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Effects of a Multi-Ingredient Pre-Workout Supplement on Post-Exercise Brachial Artery Diameter and Blood Flow Velocity

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Multi-ingredient pre-workout supplements (MIPS) containing vasodilatory compounds have demonstrated the potential to augment performance during acute workout bouts by enhancing blood flow to the working muscles via increased nitric oxide production. **PURPOSE:** To evaluate the effects of two different MIPS on blood flow velocity and vessel diameter in the brachial artery via ultrasound. **METHODS:** Fourteen males (Mean \pm SD, Age: 24.6 ± 5.0 y, Height: 179.2 ± 5.9 cm, Weight: 84.3 ± 14.3 kg, BMI: 26.1 ± 3.3 kg/m²) volunteered to participate in a randomized double-blind, counterbalanced and placebo (PLA) controlled study. Participants performed a familiarization visit followed by three supplement visits. The treatments (separated by ≥ 7 days) included a MIPS with beta-alanine and caffeine (BAC), without beta-alanine and caffeine (NBAC), or PLA. Consistency between trials was achieved through a one-week washout between trials, and exercise and dietary recall controls. On trial days participants consumed half of the dose at baseline, and the other half at the start of the trial (30 min later). The exercise protocol included vertical jumps, ballistic squat and bench, a 5-10-5, a Wingate, and a VO₂ peak on a cycle ergometer. Ultrasound scans of the brachial artery were performed at baseline, 30 min post-supplement, and post-exercise. Doppler mode was used to collect blood velocity (VEL, cm/s), and a cross-sectional image was used to measure vessel diameter (VD, cm). Inter-rater reliability was improved by having all measurements taken by the same researcher. One-way repeated measures analysis of variance was used to analyze differences in VEL and VD baseline to post-workout (Δ VEL and Δ VD, respectively) between visits. **RESULTS:** There were no significant differences in Δ VEL between trials ($p = 0.285$). Values for Δ VEL for BAC were (Mean \pm SD) 8.84 ± 20.25 cm/s, 13.04 ± 15.38 cm/s for NBAC, and 6.64 ± 11.10 cm/s for PLA. There were no significant differences for Δ VD ($p = 0.515$). **CONCLUSIONS:** Preliminary data suggests that neither MIPS tested effected post-exercise VEL or VD. While no differences were observed in VEL, the Δ VEL was the greater in NBAC and lowest in PLA. Inter-subject variability may present obstacles in analyzing the effects of the supplements.

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