

## P1110

## Role of an extensive diagnostic work-up in the detection of concealed cardiomyopathies in athletes with complex ventricular arrhythmias and implications for sports" eligibility assessment

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**Background:** ventricular Arrhythmias (VAs) are a common clinical problem and a critical issue with regards to sports" eligibility in athletes. Although VAs can be considered a benign feature of the athlete's heart adaptive phenotype, they may also be the only clinical manifestation of a concealed cardiomyopathy, potentially heralding sudden cardiac death (SCD) during sports activity.

**Purpose:** to evaluate the diagnostic contribution and the implications for sports eligibility assessment of a thorough non-invasive and invasive work-up including electrophysiology study (EPS), electroanatomical mapping (EAM) and endomyocardial biopsy (EMB) in athletes with complex VAs and to derive a multiparametric risk score in order to easily predict structural heart diseases' diagnosis.

**Methods:** we conducted a prospective, single-arm, open-label single center, observational study. All consecutive athletes presenting for evaluation at our institution after being disqualified from participating in sports due to complex VAs were enrolled. The athletes underwent a baseline non-invasive diagnostic protocol with transthoracic echocardiogram and gadolinium enhanced cardiac magnetic resonance imaging (cMRI). Subsequently EPS, EAM and EAM-guided EMB were performed if deemed necessary. Sports eligibility status was re-assessed at 6 months' follow-up. A multivariable logistic regression model was built, considering cMRI as the gold standard exam.

**Results:** after diagnostic evaluation, 55 subjects (26.4%) had a diagnosis of heart disease, most commonly myocarditis (n = 27) and arrhythmogenic right ventricular cardiomyopathy (ARVC, n = 16). After 6 months, 100 athletes (48.1%) were judged eligible to participate in competitive sports and 46 subjects (22.1%) were deemed eligible to participate in non-competitive sports. On multivariable logistic-regression analysis, abnormalities on ECG (OR 5.3) or on echocardiogram (OR 3.7), sustained VA inducibility on EPS (OR 17.7) and low-voltage areas on EAM (OR 7.7) proved all predictive of concealed structural heart diseases' diagnosis. We derived two simple risk scores: a 40-points risk score and an 8-points risk score (obtained by weighing each variable according to the regression model's ORs). Both these risk scores' performance proved very good (AUC = 0.856 for the 40-points score and AUC = 0.852 for the 8-points score, figure 1).

**Conclusions:** approximately 1/4 of athletes presenting with complex VAs have a concealed heart disease, most commonly myocarditis or ARVC. ECG, echocardiogram and EAM abnormalities and sustained VAs inducibility on EPS are predictive of structural heart diseases' detection. Therefore, these diagnostic tests should be routinely included in the evaluation of athletes with complex VAs. A risk score including the results of these tests can greatly help in the prediction of concealed structural heart diseases' diagnosis. More than 2/3 of subjects were judged eligible to participate in sports at 6 months' follow-up.

Abstract Figure 1. ROC curves for diagnosis

