can interfere with the harmony between the brain and the heart, thereby following impaired cardiovascular function. Stress cardiomyopathy (SC) is a typical sample. SC is a disorder associated with transient left ventricular apical ballooning that is induced by stress. The precise molecular mechanisms of SC remain unclear.

**Methods and results:** (1) We analyzed a new animal model of SC in rodents inducing by epilepsy, we demonstrated hypothermic activation due to CoCl2 causes LV dysfunction like SC. (2) Upstream sympathetic activation induces strong upregulation of neuropeptide Y (NPY) expression in the left stellate ganglion (LSG) and LV sympathetic nerves. (3) NPY reduced the frequency of Ca2+ sparks when co-injected with noradrenaline in the ventricular myocytes of adult rat. (4) We demonstrated that NPY reduced the contraction of ventricular myocytes of neonatal rat when co-incubated with noradrenaline by using phase-contrast microscopy. (5) NPY injection into the LSG induces SC-like LV wall motion. (6) The incidence of SC was less frequent in NPY−/− mice than in NPY+/+ mice.

**Conclusions:** Our results demonstrate how brain activation translates into molecular signals in the cardiac nervous system and leads to LV apical ballooning.

### P1204 | BEDSIDE

**Frequent electrocardiographic abnormalities and associated conditions in Chagas disease patients**

M.S. Marcellino, T.G.P. Assis, E.V. Santos, D.M.F. Palhares, L.R. Ferreia, A.L. Ribiero. Medical School, Universidade Federal de Minas Gerais, Belo Horizonte, Brazil

**Purpose:** Chagas disease (CHD) is endemic in Latin American countries, but has become a worldwide problem due to migration of infected individuals to developed countries, mostly in Europe and North America. Electrocardiography has been considered an essential exam to evaluate CHD patients. The objective of this study was to identify prevalent abnormalities in the electrocardiogram (ECG) and common associated conditions in patients with CHD.

**Methods:** In this observational and retrospective study, all 12-lead standard digital electrocardiograms (ECGs) analyzed by cardiologists of a public telemedicine service in Brazil, from January to December 2011 were assessed. This service attends primary care of 658 cities in Minas Gerais province. ECGs were sent by remote professionals through internet to be analyzed by cardiologists who are trained and experienced in the analysis and interpretation of ECG. The prevalence of ECG abnormalities in patients who declared to have CHD was assessed.

**Results:** During the study period, 264,324 patients were evaluated; 7900 were CHD patients (mean age 57.0±13.7 years, 64.1% women). Hypertension was the most frequent comorbidity, present in 61.3% of the CHD patients, followed by diabetes (9.1%) and dyslipidemia (6.9%). Family history of coronary disease was reported by 32.6% of the patients, and 10.7% referred smoking. Only 30.1% of the patients had normal ECGs. Regarding the rhythm, 86.9% of them had a normal sinus rhythm, 5.3% atrial fibrillation or flutter, 5.4% ventricular premature beats, 2.5% supraventricular premature beats and 3.5% were pacemaker users. Right bundle branch block (RBBB) was observed in 22.7% of the ECGs, left bundle branch block in 3.1% and left anterior hemiblock (LAH) in 22.5%. The presence of first degree atrioventricular block was found in 4.9%, second and third degrees in 0.2% and complete atrioventricular block in 0.7% of patients. Hypertrophy in 3.6% and LV hypertrophy in 3.6% of patients, respectively.

**Conclusion:** In this large sample of primary care patients with CHD, there was a high prevalence of ECG abnormalities. As expected, the most common abnormalities were RBBB and LAH.

### P1206 | BEDSIDE

**Angiographic and clinical outcomes of paclitaxel coated balloon angioplasty versus uncoated balloon angioplasty in drug eluting stent restenosis: subgroup analysis from the PEPCAD-DES study**


**Background:** In PEPCAD-DES late loss as well as the need for repeat revascularization was significantly reduced with drug coated balloon (DCB) angioplasty compared with plain old balloon angioplasty (POBA) for drug eluting stent (DES) restenosis (clinical trials.gov NCT00984339). We now evaluated whether the use of DCB is different in paclitaxel DES restenosis or non-paclitaxel DES restenosis and in diabetics and non-diabetics.

**Methods and results:** 110 patients with a DES restenosis of either Sirolimus (SES), Everolimus- (EES) or Paclitaxel-eluting (PTX) stents in a native coronary artery with indication for percutaneous intervention were referred to a reference center. Parameters to analyze were: (1) NPY injection into the LSG induces SC-like LV wall motion. (2) Upstream sympathetic activation induces strong upregulation of NPY (NPY) expression in the left stellate ganglion (LSG) and LV sympathetic nerves. (3) NPY reduced the frequency of Ca2+ sparks when co-injected with noradrenaline in the ventricular myocytes of adult rat. (4) We demonstrated that NPY reduced the contraction of ventricular myocytes of neonatal rat when co-incubated with noradrenaline by using phase-contrast microscopy. (5) NPY injection into the LSG induces SC-like LV wall motion. (6) The incidence of SC was less frequent in NPY−/− mice than in NPY+/+ mice.

**Conclusions:** Our results demonstrate how brain activation translates into molecular signals in the cardiac nervous system and leads to LV apical ballooning.

## Advances in cardiomyopathies / Interventional cardiology

**INTERVENTIONAL CARDIOLOGY**

### P1207 | BEDSIDE

**SYNTAX score is associated with in-hospital mortality as assessed by GRACE risk score in patients with acute myocardial infarction**

A. Gudjoncik1, S. Richet1, A. Derrou1, J. Hamblin1, L. Mock2, P. Buffet1, P. Brunet1, D. Brunet2, M. Zeller1, Y. Cotin1 on behalf of Observatoire des Infarctus de Côte d’Or. 1University Hospital Center, Department of Cardiology, Dijon, France; 2Clinic Fontaine, Fontaine les Dijon, France

**Background:** Current guidelines for the management of patients with acute myocardial infarction (AMI) recommend the GRACE score for risk stratification with assessment of admission variables. The syntax score (SS) is a comprehensive angiographic scoring system that is derived entirely from the coronary anatomy and non-PES restenosis with 0.46±0.50mm vs. 1.56±1.10mm (p=0.002) and 0.31±0.45mm vs. 0.90±0.67mm (p<0.001), respectively. DCB as compared with POBA significantly reduced late loss in diabetics and non-diabetics, respectively. At angiographic 6 month follow-up late lumen loss (LLL) in patients treated with a DCB (n=22) was 0.51±0.72 mm in diabetics, and 0.39±0.54 mm in non-diabetics (n=42). In patients treated with POBA LLL was 1.45±0.85 mm in the diabetic subgroup and 0.91±0.71 mm in non-diabetics (n=24).

**Conclusions:** Paclitaxel coated balloon angioplasty was superior to POBA for treatment of DES and non-PES restenosis. DCB effect on late loss did not differ between type of DES. DCB effect on late loss was more effective in patients without diabetes.