

Acute Caffeine Supplementation in Regular Caffeine Consumers Minimally Affects Strength in Knee Flexors

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There is strong evidence supporting the ergogenic properties of caffeine with aerobic exercise, but potential ergogenic benefits to anaerobic activities remain in question. These studies of anaerobic exercise have varied designs and equivocal results. The impact of acute caffeine ingestion in habitual caffeine consumers is also unclear.

PURPOSE: To study the effects of acute caffeine ingestion on peak torque (PT), average power, perceived exertion (RPE) and perceived pain index (PPI) during exercise with an isokinetic dynamometer in habitual caffeine consumers. **METHODS:** Physically active, habitual caffeine consumers (n=33; 30 female, 3 male; age: 21 ± 1 ; mass: 60.25 ± 6.79 kg) participated in a placebo-controlled intervention. Subjects were matched and added to a caffeine or placebo group. All subjects abstained from caffeine for 4 days, supplemented with $5 \text{ mg} \cdot \text{kg}$ of caffeine for 3 days and on the final testing day consumed $6 \text{ mg} \cdot \text{kg}$ of caffeine or placebo (insoluble fiber) one hour before testing. Isokinetic PT and average power were tested in the subjects' dominant leg at $60^\circ \cdot \text{s}^{-1}$, $180^\circ \cdot \text{s}^{-1}$, and $300^\circ \cdot \text{s}^{-1}$. Short duration endurance was assessed in 30 repetitions at $180^\circ \cdot \text{s}^{-1}$. Isometric PT was measured at 30° and 90° flexion. Data were analyzed with either independent t-tests or repeated measures ANOVA with an alpha of 0.05 and presented as mean differences (caffeine vs. placebo) \pm SD. **RESULTS:** No significant differences between caffeine and placebo groups were observed for any knee extension variables. Knee flexion peak torque at $60^\circ \cdot \text{s}^{-1}$ (0.85 ± 0.23 vs. 0.66 ± 0.18 N-m/kg; $p=0.03$) and $300^\circ \cdot \text{s}^{-1}$ (0.61 ± 0.11 vs. 0.58 ± 0.22 N-m/kg; $p=0.02$) were statistically significantly higher in caffeine group compared with placebo. No significant differences observed in average power. No between group differences in RPE or PPI were observed in response to the exercises. **CONCLUSION:** The current study demonstrates that acute caffeine ingestion slightly increases isokinetic peak torque in subjects regularly ingesting moderate amounts of caffeine, but many other anaerobic performance markers remain unaffected by caffeine ingestion.