The Acute Effects of a Weighted Load on Glucose Metabolism
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Pre-exercise carbohydrate (CHO) intake has the potential to induce rebound hypoglycemia during aerobic exercise. **PURPOSE:** To evaluate the effects of pre-exercise CHO ingestion on blood glucose (BG) response during weighted-vest (40 lb. ruck) treadmill exercise. **METHODS:** Four males and one female member of Shippensburg University’s Army Reserve Officer Training Corps (ROTC) participated in a protocol consisting of 4 experimental trials. Trials consisted of a 20-minute simulated ruck march at a continuous speed of 3.5 mph with grade alternating between 0% and 7% incline every 5-min. A control trial (CON), pre-exercise glucose trial (CON-GL), ruck control trial (R-CON), and ruck with pre-exercise glucose trial (R-GL) were performed in sequential order. Glucose trials were performed after a four-hour fast and involved consuming 300 ml of a 13.3% CHO solution, delivering 40 g of glucose. CHO was consumed 10 min prior to exercise. Dependent variables included BG, heart rate, oxygen uptake (VO₂), and respiratory exchange ratio (RER). **RESULTS:** Blood glucose levels did not differ significantly between trials. However, RER was significantly different between CON-GL and R-GL (0.84 ± 0.02 vs. 0.90 ± 0.03; p = 0.042) and a trend (p=0.062) was present for CON vs. R-GL. VO₂ was different between CON and R-GL and R-CON (25.44 ± 2.9 vs. 32.90 ± 0.9 (R-GL) and 32.26 ± 1.4 ml•kg⁻¹•min⁻¹; p = 0.012 and .007, respectively); a trend (p=0.075) was also present for CON-GL VO₂ to be different from R-GL VO₂ (28.34 ± 0.8 vs. 32.9 ± 0.9 ml•kg⁻¹•min⁻¹). **CONCLUSION:** CHO intake immediately prior to moderate-to-vigorous exercise may influence CHO oxidation but was not found to adversely affect BG concentration or other physiologic measures. While timing of pre-ex CHO ingestion may be relevant if seeking to avoid rebound hypoglycemia, CHO consumed 10 min prior to ruck marching did not induce a hypoglycemic response.