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A Backpack Hip Strap Does Not Influence Oxygen Consumption or Blood Pressure in 30 minutes of Walking

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Energy expenditure increases when carrying a loaded backpack. However, it is unclear what effects, if any, the use of a backpack hip strap has on metabolic and cardiovascular stress during exercise. **PURPOSE:** To determine if a backpack hip strap has any beneficial physiological effects while walking. **METHODS:** Thirteen subjects (23 ± 4.8 yrs; 5 females, 8 males) walked for 30 minutes on a treadmill with a backpack containing 30% of the wearers bodyweight. The treadmill was set to 3% grade with a speed eliciting a heart rate reserve of 40-50%. Two trials were performed: unstrapped (UnST) and strapped (ST). Heart rate (HR), oxygen consumption (VO_2), and systolic blood pressure (SBP) were measured throughout each trial. Five minute averages were calculated for each variable from baseline (BL) to 30 minutes. SBP measures were calculated as change scores from the first 5 minutes of baseline. A repeated measures ANOVA was used to evaluate the differences between conditions at each time point. **RESULTS:** HR beginning at 10mins (UnST: 131 ± 4 bpm; ST: 130 ± 4 bpm) was elevated compared to BL (UnST: 81 ± 4 bpm; ST: 80 ± 4 bpm) and 5mins (UnST: 121 ± 4 bpm; ST: 120 ± 3 bpm). All other HR measures were similar. No difference in HR was found between trials ($p=0.912$) at any point. VO_2 at 5mins (UnST: 1.6 ± 0.1 L/min; ST: 1.5 ± 0.1 L/min) was elevated ($p<0.001$) compared to BL (UnST: 0.38 ± 0.02 L/min; ST: 0.38 ± 0.03 L/min), but was similar to all other time points. There was no difference in VO_2 between trials ($p=0.317$). The change in SBP at 0-5 min (UnST: 26 ± 8 mmHg; ST: 31 ± 6 mmHg) was similar to the rest of the time points throughout the trial ($p=0.115$) and did not differ between trials ($p=0.224$). **CONCLUSION:** These results indicate that use of a backpack hip strap has little effect on oxygen consumption or systolic blood pressure during 30 minutes of walking with a load of 30% the wearers body weight.