

Investigating the Use of Vibration Platform and Blood Flow Restriction as a Warm-Up Procedure

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ABSTRACT

Blood Flow Restriction (BFR) training is a novel form of exercise that is emerging as an alternative to traditional resistance training. The research on BFR training as a warm up is limited. **PURPOSE:** The purpose of this study was to observe the combined effect of a whole body vibration (WBV) warm up and Blood Flow Restriction (BFR) on muscle temperature, flexibility, vertical jump height, and estimated VO₂max. **METHODS:** Nineteen subjects (8 males and 11 females; Mean \pm STDEV age = 24.21 \pm 3.47 years; height = 166.94 \pm 8.82 cm) completed the study, which involved performing a warm-up protocol under 5 conditions. The conditions were: 5-min treadmill walking (C1), 5-min WBV at a low amplitude (C2), 5-min WBV at a low amplitude with BFR (C3), 5-min WBV at a high amplitude (C4), 5-min WBV at a high amplitude with BFR (C5). For the BFR sessions, cuffs were placed on the uppermost portion of the thighs. Cuffs were then inflated to 120 mmHg, and then increased in increments of 20 mmHg until the final pressure was achieved. Final pressure was found via thigh circumference and capillary refill time. The vibration plate was set at a frequency of 30 Hz. During the four interventions, the subjects performed 3 lower-body exercises (squat, sumo squat, calf raises) for 60 seconds each, with 30 seconds of rest between exercises. Thigh temperature was measured between exercises. Total training time with rest was 12 minutes. Following the warm-ups, vertical jumping height, flexibility, and aerobic fitness (via Queen's College Step Test) were assessed. **RESULTS:** Significant time and gender main effects for thigh temperature were seen ($p < .01$). Males had a higher mean thigh temperature than females. A significant condition main effect for average flexibility values was detected ($p < .01$). The C4 (compared to C1, C2, and C3) and C5 (compared to C1 and C2) protocols resulted in higher values in flexibility ($p < 0.03$). There was also a significant condition*gender interaction for estimated VO₂ max ($p < 0.04$). Females had the highest values for estimated VO₂max following the C1 protocol and the lowest for the C5 protocol, but males had the highest values for estimated VO₂ max following the C5 protocol. **CONCLUSION:** Based on our findings, the high amplitude WBV condition with or without BFR improved flexibility, but the effects of conditions on estimated VO₂ max values were different for each gender. The findings indicate that gender of individuals performing tests may be important and should be considered for testing different health/fitness variables.