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Reproducibility of a Laboratory Based 20-km Time Trial Evaluation in Competitive Cyclists Using the Velotron Pro Ergometer.

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The purpose of this study was to evaluate the reliability of a 20-km cycling time trial using the Velotron cycle ergometer in competitive cyclists. Twenty male cyclists (V.O (2max) = 68.5 +/- 3.6 ml . kg (-1) . min (-1); peak power (P (peak)) = 469 +/- 33 W) participated in this study. Each subject performed a V.O (2max) test and 3 separate 20-km time trials (TT1, TT2, and TT3). Data from trials were compared using a one-way ANOVA. Coefficients of variation (CV) and 95 % confidence intervals (CI) were calculated between trials. Values are mean +/- SD unless otherwise noted. Performance time T (tot) (30.03 +/- 1.24, 30.12 +/- 1.21, and 30.14 +/- 1.21 min) and mean absolute power (P (mean)) (326 +/- 35, 323 +/- 35, 322 +/- 34 Watts) were not significantly different across TT1 - TT3. P (mean) was highly related between TT1 - TT2 ($r = 0.96$; $p < 0.01$) and TT2 - TT3 ($r = 0.97$; $p < 0.01$). A low CV was also demonstrated between trials for P (mean) (TT1 - TT2 = 2.1 %, CI = 1.6 % to 3.1 %; TT2 - TT3 = 1.9 %, CI = 1.4 % to 2.8 %). P (peak) and P (mean) were both correlated to T (tot) in TT1 with P (mean) accounting for most of the variance in T (tot) ($R (2) = 0.993$). These data show that performance in a 20-km time trial using the Velotron ergometer is highly reproducible in competitive cyclists. Furthermore, the CV variance demonstrated between trials is comparable to that expected during actual performance in elite athletes.