

24. SWACSM Abstract

Rapid Onset Vasodilation with Lower Body Positive and Negative Pressure

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ABSTRACT

PURPOSE: Investigate the impact of muscle sympathetic activity changes on the hyperemic response to single muscle contraction (*i.e.*, rapid-onset vasodilation, ROV). **METHODS:** Muscle sympathetic activity was altered in 14 healthy young subjects (8 male, 6 female) through randomized application of lower body negative pressure (-10, -20, and -40 mmHg) and lower body positive pressure (+10, +20 mmHg). A 1-s hand grip contraction at 50% MVC was performed at each pressure and control (0 mmHg). Blood flow and vascular conductance were quantified with muscle blood flow being measured in the brachial artery using Doppler ultrasound and blood pressure being determined beat-by-beat using a Finometer finger blood pressure monitor. The ROV response was described by the area under the Δ VC-time curve (AUC, ml • min) and was normalized as a percentage of the AUC value of the control condition. **RESULTS:** Baseline muscle vascular conductance was significantly reduced from a baseline of 1.20 ± 0.75 ml•min⁻¹•mmHg to 0.97 ± 0.35 , 0.91 ± 0.45 , and 0.75 ± 0.28 ml•min⁻¹•mmHg during -10, -20, and -40 mmHg LBNP, respectively ($p < 0.05$). The AUC was reduced to $65.6 \pm 23.6\%$ of control during -40 mmHg LBNP ($p = 0.0004$) and increased $132.6 \pm 39.0\%$ of control ($p = 0.0108$) during +20 mmHg LBPP. **CONCLUSION:** In healthy young individuals, changes in sympathetic muscle activity through LBNP/LBPP show a significant linear relationship with increases in sympathetic activity decreasing ROV and inhibition of sympathetic activity increasing ROV. A similar trend is observed with resting vascular conductance.