

ABSTRACT

THESIS: The Acute Effects of MitoQ Supplementation on Pulse Wave Velocity and Wave Reflection Properties in Middle Aged and Older Adults

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Arteriosclerosis can be defined as the thickening and stiffening of the arteries, a process that occurs naturally with age. In part, these arterial changes can be attributed to reactive oxygen species that arise from within the mitochondria of vascular smooth muscle cells. Research exploring the effects of antioxidant supplementation, such as MitoQ, on vascular health has been limited in human subjects. **PURPOSE:** To examine arterial stiffness measured via cfPWV and wave reflection properties with an acute dose of MitoQ in a population of middle aged and older adults. **METHODS:** 16 adults (9 females, 7 males) >50 years of age participated in this double-blind, placebo-controlled crossover study. Participants completed a comprehensive health screening and maximal cardiopulmonary exercise test to determine baseline health and fitness. Participants then completed two trials in a randomized order in which cfPWV and pulse wave analysis were measured before and 1 hour after consumption of either 80mg of MitoQ or a placebo. 2-way ANOVA was used to examine differences between trials. **RESULTS:** cfPWV was not different ($p>0.05$) between MitoQ and placebo trials and this lack of difference persisted when the cohort was split into groups based on the healthy vascular aging criteria of cfPWV <7.6 m/s and after normalization for mean arterial pressure. Central diastolic blood pressure (cDBP),

diastolic pressure-time index (DPTI), and subendocardial viability ratio (SEVR) were higher ($p < 0.05$) in MitoQ. **CONCLUSIONS:** Acute consumption of 80mg of MitoQ did not alter cfPWV in a cohort of apparently healthy middle aged and older adults. However, MitoQ supplementation was associated with changes in pressure that appear to drive improved myocardial perfusion as noted with significantly increased cDBP, DPTI, and SEVR. Considering these pressure changes, MitoQ may acutely enhance cardiac health through improved myocardial perfusion.