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 afterload.
- 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 adults.
- Physicians caring for patients with HCM recommend conservative physical activity restrictions.
- 50% of patients with HCM do not meet minimum physical activity guidelines due to the belief that they are unable to exercise.
- 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%).

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 HCM.
- 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 assessment.
- 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.
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- Changes in patient characteristics over time were performed using the t-test for continuous variables and χ2 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

- 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 health.
- 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 HCM.
- 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 group.
- This study provides support for a regimen of unsupervised brisk walking 4 to 7 days per week for a minimum of 30 minutes.
- This study also provides the rationale for future studies examining longer-term outcomes related to exercise training in this population.

REFERENCES