

The Caffeine Dose Response in Habitual Consumers Performing a Maximal Anaerobic Test

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Caffeine is the most common substance used by athletes to enhance performance; however, the ideal dosage of caffeine for ergogenic effects in maximal anaerobic exercise is presently unknown. **PURPOSE:** Thus, the purpose of this study was to investigate the caffeine dose response in habitual consumers using the 90-s Wingate Anaerobic Test (WAnT90). **METHODS:** Nine (3 F, 6 M; mean \pm SD: age = 20.2 \pm 1.0 years; body mass = 69.9 \pm 8.1 kg) anaerobically-conditioned subjects who were classified as habitual caffeine users (consumption \geq 2 servings/day) volunteered for a randomized counterbalanced double-blind study. Subjects reported to the lab to ingest 3, 5, or 7 mg \cdot kg $^{-1}$ caffeine or a placebo (PLB) one hour prior to testing. The testing protocol included a 3 minute progressive warm-up and a WAnT90 with a resistance of 0.05kg \cdot kg $^{-1}$. Peak power (PP), total power (TP), and total power decline (PD) were calculated for the entire test. TP and PD were also calculated for each 30-s interval (TP₃₀, TP₆₀, TP₉₀, PD₃₀, PD₆₀, and PD₉₀). Rating of perceived exertion (RPE) was recorded immediately following each test. One-way ANOVA was conducted to compare the specific dosage of caffeine with each variable across the WAnT90. Significance was set at $p < 0.05$. **RESULTS:** Caffeine intake log analysis revealed that the subjects were habitual users with 4 \pm 1.7 servings/day. No significant differences were found among doses (PLB, 3, 5, and 7 mg \cdot kg $^{-1}$) for PP (8.1 \pm .5, 8.2 \pm .9, 8.2 \pm .6, and 8.4 \pm .7 W \cdot kg $^{-1}$, respectively), TP (74.9 \pm 13.8, 72.2 \pm 10.4, 72.6 \pm 9.7, and 75.0 \pm 5.8, W \cdot kg $^{-1}$ respectively), and PD (58.5 \pm 5.1, 58.2 \pm 6.7, 57.3 \pm 5.7, and 63.5 \pm 5.6 %, respectively). In addition, no significant differences were found for each 30-s interval across the test (TP₃₀, TP₆₀, TP₉₀, PD₃₀, PD₆₀, and PD₉₀). Finally, there were no differences in RPE among doses. **CONCLUSION:** Although previous research on collegiate athlete habitual caffeine consumers showed improvement in power output for anaerobic power activities, our research showed no improvement in power performance. Thus, more research is needed to confirm the ergogenic effects of caffeine with long anaerobic activity as well as the efficacy of specific dosing strategies.