

Physiological Adaptations to Moderate Intensity Training in an Elite Cyclist

ZACH GREGG, MARISSA LOPEZ, SONATA BROWN and FRANK WYATT

Department of Athletic Training and Exercise Physiology; Midwestern State University; Wichita Falls, TX

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Advisor / Mentor: Wyatt, Frank (frank.wyatt@msutexas.edu)

ABSTRACT

Efforts to improve cycling performance have to be multifactorial and respect both the intensity and duration of the sport. Elite cyclists utilize moderate intensity, long duration efforts in training to improve physiological parameters associated with performance. **PURPOSE:** to compare two 6-week Moderate Intensity Training (MIT), pyramidal intensity distribution (PYR) protocols and their effects on key performance variables in an elite level cyclist. **METHODS:** Prior to testing, this study obtained Institutional Review Board (IRB) approval and the subject signed an IRB approved informed consent. A cyclist underwent two 6-week MIT protocols following the Training Intensity Duration (TID) seen in professional cyclists' pre competition phase. Physiological testing was conducted pre and post 6-week intervention to record maximal oxygen consumption (VO_{2max}), maximal fat oxidation (FatMax), peak blood lactate (BLA_{peak}) using the Australian Institute for Sport (AIS) protocol for a graded exercise test (GXT) on a cycle ergometer. A submaximal GXT was administered every two weeks to determine power output (W) at 2.0 mmol BLA as a marker for aerobic power. The first 6-wk intervention consisted of increasing duration MIT at 80-85% maximal heart rate ($b \cdot \text{min}^{-1}$) (HR_{max}) from 2h to 5h/wk. The second 6-wk intervention utilized specific cadence ranges during MIT at lower volumes of 1h to 3h/wk. **RESULTS:** VO_{2max} increased from 80 to 83.5 $\text{mL} \cdot \text{kg}^{-1} \cdot \text{min}^{-1}$ (4.4%); FatMax increased from 400W to 425W (6.25%); and BLA_{peak} increased from 12.0 to 14.2 mmol (18.3%). Power output at 2.0 mmol BLA did not change over the 12-week intervention. **CONCLUSION:** MIT can be effectively used in the pre competition phase of an elite cyclist's training to increase VO_{2max} and FatMax power output, both important performance parameters for the long duration events for which these athletes participate.