HEMODYNAMIC CAUSES FOR EXERCISE INTOLERANCE IN FONTAN PATIENTS

Poster Contributions
Hall C
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Session Title: Functional Heart Assessment and Outcomes in Congenital Heart Disease and Hypertrophic Cardiomyopathy
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Background: Exercise intolerance is frequent among Fontan patients and may be an important determinant for quality of life. This study investigated the hemodynamic causes of impaired exercise capacity in Fontan patients with particular focus on the influence of heart rate (HR) and stroke volumes.

Methods: In 38 Fontan patients, peak oxygen consumption (VO2), HR and non-invasive measures of cardiac output (CO) and stroke volume index (SVI) were recorded during incremental load exercise test and compared with 19 age and gender matched controls.

Results: The Fontan patients had a lower VO2, CO and HR at peak exercise than controls, all p<0.0001. Furthermore, SVI dropped 14% (from 44.2±10.6 to 37.6±7.3 ml/m2) in Fontan patients from the peak plateau to maximal exercise vs. 5% (from 57.2±8.4 to 54.4±7.8 ml/m2) in controls, p<0.0001.

The low SVI and HR explained 67% and 20% of the difference in peak VO2 between Fontan patients and controls respectively.

Conclusions: Low SVI at maximal exercise was the most important hemodynamic factor limiting exercise capacity in Fontan patients, whereas chronotropic impairment had a smaller impact. The low HR and SVI at maximal exercise accounted for the difference in peak VO2 between Fontan patients and controls in this study. Further studies are needed in order to identify the causes of the decreasing SVI during exercise in Fontan patients.