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Effects of Precooling on Recreationally Active Individuals During Loaded Carriage Foot Marches in Heated Conditions

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Over the last 20 years, literature has demonstrated that military members are prone to exertional heat illness (EHI) due to engaging in physical activity while carrying necessary military equipment. Solutions such as cold-water immersion or convective cooling vests help ease this physiological strain, however, these methods require time, space, equipment, and/or costs that may make them impractical for broad implementation. Precooling (Pc) is when an individual either applies an external cooling method or ingests a cold substance to preemptively lower core temperature before an activity. **PURPOSE:** The aim of this study was to investigate the effects of a Pc protocol employing ice slurry ($0\pm 1^{\circ}\text{C}$) vs. cold water (4°C) on core body temperature (CT) and time to exhaustion (TTE, minutes) during a simulated military full combat gear foot march in males aged 18 to 35 years. **METHODS:** Six college aged males, (23.5 ± 1.0 y/o, 91.0 ± 9.3 kg, 183.3 ± 8.1 cm), engaged in two separate simulated army ruck march trials in heated conditions ($33\pm 2^{\circ}\text{C}$). The researchers used a Pc protocol of 7.5g/kg of bodyweight of both water (control) and ice-slurry (experimental) administered over a 30-minute period prior to activity. Following the Pc protocol, the participants self-selected a pace from 3.0-4.0 MPH and walked for up to 90 minutes or until volitional fatigue inside a heat tent while wearing full Army combat gear. CT, heart rate (HR) and RPE were collected every 5 minutes. Blood pressure was collected pre and post exercise. A t-test was run for TTE, and two separate ANOVA's were conducted on both HR and CT. **RESULTS:** There was no significant difference in TTE (control = 26.3 ± 8.2 min vs. Pc = 28.2 ± 11 min; $p = 0.227$), HR (control = 133.6 ± 13.4 bpm vs. Pc = 135.7 ± 16.2 bpm; $p = 0.763$) or CT (control = $37.4\pm 0.4^{\circ}\text{C}$ vs. Pc = $37.4\pm 0.4^{\circ}\text{C}$; $p = 0.876$) between conditions. **CONCLUSION:** The Pc protocol was ineffective at lowering CT vs. control and thus did not increase TTE. Additional research on ice slurry Pc with military equipment is needed to further elucidate the potential benefits of Pc on exercise performance and decreasing the risk of EHI.