

Effect of Cadence on Lactate Threshold and Peak Power Output in Trained Cyclists

Brett Petersen, Jonathan Dugas, Thayne Munce

Abstract

Purpose: We tested the hypothesis that cycling at 80 RPM would result in a lower HR and rating of perceived exertion (RPE) and increased power output compared to cycling at 70 RPM, 90 RPM or a freely chosen cadence (FCC) at two definitions of lactate threshold: lactate deflection point and onset of blood lactate accumulation (OBLA) ($4 \text{ mmol} \cdot \text{L}^{-1}$). We also hypothesized that cadence would not affect peak power output (PPO). **Methods:** Seven trained cyclists (mean \pm SD: PPO 342.0 ± 37.8 Watts, Mass 82.4 ± 10.2 kg, Age 36 ± 4 years) performed four graded exercise tests to exhaustion at 70 RPM, 80 RPM, 90 RPM, or their freely chosen cadence. Heart rate and power output were determined at the lactate deflection point and OBLA in each trial. **Results:** It was found that 1) a cadence of 70 RPM yielded significantly greater power output at OBLA compared to the other three trials, 2) cadence did not affect HR at the lactate deflection point or OBLA, 3) cadence did not significantly affect peak power output, though there was a trend of higher PPO at 70 RPM, and 4) cadence did not affect RPE, though there was a trend towards lower RPE at 80 RPM. **Conclusions:** The results from this study suggest that cadence should be taken into account when determining lactate threshold.