



## Mid Atlantic Regional Chapter of the American College of Sports Medicine

Annual Scientific Meeting, November 5<sup>th</sup> - 6<sup>th</sup>, 2021  
Conference Proceedings  
International Journal of Exercise Science, Issue 9, Volume 10



### The Effect of Vigorous Exercise on the Inter-Arm Difference in Systolic Blood Pressure

Benjamin A. McEldowney, Seth B. Markle, Jonathan D. Keyser, Chase M. Dillion, Alyssa M. Hahn, Benjamin D.H. Gordon, Brock T. Jensen, Michael E. Holmstrup. Slippy Rock University, Slippy Rock, PA

A large inter-arm difference (IAD+;  $\geq 10$ mmHg) in systolic blood pressure (BP) has been linked to poor cardiovascular health. Further, moderate-intensity exercise has been shown to induce an exercise-effect (eIAD) on this difference, unique to resting IAD status. The eIAD response to vigorous exercise is unknown. Finally, both hemodynamics and vascular biomarkers may help explain variability in vascular function, IAD status, and eIAD responses. **PURPOSE:** To determine the eIAD response to vigorous exercise, while considering the contributions of hemodynamics and vascular biomarkers. **METHODS:** BP was simultaneously measured using two automated, auscultatory monitors in apparently healthy individuals during a graded exercise test (GXT). Specifically, BP was measured at baseline, at the two-minute mark of each three-minute stage, immediately post-exercise, and during recovery. Continuous hemodynamic measurements were performed using non-invasive impedance cardiography. Finally, electrochemiluminescence assays were performed to determine the expression of markers of vascular injury from blood plasma drawn at rest and following the vigorous exercise bout. Descriptive and inferential statistics were generated. **RESULTS:** Nine individuals (31%) were IAD+ at rest. IAD- individuals ( $n=20$ , 69%;  $<10$ mmHg at rest) demonstrated an augmented relative percentage change in IAD during, immediately following, and in recovery from vigorous exercise. Hemodynamic variables including stroke volume, cardiac output, and systemic vascular resistance did not differ by IAD status and followed expected patterns during exercise. C-reactive protein, intracellular adhesion molecule-1, and serum amyloid-A were not different based on resting IAD status or altered by vigorous exercise. However, an interaction was found where vascular adhesion molecule-1 (VCAM-1) was augmented in IAD+ and attenuated in IAD- individuals pre- to post-exercise. **CONCLUSION:** In apparently healthy individuals, vigorous exercise induced by a GXT altered eIAD in accordance to resting IAD status, similar to previous studies. Resting IAD and alterations in eIAD may be independent of hemodynamic changes and the influence of select vascular biomarkers, though the further examination of VCAM-1 may be warranted due to a potential link with eIAD.