

Expression of Strength and Power Relative to Lean Body Mass Impacts Results of Caffeine Intervention

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Differences in performance tests for strength or power could be attributed to the amount of lean body mass (LBM). So it may be important to report results of such tests not only relative to weight, but also relative to LBM. Depending on their proposed ergogenic mechanism(s), discerning between absolute and relative strength may be even more important in dietary supplement research. **PURPOSE:** Previously, our lab examined effects of caffeine withdrawal and acute caffeine ingestion, while this current investigation aims to elucidate if the prior results are dependent upon whether strength and power variables are expressed in absolute values or relative to body mass / LBM. **METHODS:** Subjects were strength trained, habitual caffeine consumers (n=50; 40 female, 10 male; age: 22±3; mass: 63.9±10.0 kg). Subjects abstained from caffeine for 4 days, consumed 5mg·kg⁻¹ for 3 days and finally ingested 6mg·kg⁻¹ caffeine or placebo one hour before final testing. Groups were assigned in matched pairs. Isokinetic peak torque (PT), total work, average power, and average PT were tested in the subjects' dominant leg at 60°·s⁻¹, 180°·s⁻¹, and 300°·s⁻¹. Endurance was assessed by 30 reps at 180°·s⁻¹. Isometric PT was measured at 30° and 90° flexion of the non-dominant leg. Absolute performance measures were converted to relative measures by dividing by the subject's body mass, LBM, or LBM of the exercising limb. Data were analyzed with independent or paired t-tests and an alpha of 0.05. **RESULTS:** Caffeine yielded many significant increases in strength and power. However, 5 of these measures were statistically significant in absolute terms, but no longer significant when divided by body mass. Isometric PT at 30° yielded significant results for caffeine supplementation in absolute PT (p=0.042) and relative units (p=0.032), but not when divided by the LBM of the exercising leg (p=0.059). **CONCLUSION:** This analysis demonstrates that the significant results of a study looking at the effects of acute caffeine ingestion are overestimated when strength variables are reported in absolute units as opposed to relative. Moreover, strength relative to LBM is important to examine changes independent of subjects' %BF. These relative values would then be more associated with differences in neuromuscular stimulation or fatigue irrespective of muscle size.