Low-gradient aortic stenosis in patients with concomitant mitral regurgitation - a subgroup analysis from the German aortic valve registry (GARY)

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Background: Patients with severe aortic stenosis (AS) frequently present concomitant mitral regurgitation (MR), which may interfere with echocardiographic measurement of mean pressure gradient (MPG), maximal flow velocity and aortic valve area (AVA).

Purpose: We therefore, aimed to investigate the impact of different grades of MR on parameters of AS severity in a large cohort of all-comer patients with severe AS, prospectively included in the national German Aortic Registry (GARY).

Methods: All patients undergoing transcatheter or surgical aortic valve replacement for severe AS enrolled in GARY between 2011 and 2017 were considered for this analysis. After excluding cases with mitral stenosis and unknown causes of MR, 119,641 patients were considered for the present study. Based on LVEF, the study population was divided into the following subgroups: group 1 (LVEF < 30%, n = 7545), group 2 (LVEF 30-50%, n = 30,116), and group 3 (LVEF > 50%, n = 81,980). Differences in the values of the mPG were explored in each group and in relation to the decremental values of aortic valve area (AVA).

Results: Overall, 37,489 (31.3%) patients had no MR, 77,890 (65.1%) had MR grade I-II, and 4262 (3.6%) had MR grade III-IV.

In group 1, 2 and 3, no MR was reported in 1339 (17.7%), 7612 (25.3%) and 28,538 (34.8%) patients respectively. MR grade I-II was more frequently observed (group 1 5621 [74.5%] vs. group 2 20,972 [69.6%] vs. group 3 51,297 [62.6%]), whereas MR grade III-IV was observed less frequently and present only in 585 (7.7%), 1532 (5.1%) and 2145 (2.6%) patients in subgroups 1, 2 and 3, respectively.

The aortic mPG was significantly lower in subgroup 1 compared to 2 and 3 (33.74 ± 14.93 versus 41.4 ± 16.47 and 46 ± 16.19mmHg respectively, p < 0.001). With increasing severity of MR, there was a significant reduction of the aortic mPG in each LVEF subgroup (Figure 1). This pattern was maintained irrespective of the AVA value.

Conclusions: In patients with severe AS, concomitant MR may potentially affect diagnostic accuracy of echocardiographic AS evaluation. In this first GARY analysis of patients with severe AS and concomitant MR, we observed that increasing MR severity affects transvalvular aortic mPG and results in a low-gradient AS pattern. In contrast, AVA is a robust diagnostic parameter for the diagnosis of true severe AS that maintains its validity independently of LVEF and severity of concomitant MR.

Abstract Figure 1