

Walking with Leg Blood Flow Restriction: Wide-Rigid Cuffs vs. Narrow-Elastic Bands

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ABSTRACT

Blood flow restriction (BFR) training has become a popular form of exercise in recent years. The concept is that light-load exercise with BFR elicits similar adaptations achieved with heavy-load exercise. Walking exercise in combination with pressurized wide-rigid (WR) cuffs has been shown to elicit higher cardiac workload and a vascular dysfunction due presumably to reperfusion injury to the endothelium. In contrast, narrow-elastic (NE) BFR bands may elicit different hemodynamic effects, as the limb is able to increase in diameter with increased blood flow accompanying exercise. **PURPOSE:** To compare two distinct forms of BFR bands during light-intensity exercise on cardiovascular responses **METHODS:** Eight young healthy participants (M =5, F=3) performed 5 bouts of 2-minute walking intervals at 3.2 kph with a 1-minute rest and deflation period between bouts with either WR or NE bands placed on both upper thighs. Cuff pressure was increased to 160 mmHg in WR cuffs and 300 mmHg in NE bands. Beat-by-beat blood pressure and heart rate were measured continuously using finger plethysmography. Blood lactate concentration, rating of perceived exertion (RPE), flow-mediated dilation (index of endothelium-dependent vasodilation), and cardio-ankle vascular index (measure of arterial stiffness) were assessed before and after the walking exercise. **RESULTS:** At baseline, there were no significant differences in any of the variables between the WR and NE conditions. Heart rate increased similarly in both conditions. Increases in systolic and diastolic blood pressure were greater ($p<0.01$) in the WR than the NE condition ($160\pm13 / 92\pm11$ mmHg vs. $127\pm9 / 71\pm16$ mmHg, respectively). Double product, a function of heart rate and systolic blood pressure, increased to a greater extent in the WR than in the NE condition. Increases in RPE and blood lactate concentration from baseline were greater in the WR compared with the NE condition ($p<0.05$). **CONCLUSION:** Use of wide-rigid BFR cuffs resulted in a marked increase in pressor responses compared with narrow-elastic BFR bands, suggesting that narrow-elastic bands may present a safer alternative for at-risk populations to perform BFR exercise.