

Comparison Of Cognitive Performance Following One Hour Of Passive Heating Or Walking In Older Adults: A Preliminary Analysis

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ABSTRACT

Moderate-intensity exercise increases measures of cognitive performance such as working memory and cognitive flexibility. Hyperthermia can result in declines in cognitive performance through reduced motor function and response inhibition. However, these results have been observed during cognitive performance in the heat while core temperatures remain elevated. Heat therapy may promote improvements in cognitive function after treatment similar to exercise training by inducing a stress-related response. The purpose of this study was to compare cognitive performance immediately following one hour of moderate-intensity aerobic exercise or one hour of whole-body passive heating. **METHODS:** Four adults (age: 67.3 ± 3.3 years, BMI: 29.0 ± 5.4 kg/m², 2 female) participated in a randomized repeated measures study. Participants completed either one hour of moderate intensity walking on a treadmill (TM; 65-75% age-predicted maximum heart rate) or one hour of seated passive heating (HEAT) in a controlled environmental heat chamber (32-35 degrees Celsius, < 40% humidity). Cognitive performance was measured using computerized software (Automated Neuropsychological Assessment Metrics, ANAM, Vista LifeSciences, Inc.), which provides objective measures of cognitive performance through a variety of test batteries designed to measure variables such as motor coordination, cognitive flexibility, and response inhibition. Variables were analyzed as a change in score from the familiarization exam (pre- or post-treatment minus - baseline) to minimize the learning effect. **RESULTS:** No differences between measures of motor coordination (TM: 6 ± 12.7 vs. 5 ± 12.7 ; HEAT: 0 ± 1.4 vs. -1 ± 1.4), cognitive flexibility (TM: -1 ± 1.4 vs. 1.5 ± 0.7 ; HEAT: 3.5 ± 0.7 vs. 3.5 ± 0.7), or response inhibition (TM: 17 ± 22.6 vs. 23.5 ± 23.3 ; HEAT: 1.5 ± 2.1 vs. 8 ± 2.8) were found following either treatment. **CONCLUSION:** One bout of moderate intensity aerobic exercise or whole-body passive heating does not impair cognitive performance. In addition, one hour of passive heating does not result in decreased cognitive performance in older adults. Post-hyperthermic stress response did not impair cognitive function.