

## Acute Effects of Aerobic Exercise with Blood Flow Restriction on Pulse Wave Velocity in Females

BRITTANY ESPARZA, MARGARITA GONZALEZ, PATRICK MURPHY, MURAT KARABULUT

Health and Human Performance Lab; Health and Human Performance; University of Texas Rio Grande Valley; Brownsville, TX

---

*Category: Masters*

*Advisor / Mentor: Karabulut, Murat (murat.karabulut@utrgv.edu)*

### ABSTRACT

**PURPOSE:** To investigate the acute effects of a 20-minute walk/run at 40% VO<sub>2</sub> with and without blood flow restriction on pulse wave velocity (PWV).

**METHODS:** Seventeen female subjects, between the ages of 18 and 40, signed informed consent and were familiarized with the study protocol, on the same day measurements were assessed: height, weight, body composition, and thigh circumference. Followed by each subject performing the Bruce Protocol on a treadmill. Subjects were asked to come back to the lab hydrated and 8 hours fasted on two different days (separated by at least 48 hours). After reaching hydration, participants were asked to lie down in the supine position for a minimum of 10 minutes and baseline hemodynamics and measurement of PWV using SphygmoCor® CPV Pulse Wave Analyzer. The sites tested were carotid to radial (C-R), carotid to femoral (C-F), and femoral to posterior tibial (F-PT). The randomized testing sessions consisted of two 20-minute walk/run sessions at 40% VO<sub>2</sub> intensity with BFR cuffs inflated (BFR), and the BFR cuffs uninflated (CON). Tightness of the cuffs was set at 55-60 mmHg for BFR, and the cuffs were placed snug enough that they don't move during exercise for the CON session. The final cuff pressures were achieved by starting at 120 mmHg and increasing progressively by 20 mmHg with 10 s rest in between increments. Upon completion of exercise, post exercise PWV was assessed at immediately, 15, 25, and 45 minutes.

**RESULTS:** No condition\*time interaction or condition and time main effects were observed for C-R and C-F sites ( $p > 0.05$ ). There were no significant condition\*time interaction or time main effect for the F-PT site ( $p > 0.05$ ), but a significant condition main effect was detected at the 15 minute mark post exercise following the BFR session ( $p < .01$ ).

**CONCLUSION:** The results suggest that the BFR session resulted in an improved arterial compliance at the F-PT site. This may have been caused by the increased shear stress from blood pooling during the BFR session resulting in a greater release of nitric oxide therefore vasodilation in the lower body. There may be a practical application of using this combination of exercise and settings to help improve cardiovascular health. Since this was an acute study, future training studies should look at the chronic effects on pulse wave velocity using these settings.