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Title: Effect of rheumatic process on myocardial performance in patients with mild to moderate rheumatic mitral regurgitation: a strain study

Authors: Asim Katbeh

Background & Aims: Myocardial structural and functional changes may develop as a result of the inflammatory process in patients with rheumatic heart disease (RHD). How changes in myocardial function correlate to continuous rheumatic process in chronic RHD is not known.

Aim: To describe the long-term effect of rheumatic process on overall myocardial performance and its correlates to the maintenance of volume overload state induced by mitral regurgitation (MR).

Methods: We enrolled 210 consecutive patients (age: 43±9 years, 54% females) with primary MR. The study population was divided in two sub-groups according to etiology of primary mitral disease, due to rheumatic or degenerative process with mild to moderate regurgitation. All patients underwent comprehensive transthoracic echocardiography for detection of myocardial dysfunction, including the assessment of LV and LA strain using 2D speckle tracking echocardiography. The MR was considered rheumatic in etiology when the morphology of the valve satisfied the World Heart Federation criteria for the diagnosis of chronic RHD. Patients with ischemic heart disease, reduced LV ejection fraction or in arrhythmia at the time of echocardiography scan were excluded.

Results: The study included 70 patients with isolated degenerative MR and 70 patients with rheumatic MR and 70 sex matched healthy controls. Patients with rheumatic MR were younger and had a higher prevalence of atrial fibrillation, lower left ventricle (LV) global longitudinal strain (GLS), larger left atrium (LA) size and lower peak LA longitudinal strain (PALS) compared to patients with degenerative MR. Age, LV end-systolic volume and rheumatic etiology were independently associated with impaired LVGLS. Whereas increased LV mass index and higher pulmonary hypertension were independently associated with significantly impaired PALS. However, there was no significant difference in right ventricle (RV) dimensions or function indices between the two sub-groups.

Conclusions: The LV GLS and PALS seem to be the most sensitive echocardiographic parameters to assess changes in myocardial performance and to tackle overload state related to chronic RHD.