Abstract: P1674

**High intensity interval exercise program in heart failure patients seems to benefit cardiac power along with aorto-ventricular mechanical pump capacity and cardiorespiratory indices.**

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Topic(s):
Experimental Heart Failure

Citation:

Funding Acknowledgements:
None

Background: Cardiac power has been suggested as the most powerful predictor of mortality in heart failure (HF) patients. In those patients aorta elastic properties and compensation is lost, systolic (and pulse) pressure are therefore reduced and associated with a decrease in ejection duration and pump efficiency. Cardiac rehabilitation programs have showed enhancement in cardiac performance and quality of life in HF patients.

Aim of this work was to evaluate the effect of high-intensity interval exercise (i.e., 30 sec at 100% of max workload, followed by 30 sec at rest, on a day-by-day 30 minutes working-out schedule for 12 weeks), on cardiac power, diastolic function indices, right ventricle performance and cardiorespiratory parameters among chronic HF patients.

Methods: 72 consecutive HF patients (NYHA class II-IV, ejection fraction <50%) who completed the study (exercise training group, n=33, 63±9 years, 88% men, and control group, n=39, 56±11 years, 82% men), underwent cardiopulmonary stress test, non-invasive high-fidelity tonometry of the radial artery, pulse wave velocity measurement using a SphygmoCor device, and echocardiography before and after completion of the training program. Cardiac power output (CPO) (W) was calculated as mean arterial pressure × CO/451, where mean arterial pressure = [(systolic blood pressure - diastolic blood pressure)/3] + diastolic blood pressure.

Results: Both groups reported similar medical characteristics and physical activity status. General mixed effects models revealed that the intervention group increased 6MWT (by 13%, p<0.05); increased cycle ergometry WRpeak (by 25%, p<0.01), showed higher O2max by 31% (p<0.001) and lower VE/VCO2 (p=0.05), whereas patients in the control group showed no significant changes in the aforementioned indices. Also, in the intervention group Emv/Vp was decreased by 14% (p=0.06); E to A ratio by 24% (p=0.004) and E to Emv ratio by 8% (p=0.05); while Stv increased by 25% (p=0.01). Most importantly, the intervention group reduced pulse wave velocity by 9% (p=0.05) and increased augmentation index by 26%; and VTI by 4% (p=0.05); Those parameters were not significantly changed on control group (all p>0.05).

Conclusion: High intensity exercise rehabilitation program revealed beneficial effect on left ventricular diastolic indices and right ventricle performance. As, in those patients compensation of the aorta is also lost and the LV cannot generate the extra force necessary to completely overcome the late systolic augmented pressure, the increase in the augmented pressure (Ala) observed in the intervention group reflects the benefit in aorto-ventricular coupling and cardiac power that boosts systolic pressure and restores a positive influence in pressure, like in early stages of HF.