Prognostic differences between atrial functional mitral regurgitation and ventricular functional mitral regurgitation

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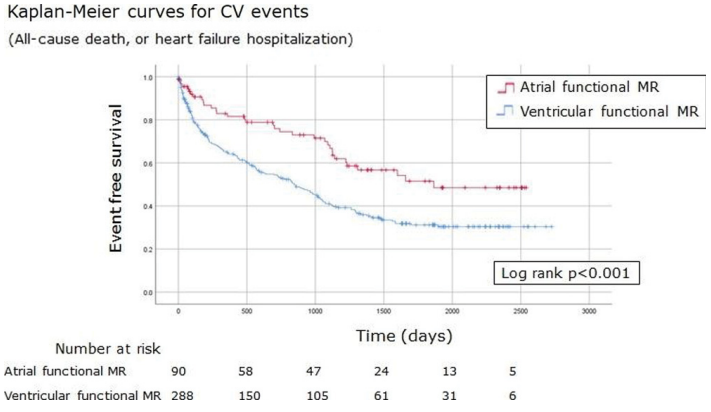
Introduction: Atrial functional mitral regurgitation (A-FMR) has been under-recognized until recently as a cause of FMR, and the prognostic difference between A-FMR and ventricular FMR (V-FMR) has not been fully elucidated. As there has been different mechanisms of FMR suggested in A-FMR and V-FMR, we hypothesized that prognosis and prognostic predictors of A-FMR may differ from those of V-FMR.

Purpose: To investigate the prognosis and prognostic predictors of A-FMR in comparison with V-FMR.

Methods: Among 1312 consecutive patients with grade 3+ (moderate to severe) or 4+ (severe) MR, 378 consecutive FMR patients were identified by excluding patients with degenerative MR, previous cardiac surgery, or concomitant aortic valve disease and/or mitral stenosis. FMR with ejection fraction (EF) <40% or FMR due to regional wall motion abnormalities with leaflet tethering were classified as V-FMR (N=288), and FMR due to left atrial (LA) and/or annular dilatation with preserved or mid-range EF (≥40%) were classified as A-FMR (N=90). All-cause death and heart failure hospitalization were analyzed as cardiovascular (CV) events in this study. Surgical or percutaneous mitral valve intervention without CV events was handled as not reaching an endpoint and these cases were censored.

Results: A-FMR were significantly older (76 [69–82] vs. 70 [58–77] years), higher rates of female (64 vs. 35%) and atrial fibrillation (88 vs. 42%), and lower B-type natriuretic peptide (BNP) values (169 [101–318] vs. 447 [213–952] pg/ml) compared to V-FMR (all P<0.05). On echocardiography, LV end-diastolic and end-systolic dimensions (52 [48–57] vs. 64 [58–72] mm, 34 [31–37] vs. 55 [48–64] mm), respectively) were smaller, and EF (55 [50–60] vs. 28 [19–35] %) and LA volume (99 [73–137] vs. 73 [57–91] ml/m^2) were larger in A-FMR (all P<0.05). Effective regurgitant orifice area (32 [26–40] vs. 31 [24–45] mm^2) and regurgitant volume (50±15 vs. 52±16 ml) were similar (both n.s.). During a median follow up of 1407 days, 206 (54%) patients developed CV events. Kaplan-Meier analysis revealed that V-FMR had a significantly higher rates of CV events compared to A-FMR (Figure) with adjusted hazard ratio (HR) of 1.762 [1.168–2.660], P=0.007 after adjusted for variables including age, sex, New York Heart Association functional class, previous heart failure hospitalization, estimated glomerular filtration rate (eGFR) and BNP. Further, stepwise multivariate analysis showed that independent prognostic predictors of A-FMR were LA volume and eGFR, while those for V-FMR were LA volume, age, and LV end-systolic dimension.

Conclusions: A-FMR had relatively better prognosis compared to V-FMR, and there were different prognostic predictors between A-FMR and V-FMR. Our results suggest that different treatment strategies need to be considered between A-FMR and V-FMR.



The Kaplan-Meier life table