Abstract: P6483

Predictors of contractile reserve on dobutamine stress echocardiography in patients with classical low-flow, low-gradient aortic stenosis

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Background: There is a lack of information on factors that influence contractile reserve (CR) on dobutamine stress echocardiography (DSE) in patients with classical low-flow, low-gradient aortic stenosis (LFLG-AS).

Purpose: This study sought to evaluate the predictors of CR in patients with LFLG-AS.

Methods: Prospective study including 43 consecutive LFLG-AS patients (aortic valve area [AVA] = 1.0 cm², mean transaortic gradient < 40 mmHg, left ventricular ejection fraction [LVEF] <50%) with true severe aortic stenosis. All patients underwent dobutamine stress echocardiography and T1-mapping cardiac magnetic resonance (CMR). CR was defined as an increase = 20% in the left ventricular stroke volume at peak stress. Patients with pseudo-severe aortic stenosis were excluded.

Results: All of the patients in the study had degenerative aortic stenosis, with a median age of 67 [60-74] years, most of them being male (83.7%). A high prevalence of comorbidities was found, highlighted by diabetes (42%), hypertension (70%), atrial fibrillation (25%) and coronary artery disease (38%). Mean transaortic gradient was 25 [20-33] mmHg, AVA was 0.88 [0.68-0.95] cm², LVEF was 35 [28-43]% and 32.6% had moderate/severe functional mitral regurgitation. CMR myocardium extracellular volume fraction (ECV) was 28.8 [26.3-33.0] %, indexed ECV was 35.4 [25.0-41.2] ml/m², 32.6% had positive transmural delayed-enhancement images and 25.6% had positive mesocardial delayed-enhancement images. On DSE, 30 patients (69.7%) had CR and 13 patients (30.3%) had no CR. Global longitudinal strain was 10 [7-12] %, ? indexed flow rate was 25 [3-38] ml/m².seg and ? mean gradient was 10 [3-16] mmHg. By multivariate analysis, moderate/severe functional mitral regurgitation (HR 0.122, 95% CI 0.020-0.759, p=0.024) and AVA (HR 0.606, 95% CI 0.396-0.925, p=0.020 [for each increase of 0.05 cm²]) were the only factors associated with CR. ECV, indexed ECV and positive transmural or mesocardial delayed-enhancement images were not associated with CR in the univariate analysis.

Conclusions: In our study, the absence of moderate/severe functional mitral regurgitation and AVA were predictors of CR on DSE in patients with LFLG-AS. As AVA was smaller in patients with CR, our finding contradicts the hypothesis that more severe aortic stenosis could also contribute to the lack of CR. Other possible factors that are surrogate of myocardium fibrosis, as ECV, indexed ECV and positive delayed-enhancement images, were not associated with the absence of CR.