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Right ventricular longitudinal strain predicts symptoms in patients with chronic primary mitral regurgitation

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Mitral regurgitation (MR) leads to subclinical changes that often cannot be detected by low sensitive conventional parameters and early predictors of deterioration could suggest a better timing for intervention.

Methods: We follow up 175 asymptomatic patients 56±13 years (79 female) with severe primary MR in sinus rhythm and without diabetes mellitus and renal disease for 2 years. Global longitudinal strain (LS) of left ventricle (LVGLS), right ventricular (RV) free wall LS (RVLS), and left atrial (LA) peak reservoir LS as average of two basal segments in 4 chamber view were measured by speckle tracking along with indexes of LV end-systolic and end-diastolic volumes, LV ejection fraction (EF), left atrial end-systolic volume index (LAVi) every 6 months. Normal reference values of LS were obtained from age and sex matched 40 healthy controls.

Results: Patients with MR had higher LV ejection fraction (EF), LVGLS, LALS and lower values of RVLS compared with controls (EF 67.4±5% vs 59.3±4%, $p < 0.05$; LVGLS −25.2±2.3% vs −21.2±1.9%, $p < 0.03$; LALS 46.2±5.1% vs 42.4±3.7%, $p < 0.04$; RVLS −23.4±5.1% vs −27.3±2.8%, $p < 0.03$). 53 (30%) patients developed symptoms at exercise during follow up. Symptomatic patients at baseline had higher values of RVLS compared with patients who remained asymptomatic during follow up without significant differences in EF, LVGLS, LALS (RVLS −21.4±2.6% vs −25.8±3.2%, $p < 0.02$; EF 66.8±2.4% vs 68.1±3.1%, $p > 0.05$; LVGLS −24.8±2.1% vs −25.3±2.3%, $p > 0.05$; LALS 45.7±4.1% vs 46.5±4.4%, $p > 0.05$). RVLS correlated with LAVi (r=0.53, $p < 0.01$) and LALS (r=0.57, $p < 0.01$). Regression analysis defined RVLS as an independent predictor of symptoms development (OR=3.2; 95% CI=1.37–7.63; $p < 0.01$).

Conclusion: RV longitudinal strain predicts symptoms in patients with chronic primary mitral regurgitation.