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Hydration status, executive function and response to orthostatism following a 118-km mountain race: [inverted question mark]are they interrelated?.

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Abstract

Purpose. The present study aimed to explore whether Blood Pressure (BP) and Heart Rate Variability (HRV) responsiveness to orthostatism, jointly with Executive Function (EF) performance, were diminished following an ultraendurance mountain race. Besides, we wanted to assess whether hydration status was related to either performance or the abovementioned alterations.

Methods. Fifty recreational ultraendurance athletes participating in the Penyagolosa Trails CSP115 race (118 km and a total positive elevation of 5439 m) were evaluated before and after the competition. HRV and BP were measured in response to an orthostatic challenge. EF was evaluated using the color-word interference task of the Stroop test. Body Mass (BM) and Urine Specific Gravity (USG) changes were employed to assess hydration status.

Results. HRV and BP responsiveness to orthostatism were diminished following the race. Besides, a significant BM loss of 3.51 +/- 2.03% was recorded. Conversely, EF and USG showed no significant changes from prerace to postrace. Eventually, BM loss was inversely related to finishing time (r=-0.34) and postrace orthostatic HR and EF were positively associated (r=0.60).

Conclusions. USG and BM loss appears to provide different insights into hydration status and our results challenge the well-established criteria that BM losses >2% are detrimental to performance.

Practical Applications. Coaches are advised to consider athletes' performance level when interpreting their BM changes during an ultraendurance competition. Similarly, coaches should be aware that increased vulnerability to orthostatism is a common phenomenon following ultraendurance races and diminished HR responsiveness to orthostatism could constitute a practical indicator of EF worsening.