Abstract

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Oral Consumption of Vitamin K2 for 8 Weeks Associated With Increased Maximal Cardiac Output During Exercise.

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BACKGROUND: Vitamin K1 and K2 are not typically common in a Western diet because they are found in a variety of fermented foods. Vitamin K2 in particular has been demonstrated to restore mitochondrial function and has a key role in production of mitochondrial adenosine triphosphate. Thus, it is reasonable to speculate that dietary supplementation with vitamin K2 could increase the function of muscle with high mitochondrial content (ie, skeletal and cardiac muscle).

OBJECTIVE: The purpose of this study was to determine if 8 wk of dietary supplementation with Vitamin K2 could alter cardiovascular responses to a graded cycle ergometer test.

DESIGN: The study was a randomized controlled trial.

SETTING: The study took place in the Applied Physiology Laboratory of the Department of Biological Sciences at the University of North Texas (Denton, TX, USA).

PARTICIPANTS: Participants were aerobically trained males and female athletes (N = 26).

INTERVENTION: Participants were randomly assigned either to a control group that received a rice flour placebo or to an intervention group that received vitamin K2. For weeks 1 to 4, participants received 300 mg/d; for weeks 5 to 8, they received 150 mg/d. Subjects assigned to the control group received similar doses to mirror the intervention group. Subjects consumed the supplements during an 8-wk period while they maintained their typical exercise habits.

OUTCOME MEASURES: At baseline and postintervention, participants completed a standard, graded exercise test on an electronically braked cycle ergometer. Before the test, participants were fitted with a mouth piece, and their oxygen consumption, carbon dioxide production, respiratory rate, and respiratory exchange ratio were measured. In addition, participants were fitted with skin-mounted electrodes that measured noninvasive cardiac output, stroke volume, and heart rate. To assess the cumulative exercise change, an area-under-the-curve (AUC) value was calculated separately for each outcome variable at each treatment time point.

RESULTS: Vitamin K2 supplementation was associated with a 12% increase in maximal cardiac output, with P = .031, with a trend toward an increase in heart-rate AUC, with P = .070. No significant changes occurred in stroke volume.

CONLUSIONS: Although vitamin K2 supplementation has previously been reported to improve cardiovascular function in diseased patients, to the research team's knowledge, the current study is the first to report its potential in active individuals. More research is needed to fully evaluate the potential effects of the observed effects.

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