Changes in Peak Oxygen Consumption with Early Outpatient Cardiac Rehabilitation

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Abstract

Introduction: Measurement of peak oxygen consumption (peak VO2) has been shown to accurately predict outcomes for patients in Cardiac Rehabilitation (CR). Improvement in peak VO2 after CR has not been extensively studied.

Purpose: To assess changes in directly measured peak VO2 after participation in early outpatient CR.

Methods: This was a population-based cohort study of Olmsted County Minnesota residents who participated in CR at Mayo Clinic, Rochester, MN.

The data was extracted from medical records for patients who participated in CR between 2002-2012. Dependent variables include baseline peak VO2, and post-CR peak VO2. These variables were compared to the number of sessions completed and sex (independent variables) for each patient. The mean CR sessions attended was calculated to be 21 sessions and was used to define CR benefits. Data are described using mean ± standard deviation or number (percentages). Chi-Square, Student’s t-tests, and analysis of variance were used to determine statistical differences within and across groups.

Results: The population included 622 patients with 442 (71%) having a positive change in peak VO2. Of the 442 patients, 99 (22%) were male, and 343 (78%) were female. Baseline peak VO2 was 20.3±5.4 ml/kg/min, and the average post-CR peak VO2 was 21.5±5.9 ml/kg/min, average change in peak VO2 was 1.4±5.9 ml/kg/min (P<0.001). Peak VO2 was different for men and women at baseline (21.2±5.3 vs 16.8 ± 4.0, p<0.0001), at follow-up (22.6±5.9 vs 17.9±4.1, p<0.0001), and in the change in peak VO2 (1.4±2.0 vs 1.0±1.44, p≤0.03, respectively. We used the median number of sessions attended (21 sessions) to define CR peak VO2 benefit groups (<21 sessions: 144 (33%) vs. ≥21 sessions: 225 (61%)).

There was no significant difference in these two groups when compared by sex (<21 sessions: Male 121 (32.7%) vs. Female: 23 (6.2%) and ≥21 sessions: Male 171 (46.3%) vs. Female 54 (14.6%). Those individuals who attended ≥21 sessions had a greater improvement in VO2 compared to individuals who attended <21 sessions (1.6±3.0 vs -0.5±3.5 ml/kg/min, p<0.001). The VO2 for the <21 sessions was 18.2±1.1 ml/kg/min vs. 21.2 ± 1.7 ml/kg/min (P=0.007) for the ≥21 sessions group.

Conclusions: These findings suggest significant differences in baseline and post-CR peak VO2, between sexes. Additionally, individuals who participated in a greater number of CR session demonstrated a greater improvement in VO2. Our results confirm the importance of CR on aerobic capacity across sexes.

Discussion

- Individuals who participated in a greater number of CR session demonstrated a greater improvement in VO2.
- These findings suggest significant differences in baseline and post-CR peak VO2, between sexes.
- Our results confirm the importance of CR on aerobic capacity across sexes.