

Comparing time-trial and time to exhaustion performance

L Passfield ¹✉ and S Coakley ¹

Abstract

Introduction: Time to exhaustion trials (TTE) at a fixed exercise intensity have been widely used in a laboratory setting to measure endurance performance. However, they have been criticised for lacking ecological validity compared with laboratory time-trials (TT). Therefore we hypothesised that competitive cyclists would perform better in a TT than TTE over the same duration.

Method: Ten male competitive cyclists (mass 69.5 ± 7.9 kg, VO_{2max} (60 ± 7.6 ml·kg⁻¹·min⁻¹) completed 3 TTE trials at 80, 100 and 105% of VO_{2max} . On a second visit the cyclists were asked to perform 3 TT's of the same duration as the first visit. On this occasion the cyclists were asked to average the highest power output possible. During both visits riders received no feedback on their power output or elapsed time during the rides. Average power output, RPE after 1 and 5 minutes of each trial were recorded. These measurements were compared with a paired t-test, where statistical significance was assumed at $P < 0.05$.

Results: No difference in measurements between TT and TTE was found for the average power output at 100 or 105% VO_{2max} (354 ± 68 vs. 352 ± 56 W, and 374 ± 59 vs. 378 ± 55 W, $P > 0.05$, respectively). Average power output at 80% VO_{2max} was significantly lower for TT vs. TTE (292 ± 35 vs. 300 ± 36 W, $P < 0.05$ respectively), although no difference was found in RPE ($P > 0.05$).

Conclusion: Performance in TT and TTE trials at high intensity is not different for competitive cyclists. However, at 80% VO_{2max} TT average power output is lower suggesting that riders were unable to pace the trial as effectively.

✉ **Contact email:** l.passfield@kent.ac.uk (L Passfield)

¹ Endurance Research Group, School of Sport and Exercise Sciences, University of Kent, Chatham Maritime, UK. ME4 4AG, United Kingdom

Received: 1 May 2014. Accepted: 1 June 2014.

