

C29

Jeremy Wadowski

Advisor(s): Sarita Dhuper

Comparing Cardiorespiratory Fitness in Pediatric Patients with Congenital Heart Disease, Increased Cardiac Risk, or Severe Obesity to Healthy Controls

Rationale: The relationship between low cardiorespiratory fitness (CRF), cardiovascular disease and all-cause mortality is well established. CRF testing is typically done in children with conditions predisposing to CV risk, congenital heart disease (CHD), and obesity. This study compared CRF in children with severe obesity to those with relative cardiac risk and healthy controls. **Methods:** A retrospective review of patients referred for cardiopulmonary exercise testing (CPET) was performed. Patients were categorized into 4 groups including healthy controls, non-obese cardiac group 1 (mild CHD or with increased cardiac morbidity risk, e.g. sickle cell disease), cardiac group 2 (severe complex post-operative CHD), and severe class III obesity. Measured CPET variables included oxygen consumption at peak exercise (VO₂max) and anaerobic threshold (AT), endurance time (ET), maximum heart rate (HR) and heart rate recovery (HRR), minute ventilation (VE) vs. VCO₂, peak respiratory quotient (RQ), and subjective Rating of Perceived Exertion (RPE). Kruskal Wallis, ANOVA and chi-square tests were used in the statistical analysis. **Results:** A total of 210 patients were included with mean age of 15.15 (3.21); 61.9% were male and 85.7% African American. Class III obesity had a significantly lower ET and relative peak VO₂(mL/kg/min) (p<0.001) and highest HRR at all intervals (p<0.024). Cardiac group 1 had a significantly longer endurance time (p<0.029) and maximum heart rate (p<0.001) compared to Cardiac group 2. There was no significant difference in peak RPE or peak RQ. **Discussion:** Class III obesity showed the lowest CRF measures compared to all other groups, including severe complex post-operative CHD. This objective comparison of CRF in severe obesity reinforces the concept that obesity is a chronic disease with severe associated cardiometabolic risk and requires an urgency for its treatment with intensive lifestyle changes, anti-obesity medications and/or surgery.