External validation of the unifying concept for the quantitative assessment of secondary mitral regurgitation

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Background: A Unifying Concept for the Quantitative Assessment of Secondary Mitral Regurgitation (SMR) was recently proposed in order to provide a solution for the ongoing guideline controversy. However, these data were derived from a single center cohort and lacks external validation. We aimed to validate the proposed algorithm in a different patient population.

Methods: Patients with at least mild SMR and reduced left ventricular ejection fraction (< 50%) under optimal guideline-directed medical therapy were retrospectively identified at a single-center. The cohort was stratified in low-risk (effective regurgitant orifice area [EROA] < 20 mm2 and regurgitant volume [RegVol] < 30 ml), intermediate-risk (EROA 20 to 29 mm2 and RegVol 30 to 44 ml) and high-risk (EROA ≥ 30 mm2 and RegVol ≥ 45ml) according to the defined risk-based thresholds tailored to the pathophysiological concept of SMR. In the intermediate-risk group, patients were further stratified on the basis of the hemodynamic severity of SMR, into intermediate low-risk and intermediate high-risk (regurgitant fraction < 50% or ≥ 50%, respectively). The primary endpoint was all-cause mortality.

Results: A total of 572 patients (median age 70 years; 76% male) were included. Median LVEF was 35% (IQR 28-40) and LVEDV was 169 ml (IQR 132-215). Median measures of SMR severity were EROA of 14 mm2 (IQR 8-22) and RegVol of 23 ml (12-34). During a median follow-up of 3.8 years (interquartile range: 1.8 to 6.2 years) there were 254 deaths (44%). The mortality at 6-years was 38.9% for the low-risk group, 30.7% for the intermediate low-risk, 64.9% in the intermediate high-risk and 63.2% in the high-risk group. On multivariable analysis, the defined thresholds of risk for SMR severity remained independently associated with all-cause mortality (adjusted hazard ratio: 1.164; 95% confidence interval [CI]: 1.020 to 1.327; P = 0.024). The unifying concept showed similar discriminative power (C-statistic 0.588; 95% CI: 0.540 to 0.635) to the American (C-statistic 0.588; 95% CI: 0.541 to 0.635; P for comparison = 1) and European guidelines (C-statistic 0.563; 95% CI: 0.515 to 0.610; P for comparison = 0.458), but it was able to increase the net reclassification index (0.143 [P < .001] and 0.026 [P = .025], respectively).

Conclusions: In this cohort of patients with SMR and LVEF <50%, the proposed unifying concept based on combined assessment of the EROA, the RegVol, and the RegFrac proved to be associated with an increased risk of all-cause mortality and could improve risk prediction of current guidelines.

Abstract Figure.