

Predicting VO₂ peak from Six Minute Walk Test in Patients with Pulmonary Hypertension

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(No relationships reported)

Cardiopulmonary Exercise Test (CPET) and Six-minute walk test (6MWT) are important tools in the evaluation and follow up of patients with Idiopathic Pulmonary Arterial Hypertension (IPAH).

PURPOSE: To determine if the simple Six-minute walk test (6MWT) is a valid predictor of VO₂ peak in patients with IPAH.

METHODS: 157 patients being treated for IPAH from 2003 to 2013 were included in this study. A 6MWT and a Cardiopulmonary Exercise Test (CPET) were performed as part of routine care. The 6MWT was conducted in accordance with American Thoracic Society (ATS) standards, using a 30m hallway. Heart rate (HR), pulse oximetry (SpO₂) via finger probe and Borg's rate of perceived exertion (RPE) were measured at baseline and post-test. The CPET was performed on a cycle ergometer using a ramp protocol. Electrocardiogram (EKG), analysis of expired air, SpO₂, and blood pressure (BP) were monitored throughout the CPET. Subjects were stratified post-hoc by age (26 children=6-12 mean age 9.96±1.66, 73% female 27% male ; 49 adolescents=13-18 mean age 15.33±1.86, 47% female 53% male; 82 adults=>19 mean age 27.33±6.70, 69.5% female 30.5% male), for between-group comparison of anthropometric and 6MWT variables. Multiple linear regression analysis was performed to predict VO₂ peak for each of the groups from the 6MWT.

RESULTS: The regression equation generated for the children group (VO₂ peak= 38.853 + 4.847xGender - 0.073Height - 0.293xWeight +15.022xSpeed (m/s) - 1.153xDyspnea (Borg 1-10) -0.175xResting HR) was the only model to significantly predict VO₂ peak (r²=0.80, p=0.804). Similar models for the adolescent and adult groups did not achieve statistical significance (r²=0.39, p=0.142 and r²=0.38, p=0.025, respectively)

CONCLUSION: The measured VO₂ peak of the patient population varied greatly by age. A 6MWT was able to accurately predict VO₂ peak in children (6-12 years) with IPAH, however the model failed to predict VO₂ peak in older populations. These findings suggest that CPET measured VO₂ peak is the only reliable method for the evaluation of all patients with IPAH.