Aim: To assess left ventricular systolic function and arterial stiffness in patients with moderate to severe OSA, before starting CPAP treatment, by comparison with control, normal, subjects (age-matched).

Methods: 60 patients were studied (54±11 years, 11 women): 30 patients with moderate-to-severe OSA (mean apnea-hypopnea index 33±23) without known cardiovascular disease or risk factors, and 30 control, normal, subjects. LV systolic function was assessed using standard (LVEF, tissue Doppler (mean basal systolic velocity, S, averaged for 6 segments and measured offline), and 2D speckle tracking echocardiography (LV global longitudinal strain, GLS); arterial function was assessed using intra-media thickness (IMT), "e-tracking" (Young elastic modulus, Ep; and augmentation index, Aix). We also determined Nt-proBNP as a biological marker of ventricular dysfunction.

Results: LVEF, tissue Doppler systolic velocities, and GLS were significantly lower in the OSA group (table), although mean values were still in the normal ranges. Similarly, arterial stiffness and Nt-proBNP values were significantly higher in the OSA group (table).

Conclusion: Patients with moderate-to-severe OSA have LV subclinical systolic dysfunction associated with increased arterial stiffness, suggesting that OSA is a disease associated with a high cardiovascular risk and, therefore, intensive preventive measures should be considered.

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Prognostic value of cardiac magnetic resonance imaging in patients with left ventricular noncompaction
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Purpose: Left ventricular noncompaction (LVNC) cardiomyopathy is usually diagnosed by echocardiography (ECHO) but cardiac magnetic resonance imaging (CMRI) has evolved as an alternative method. This study assessed the diagnostic and prognostic value of CMRI in adults with LVNC.

Methods: Twenty eight pts (18m, 10f, age 52±16) with ECHO diagnosis of LVNC underwent cine and contrast-enhanced CMRI with a 1.5 T scanner. LV volume, volume fraction, degree of mitral regurgitation, ratio of noncompacted to compacted myocardium (NC/C) and the presence and localization of late gadolinium enhancement (LGE) were determined. CMRI findings were correlated to clinical events, ECHO and angiography.

Results: Sixteen pts (57%) were in heart failure NYHA III or IV, 11 (39%) had episodes of acute pump failure, 7 patients had sustained VT, 6 pts died. LV end-diastolic volume (227±84) was shorter (42±16 vs 86±21, p<0.05). Of these 11 pts with death or sustained VT, 8 (72.7%) had LGE and noncompacted trabecular layer involvement (n=3), in the noncompacted trabecular layer (n=5) and within the papillary muscles (n=3). LGE was seen in all 3 areas in 1 and in 2 areas in 3 pts. All 3 pts with papillary muscle LGE also had trabecular LGE and high grade mitral regurgitation, and 1 of these pts died while awaiting HTx. Thrombus and stroke occurred mainly in pts with LGE (4/8 vs 2/21 pts, p=0.01). Three of 11 pts with LBBB and 3/6 pts with ventricular tachycardia exhibited LGE. A high NC/C ratio, however, was not associated with heart failure, thrombus and stroke, LBBB, VT or ejection fraction.

Conclusions: In LVNC, evaluation by CMRI and demonstration of LGE identifies these patients at high risk for clinical events. Extensive LGE may predispose to thrombosis formation and stroke, warranting anticoagulation. LGE within the papillary muscles is associated with high grade mitral regurgitation, aggravating heart failure in these patients.

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Real time three dimensional speckle tracking echocograpy for evaluation of fibrosis in ischemic and hypertrophic cardiomyopathy: comparison with late gadolinium enhancement MR
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Background: Myocardial scar detection has an increasing role in the monitoring of patients with cardiomyopathy. Late gadolinium enhancement cardiovascular magnetic resonance (LGE-CMR) is the actual gold standard but is not always available in daily practice. This study compares 3D Speckle Tracking Echocardiography to LGE-CMR as an alternative to quantify fibrosis in ischemic and hypertrophic cardiomyopathy.

Methods: This is a monocentric retrospective study. We enrolled 26 patients with hypertrophic cardiomyopathy (HCM) (13 men, mean age 56±17 years), 33 patients with ischemic cardiomyopathy (ICM) (27 men, mean age 63±13 years) and 23 healthy subjects (23 men, mean age 51±12 years). 3D left ventricular (LV) full volume echo was performed for all of the three groups. Global and regional peak strain values were obtained using commercially available software 4D-LV Analysis (TomTec Imaging System®). Patients from both ICM (n=25) and HCM (n=26) groups also underwent LGE-CMR. Segmentation and scar extent quantification was performed using a semiautomated software (Segment®).

Conclusion: Average time between Echocardiography and MRI was 83 days.

Results: Ejection Fraction (EF) was significantly lower in the ICM group (mean=31.2%) than in HCM (mean=55.1%) and healthy groups (mean=59.9%). Global Longitudinal Strain (GLS) was decreased in both patient groups compared to control (12.95±4.55 in ICM group p<0.0001, -6.47±3.38 in HCM group, p<0.0005). Systolic Dyssynchrony Index (SDI) was increased in the ICM group (5.56±1.97, p<0.0001) and in the HCM group (6.58±2.39, p=0.0052).

Twist and torsion were only reduced in the ICM group. (Twist = 6.12±3.85%, p<0.0001 and torsion (0.7±0.35%/cm, p=0.0003 for ICM group). Global strain values derived from 3D speckle tracking wasn’t well correlated with global scar extent. Regional Longitudinal and Circumferential peak strain’s accuracy to detect fibrosis was nearly good (AUC=0.78) for each parameter and for Radial peak strain wasn’t (AUC=0.165). Inter- and intra-observer agreement were good for EF (r=0.75, r=0.70) and for GLS (r=0.74, r=0.87) measurements and less good for twist, rotation and SDI.

Conclusion: 3D Longitudinal and Circumferential peak strain values are new interesting measurements for scar transmurality detection in ischemic and hypertrophic cardiomyopathy. Global indices such as EF, GLS, twist and torsion are less correlated to global scar mass.

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Prevalence and clinical significance of right ventricular involvement in patients with tako-tsubo cardiomyopathy
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Purpose: Tako-tsubo cardiomyopathy (TTC) is a transient form of acute heart failure. Besides ballooning of the left ventricle (LV), some patients develop wall-motion abnormalities of the right ventricle (RV).

This study assessed the prevalence, clinical significance and time course of RV involvement in patients with TTC by echocardiographic follow-up.

Methods: Over a 9-year period, we observed 76 TTC patients (69 f, 7 m, age 70±12). By echocardiography, 15 pts (20%) had RV involvement. Clinical parameters, ECG, echocardiographic and angiographic findings were compared in patients with and without RV involvement.

Results: RV wall motion abnormalities involved the apicodermal (n=9), mediodermal (n=4), anterolateral (n=1) and inferior (n=1) segments. Normalization of RV contraction always occurred before normalization of LV function (11±4 vs 33±27 days).

In patients with RV involvement, time from symptom onset to hospital admission was shorter (4±5 vs 9±8 hours, p=0.04). The ECG on admission showed a higher heart rate (100±22 vs 86±20 beats per minute, p=0.02), and more patients with RV involvement developed giant negative T waves during follow-up (6/15 vs 2/20, p=0.04). Other ECG parameters were not different in patients with or without RV involvement. Cardiac markers, angiographic ballooning pattern of the LV and end-diastolic LV pressure were comparable in both groups. LV ejection fraction, however, was significantly lower in patients with RV involvement (42±12 vs 53±13, p=0.001).

Overall, more patients with RV involvement developed complications during the acute clinical course (73% vs 36%, p=0.01). There was a higher frequency of ventricular tachycardia (27% vs 5%, p=0.03), acute mitral regurgitation (20% vs 5%, p=0.04) and LV thrombus and/or stroke (20% vs 5%) in patients with RV involvement, and time to complete normalisation of LV function was longer (32±27 vs 22±13 days, p=0.001).

Conclusion: As assessed by echocardiography, RV involvement occurs in 20% of patients with TTC and is associated with a significantly higher rate of complications. Since ventricular tachycardia and mitral regurgitation are frequently observed, prolonged monitoring and anticoagulation is advisable in these patients.
sis (Sarc). However, few data exist for the predictive role of BNP in mortality in this disease. Our aim was to investigate the predictive role of BNP on all-cause mortality and the possible correlations with other clinical and demographic parameters.

Methods: One hundred seventy four consecutive patients (mean age, 48.9±12.66 years; male/female, 66/108) with biopsy proven sarcoidosis were prospectively studied. Baseline evaluation upon BNP included conventional echocardiography, 24h ambulatory Holter monitoring with ability to calculate heart rate variability indices and cardiac MRI in case this was indicated. Pulmonary function tests including total lung capacity (TLC) and diffusing capacity for carbon monoxide (DLCO) at baseline were also performed.

Results: Average BNP level of all patients was 24.58±28.2 pg/dl. Baseline BNP was significantly correlated with age (p=0.0001, r=0.541), left atrium (p=0.0001, r=0.305), interventricular septum (p=0.0001, r=0.260), posterior wall (p=0.001, r=0.240), transmural A wave (p=0.003, r=0.228), systolic pressure of pulmonary artery (p=0.0001, r=0.382), Forced Expiratory Volume at 1 second (p=0.044, r=0.150), DLCO (p=0.012, r=0.190), the presence of premature ventricular beats (p=0.0001, r=0.281) and the 24-hour derived standard deviation of NN, an index of HRV (p=0.001, r=0.258). During a mean follow-up of 5±2 (range 1-101) months, 15 sarcoidosis patients (36.7%) died. Baseline BNP (69.0±48.58) of this group of patients was significantly elevated compared to the BNP levels (21.4±22.69) of those still alive (p=0.00001). BNP at a cutoff value of 28.35 pg/ml predicted all-cause mortality with a sensitivity of 85.8% and a specificity of 78.1% (area under the ROC curve, 0.857).

Conclusion: BNP can be used as an additive predictor of all-cause mortality in patients with sarcoidosis.

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Predictors of reversibility in constrictive pericarditis patients
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Background: Constrictive pericarditis is a debilitating disease and reversible constriction is a well-described phenomenon. However, factors which predict reversibility remain unknown. No study has shown factors that might predict reversibility and thus preclude these patients from pericardiectomy which has its own host of debilitating sequelae. In this study we sought to look into factors which predict constriction reversibility in CP patients.

Method: We evaluated 48 consecutive patients who developed CP following the first attack of pericarditis in year 2011. All patients were treated with NSAIDS, colchicine and steroids as first treatment. Demographics, etiology, laboratory, echocardiographic and outcome data were collected retrospectively using electronic medical record offline echocardiograms films.

Results: 27 patients had reversible constriction with medical therapy only and 19 patients underwent pericardiectomy who were identified as irreversible. Those who had surgery had normal inflammatory marker (ERG, 11.8±7 vs. 40.1±25, CRP 2.5±2 vs. 6.9±5, p<0.001), more septal bounce (17 vs. 7, p<0.001) and more dilated inferior vena cava (2.69±0.4 vs. 2.12±0.35, p<0.001) and less inspiratory collapse (3 vs. 20, p=0.001). Furthermore, patient who had surgery had thicker pericardium (0.5 vs. 4.6±0.5, p=0.28). Using tissue doppler, septal and lateral E’/E” were higher among those who had reversible disease (11.36±4.8 vs. 7.25±1.9 p=0.001 and 9.8±3.9 vs. 5.9±2.4, p=0.01), respectively. On multivariate analysis, septal bounce correlated with need for surgery (p=0.05). High ESR and high E/e’ lateral correlated with resolution (p=0.05).

Conclusion: In CP, pericardiectomy can be the ultimate treatment in advanced cases. In few cases CP can be reversible and respond to medical therapy only. In this study we identified septal bounce, increased pericardial thickness, and normal inflammatory markers as predictors for pericardiectomy, which represent less inflammation and more fibrosis as pathology of pericardial constriction. On the other hand, higher inflammatory markers, and mitral valve annular velocity, as predictors for reversibility and potential to response to medical therapy. Knowing the features that describe irreversible disease will be helpful in pursuing aggressive medical management for those who will benefit and avoiding unnecessary surgery.

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Allopurinol regresses left ventricular hypertrophy especially in those with highest left ventricular mass
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Aims: Left Ventricular Hypertrophy (LVH) is common in Type 2 Diabetes (T2DM) and contributes to their high Cardiovascular (CV) event rate. LVH can be related to Oxidative Stress (OS) and allopurinol reduces OS. We therefore investigated whether allopurinol regresses LVH in patients with T2DM.

Methods: We conducted a randomised, double blind, placebo controlled study in 66 T2DM patients with echocardiographic evidence of LVH. Allopurinol 600mg/day or placebo was given for nine months over the study period. The primary outcome was reduction in Left Ventricular Mass (LVM) as calculated by carry-

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Magnetic Resonance Imaging (MRI) at baseline and at nine months follow-up. The secondary end-points were change in Flow Mediated Dilatation (FMD) and Augmentation Index (Aix).

Results: Allopurinol significantly reduced absolute LVM (-2.65±5.91g and placebo group +1.21±5.10g (p=0.012) and LVMi (indexed) to body surface area (-1.32±2.84mg/m² and placebo group +0.65±3.07mg/m² (p=0.017)). No significant change was seen in either FMD or Aix. Allopurinol induced LVH regression was however concentrated in those with an above median LV mass at baseline, as might be expected, as shown in Figure 1.

Conclusion: Allopurinol regresses LVM in patients with T2DM and LHV. Importantly the effects of allopurinol on regression of LVM was more marked in the cohort with above median baseline LVM. Regressing LVH has been shown previously to improve LV mortality and morbidity. Therefore allopurinol may become a useful therapy to reduce CV events in T2DM patients with LHV and patients with more marked LHV may have more to gain.

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Diagnostic challenge in constrictive pericarditis: the role of brain natriuretic peptide and image tools
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Background: Constrictive pericarditis (CP) is characterized by chronic pericardial inflammation, leading to fibrosis and restriction to the filling of the cardiac chambers. CP’s pathophysiological landmarks are ventricular interdependence, respiratory variations of tricuspid and mitral flow and low cardiac output. Due to CP’s low prevalence and peculiar clinical presentation constrictive pericarditis is commonly unsuspected, leading to misdiagnosis of other causes of heart failure, hepatic and pulmonary diseases. The aim of this study was to assess the role of clinical signs, brain natriuretic peptide (BNP) and image tools in patients with surgically proven constrictive pericarditis.

Methods: We retrospectively analyzed 33 patients who underwent pericardectomy for CP in a single center from 2003 to 2012. Constrictive pericarditis diagnosis was confirmed in surgical report.

Results: Mean age was 43±15 years with predominance of men (82%). CP etiology was idiopathic in 24 patients (72.7%), tuberculosis in 7 (21.2%) and postoperative in 2 (6.1%). Limiting symptoms, defined by New York Heart Association functional class III/IV, were present in 26 (78.7%). Mean BNP (obtained in 22 patients) was 170±100 (range 37-468 pg/ml) and in only one patient was more than 400 pg/ml. Other common findings were jugular venous distention (91%), peripheral edema (84.8%), ascites (63.3%), pleural effusion (39.3%), pericardial calcification in chest radiograph (30.3%), pericardial knock (24.2%), paradoxal pulse (15.1%) and kussmaul sign (15.1%). Transthoracic echocardiogram (TE) and cardiac magnetic resonance imaging (MRI) had good specificity (100%) but different sensitivity (63 vs 93%, respectively). MRI showed thickened pericardium (≤ 4mm) in 26 patients (78.7%), septal bounce in 29 (87.7%) and dilated inferior vena cava in 31 (93%). All the patients underwent median sternotomy and there were no deaths in the first 30 days after surgery.

Conclusion: Constrictive pericarditis remains a diagnostic challenge in clinical practice. The presence of right heart failure with preserved ejection fraction and BNP levels normal or slightly elevated may suggest the diagnosis, even with a normal TE. BNP has good sensitivity and should be performed in all suspected cases.

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