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The Effects of Acute Creatine Supplementation on Arterial Stiffness

Colin J. Gimblet, Morgan M. Vance, Meghan Shepherd, Austin T. Ortlip, Timothy Staudmyer, Nabil E. Boutagy, John J. LaManca, Thomas K. Pellingier, Timothy J. Werner. Salisbury University, Salisbury, MD.

PURPOSE: To determine the effects of acute creatine monohydrate supplementation on arterial stiffness (AS). There is a void in our knowledge on the impact of exercise supplements, in particular creatine monohydrate supplementation, on AS in the major elastic arteries. As of this writing, there is one experiment that examined the relationship between creatine supplementation and arterial stiffness. However, the previous study used arterial stiffness indices that were dependent on several factors including blood pressure, thus subjected to interpretation. This study attempted to clarify some of these discrepancies through our proposed model. **METHODS:** 20 male, physically active participants were randomized in a double-blind fashion to placebo (PL) (n=10, 22.9±3.1 yrs) or creatine (CM) (n=10 21.3±1.8yrs) groups. Subjects received 0.3 g/kg/day creatine monohydrate or placebo in gelatin capsules for 7 days. Each subject underwent a series of anthropometric assessments, ultrasonography of the carotid artery, applanation tonometry, and seated and supine blood pressure measurements at baseline and on day 7 of the study period. **RESULTS:** There were baseline differences in central systolic blood pressure (cSBP) (mean difference, 109; 95% confidence interval (CI) 105 to 113, vs. mean difference, 130; 95% CI 114 to 146, $p < 0.05$) between the PLA and CM groups, respectively. Following the intervention, there were no significant differences between PL and CM in arterial stiffness indices between the groups. Percent fat free mass (FFM) was significantly increased (mean, 68.5±7.5%; 95% CI 62.1% to 72.9%, to mean 69.3±7.5% 95% CI 62.9% to 73.6%, $P < 0.05$) in the CM group only. There were no other significant changes in anthropometric measurements. **CONSLUSIONS:** Using a randomly controlled, double-blind trial with validated measurements of AS; acute creatine supplementation does not appear to impact vascular compliance in young, otherwise healthy males.