POWER OUTPUT DURING SUCCESSFUL MOUNTAIN BIKE AND ROAD CYCLING PERFORMANCES

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Some successful mountain bike (MTB) cyclists use road cycling competition as preparation for mountain bike races. Cycling on smooth roads may reduce the stress on joints and muscles whilst at the same time allowing for the sustained cycling-specific efforts that lead to improvements in aerobic conditioning. However, road cycling races can vary in format from mass-start races to individual time trials and are often categorised by terrain profile, which can range from predominantly flat to extremely mountainous. Therefore, based on the principle of ‘specificity of training’ certain categories of road racing may be more suitable for replicating the loading patterns observed during mountain bike racing. Thus, the aim of this study was to characterise the power output profile of a mountain bike race and to compare this profile to the various categories of road races. Cycling power output data (SRM cranks, Schoberer Rad Messtechnik, Germany) were examined by stratifying both the amount of time spent at different power output zones, and describing the intermittent nature of the surges and recovery between efforts in successful competitors. Power data from a world-class cross-country MTB cyclist simulating a race on an Olympic MTB course was compared to those obtained using SRM cranks during successful road cycling performances (placing top 3) in flat (FLAT), semimountainous (SEMO), high-mountainous (HIMO), individual time trial (ITT) and criterium (CRIT) road races. During the MTB race, relatively more time (57\%) was spent at lower cadences (<80 rpm) compared to any of the road races (3 to 33\%). This was evident across a wide range of power outputs, but particularly at higher power outputs (>7.5 W.kg\(^{-1}\)). Less time (26 vs. 62-70 min; 19 vs. 28-37\%) was spent at lower power outputs (0.75-3.74 W.kg\(^{-1}\)) for MTB compared to the longer mass-start road races (FLAT, HIMO and SEMO). In addition, the MTB cyclist accumulated the greatest number of high intensity surges up to the 7.50-8.24 W.kg\(^{-1}\) power output range compared to the road races (MTB, 201 vs. SEMO, 155; HIMO, 126; FLAT, 100; CRIT, 36 and ITT, 8). Approximately half of the surges in power output during MTB and the hillier road races (HIMO and SEMO) were instigated whilst already pedalling at moderate to high power outputs (3.00-6.74 W.kg\(^{-1}\)). These results indicate that MTB racing is associated with frequent oscillating patterns of power output production with many high-intensity surges. These surges in power output are often generated with lower cadences and thus greater torque at the pedal crank than that observed during road cycling races. When compared to road racing, the power output profile during MTB racing appears to be a mixture of the low cadences observed during hill climbing, but with the intermittent nature of criterium racing.

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