

Psychophysiological, Body Composition, Biomechanical and Autonomic Modulation Analysis Procedures in an Ultraendurance Mountain Race

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Abstract

The current research aimed to analyze psychophysiological, body composition, biomechanical and autonomic modifications in an ultraendurance mountain race. We analyzed 11 finisher voluntary athletes that participated in a 51.2 km ultraendurance mountain race. We measured before and after the mountain ultraendurance event the following parameters: Rate of perceived exertion, body composition, cortical arousal, blood pressure, body temperature, forced vital capacity, blood oxygen saturation, isometric hand strength and heart rate variability parameters. The results of temperature, rate of perceived exertion, heart rate and the percentage of body water at the end of the race increased significantly. However, the variables of body weight, body fat, muscle, body mass index, abdominal fat, blood oxygen saturation, systolic and diastolic blood pressure, cortical arousal and hands and legs strength significantly decreased after the race. The square root of the average of the sum of the differences squared between normal adjacent R-R intervals, percentage of differences between normal adjacent R-R intervals, high-frequency, sensitivity of the short-term variability, and long-term variability decreased significantly after the race. By contrary low-frequency increased significantly at the end of the race. An ultraendurance mountain event produced a large anticipatory anxiety response, an increase in sympathetic modulation, body fat consumption, percentage of body water, and RPE, not affecting the cortical arousal.

Keywords:

Cortical arousal, Heart rate variability, Bioimpedance, Rate of perceived exertion, Lactate, Training