

Abstract

The Effect of Maximal Interval Training Sets on Metabolic Markers in Adolescent Competitive Swimmers [†]

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Abstract: **AIM:** Although high-intensity interval sets are routinely used in the training regimen of competitive swimmers, information about the acute metabolic effects of such sets is lacking. Thus, the aim of the present study was to evaluate the effects of swimming training sets of maximal intensity and different volumes on blood metabolic markers in adolescent swimmers. **MATERIAL & METHOD:** Twenty-four adolescent competitive swimmers (12 female and 12 male) completed two training sets of 8 × 50 m and 8 × 25 m. Both sets were performed in freestyle, at maximal intensity and at a work-to-rest ratio of 1:1. They were spaced one week apart and were performed in a random and counterbalanced order. Blood samples were taken before, immediately after and one hour after both sets for the determination of glucose and uric acid (at all three time-points, spectrophotometrically), as well as irisin, insulin, glucagon, and cortisol (in pre- and immediately post-exercise samples, through enzyme immunoassays), in plasma. Three-way analysis of variance (set × time × gender) was used for the statistical analysis. The level of statistical significance was set at $\alpha = 0.05$. **RESULTS:** Glucose was higher immediately post-exercise compared to pre- and 1 h post-exercise ($p = 0.001$). Uric acid was higher immediately and 1 h post-exercise ($p < 0.001$). Irisin exhibited a time × gender interaction ($p = 0.005$) due to the fact that exercise caused an increase in females and a decrease in males. Insulin, glucagon, and cortisol increased with exercise ($p < 0.001$). No gender effect was found for any of the markers except for uric acid, of which males had higher concentrations than females ($p < 0.001$). **CONCLUSIONS:** Maximal interval swimming sets induced remarkable increases in plasma glucose, uric acid, insulin, glucagon, and cortisol, suggesting a satisfactory metabolic effectiveness of such types of exercise training. Despite the difference in volume, the two training sets did not induce different metabolic responses in adolescent competitive swimmers. This is also true of blood lactate response, which has been presented previously.

Keywords: adolescence; exercise metabolism; interval training; swimming



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