Intensity of exercise recovery, blood lactate disappearance, and subsequent swimming performance.


Abstract: The aim of this study was to examine the effects of active versus passive recovery on blood lactate disappearance and subsequent maximal performance in competitive swimmers. Fourteen male swimmers from the University of Virginia swim team (mean age 20.3 years, s = 4.1; stature 1.85 m, s = 2.2; body mass 81.1 kg, s = 5.6) completed a lactate profiling session during which the speed at the lactate threshold (VLT), the speed at 50% of the lactate threshold (VLT.5), and the speed at 150% of the lactate threshold (VLT1.5) were determined. Participants also completed four randomly assigned experimental sessions that consisted of a 200-yard maximal-effort swim followed by 10 min of recovery (passive, VLT.5, VLT, VLT1.5) and a subsequent 200-yard maximal effort swim. All active recovery sessions resulted in greater lactate disappearance than passive recovery (P < 0.0001 for all comparisons), with the greatest lactate disappearance associated with recovery at VLT (P = 0.006 and 0.007 vs. VLT.5 and VLT1.5 respectively) [blood lactate disappearance was 2.1 mmol · l-1 (s = 2.0), 6.0 mmol · l-1 (s = 2.6), 8.5 mmol · l-1 (s = 1.8), and 6.1 mmol · l-1 (s = 2.5) for passive, VLT.5, VLT, and VLT1.5 respectively]. Active recovery at VLT and VLT1.5 resulted in faster performance on time trial 2 than passive recovery (P = 0.005 and 0.03 respectively); however, only active recovery at VLT resulted in improved performance on time trial 2 (TT2) relative to time trial 1 (TT1) [TT2-TT1: passive +1.32 s (s = 0.64), VLT.5+1.01 s (s = 0.53), VLT-1.67 s (s = 0.26), VLT1.5-0.07 s (s = 0.51); P < 0.0001 for VLT]. In conclusion, active recovery at the speed associated with the lactate threshold resulted in the greatest lactate disappearance and in improved subsequent performance in all 14 swimmers. Our results suggest that coaches should consider incorporating recovery at the speed at the lactate threshold during competition and perhaps during hard training sessions.

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