



Mid Atlantic Regional Chapter of the American College of Sports Medicine

Annual Scientific Meeting, November 4th- 5th, 2017
Conference Proceedings

International Journal of Exercise Science, Issue 9, Volume 6



Effect of Continuous BFR Exercise on Tissues Oxygenation Characteristics in Incomplete Spinal Cord Injured Patients

Jon R. Stavres^{1,2,3}, Tyler Singer¹, John D. McDaniel^{1,2}. ¹Kent State University, Kent, OH, ²Louis Stokes Cleveland VA Medical Center, Cleveland, OH, ³Penn State University, Hershey, PA

Previous reports indicate that blood flow restriction (BFR) maximizes muscular adaptations to low-intensity exercise, which may be particularly beneficial for individuals with incomplete spinal cord injuries (ISCI's). However, the effects of BFR exercise on tissue oxygenation characteristics have not yet been reported in this population. **PURPOSE:** To examine the effect of discontinuous BFR exercise on localized tissue oxygenation in a sample of subjects with iSCI's. **METHODS:** Nine individuals with iSCI's (all classified as ASIA-D) completed two bouts of unilateral knee extension (3 sets x 10 reps), which were matched for work and performed in a counterbalanced order. One set included BFR (125% of venous occlusion pressure; BFR), which was applied throughout exercise and rest. A control session was also performed without BFR. Tissue oxygenation characteristics were collected from the rectus femoris, and compared to baseline across time, sequentially between sets and rests, and between conditions. **RESULTS:** Oxyhemoglobin decreased during each set of CON (peak diff.= -93.0±99.0 NU), and was significantly lower throughout all of CON compared to BFR (peak diff.= -88.6±73.2 NU; all p<0.05). Deoxyhemoglobin significantly increased between sets of CON compared to baseline (peak diff.= +25.6±33.6 NU), and throughout all but the first set of exercise in BFR (peak diff.= +153.5±86.8 NU, all p≤0.05). Total Hb significantly increased from each set of exercise to its subsequent rest period in both conditions (Peak diff.= 117.23±70.2 NU and 98.1±67.4 NU in CON and BFR, respectively), and was higher throughout BFR exercise compared to CON exercise (P≤0.003 for all). Lastly, tissue oxygenation index decreased from the first rest period throughout the exercise bout compared to baseline in CON (peak difference= -3.2±2.4 %), throughout the entire exercise bout compared to baseline in BFR (peak difference= -8.0±3.5%), and across the entire exercise bout in BFR compared to control (p<0.03 for all comparisons). **CONCLUSIONS:** These data suggest that BFR knee extension exercise at 125% of venous occlusion pressure is sufficient in eliciting significant venous and arterial restriction during knee extension exercise in this population, but seems to leave the muscle pump intact.