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The Effect of Caffeine on Motor Task Performance

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PURPOSE: The purpose of this study was to determine the influence of caffeine during task performance tests that require fine motor skills. **METHODS:** Thirty-two subjects volunteered for the study, gave informed consent and practiced the motor performance tests during a familiarization session and completed two experimental trials. The subjects reported to the lab one hour prior to the experimental trials and ingested a gelatin capsule containing $5\text{mg}\cdot\text{kg}^{-1}$ BW of caffeine anhydrous (CAF) or a placebo (PLA) containing maltodextrin administered in a random and counterbalanced order. Following the hour absorption period, fine motor abilities were assessed using the Purdue Pegboard Test (PPT) and the Minnesota Dexterity Test (MDT). The PPT required participants to manipulate pegs, collars, and washers in a systematic order, and the scores were calculated by the number of pegs the subject placed within a certain time frame. Four different tests and subscores were obtained or calculated during 30 and 60 second trials. The tests of the PPT included a right-hand, a left-hand, a two-hand, and an assembly test. The MDT required participants to place and manipulate small discs systematically into holes on a large board, and scores were calculated according the time it took participants to complete the tests for both a placing and turning trial. Paired t-tests were used to identify significant difference between the CAF and PLA trials for each score, $p < 0.05$. **RESULTS:** No significant difference in motor task for any subscores of the PPT. Scores for CAF vs PLA were: right hand (17.0 ± 1.9 vs 16.7 ± 1.9 s, $p=0.61$), left hand (16.5 ± 5.9 vs 45.1 ± 1.6 s, $p=0.56$), two-hand (13.5 ± 1.7 vs 13.6 ± 1.3 s, $p=0.18$) and assembly (46.5 ± 1.9 vs 16.7 ± 9.4 s, $p=0.61$). In addition, there was no significant difference between trials of CAF and PLA for MDT tasks of placing ($57.2.0 \pm 6.6$ vs 56.5 ± 5.4 s, $p=0.75$) or turning (41.7 ± 5.4 s vs 40.3 ± 1.9 s). **DISCUSSION:** Ingesting CAF prior to task performance activities did not affect motor performance; however, some individuals increased performance 3-15% under the CAF condition. Future studies will consider variables that help dictate individual responses.