Handgrip echocardiography improves risk stratification in patients with atrial functional mitral regurgitation

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Background: In the last years, cardiologist increasingly recognize “atrial functional mitral regurgitation” (AFMR) frequently associated with heart failure with persevered ejection fraction and atrial fibrillation. Exercise echocardiography is recommended by current guidelines in patients with secondary mitral regurgitation (MR) in several clinical scenarios. However, there are no data on the prognostic impact of exercise induced AFMR yet. We hypothesise that handgrip exercise during echocardiography unravels dynamic changes of MR severity that may impact further clinical decision making.

Purpose: We aimed to assess the prognostic impact of isometric exercise-induced changes in patients with AFMR.

Methods: Patients with atrial fibrillation and at least mild AFMR who underwent handgrip exercise echocardiography between January 2019 and September 2021 were included. Patients were followed-up for one year to assess clinical outcomes. The combined endpoint included all-cause mortality, heart failure hospitalisation and mitral valve surgery/intervention.

Results: We included 80 patients with AFMR (median age was 80 (77-83) years; 53.8% were female). Echocardiography at rest showed mild MR in half of the patients (53.8%), moderate MR in 20 patients (25.0%), and severe MR in 17 patients (21.2%). In nearly every fifth patient (17.5%) with non-severe MR at rest, the MR became severe during exercise. Median follow-up duration was 12 months (IQR: 4-17 months). Follow-up was completed in 78 of the 80 patients (97.5%). Thirty-five patients (44.9%) experienced adverse events. Kaplan-Meier survival analysis revealed severe clinical outcomes more often in patients with severe MR during exercise (76.9%) compared to patients with non-severe MR during exercise (33.3%)(p<0.001). Addition of handgrip exercise testing to echocardiographic assessment at rest improved the global chi-square (from 21.2 to 30.2) and the Harrell’s c-index (from 0.69 to 0.78) for prediction of mitral valve surgery/interventions during follow-up.

Conclusions: Isometric handgrip exercise testing unmasks severe MR in a significant proportion of patients with non-severe MR at rest and improves further risk stratification in these patients.