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## Superior cardiovascular effect of aerobic interval training versus moderate continuous training in heart failure patients: a randomized study.

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### Abstract

**BACKGROUND:** Exercise training reduces the symptoms of chronic heart failure. Which exercise intensity yields maximal beneficial adaptations is controversial. Furthermore, the incidence of chronic heart failure increases with advanced age; it has been reported that 88% and 49% of patients with a first diagnosis of chronic heart failure are >65 and >80 years old, respectively. Despite this, most previous studies have excluded patients with an age >70 years. Our objective was to compare training programs with moderate versus high exercise intensity with regard to variables associated with cardiovascular function and prognosis in patients with postinfarction heart failure.

**METHODS AND RESULTS:** Twenty-seven patients with stable postinfarction heart failure who were undergoing optimal medical treatment, including beta-blockers and angiotensin-converting enzyme inhibitors (aged 75.5±11.1 years; left ventricular [LV] ejection fraction 29%; VO<sub>2</sub>peak 13 mL x kg<sup>-1</sup> x min<sup>-1</sup>) were randomized to either moderate continuous training (70% of highest measured heart rate, ie, peak heart rate) or aerobic interval training (95% of peak heart rate) 3 times per week for 12 weeks or to a control group that received standard advice regarding physical activity. VO<sub>2</sub>peak increased more with aerobic interval training than moderate continuous training (46% versus 14%, P<0.001) and was associated with reverse LV remodeling. LV end-diastolic and end-systolic volumes declined with aerobic interval training only, by 18% and 25%, respectively; LV ejection fraction increased 35%, and pro-brain natriuretic peptide decreased 40%. Improvement in brachial artery flow-mediated dilation (endothelial function) was greater with aerobic interval training, and mitochondrial function in lateral vastus muscle increased with aerobic interval training only. The MacNew global score for quality of life in cardiovascular disease increased in both exercise groups. No changes occurred in the control group. **CONCLUSIONS:** Exercise intensity was an important factor for reversing LV remodeling and improving aerobic capacity, endothelial function, and quality of life in patients with postinfarction heart failure. These findings may have important implications for exercise training in rehabilitation programs and future studies.

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