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The long-term impact of persistent pulmonary hypertension in patients undergoing TAVR with a self-expanding valve

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Background: Persistent severe pulmonary hypertension (PH) is considered to negatively affect early and late outcomes of patients undergoing aortic valve surgery. There is limited data however, cincerning the incidence of persistent PH after transcatheter aortic valve replacement (TAVR) and its impact on outcome is limited.

Purpose: We sought to investigate the impact of persistent PH on clinical outcomes of patients undergoing TAVR with a self-expanding valve.

Methods : Consecutive patients with severe symptomatic aortic stenosis scheduled for TAVR in our tertiary center were included in the study. Prospectively collected data before and after TAVR were retrospectively analyzed in all patients. Severe PH was defined as systolic pulmonary arterial pressure (sPAP) ≥45mmHg as assessed by echocardiography. For analysis purposes, patients with a sPAP decrease after TAVR to below 45mmHg were compared to patients with persistent PH following TAVR. All outcomes were evaluated according to the VARC-2 criteria.

Results: In total, 258 patients were included in this study (mean age 80.06 ± 7.50 years old, logEuroscore 24.50 ± 9.70%, NYHA III/IV Class 98.6%). Of these, 149 (57.8%) had sPAP less than 45mmHg and 109 (42.2%) had sPAP above or equal to 45mmHg at baseline. Patients with severe PH were older (81.1 ± 7.0 vs 79.1 ± 7.7, p = 0.034), presented with higher logEuroscore (26.9 ± 9.3% vs 22.5 ± 9.9%, p< 0.001), lower ejection fraction (47.9 ± 9.3% vs 52.2 ± 8.5%, p< 0.001) and higher rates of at least moderate mitral regurgitation (36.7% vs 16.2%, p = 0.002) compared to the group without PH. After TAVR, 161 (62.4%) patients had sPAP less than 45mmHg and 97 (37.6%) had sPAP above 45mmHg. There was a significant decrease of 2.4 ± 12.2mmHg in sPAP post TAVR (p < 0.01). Multivariable analysis (univariate analysis: age, logEuroscore, pre TAVR mitral regurgitation, pre TAVR ejection fraction below 40%) identified pre TAVR ejection fraction below 40% to be the most powerful predictor for persistent PH after TAVR (odds ratio 2.4, 95% confidence interval 1.0.9 – 5.26, p = 0.028). During a mean follow up period of 26.6 ± 26.8, the presence of pre TAVR severe PH was not found to be predictive of cumulative mortality[Hazard Ratio(HR) : 1.57, 95% Confidence Intervals (CI) 0.92 – 2.66, p = 0.09). However, in the same follow up period, patients with persistent PH after TAVR had higher cumulative risk of death compared to patients with sPAP < 45mmHg after TAVR (Hazard Ratio 0.49, 95% Confidence Intervals 0.29-0.82, p = 0.007) (Figure).

Conclusions: Our data suggest that TAVR is associated with a significant reduction in sPAP. Persistent PH post TAVR seems to be a predictor of higher cumulative mortality post TAVR.

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