Valvular Heart Disease

THE MPAP/CO SLOPE AND OXYGEN UPTAKE ADD PROGNOSTIC VALUE IN AORTIC STENOSIS

Poster Contributions
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Background: Guidelines redefined exercise pulmonary hypertension as a mean pulmonary artery pressure/cardiac output (mPAP/CO) slope >3 mmHg/L/min. A systolic pulmonary artery pressure (peak sPAP) >60 mmHg during exercise has been associated with an increased risk of cardiovascular events in aortic valve stenosis (AS). The prognostic value of the mPAP/CO slope in AS remains unknown.

Methods: In this prospective cohort, 143 patients with an aortic valve area (AVA) ≤1.5 cm^2 underwent cardiopulmonary exercise testing with echocardiography. The occurrence of cardiovascular death, heart failure hospitalization, new-onset atrial fibrillation and aortic valve replacement was evaluated during a 1-year follow-up. Findings were externally validated.

Results: Peak aortic velocity (odds ratio per standard deviation (OR per SD), 1.48; p=0.036), indexed left atrial volume (LAVi; OR per SD, 2.15; p=0.001), E/e' at rest (OR per SD, 1.61; p=0.012), mPAP/CO slope (OR per SD, 2.01; p=0.002) and peak exercise oxygen uptake (VO$_2$, % predicted; OR per SD, 0.59; p=0.007) independently associated with cardiovascular events at 1 year, whereas peak sPAP did not (OR per SD 1.28, p=0.219). Peak VO$_2$ (%) and mPAP/CO slope provided incremental prognostic value in addition to LAVi and AVA (p<0.001).

Conclusion: In moderate and severe AS, mPAP/CO slope and peak VO$_2$ (%) were independent predictors of cardiovascular events, while peak sPAP was not. Both peak VO$_2$ (%) and mPAP/CO slope cumulatively improved risk stratification.