AEROBIC INTERVAL TRAINING ELICITS DIFFERENT HEMODYNAMIC ADAPTATIONS BETWEEN HEART FAILURE PATIENTS WITH PRESERVED AND REDUCED EJECTION FRACTION

Jong-Shyan Wang. Graduate Institute of Rehabilitation Science, Chang Gung University, Taiwan. E-mail address: s5492@mail.cgu.edu.tw

Objectives
This investigation explored whether aerobic interval training (AIT) influences central/peripheral hemodynamic responses to exercise in heart failure patients with preserved (HFpEF) or reduced (HFrEF) ejection fraction.

Methods
One hundred twenty HF patients were randomly divided into four groups: HFpEF (EF>50%) and HFrEF (EF<30%) with AIT (3-minute intervals at 40% and 80% VO_{peak} for 30 minutes/day, 3 days/week for 12 weeks) and general healthcare groups (n=30 for each group). A noninvasive bio-reactance device was adopted to measure cardiac hemodynamics, whereas a near-infrared spectroscopy was employed to assess perfusion and O_2 extraction in frontal cerebral lobe (FC) and vastus lateralis muscle (VL), respectively.

Results
AIT for 12 weeks significantly (i) enhanced peak cardiac power output in HFrEF group and reduced E/E' ratio in HFpEF group, (ii) increased blood distribution to FC/VL and O_2 extraction by VL during exercise in HFpEF group compared to HFrEF group, (iii) heightened VO_{peak} in either HFpEF or HFrEF group and lowered V_E/VCO_2 slope in HFpEF group, and (iv) increased the Short Form-36 physical/mental component scores and decreased the Minnesota Living with HF questionnaire score in both HFpEF and HFrEF groups.

Conclusion
AIT effectively enhances cardiac hemodynamic response to exercise in HFrEF patients while increasing the delivery/utilization of O_2 to exercising skeletal muscles/cerebral tissues in HFpEF patients. Furthermore, enhanced central or peripheral hemodynamics by AIT may contribute to improving global/disease-specific quality of life in HF patients, respectively.