

Abstract

Reliability of the Urine Lactate Concentration After Alternating-Intensity Interval Exercise[†]

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Abstract: Aim: Our previous studies have shown that the post-exercise urine lactate concentration is a reliable exercise biomarker under controlled post-exercise hydration conditions. However, the reliability of the urine lactate concentration has been examined only after brief maximal exercise. As a result, there is no information about the reliability of this biomarker after prolonged submaximal exercise. Thus, the aim of the present study was to examine the reliability of the urine lactate concentration after interval exercise of alternating intensity under controlled or ad libitum hydration during exercise. **Material & Method:** Twenty-eight physically active adults (16 men and 12 women) performed three identical 45-min running tests (2 sets of 22.5 min with 3 min rest interval) on the treadmill with alternating speed and inclination at 19–24 °C, spaced three days apart. The participants drank the same amount of water during exercise in two of tests and ad libitum in the other test, in random, counterbalanced order. Blood samples were collected before exercise and 1, 3, as well as 5 min post-exercise. The highest lactate value among the post-exercise samples of each individual was recorded as his/her peak post-exercise value. Urine samples were collected before exercise and 10 as well as 60 min post-exercise and the average value of the post-exercise samples was recorded. Blood and urine lactate were analyzed spectrophotometrically. **Results:** The peak post-exercise blood lactate concentration was 5.5 ± 1.7 mmol/L (mean \pm SD throughout) for men and 4.7 ± 1.8 mmol/L for women. The post-exercise urine lactate concentration was 1.6 ± 1.0 mmol/L for men and 1.5 ± 1.0 mmol/L for women. The reliability of the blood lactate concentration at the three tests was high (ICC 0.77–0.88), being higher under controlled hydration. However, the reliability of the urine lactate concentration was low or non-significant (ICC 0.29–0.36). **Conclusions:** The urine lactate concentration after prolonged submaximal exercise was lower than the corresponding blood lactate concentration and showed unsatisfactory reliability regardless of the hydration pattern during exercise. Thus, it cannot be used as a biomarker for this kind of exercise.

Keywords: blood lactate; interval exercise; reliability; urine lactate



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