

# Abstract

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## **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  $21 \pm 3$  years ( $n=8/\text{group}$ ). 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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