those 5 patients with VT had myocardial scar but only 2 had left ventricular ejection fraction (LVEF) <35%. Patients without scar did not present any malignant arrhythmia. Sensitivity, specificity, positive and negative predictive values for the presence of scar to predict VT were 100%, 70%, 35% and 100% respectively; and 40%, 93%, 40% and 93% for LVEF <35%.
Conclusion: LGE-CMR identifies patients at risk for malignant arrhythmias beyond the prediction provided by LVEF. Myocardial scar by LGE-CMR confers higher sensitivity and negative predictive value for malignant arrhythmias in our population.

P1602
Dysregulation of insulin levels in Chagas heart disease is associated with altered adipocytokine levels

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Background: Metabolic, inflammatory, and autonomic nervous system dysfunctions are present in patients with heart failure (HF). However, whether these changes are due to left ventricular dysfunction or heart failure is unknown.
Methods: We evaluated metabolism and inflammatory activity in patients with idiopathic dilated cardiomyopathy (IDC) and chagasic cardiomyopathy (CHG) and their correlation with the autonomic nervous system (ANS). Forty-six patients were divided into 3 groups: IDC, CHG, and control (CG). All patients underwent anthropometric measurements. Levels of adiponectin, leptin, insulin, interleukin-6 (IL-6), and tumor necrosis factor-alpha (TNF-alpha) were assayed in serum samples using ELISA. ANS was assessed by heart rate variability in time and frequency domains on a 24-hour Holter monitor. High-frequency (HFr) component values were used to estimate parasympathetic activity, and low-frequency (LFr) component values were used for sympathetic activity. Analyzes were made of the correlations of each of the metabolic parameters (insulin, leptin, and adiponectin) with the inflammatory cytokines (interleukin-6 and TNF-alpha) and with ANS assessment measurements.
Results: No differences were noted between groups regarding blood glucose levels, total cholesterol, leptin, and adiponectin. Insulin levels were lower in CHG 5.4±3.3 μU/mL compared with that in CG 8.0±4.9 μU/mL and IDC 9.9±5.0 μU/mL (p=0.007). Levels of interleukin-6 and tumor necrosis factor-alpha were also higher in CHG compared with that in the other groups. Insulin was positively associated with leptin (r=0.579; p=0.024), LFr/HFr ratio (r=0.562; p=0.029), and with the LFr component (r=0.562; p=0.029) in CHG. Insulin levels were negatively associated with adiponectin (r = -0.603; p=0.017). The addition of an adiponectin unit reduced average insulin by 0.332 ug/mL. A decrease was noted in insulin levels in CHG compared with that in IDC and CG. Insulin levels were associated with ANS parameters and adiponectin.

P1603
Efficacy of combination therapy of methotrexate and low-dose corticosteroid for cardiac sarcoidosis evaluated by fuluorine-18 fluorodeoxyglucose positron emission tomography

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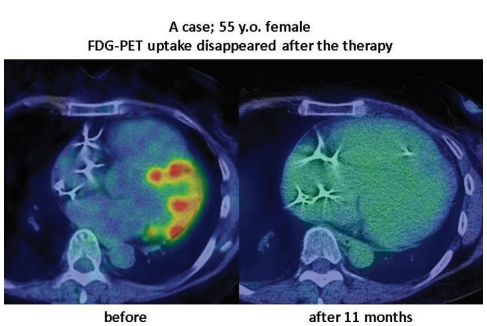
Background: Although cardiac sarcoidosis can be life threatening if not treated appropriately, there is no large study to guide therapeutic strategy. Some reports say that the combination therapy of methotrexate (MTX) and low-dose corticosteroid was effective to improve the clinical condition, and other report says such therapy was effective to preserve cardiac ejection fraction. Such combination therapy may also be able to reduce the adverse event of high dose steroid therapy. On the other hand, fuluorine-18 fluorodeoxyglucose positron emission tomography (FDG-PET) can evaluate the activity of cardiac sarcoidosis, so we can see the efficacy of combination therapy by FDG-PET.
Methods: We retrospectively reviewed 6 cardiac sarcoidosis patients who were treated with initial dose of 6mg/week MTX and 10mg/day predonisolone. Dose of predonisolone were decreased gradually to 3–5mg/day. FDG-PET was performed at the beginning and after more than 1 year. We evaluated the clinical event during the follow-up period and the area of FDG uptake, the maximum value of standardized uptake (SUVmax).



Results: Six patients including 4 females, average age of 66 y.o. were treated with combination therapy. One patient was already implanted DDD pacemaker, and 2 were implanted CRT-D device. Three patients had histories of admission due to congestive heart failure. Mean clinical follow-up period was 22.2 months and follow FDG-PET was performed at 17.3 months. The average ejection fraction was 41.8% at the baseline and 45.4% at the chronic stage. Cardiac function was preserved in all cases. Although 1 patient admitted due to pneumonia (not fatal), no other adverse event and no cardiac event occurred during follow-up. We could see the reduction of FDG uptake area in all cases, and almost complete disappearance in 3 cases. SUVmax also decreased in all cases, the average index significantly reduced from 11.70 to 5.08 (p=0.002).
Conclusion: FDG-PET findings suggest that the combination therapy of MTX and low-dose corticosteroid may affect the good clinical course for cardiac sarcoidosis.

P1604
Prevalence of obstructive sleep apnea in patients with cardiac sarcoidosis and its influences to physical and mental health

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Background: Fatigue is a common symptom in sarcoidosis. Obstructive sleep apnea (OSA) is a treatable cause of fatigue and sleepiness. In cardiac sarcoidosis (CS), all patients are treated with corticosteroids that often results in significant weight gain and thus predispose to OSA.
Purpose: To determine the prevalence of OSA in CS and determine the effect of OSA on adverse cardiac events and the health-related quality of life (HRQOL).
Methods: Biopsy-verified CS patients were screened for OSA between February 2013 and December 2016 using polysomnography or home sleep testing devices Embletta or ApneaLink. Patients completed in January 2017 RAND-36 (general health-related quality of life questionnaire), FSS (Fatigue Severity Scale) and BDI (Beck Depression Inventory) questionnaires. Clinical data was retrieved from registry of myocardial inflammatory diseases.
Results: This study included a total of 106 CS patients of which 74 (70%) were female and mean age was 53,9±10,7. Of 106 patients, OSA was diagnosed in 18 patients (17%) (prevalence in general population is 2–4%). No significant differences between groups (with or without OSA) in age, gender, depression or reduced LV dysfunction were found. Consistent with prior studies, BMI correlated with OSA (BMI with OSA 30,7 vs without OSA 26,7, p=0,001). All these patients were treated according to current guidelines. OSA did not result in higher rate of ventricular arrhythmias (VT/VF) (log-rank test p=0,522).
Fatigue was significantly more common symptom in CS patients with treated OSA (FSS normal value ≤4; with OSA FSS mean 4,74 vs without OSA 3,62. p=0,015). Health-related quality of life (sub scores; role physical, role emotional and general health) was significantly worse among patients with OSA. Furthermore, quality of life remained lower in patients with OSA, regardless of receiving therapy or not.

Fatigue and HRQOL scores

		CS patients with OSA (n=18)	CS patients without OSA (n=88)	
FSS total (fatigue)	normal value scores ≤4	6 (33%)	51 (58%)	
FSS total	scores >4	12 (67%)	37 (42%)	
RAND-36 (HRQOL)	mean values in Finnish population			
Role function/physical	74,8	27,8	57,7	p=0,006
Role function/emotional	75,0	42,6	72,0	p=0,003
General health	65,0	39,4	51,4	p=0,045

Conclusion: OSA is a common (17%) co-morbidity in CS. Screening for OSA should be considered in CS.

P1605
High occurrence of sustained ventricular tachycardia despite immunosuppressive treatment in cardiac sarcoidosis

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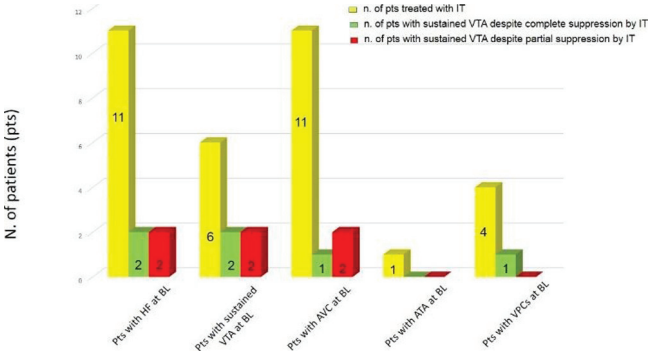
Background: Heart failure (HF), atrioventricular conduction disorders (AVC), ventricular (VTA) and atrial (ATA) tachyarrhythmias are pivotal manifestations of cardiac sarcoidosis (CS). Whether patients (pts) with CS treated by immunosuppression (IT) are at risk of VTA remains to be determined.
Purpose: To investigate the risk of developing sustained VTA during follow-up (FU) among patients with CS treated with IT.
Methods: We report the FU of a series of 28 pts from two tertiary care centers with HF and/or arrhythmias due to CS proven by metabolic PET and/or biopsies. Nineteen (68%) pts started IT and were followed-up (20±10 months) with a metabolic PET to evaluate the inflammatory activity during the time course of the IT treatment.

Results: The initial manifestation of CS was HF in 57% (16/28), sustained VTA in 25% (7/28), AVC in 57% (16/28), ATA in 14% (4/28), and premature ventricular contractions (PVCs) in 29% (8/28). Among the 19 pts treated with IT, 29% (8/28) developed sustained VTA during FU while among the remaining 9 untreated pts no one presented with sustained VTA of new onset. Figure 1 reports the number of pts treated with IT (yellow) who developed sustained VTA with complete (green) or partial (red) suppression of metabolic PET activity in the different subgroups. Importantly, complete or partial suppression of PET activity by IT did not prevent sustained VTA occurrence or recurrence in any of the subgroups except for those presenting with ATA. Pts with complete suppression of PET activity, however, showed a significant improvement in LVEF compared to pts with a partial suppression by IT (43% to 56% vs 47% to 46%, $p<0.05$) at FU. Of note, only one pt, whose initial presentation was HF, died during FU due to cardiogenic shock on end-stage HF.



Conclusions: Pts with CS remain at substantial risk of sustained VTA during follow-up regardless of IT response. This finding suggests a low threshold for ICD implantation in this population. IT only improves LVEF in pts with a complete suppression of inflammatory activity at PET.

P1606
Blood transcriptome profiling in suspected cardiac sarcoidosis

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Background: Cardiac sarcoidosis (CS) has proven to be a clinically significant cause of otherwise unexplained atrioventricular block (AVB) and/or ventricular tachyarrhythmias. Recent MRI studies have also shown that 25–30% of patients with extracardiac sarcoidosis have myocardial involvement which is mostly clinically silent but can eventuate in life-threatening arrhythmias. Diagnosing CS today requires myocardial and/or extracardiac tissue biopsies and cardiac imaging studies (echo, MRI, PET) that may take time and involve some risk. A blood test to help screen for and diagnose CS would be more than welcome.
Purpose: Assess the potential of RNA transcriptome profiling of circulating platelets and monocytes ("liquid biopsy") in CS screening.
Methods: Genome-wide analysis of blood platelet and monocyte RNA transcriptomes was made in 5 patients (mean age of 46, 2 women) with a clinical suspicion of CS and in 4 healthy controls of similar age and gender. The diagnostic procedures for CS included imaging with echocardiography, cardiac Gd-MRI and/or whole-body 18F-FDG PET. All patients underwent endomyocardial biopsies (EMB) followed by PET-guided extracardiac tissue biopsies if EMB was negative but suspicion of CS persisted.
Results: The primary manifestation of the myocardial disease was high-grade AVB in 4 patients and heart failure in 1 patient. The histology of sarcoidosis was confirmed by EMB in 3 patients and by a mediastinal lymph node biopsy in 1 case. The final diagnosis in the fifth patient was dilated cardiomyopathy instead of CS. In RNA profiling, expression of 966 and 57 genes was found to be altered at the Q-value 0.1 between the CS and control group samples in monocytes and platelets, respectively. Hierarchical clustering of both platelet and monocyte data allowed a clear discrimination of patients from controls, indicating the power of our approach to classify patients (Figure 1).

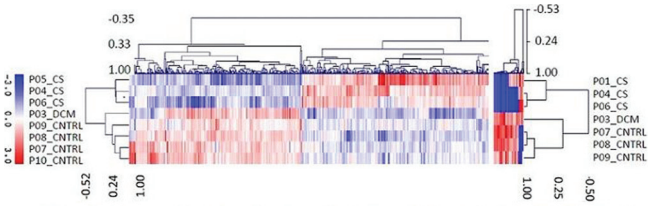

Figure 1. Hierarchical clustering of the differentially expressed blood monocyte (left heatmap) and platelet (right heatmap) genes revealed a clear separation of patient groups.

Figure 1

Conclusions: This proof-of-concept study assessed the value of blood transcriptome profiling ("liquid biopsy") in the diagnosis of CS. It demonstrated that blood-based RNA expression analysis can distinguish CS patients from controls and has the potential to become a useful adjunct in the screening for CS.

P1607
Splenectomy is a risk factor for cardiac complications in thalassemia major

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Background: The use of splenectomy for thalassemia major (TM) is restricted over concerns of its long-term outcome.
Purpose: The aim of this retrospective cohort study was to assess the incidence of cardiac complications (CC) in a large multicentric cohort of splenectomized TM patients.
Methods: We considered 360 TM patients (177 males, mean age 36.59±7.11 years) who performed the splenectomy between 1966 and 2010 (mean age at splenectomy 13.75±8.06 years) and an equal number of TM patients with the spleen, matched by age and sex. Both groups of patients were consecutively enrolled in the Myocardial Iron Overload in Thalssemia (MIOT) Network and were followed-up until October 2016. For each splenectomized patient, the years at risk were calculated from the date of splenectomy until the date of completion of the study, death, or diagnosis of a CC, whichever occurred first. For each non-splenectomized patient the same time at risk of the correspondent splenectomized patient was used. In case of death or CC, the time at risk was the difference between the date of death or CC and the date of transplantation of the matched patient. The cumulative incidence was used to assess the absolute risk of CC over different periods of time.
Results: Among the splenectomized patients, 62 CC were recorded (32 arrhythmias, 25 heart failure, 4 pulmonary hyperthension, and 2 thromboembolic events). The cumulative incidence of CC was 5.79% at 10 years from splenectomy, 12.29% at 20 years from splenectomy, 22.42% at 30 years from splenectomy, and 35.95% at 40 years from splenectomy. Among the TM patients with the spleen, 28 CC were recorded (8 supraventricular, arrhythmias, 14 heart failure, 3 pulmonary hyperthension, and 3 thromboembolic events). In this cohort of patients, the cumulative incidence of CC was 0.92% after 10 years, 5.68% after 20 years, 12.78% after 30 years, and 25.65% after 40 years.
The cumulative incidence of CC in both groups is shown in Figure 1: it was higher in splenectomized patients, with a statistically significant difference (P=0.0008).

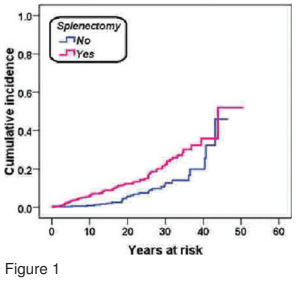

Figure 1

Conclusions: In the present study we showed for the first time that thalassemic splenectomized patients had a significant higher incidence of cardiac complications. The pathophysiologic mechanisms are multiple: splenectomy leads to increased platelet activation and red cell microparticles, upregulating vascular adhesion molecules and promoting thrombosis, causes increased scavenging of nitric oxide contributing to pulmonary vasculopathy and development of pulmonary hypertension, and predisposes patients to infections increasing the risk of myocarditis that can result in heart failure and arrhythmia.
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P1608
Chronic hepatitis C virus infection in thalassemia major: a new cardiovascular risk factor?

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Background: Hepatitis C virus (HCV) infection is associated with a number of important extrahepatic manifestations.