

Can Aerobic Exercise Improve Exercise Capacity and Quality of Life for Patients Living with Hypertrophic Cardiomyopathy?

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BACKGROUND

- Hypertrophic cardiomyopathy (HCM) is characterized by left ventricular hypertrophy in the absence of increased afterload².
- HCM is the most common inherited heart disease, affecting 1 in 500 individuals, and has been identified as a leading cause in sudden cardiac death in young adults³.
- Physicians caring for patients with HCM recommend conservative physical activity restrictions⁶.
- 50% of patients with HCM do not meet minimum physical activity guidelines due to the belief that they are unable to exercise⁶.
- Two-thirds of HCM related deaths in individuals between 5-59 years of age occur during routine daily activities (43%), and rest or sleep (24%)¹.

PURPOSE

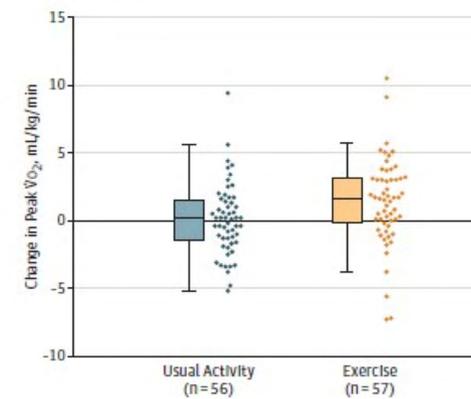
To determine the effects of aerobic exercise on HCM and evaluate if changes in aerobic fitness outweigh the theoretical risk seen with exercise in patients with HCM.

METHODS

- To date, only the RESET-HCM study (Study of Exercise Training in Hypertrophic Cardiomyopathy) has examined the effect of exercise training in patients with HCM⁵.
- 136 participants were randomly assigned to 16 weeks of moderate-intensity (3-5.9 METS) exercise training (n=67) or usual activity (n=69).
- Baseline studies included history and physical examination, a physical activity questionnaire assessing average weekly frequency and duration of exercise sessions in the previous month, 12-lead electrocardiography, serum biomarker analysis, genetic testing, transthoracic echocardiography, CMR, cardiopulmonary exercise testing, and QOL assessment⁵.
- Patients randomized to the exercise training group participated in a structured, unsupervised exercise program individually prescribed based on heart rate reserve derived from the baseline cardiopulmonary exercise test.
- Exercise was initiated at a minimum of 3 sessions per week, 20 minutes per session, at a heart rate corresponding to 60% of heart rate reserve (resting heart rate +0.6 [maximal heart rate minus resting heart rate]).
- A rating of perceived exertion on the Borg scale was used as a secondary measure of goal exercise intensity, and participants were instructed to maintain an intensity correlating to perceived exertion ratings between 11 to 14, which correlates with a moderate level of intensity.
- The exercise prescription was designed to increase exercise duration by 5 to 10 minutes every week, up to 60 minutes per session, 4 to 7 sessions per week, and then incrementally increase training intensity to a goal of 70% of heart rate reserve during the first month of the study protocol.
- Change in patient characteristics over time were performed using the *t* test for continuous variables and χ^2 or Fisher exact test for categorical variables. The Kruskal-Wallis test was used for testing differences in medians.
- Statistical significance was set at $P < .05$

RESULTS

Figure 2. Change in Peak Oxygen Consumption From Baseline to 16-Week Follow-up



Dark horizontal lines indicate median values, and the top and bottom of the boxes represent the 75th and 25th percentiles, respectively. The top and bottom whiskers represent the 97.5th and 2.5th percentiles, respectively. Individual data points are also shown. $P = .02$ for the difference between groups.

- At 16 weeks, the change in mean peak oxygen consumption was +1.35 (95% CI, 0.50 to 2.21) mL/kg/min among participants in the exercise training group and +0.08 (95% CI, -0.62 to 0.79) mL/kg/min among participants in the usual-activity group (between-group difference, 1.27 [95% CI, 0.17 to 2.37]; $P = .02$).
- There were no occurrences of sustained ventricular arrhythmia, sudden cardiac arrest, appropriate defibrillator shock, or death in either group.

CONCLUSION

- Findings from this study show that moderate intensity exercise improves overall cardiovascular health⁵.
- Such increases in fitness (1 MET) are associated with substantial reductions (21%) in all cause mortality. These benefits may outweigh the theoretical risks associated with exercise in patients with HCM⁴.
- The current study demonstrates the feasibility of implementation of a 16-week structured exercise program for patients with hypertrophic cardiomyopathy, with no major adverse events observed in either group⁵.
- This study provides support for a regimen of unsupervised brisk walking 4 to 7 days per week for a minimum of 30 minutes⁵.
- This study also provides the rationale for future studies examining longer-term outcomes related to exercise training in this population⁵.

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