TACSM Abstract

Sex Differences in Change in Skin Temperature When Exercising in a Hot, Humid Environment

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ABSTRACT

The risk for heat-related illness is increased when exercising in a hot, humid environment. In an effort to protect the athlete, body temperature is measured continuously while exercising in extreme environments. Currently, researchers and laboratory personnel employ the use of mean skin temperature to monitor athlete safety; however, this measurement fails to consider localized changes in temperature that may arise as a function of sex and exercise time. Therefore, the purpose of this study was to examine potential sex differences in the change in skin temperature at 17 different upper body locations while exercising in a hot, humid environment. Young men and women were recruited and completed a 60-min walk/jog interval protocol in a hot (34.1 ± 1 °C), humid (64 ± 8%) environment while skin temperature was continuously measured. To account for differences that may have arisen due to differing workloads between men and women, energy expenditure and metabolic heat production were calculated after the completion of exercise. Data was analyzed either a repeated-measures ANOVA (change in skin temperature) or *t-test* (energy expenditure and metabolic heat production). Location of interaction effects was determined using a Fisher's Least Significant Difference test. Significance was set a $p<0.05$ for all statistical testing. There was no difference between men and women in total energy expenditure; however, men were found to have a higher metabolic heat production. Women had a higher change in skin temperature at three locations on the back (left upper, right upper, and right mid-back). Conversely, there were no differences at any time point between men and women in the change in core temperature from baseline measurements. This study highlights the need to further investigate sex differences in cooling mechanisms while exercising in a hot, humid environment.