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The Effects Of Aerobic and Anaerobic Training On Heart Failure Patients

Cameron Weiser, Donna Cataldo PhD, 500 N 3rd St, Phoenix. AZ 85004

Clinical Exercise Physiology Program, Arizona State University, Phoenix, AZ

BACKGROUND

- Chronic heart failure is characterized by the heart's inability to pump blood at a sufficient rate to meet the metabolic demands of the body's tissues and organs.[1]
- This inability of the heart to pump enough blood is specifically linked to left ventricular dysfunction.[1]
- Heart failure is associated with high morbidity and mortality, poor quality of life and high cost of care.[3]
- Exercise intolerance is the primary manifestation of chronic heart failure and is a strong determinant of prognosis.[3]

PURPOSE

To examine the effect different types of aerobic and anaerobic training have among heart failure patients.

METHODS & RESULTS

- Thirteen patients characterized with heart failure and diminished ejection fraction engaged in an 18-week resistance training program 3 times per week at 80% of 1-RM intensity.[4]
- The strength exercises performed included 1) leg extension, 2) leg press, 3) leg curls, 4) shoulder press, 5) bench press, 6) bicep curls, and 7) lateral pull-downs.[4] *(results in Table 1)*
- 24 heart failure patients with HFpEF participated in a 16-week aerobic training program 3 times a week at an initial intensity of 40% - 50% of HRR and progressively increased to 60% - 70% of HRR.[3]
- Aerobic activity was carried out by cycling and on walking on a track.[3] *(results in table 2)*
- Twenty-seven patients with heart failure completed a 12-week interval training program mixed with aerobic and strength training.[2]
- Aerobic training was carried out on a cycle ergometer at a 70% - 80% of HR max.[2]
- Strength training consisted 3 sets of 10 – 12 reps of quadriceps and upper limb resistance exercises at an intensity of 50% of 1-RM.[2] *(results in table 3)*

Table 1. (Savage et al 2011)

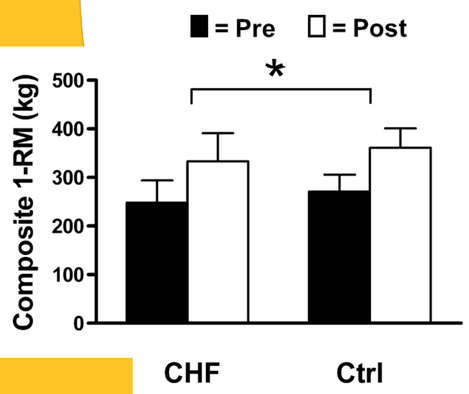
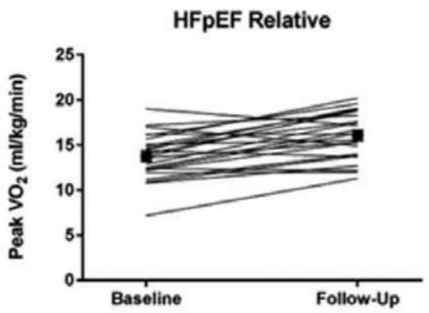


Table 2. (Pandey et al., 2017)



METHODS & RESULTS

Table 3. (Laoutaris et al., 2013)

Variable	Interval group (n = 18)		Aerobic group(n = 8)	
	PreTx	PostTx	PreTx	PostTx
VO_{2peak} (mL/kg/min)	16.8 ± 5.2	19.6 ± 6.2	17.6 ± 3.6	19.5 ± 4.1
Exercise time (min)	9.0 ± 2.0	10.5 ± 1.9	9.1 ± 1.2	9.9 ± 0.9
VT (ML/kg/min)	14.4 ± 4.5	16.3 ± 6.3	13.7 ± 2.1	15.1 ± 2.4
LVEF (%)	27.8 ± 8	30.4 ± 8.2	30.6 ± 5.4	33.4 ± 5.7

Ventilatory threshold (VT), Left ventricle ejection fraction (LVEF)
Pre training program (PreTx), Post training program (PostTx)

CONCLUSION/TAKEAWAYS

- Most beneficial results came when training program incorporated a higher exercising intensity.
- Interval training (70% - 80% of HR max) resulted in a 17% increase in aerobic capacity compared to 11% in continuous training. (40% - 70% of HRR).[2]
- Aerobic and interval training also proved beneficial in improving LVEF among heart failure patients.
- Resistance training elicited very beneficial results for heart failure patients with the data showing an increase of up to 33% in muscular strength after an 18-week resistance training program which had an intensity starting at 50% of 1-RM and progressively increasing to 80% of 1-RM.[4]
- The 33% increase among heart failure patients was also seen among healthy but sedentary individuals.[4]
- Further proving that regardless of being a heart failure patient or healthy sedentary individual, resistance training induces the same skeletal muscle adaptations across both populations.
- A trend is seen which points towards higher volume of activity elicits the most improved and beneficial results.

REFERENCES

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