Right ventricular dysfunction before transcatheter aortic valve implantation: incidence, predictive factors and prognostic impact

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Background: Right ventricular dysfunction (RVD) is considered to be a late marker of advanced aortic stenosis (AS) and is associated with poor prognosis. Currently. there are conflicting data on the impact of RVD on clinical outcomes in patients with severe AS treated with TAVI. Moreover, few studies have studied the evolution (recovery or persistence) of RVD and its prognostic impact.

Objectives: To assess the incidence and predictive factors of RVD before TAVI, its prognostic impact and its evolution after TAVI.

Methods: All patients treated with TAVI for severe AS were included in a prospective single center database. Only patients who had a quantitative assessment of RV including Tricuspid Annular Plane Systolic Excursion (TAPSE) and/or doppler tissue imaging-derived tricuspid lateral annular systolic velocity (S') measurements, were eligible to this study. RVD was defined by a TAPSE $<$17 mm or S' $<$9.5 cm/s if TAPSE was not available.

Results: Between May 2014 and April 2019, 503 patients with RV function evaluation were included. Incidence of RVD before TAVI was 18.7%. Predictors of RVD were diabetes (P=0.03), atrial fibrillation (P=0.001), altered left ventricular ejection fraction (P$<$0.0001), left ventricular dilatation (P=0.007), and previous cardiac surgery (P=0.002). Long-term survival was altered in patients with RVD before TAVI as compared to those without RVD (HR 1.97, 95% CI: 1.1–3.4, P=0.01). One year after TAVI, 58.7% of patients with baseline RVD had a normal RV function and had similar outcome as compared to those without RVD at baseline. In contrast, patients with persistent RVD had the worst prognosis.

Conclusions: RVD is not rare and has a deleterious prognostic impact in patients treated by TAVI. Recovery of normal RV function is frequent after TAVI whereas persistence of RVD is associated with poor outcomes.