

## The Effects of High-Intensity Aerobic Interval versus Moderate-Intensity Continuous Aerobic Exercise on Post-Exercise Cardiovascular Responses

*D.S. Kimmerly, D. Ramsay, and A.M. Irwin*

*Dalhousie University, School of Health And Human Performance, Division of Kinesiology*

**Objectives:** After an acute bout of moderate-intensity continuous aerobic exercise (CAE), leg blood flow (LBF) and vascular conductance (LVC) remain elevated contributing to a corresponding decrease in arterial blood pressure (ABP). However, little is known about the vascular and ABP response following high-intensity interval aerobic exercise (HIAE). The current study tested the hypothesis that HIAE, matched for total work to CAE, would elicit greater post-exercise reductions in ABP and larger increases in LBF and LVC.

**Methods:** Heart rate (HR), ABP, blood lactate and LBF (popliteal artery, Doppler) were measured in 10 healthy participants (7M/3F,  $20.2 \pm 1.6$  years) in a side-lying position before and every 5 minutes for 1 hour following CAE and HIAE treadmill protocols. LVC was calculated as LBF divided by mean ABP. The HIAE consisted of four, 4-minute intervals at  $85\%VO_{2peak}$  separated by 3-minute active recovery intervals at  $55\% VO_{2peak}$ . The CAE protocol consisted of treadmill running at  $\sim 55\% VO_{2peak}$  for a duration that produced the same total oxygen consumption as HIAE.

**Results:** Compared to pre-exercise values, peak decreases in mean ABP ( $-6 \pm 1$  mmHg vs.  $0 \pm 1$  mmHg) and diastolic ABP ( $-5 \pm 2$  mmHg vs.  $-1 \pm 1$  mmHg), as well as, increases in blood lactate ( $10.5 \pm 3.2$  mmol/L vs.  $3.4 \pm 1.4$  mmol/L), HR ( $37 \pm 10$  beats/minute vs.  $21 \pm 6$  beats/minute) and leg vascular conductance ( $8 \pm 5$  mL/min/mmHg vs.  $5 \pm 4$  mL/min/mmHg) were greater during the passive post-exercise recovery period following HIAE than CAE (all,  $p < 0.05$ ).

**Conclusions:** These results highlight that a matched-work HIAE treadmill protocol resulted in greater skeletal muscle vasodilation during a 1 hour passive post-exercise recovery period than CAE. These data suggest that HIAE may prove to be more beneficial as a therapeutic strategy for patient populations with peripheral blood flow limitations (e.g., peripheral arterial disease).

\*Supported by a Canadian Foundation for Innovation: Leader's Opportunity Fund grant to D.S. Kimmerly.