

## **The Abdominal Musculature and Cycling Performance**

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**Purpose:** Our purposes were to determine if abdominal power and endurance were related to anaerobic and aerobic cycling performance and to evaluate if abdominal fatigue effects the aforementioned cycling parameters. **Methods:** Twenty three college aged subjects had their age ( $19.17 \pm 0.98$  yrs), height ( $170.41 \pm 7.54$  cm), and weight ( $74.48 \pm 14.06$  kg) taken and completed the front abdominal power throw and ACSM Crunch test so we could evaluate their abdominal power and endurance, respectively; the tests were completed twice across 48 hr to attenuate any learning effects. Twelve of the subjects completed the Wingate anaerobic power test on a Monark 834 E ergometer set at 7.5% of body mass. The remaining 11 subjects completed a 3 km cycling time trail (TT), an aerobic cycling test, on an Espresso S3U virtual reality bike. Subjects completed familiarization, baseline, and performance trials for the cycling measures; immediately before the performance trials, subjects completed abdominal crunches to fatigue. All tests were preceded and followed by a warm-up and cool-down. Dependent *t*-tests were used to assess differences between baseline and performance cycling trails, whereas correlational analyses were used to evaluate the relationships between abdominal and cycling measures;  $\alpha$  was set at 0.05. **Results:** Abdominal muscle fatigue significantly decreased mean anaerobic power ( $p = 0.000$ ) and rate of fatigue ( $p = 0.004$ ); the decrease in peak power approached significance ( $p = 0.088$ ). Abdominal muscle fatigue didn't affect TT performance; however, after fatigue, abdominal power was significantly correlated to TT mean power and time ( $r = -0.708$  and  $0.704$ , respectively). No other significant correlations were found before or after fatigue between the abdominal and cycling measures. **Conclusion:** The data show that abdominal fatigue affects anaerobic cycling performance in our subject population; consequently, individuals may wish to avoid fatiguing abdominal exercise prior to anaerobic power tests or competitions that include anaerobic power elements.