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Step length and individual anaerobic threshold assessment in swimming.

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Abstract

Anaerobic threshold is widely used for diagnosis of swimming aerobic endurance but the precise incremental protocols step duration for its assessment is controversial. A physiological and biomechanical comparison between intermittent incremental protocols with different step lengths and a maximal lactate steady state (MLSS) test was conducted. 17 swimmers performed 7×200, 300 and 400 m (30 s and 24 h rest between steps and protocols) in front crawl until exhaustion and an MLSS test. The blood lactate concentration values ([La-]) at individual anaerobic threshold were 2.1 ± 0.1, 2.2 ± 0.2 and 1.8 ± 0.1 mmol.l-1 in the 200, 300 and 400 m protocols (with significant differences between 300 and 400 m tests), and 2.9 ± 1.2 mmol.l-1 at MLSS (higher than the incremental protocols); all these values are much lower than the traditional 4 mmol.l-1 value. The velocities at individual anaerobic threshold obtained in incremental protocols were similar (and highly related) to the MLSS, being considerably lower than the velocity at 4 mmol.l-1. Stroke rate increased and stroke length decreased throughout the different incremental protocols. It was concluded that it is valid to use intermittent incremental protocols of 200 and 300 m lengths to assess the swimming velocity corresponding to individual anaerobic threshold, the progressive protocols tend to underestimate the [La-] at anaerobic threshold assessed by the MLSS test, and swimmers increase velocity through stroke rate increases.

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Publication Types, MeSH Terms, Substances

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