The Physiological Profile of a Blind Female Solo Ultra-Endurance Cyclist – a Novel Case Study

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ABSTRACT

Ultra-endurance mountain biking (MTB) greater than 2,450 miles in 51 days with over 150,000 feet of elevation gain is a significant physiological and fear-inducing journey for anyone. This case study showcases the psychophysiology of a blind solo (i.e., single bike) rider (BSR) with history of traumatic brain injury (TBI) who achieved an unparalleled ride of the Tour Divide MTB route with 2 male guides (MG). **PURPOSE:** The primary purpose of this project was to observe the interplay between fatigue (acute training load, ATL), fitness (chronic training load, CTL), and form (training stress balance, TSB) as part of a performance management chart (PMC) and Training Stimulus Score™ (TSS™). **METHODS:** This case study was a retrospective, descriptive assessment of rider Training Peaks™ (Boulder, CO) TSS™ data, which portrays daily fluctuations between ATL (7 d avg), CTL (42 d avg), and TSB (yesterday's CTL – yesterday's ATL). The 3 riders continually wore a heart rate monitor and wearable wrist GPS technology (Garmin, Olathe, KS) to track metrics throughout the 51 d ride. **RESULTS:** BSR and MG (mean of 2 male guides) age, wt, ht, and BMI, respectively, were: 47 vs 47.5 y, 65.9 vs 77.3 kg, 1.6 vs 1.8 m, and 26.5 vs. 23.7 kg/m^2. Average rider MTB metrics per day for distance, minutes, speed, and elevation gain were, respectively: 87.7±22.2 km, 7.5±2.3 hrs, 5.5±1.4 km/hr, and 957±205 m. Average daily riding heart rate, average riding peak HR, and TSS for BSR vs MG were, respectively: 138.8±5.9 vs 103.9±6.9 bpm, 161.6±27.9 vs 143.3±11.4 bpm, and 251.9±82.3 vs 302.0±95.7 TSS. BSR and MS RPE (6-20 scale) per day averages were 11-12 for overall body fatigue (i.e., all riders) and BSR was 19 for perceived "fear" vs MG remaining at 11-12 for "fear". 51 d averages for ATL, CTL, and TSB for BSR vs MG were, respectively: 206.1±50.0 vs 216.4±48.1, 118.1±39.0 vs 117.5±32.1, and -76.6±35.0 vs -88.4±44.6. **CONCLUSION:** Despite greater, daily perceived "fear", BSR (vs MG) maintained augmented PMC metrics, indicating less daily ATL, higher CTL, and better TSB. This may, in part, support BSR's high physical ability to complete the ride despite self-reporting a greater degree of perceived "fear" each day. Ultimately, BSR's achievements may help inform the blind and visually impaired population about accruing greater physical fitness to help offset perceptions of fear.