Prevalence and determinants or right ventricular dysfunction in severe aortic stenosis

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Introduction: systolic pulmonary artery pressure (sPAP) is a well known predictor of outcome in patients with valvular heart disease. In spite of this fact, limited data are available regarding the assessment of RV function in patients with aortic stenosis (AS).

Aim: of this study is therefore to evaluate the prevalence and the determinants of RV dysfunction in severe AS patients.

Methods: 201 patients (mean age: 79.7±8.7, male sex 55.5%) with severe AS underwent 2D echocardiography and speckle tracking echocardiography (STE) for the evaluation of left ventricular and RV function, aortic valve gradients and sPAP. A tricuspid annular plane systolic excursion (TAPSE) ≤17 mm was used to define reduced RV function.

Results: RV function was impaired in 48 patients (24%). Patients with reduced TAPSE had an impaired LV ejection fraction (LVEF) (49.2±15.4 vs 57.9±10.9%, p<0.0001), significantly altered STE parameters (GLS: −10.3±3.9 vs −13.2±3.5%, GCS: −7.0±3 vs −10.4±4.9%, GRV: 18.7±11.6 vs 28.4±15.6, all p<0.001) and a higher sPAP (48.4±18.5 vs 40.9±12.7 mmHg, p=0.002) with respect to patients with a normal RV function. Correlates of a reduced TAPSE were: LVEF (β=0.35, p<0.0001), LV global longitudinal, circumferential and radial strain (β=0.40, p=0.37 respectively, all p<0.001), LV indexed stroke volume (β=0.44, see 0.0001), InNT-proBNP (β≥0.51, p<0.0001) and sPAP (β=0.27, p<0.0001). At Kaplan-Meier survival curve, a TAPSE ≤17 mm was associated with a reduced survival in patients with AS (Log Rank test, p=0.034).

Conclusions: In patients with severe AS, RV function impairment is frequent and is associated with a poor prognosis. The correlations of TAPSE highlight the RV-LV interdependence in AS patients. Further studies will clarify the real and independent prognostic value of RV function in severe AS patients and test for the RV reverse remodelling after treatment of the AS.

Risk stratification in severe aortic stenosis: the importance of ventriculo-arterial interplay

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Introduction: in patients with aortic stenosis (AS), the occurrence of adverse outcomes does not always correspond to the classical markers of hemodynamic severity. Moreover, the evaluation of outcomes in these patients is often biased by considering surgery as a censor event at follow-up analysis. Aim of the present study is therefore to evaluate the determinants of prognosis in patients with severe AS, independently from the treatment modality (aortic valve replacement/medical therapy).

Methods: 220 patients (mean age: 79.8±8.6 years, male sex: 119, 54%) with severe AS (aortic valve surface <1cm² or <0.6cm²/m²) underwent standard echocardiography to characterize aortic valve gradients and biventricular function. Hospitalization for cardiac cause, heart failure, overall death, but not intervention on the aortic valve were considered as major adverse cardiac events (MACEs).

Results: after a mean follow-up period of 7.8 months, the predefined MACEs occurred in 57 patients (26%). At Cox regression analysis, LVESV (HR 1.20, p=0.0025), age (HR 0.79, p=0.03), female sex (HR 1.45, p=0.05) and a ZV>3.2 mmHg/m²/m² (HR 3.53, p<0.0001) were the strongest predictors of events.

Conclusions: In patients with severe AS, a ZV>3.2 mmHg/m²/m² is the strongest predictor of prognosis, independently from the treatment modality. The ventriculo-arterial interplay has thus a fundamental role in AS, defining the natural history of the disease and suggesting that a careful reduction of LV afterload could be very useful in the clinical management of these patients.