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» Journal Abstract

Metabolic effect of strength endurance exercise complex in young cross-country skiers

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The aims of this study were to: 1) evaluate the metabolic changes of strength endurance exercises complex in young male cross-country skiers using heart rate (HR) and blood lactate (BLA) concentration indices; and 2) compare these changes with those occurring in the organism when performing a running load at the level of individual anaerobic threshold. Ten young skiers (17.2±2.2 yrs; 174.7±8.6 cm; 62.3±8.7 kg) were studied in preparatory period (May). A complex of 12 strength endurance exercises with moderate intensity and 1500 m running bout on indoor track with individually controlled HR of 170 – 180 beats× minute-1 were performed. HR was measured continuously with Polar Vantage NV Sporttester (Finland). BLA concentration was analysed immediately after 6th, 10th and 12th exercise and after 1500 m run and at the fifth recovery min after the strength exercises and running. A ranking was used for the evaluation of special performance. Study revealed that the metabolic reactions to the complex of strength exercises and running at the level of anaerobic threshold were very different, as shown by a quite similar mean HR after both exercises (168 and 170 beats/min, respectively) and different BLA values (5.90±2.70 and 2.70±0.75 mmol•l-1, respectively). Correlation analysis revealed that lower ranking order significantly correlated with higher HR after different strength exercises (r=0.62-0.80) and with BLA concentration after the 10th and 12th exercises and with 5th minute of recovery (r=0.62-0.77). Our results suggest that using HR and BLA concentration indices after the standard strength exercise complex gives us valuable information about adaptational and metabolic changes in skiers and helps the guidance of training process. HR underestimates the muscle's metabolic state and excessive strength exercise complex intensity can be the outcome.

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