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Hormone responses to intensive interval training in middle-distance runners
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This study examined the effects of intensive interval training session on the post-exercise level of cortisol and testosterone in a relatively homogeneous group of college-level middle-distance runners. The subjects performed a typical set of four 400 m intensive interval runs with individually chosen high speed. Recovery intervals between runs were 5 min. During recovery, runners were asked to walk slowly on the track. Blood samples were taken before, immediately after the training session and 30 min post-exercise. Cortisol, testosterone and sex hormone binding globulin were measured, and free testosterone and the free testosterone : cortisol ratio calculated. The determined hormone concentrations were not changed as a result of interval training session. However, to further analyse the hormone responses, the subjects were divided into two subgroups according to the cortisol responses to training. Group 1 (n=5) and Group 2 (n=5) consisted of subjects whose cortisol concentration was increased and decreased immediately after the training session, respectively. Resting cortisol and testosterone concentrations were significantly lower in Group 1 compared to Group 2. In Group 1, the cortisol concentration was higher after training by 102 ± 86 nmol.l⁻¹ ($P < 0.05$). Group 2 demonstrated a decrease in cortisol concentration after the training by 296 ± 77 nmol.l⁻¹ ($P < 0.05$). No further changes were noted during the first 30 min of recovery in both groups ($P > 0.05$). Testosterone was significantly decreased immediately after training and remained suppressed for the first 30 min of recovery in Group 2, while no significant changes in testosterone concentration were observed in Group 1. No significant changes were also noted in free testosterone and free testosterone: cortisol ratio as a result of training in both groups. However, both groups demonstrated similar body composition and 1500 m running performance values as well as the results of 4 x 400 m runs were similar in both groups of runners. In conclusion, the findings of this study suggest different regulation of pituitary-adrenocortical activity as a result of intensive 4 x 400 m interval running training session in middle-distance runners, expressed either by intensified or suppressed endocrine functions. Intensified and suppressed endocrine functions were observed in subjects with low and high resting hormone concentrations, respectively.

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