CAN SELECTIVE PULMONARY VASODILATOR THERAPY BE USED TO TARGET PULMONIC REGURGITATION? RESULTS OF THE PINOT NOIR TRIAL

ACC Oral Contributions
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Authors: Stephen A. Hart, Ganesh Devendra, Yuli Kim, Vidyasagar Kalahasti, Scott Flamm, Richard Krasuski, Cleveland Clinic, Cleveland, OH, USA

Background: Both tetralogy of Fallot (TOF) repair and pulmonary valvotomy for pulmonic stenosis (PS) result in progressive pulmonary insufficiency (PI), which eventually necessitates repeat surgery. Though percutaneous therapy is growing in popularity, it remains ill-suited for native right ventricular (RV) outflow tracts. We sought to examine the feasibility of medical therapy in these patients.

Methods: We designed a study to measure the acute impact of inhalation of 40 ppm of nitric oxide (iNO) in 16 patients with significant PI using cardiac magnetic resonance imaging (CMR). Patients with at least moderate PI by echo were prospectively enrolled; they were excluded if a RV-PA conduit or significant native pulmonic stenosis was present. Ventricular volume and blood flow sequences were obtained at baseline and after iNO.

Results: Eleven patients had prior TOF repair and 5 had prior valvotomy. Median age [range] was 35 [19-46] yrs, BMI was 26±5 kg/m², 50% were women and 75% were NYHA class I. Right ventricular end diastolic volume index was 157±33 mL/m², end systolic volume index was 93±20 mL/m² and RV ejection fraction was 40±6%. Baseline pulmonary regurgitant volume was 45±25 mL/beat and regurgitant fraction was 35±16%. During administration of iNO, regurgitant volume was reduced by an average of 6±9% (p=0.01) and regurgitant fraction was reduced by an average of 5±8% (p=0.02). No statistically significant changes were observed in stroke volume, ejection fraction or cardiac output for either the left or right ventricle.

Conclusion: iNO administration appears to reduce the regurgitant fraction in patients with PI, suggesting a potential role for selective pulmonary vasodilator therapy in these patients. Drug therapy that also augments RV function such as phosdiesterase-5 inhibition may provide even further benefit and merits further study.