

Physical responses between two kinds of exercise on short distance track athletes

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Abstract

Introduction: Most of short distance track training models focus on interval training to raise their performance. Previously, many studies have shown that incremental exercise model could enhance endurance ability and improve physiological responses. The previous studies comparing interval and continuous training effect, but the purpose of this study would like to investigate the differences between the high-intensity interval test (HIIT) and incremental exercise test (ICT) on physiological responses. **Methods:** Eight male track athletes (age: 17 ± 0.7 years old; training years: 4 ± 1.1 years old) participated in this study. There were two tests investigated in this study. The first was ICT, and the second was a HIIT, both of two tests used treadmill (h/p/cosmos pulsar 3p 4.0, Germany). The beginning speed of ICT was set at 3.0 m/s, and every 3 min add 0.5 m/s until to 4.5 m/s. The HIIT workload was set 100% of the individuals 100m performance times and each subject had to do a 4x15s sprint. During repetitions a 90 seconds resting period was granted. Blood samples were taken at rest before test and each speed (repetition) for lactate and glucose analyses, NH_3 at rest, 2nd and 4th speed (repetition). **Results:** Lactate was significant differences between ICT and HIIT at each speed (repetition). ICT's lactate was up to 6.1 ± 1.2 mmol/l after final incremental speed, and HIIT was 8.1 ± 1.3 mmol/l after 4th repetition. On the other hand glucose in 3rd and 4th speed (repetition) was significant differences between ICT and HIIT (3rd: 4.0 ± 0.5 vs. 4.8 ± 0.4 ; 4th: 4.1 ± 0.3 vs. 4.8 ± 0.5 mmol/l). NH_3 in ICT at 4th speed (repetition) was significant higher than HIIT (4th: 70.2 ± 12.1 vs. $61.5 \pm 10.6 \mu\text{mol/l}$). **Discussion:** In ICT lactate and NH_3 were both higher than HIIT. Many studies have shown that with increasing intensity the NH_3 value increases as well. Larger amount of NH_3 due to the activation of the AMP deaminase. And they have found a correlation between NH_3 and lactate in high intensity tests. On the other hand the gluconeogenesis might also be responsible for the increase of NH_3 . But this was not the same with, maybe the interval rest time make the different results.