Abstract


Vitamin C status is related to proinflammatory responses and impaired vascular endothelial function in healthy, college-aged lean and obese men.

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OBJECTIVE: Vitamin C supplementation has been suggested to reduce cardiovascular disease risk. However, no studies have examined the relationship between vitamin C status and vascular dysfunction in lean and obese individuals in the absence of supplementation.

METHODS: We examined whether vascular function is interrelated with vitamin C status and inflammation in healthy, college-aged lean and obese men with no history of dietary supplementation. A cross-sectional study was conducted during winter 2008 in lean and obese men aged 21±3 years (n=8/group). Brachial artery flow-mediated dilation (FMD) was measured to determine vascular endothelial function. Plasma antioxidants (vitamin C, vitamin E, and thiols), inflammatory proteins (C-reactive protein [CRP], myeloperoxidase [MPO], and cytokines), and cellular adhesion molecules were measured. Participants also completed 3-day food records on the days preceding their vascular testing. Group differences were evaluated by t tests, and correlation coefficients were determined by linear regression.

RESULTS: FMD was 21% lower (P<0.05) in obese men. They also had 51% lower vitamin C intakes and 38% lower plasma vitamin C concentrations. Obese men had greater plasma concentrations of CRP, MPO, inflammatory cytokines, and cellular adhesion molecules. Participants' CRP and MPO were each inversely related (P<0.05) to FMD (r=-0.528 and -0.625) and plasma vitamin C (r=-0.646 and -0.701).

CONCLUSIONS: These data suggest that low vitamin C status is associated with proinflammatory responses and impaired vascular function in lean and obese men. Additional study is warranted to determine whether improving dietary vitamin C intakes from food attenuate vascular dysfunction.

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