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Prognostic value of cardiac magnetic resonance imaging in mitral valve prolapse

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Background Mitral valve prolapse (MVP) is a frequent pathology that can be complicated by mitral regurgitation, heart failure, rhythm disorders, arterial embolism and death. The aim of this study was to evaluate the prognostic interest of ventricular volumes, right ventricular ejection fraction (RVEF) and late gadolinium enhancement (LGE) assessed by cardiac magnetic resonance (CMR) imaging on cardiovascular morbi-mortality in a cohort of patients with MVP

Methods We examined the prognostic value of CMR imaging in 237 patients with MVP (no to severe mitral regurgitation) included between 2010 and 2019. All patients underwent a comprehensive echocardiography. The main endpoint was a composite endpoint of cardiovascular death, heart failure, new onset atrial fibrillation, arterial embolism.

Results Among the 237 patients (63% male), 97 (41%) had LGE (75 myocardial wall, 10 papillary muscle tip and 12 both locations). Factors associated with LGE in multivariable analysis were age (OR 1.02, $P = 0.037$), left ventricular (LV) mass (OR 1.01, $P = 0.008$) and pulmonary artery systolic pressure (PAPS, OR 1.02, $P = 0.069$). Follow-up was censored at the time of surgery or percutaneous repair. In univariate analysis NYHA class, LV mass, left atrial volume, PAPS, LV end-diastolic and end-systolic volumes, chordal rupture and MR degree were associated with outcome. RVEF and biventricular dysfunction (LV EF < 60% and RV EF < 40%) were also associated with impaired event-free survival ($36.0 \pm 17.0\%$ vs $65.4 \pm 5.8\%$, $P = 0.019$). Finally, LGE was associated with a decreased event-free survival ($55.6 \pm 9.9\%$ vs $70.7 \pm 6.9\%$, $P = 0.002$). In multivariable analysis, moderate to severe mitral regurgitation (HR : 2.14 [1.44-3.19], $P < 0.0001$) and the presence of LGE were predictors of impaired event-free survival (HR : 2.12 [1.08-4.16], $P = 0.003$).

Conclusion CMR imaging provides additional prognostic information to echocardiography in the study of MVP. Myocardial fibrosis of the left ventricle and right ventricular function as assessed by CMR imaging are predictors of cardiovascular morbidity and mortality in MVP.