**RESULTS**

Performance

On the incremental exercise test, subjects reached a maximal power output (PO) of 371.1 ± 58.6 W, resulting in a VO2PEAK of 55.2 ± 7.8 ml.min-1.kg-1. The GET and RCP, corrected for MRT, where 131.0 ± 27.3 W and 245.0 ± 46.4 W respectively. Figure 1 shows the evolution of performance during the TTs. At the end of the 8-week training period, the mean performance improvement was 15.2 ± 4 % (pre: 300 ± 58 W, week 8: 345 ± 62 W, p < 0.001, ES: 0.74). Maximal performance improvement was found one week after training cessation with an improvement of 16.6 ± 3% in week 9 (pre: 300 ± 58 W, week 9: 349 ± 66 W, p < 0.001, ES: 0.79).

Training load

The total TL over the training period was 1968.4 ± 180.7 bTRIMP, 2066.4 ± 209.6 luTRIMP, 3809.7 ± 159.7 eTRIMP, 1261.3 ± 11.9 TSS and 7118.0 ± 774.0 TLRPE. A visual representation of the weekly mean TL is given in Figure 2. It is obvious from this figure that there is a drop in the weekly TL. Moreover, from this graph it is clear that the drop in TL is more pronounced in the first training phase (week 1 to week 4) than in the second training phase (week 4 to week 8, -15.4 ± 12.8 vs. -0.039 ± 12.1 respectively, p < 0.001). Based on this observation, the difference was further investigated in Table 1. For all HR methods the drop in TL was more pronounced in the first period than the second period. However, TLRPE did not show a significant difference between the periods (p = 0.139). Also, within the first time period bTRIMP decreased more than the other HR methods (p < 0.001 for eTRIMP, p = 0.01 for luTRIMP). No difference was observed with TLRPE (p = 0.124). In the second training period, all methods evolved in a similar way. TSS was not included in the analysis since this TL metric was only calculated based on the results of the pre-test and thus could not change over time.

Fitness Fatigue Model

An overview of the model parameters for each TL method is given in Table 2. The mean values of the output parameters across all methods for 1, 2, k1 and k2 were 30.0 ± 15.5, 4.2 ± 3.9, 0.14 ± 0.23 and 0.26 ± 0.28 respectively.

The SSE was similar for all TL-methods. There was also no difference found for 2 and t(n). 1 was the same for bTRIMP and luTRIMP (p = 0.056), with 1 for luTRIMP also being equal to eTRIMP (p = 0.163) and TLRPE (p = 0.157), but bigger than for TSS (p = 0.015).

The luTRIMP output for k1 and k2 was not different from any of the other methods. Also bTRIMP and eTRIMP had similar outputs (p = 0.253 for k1 and p = 0.114 for k2). TLRPE and eTRIMP also produced similar results (p = 0.065) for k1, but not for k2 (p = 0.017). k1 and k2 based on TSS were larger than all other methods, with the exception of luTRIMP (p = 0.844, p = 0.172 respectively).

The t(g) output for TLRPE was similar to all other methods. For bTRIMP, t(g) was larger than for luTRIMP (p = 0.026) and TSS (p = 0.014), with t(g) for TSS being similar to luTRIMP (p = 0.136 ) and TLRPE (p = 0.288) but smaller than for eTRIMP (p = 0.019). The individual variability, according to the TL-method used, for t(g) and t(n) is shown in Figure 3.