

## Summary

**Title:** The effect of acute caffeine intake on upper body power output.

**Background:** The main objective of the current investigation was to evaluate the effects of caffeine (CAF) on mean power (MP) and peak power (PP) output during an explosive bench press throw (BPT) in athletes habituated to CAF.

**Methods:** Fifteen resistance trained individuals (age:  $25.3 \pm 1.5$  years, body mass:  $87.8 \pm 14.8$  kg, 1 repetition maximum (1RM) in bench press:  $125.5 \pm 33.5$  kg), habituated to caffeine ( $5.5 \pm 0.51$  mg/kg/b. m.,  $\sim 486 \pm 108$  mg KOF/day) participated in a randomized double-blind experimental design. Each participant performed 5 identical experimental sessions after the intake of a placebo (PLAC) and 3 mg/kg/b. m. (CAF-3), 6 mg/kg/b. m. (CAF-6), 9 mg/kg/ b. m. (CAF-9) and 12 mg/kg/b. m. (CAF-12) of CAF. In each experimental session, the participants performed 5 sets of 2 repetitions of the bench press throw with a load equivalent to 30% 1RM on a Smith machine. The concentrations of plasma adrenaline (AD) and noradrenaline (NOR) were evaluated at rest (AD-B, NOR-B), after 60 min of the intake of CAF or PLAC (AD-PRE, NOR -PRE) and immediately after the trial (AD-PO, NOR-PO). CAF side effects were evaluated immediately after trial and within 24 hours.

**Results:** A two-way repeated measures ANOVA revealed a significant increase between PLAC and CAF-9 and CAF-12 in PP and in MP during 5 sets of the BPT. No other changes were found in the PP and MP with the ingestion of other doses of CAF in comparison with PLAC. A two-way repeated measures ANOVA revealed a statistically significant increase in NOR-PRE after CAF-6 and CAF-9 compared with rest values. No other changes were found in the AND-PRE after ingestion of PLAC and other doses of CAF in comparison with rest values. After CAF-9 values of AD-PO and NOR-PO were statistically significant higher than post exercise values after the intake of PLAC, CAF-3, CAF-6 and CAF-12. Frequency of side effects immediately after exercise and within 24 hours increased with higher doses of CAF.

**Conclusion:** The acute doses of CAF-9 and CAF-12 before resistance exercise may increase MP and PP during the bench press throw in a group of habitual caffeine users. Taking into account side effects and results in MP and PP, CAF-9 is the best dose for high habitual caffeine users.

**Keywords:** ergogenic aids, habituation to caffeine, bench press throw, noradrenaline, adrenaline