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The Cardiorespiratory Response of Caffeine Supplementation with Submaximal Exercise in College Students

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PURPOSE: The purpose of this study was to examine the effects of CAF supplementation on heart rate (HR) and oxygen consumption (VO_2) during submaximal exercise. **METHODS:** 13 healthy students (19.7 ± 1.2 yrs.) volunteered for the study, attended a familiarization, as well as two subsequent experimental sessions. During the familiarization session, informed consent was obtained, and treadmill speed for the experimental trials was determined from a protocol (2% grade, incremental speed increases) to obtain 60% of predicted HR_{max} . For the experimental sessions, the subjects reported to the lab one hour prior to submaximal testing and were administered a $6 \text{ mg} \cdot \text{kg}^{-1}$ BW bolus of CAF or placebo (PLA) of maltodextrin via gelatin capsule in a double-blinded, counterbalanced design. Following the absorption period, a 15-minute submaximal exercise session (2% grade, pre-determined speed) was completed with HR and VO_2 measured continuously and minute averages recorded. Additionally, a 2 (condition) x 15 (time) ANOVA was run for HR and VO_2 , $p < .05$. **RESULTS:** The main effects of condition indicated that the ingestion of CAF vs PLA demonstrated no significant changes for HR (123.5 ± 4.5 and 128.4 ± 4.3 bpm, respectively, $p=0.43$) or VO_2 (21.34 ± 2.0 and 19.87 ± 1.8 ml/kg/min, respectively, $p=0.60$). The main effect of time across the 15 minute submaximal exercise bout showed a lower HR for the first minute (117.7 ± 11.4 bpm) compared to the second minute (122.2 ± 14.8 bpm). The HR significantly progressed higher throughout the exercise session from the second minute (122.2 ± 14.8 bpm) to (130.4 ± 16.5 bpm) during minute 15. In addition, the VO_2 during the first minute (18.9 ± 6.4 ml/kg/min) was lower compared to the steady state exercise for the remainder of the exercise bout, ranging from (20.8 ± 6.9 to 22.3 ± 8.4 ml/kg/min). There were no interaction effects found for condition x time. **DISCUSSION:** Caffeine did not produce an ergogenic or ergolytic effect for exercise performance when performing a bout of submaximal aerobic exercise.