infections). In children and adults, adenoviral DNA was detected only in single cases with acute or chronic myocarditis.
Conclusions: In adults, we observed 3 times more often an immune-mediated than an infectious acute myocarditis provoking a rapid immunosuppressive therapy after acute onset of symptoms provided that a cardiac viral infection was excluded. Children suffer 2,3 times more often than adults from virus-induced acute myocarditis and 1,3 times more often from infectious chronic myocarditis than adults, stressing the relevance of the diagnostic molecular pathology in the successful management and therapy of these patients.

P4529
Multilevel characterization of active myocarditis in athletes: a significant right ventricular involvement

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Background: Myocarditis is a possible cause of heart disease in young healthy adults. When active myocarditis is diagnosed, concerns about sports participation represent a significant issue, especially for agonists. However, comparative studies about myocarditis characterization in athletes vs. nonathletes are lacking.
Purpose: We enrolled healthy agonists with a new diagnosis of active myocarditis to describe clinical, laboratory, electrical, imaging and histopathological features at baseline evaluation, as compared to nonathletes with the same diagnosis.
Methods: We evaluated a cohort of 35 agonist athletes (group A) presented to ER with acute symptoms and a final histological diagnosis of active myocarditis. Baseline ECG, lab, echocardiographic and CMR data were collected and compared with control subjects, chosen by a 1:1 matching for age and gender among non-agonist patients with the same clinical presentation and final diagnosis (group NA).
Results: A total of 70 patients were enrolled (56 males; age 31±8 y). Among clinical presentations, heart failure was more common in group NA (13 vs. 5, p=0.05), with no significant differences in chest pain or malignant ventricular arrhythmias (p=n.s.). Consistently, median NT-proBNP values at presentation were higher in group NA (3856 vs. 570 pg/mL, $p<0.001$). Baseline ECG was undistinguishable between groups. However, PVCs at telemetric monitoring were significantly higher in group A (PVC >1000/24h in 20 vs. 4 patients, $p<0.001$). LVEDV and LVEF by echocardiogram in groups A vs. NA were 127±19 vs. 124±20 mL and 52±13 vs. 53±12%, respectively (all p=n.s.). Notably, RV dilatation was more common in athletes (RV2 34±5 mm vs. 27±6 mm, p=0.03), in spite of a preserved RV longitudinal systolic function (median TAPSE 22 mm in both groups, p=n.s.). No significant differences were found in STIR and LGE sequences at CMR, with 2/3 of Lake-Louise criteria obtained in 30 (group A) and 29 patients (group NA) respectively (p=n.s.). Of note, RV involvement in at least one sequence for tissue characterization (T1, T2, fat-sensitive) was found in in 12 vs. 1 patients, respectively (p=0.0013). Consistently, EMB of the right ventricular septum showed signs of interstitial fibrosis and/or fibroadiposis in 21 vs. 3 patients, respectively ($p<0.001$), with Dallas criteria fulfilled in 28/35 athletes. No significant differences between groups were found about blood tests (TnT, WBC, CRP, ESR) and myocarditis aetiology (viral or autoimmune), all p=n.s.
Conclusion: A significant structural and ultrastructural involvement of the right ventricle was observed in athletes presenting with acute symptoms and EMB-proved active myocarditis. These alterations were significantly more frequent than in the matched cohort of nonathletes. Reassessment during FU and after detraining will help in differential diagnosis, although overlapping phenotypes with arrhythmogenic cardiomyopathy and athlete's heart disease cannot be totally excluded.

P4530
Sudden death in myocarditis. data from a large pathology center

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Background: Sudden cardiac death (SCD) may be the first manifestation of acute myocarditis, especially in young individuals. The aim of the study was to describe the prevalence and the specific histologic patterns of myocarditis among a large series of SCD victims referred and assessed at our cardiac pathology center.
Methods: Between 1994 and December 2017, 5326 consecutive cases of SCD were referred to the Cardiac Risk in the Young (CRY) centre for cardiac pathology. We selected SCD victims with a post-mortem diagnosis of myocarditis. All subjects underwent detailed post-mortem evaluation including histological analysis by an expert cardiac pathologist. Clinical information was obtained from referring coroners and included a number of sources such as interview with the family of the deceased, potential witnesses of the SCD and reports from the deceased's family physician.
Results: Myocarditis was identified as cause of death in 133 (2.5%) cases. The average age of individuals with a post-mortem diagnosis of myocarditis was 32±15 years and the majority were males (n=80, 61%); 9 (7%) reported a recent viral illness. While a minority died during exercise (n=4, 3%), most of deaths occurred at rest or during daily activities; 21 (16%) individuals died during sleep. The average heart weight was 378±150 g and left ventricular fibrosis was identified in 23 (17%) cases. Lymphocytic myocarditis was the most common type recognized at histology (n=49, 37%), followed by eosinophilic myocarditis (n=16, 12%) and probable toxic myocarditis characterized by histiocytic and interstitial infiltrate (n=18, 14%); giant cell myocarditis was less common (n=5, 4%).
Conclusions: Acute myocarditis is relatively rare cause of sudden cardiac death. Death occurs very rarely during exercise and more often during rest or even during sleep. The most common histological type is lymphocytic followed by eosinophilic myocarditis.
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P4531
Predictive value of plasma level of soluble ST2 receptor in setting of inflammatory cardiomyopathy

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Introduction: Inflammatory cardiomyopathy (iCMP) is important cause of sudden cardiac death and chronic heart failure. Myocardial inflammation leads to myocardial fibrosis with permanent deterioration of left ventricular function and unfavourable outcome. Soluble ST2 receptor (sST2) representsa novel independent biomarker integrating inflammation, fibrosis,and cardiac stress, proved to be helpfulin prediction of adverse outcome in heart failure patients.
Aim: 1. to determine the association of sST2 plasma levels with histolgical and cardiac magnetic resonance characteristics, as well as echocardiographic findings in iCMP 2. toevaluate prognostic performance of sST2 in setting of inflammatory cardiomyoapthy
Methods: We used plasma samples of 60 patients with proven inflammatory cardiomyopathyon endoymocardial biopsy (EMB).All patients underwent cardiac catheterization for exclusion of coronary artery disease, and cardiac magnetic resonance imagingon 1.5Tesla, including imaging protocols for the Lake-Louise-Criteria (LLC).sST2 plasma concentration was determined with doppelsandwich ELISA (Presage-ST2-Assay, Critical Diagnostics, San Diego, USA).
Results: Plasma concentration of sST2 showed normal distribution (mean 46,10±29,43ng/ml). The patients in upper quartile of sST2 plasma concentration had a lower left ventricular ejection fraction (LV-EF) in comparison to patients with lowest sST2 plasma concentration quartile (LV-EF 44±10% vs. 25±12%, p=0,04). The patients with positive Lake-Louise-Criteria had numerically higher sST2 plasma concentration without statistical significance compared to patients without signs of myocardial inflammation in CMR (mean 51,84±35,56 vs. 39,97±18,03 ng/ml). Between patients with and without histological signs of left ventricular fibrosis in endomyocardial biopsy there were no significant differences in plasma sST2 concentration (50,56±33,73 ng/ml vs. 46,77±42,63 ng/ml). In our study sST2 was superior in comparison to NT-pro-BNP predicting presence of exertional dyspnea (NYHA II-III, AUC=0,81, 95% CI=0,65–0,86 vs. AUC=0,61, 95% CI=0,39–0,79, p=0,04) and hospitalisation due to heart failure (AUC 0,82. 95% CI=0,65–0,92 vs. AUC=0,79, 95% CI=0,63–0,91, p=0,84) in iCMP patients at median follow-up of 12 months.
Conclusion: Plasma sST2 levels in patients with EMB proven iCMP are associated with the degree of LV functional impairment at the time of diagnosis and predict functional status and risk for hospitalisation during follow-up of 12 months. Hence, ST2 may be helpful in clinical practice for prognostication and treatment monitoring in patients with iCMP.

P4532
High cytotoxic cells infiltration and male gender predict adverse long-term mortality in patients with inflammatory cardiomyopathy (CMi)

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Aims: We analysed possible influence of perforin-dependent infiltration upon long-term mortality in patients with inflammatory cardiomyopathy (CMi).
Background: We previously demonstrated that left ventricular function deteriorates and progresses to substantial cardiac dysfunction in patients with perforin-positive myocardial cell infiltration.
Methods and results: Between 2003 and 2013, 2389 consecutive patients with clinically suspected CMi who underwent endomyocardial biopsy (EMB) were enrolled. EMBs were performed at first admission after exclusion of ischemic of valvular heart disease, and CMi was confirmed in 1717 patients. Follow-up was up to 10.0 years (mean 17.8±25.4 months) and information on vital status was obtained from official resident data files. Multivariable statistical analysis was conducted for all CMi patients regarding significant predictors of all-cause mortality or