Acute metabolic, physiological and neuromuscular responses to two high-intensity intermittent training protocols in endurance runners

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BACKGROUND: Since a growing body of evidence points to mean training intensity over a season as a key factor to performance improvements, and there is wide evidence of the benefits of high-intensity intermittent training (HIIT) for endurance athletes, coaches need further information about the acute impact of typical HIIT workouts on endurance runners. OBJECTIVE: To compare the physiological strain and muscular performance parameters of endurance runners during two HIIT workouts by determining whether a typical HIIT for endurance runners (10 × 400 m) leads to a similar impact as a HIIT protocol (40 × 100 m) that increases the average training pace despite maintaining the same training volume. METHODS: Eighteen endurance runners performed 2 HIITs. Metabolic (blood lactate [BLa], blood ammonia [BAmm]), neuromuscular (countermovement jump [CMJ], handgrip strength test [HS]), and physiological responses were monitored during both protocols. RESULTS: No significant differences between HIITs were found for BLa-1 min post-test, BAmm, HS and HRpeak. Significant differences were found in fatigue-induced changes in CMJ performance (-0.36 cm in 40 × 100 m; +1.48 cm in 10 × 400 m), and in average pace (P <0.001) which was faster during the 40 × 100 m. CONCLUSIONS: Despite similar physiological, metabolic, and HS responses, the 40 × 100 m protocol allowed runners to train at a higher intensity, which might have important effects on the training prescription for endurance runners. © 2016 IOS Press and the authors. All rights reserved.
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running