The value of regional myocardial function assessment in patients with acute myocarditis at baseline and mid term follow-up

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Background: The clinical course and ventricular remodeling in inflammatory myocardial disease could be unpredictable. No single functional parameter has been confirmed as a powerful predictor of clinical course and functional recovery assessment in patients with acute inflammatory myocardial disease.

Purpose: The aim of the study was to assess the mechanical properties of the myocardium in patients with active myocarditis at baseline and follow-up.

Methods: Database from a high volume, tertiary cardiology center was analysed to identify patients with active myocarditis, based on clinical presentation and ≥1 diagnostic criteria from different categories (including electrocardiography/holter, elevated troponin T/I levels, functional or structural abnormalities on cardiac imaging or tissue characterization by cardiac magnetic resonance) between 2016 and 2019. Conventional and speckle tracking echocardiography including global longitudinal strain (GLS) mechanical dispersion (MD) was completed at baseline and at 17±13 months follow-up. MD was calculated as a standard deviation of time to peak longitudinal strain derived from all left ventricle segments in 3 apical views.

Results: 61 consecutive patients [50 M, 11 F, end-diastolic volume 212±84 ml, end-systolic volume 130±90 ml, ejection fraction (EF) 42±16%] were enrolled. During the entire follow-up 1 patient died at early observation. Implantable cardioverter-defibrillator was implanted in 5 patients (primary prevention 4, secondary 1), cardiac resynchronization therapy pacemaker in 1 patient. Despite of significant global improvement (EF 42±16% vs 52±10%, p<0.001) the limited regional improvement was noticed (GLS 14±6% vs 15±4%, p = NS; MD 47±18 ms vs 45±20 ms, p=NS) in all patients at 17±13 months follow-up. There was a strong negative association between GLS and MD at baseline (Figure 1), and slightly weaker at follow-up (R=0.47, Pearson's correlation). Moreover, the GLS correlated well the change of MD in each individual patient.

Conclusions: Mechanical dispersion and global longitudinal strain may serve as an additional markers of myocardial damage and potential predictive markers in non ischemic cardiomyopathy patients with proven inflammatory origin.