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## Vitamin C shows exercise benefits: Human data

By Stephen Daniells, 11-Jun-2012

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**Daily supplements of vitamin C may decrease heart rate during exercise and reduce the perception of fatigue and exertion, suggests new data.**

A four-week study with 20 adults found that a daily supplement of 500 mg of vitamin C was associated with an average 11 fewer heart beats during exercise, compared to three fewer beats in the control group, according to findings published in *Nutrition*.



All of the participants were adhering to a vitamin C-controlled, calorie-restricted diet.

*"The most important findings of the present study are the marked decreases in heart rate response during submaximal exercise and the lower levels of general fatigue and the perception of effort reported in vitamin C participants compared with control participants at the end of the intervention period,"* report scientists from the University of Wisconsin and Arizona State University.

### Study details

Led by Arizona State's Carol Johnston, the researchers recruited 20 adults with an average age of 35 and an average BMI of 34.3 kg/m<sup>2</sup> to participate in their study. All participants consumed a calorie-controlled diet for four weeks with or without a daily vitamin C supplement.

At the start and end of the study, the participants performed 60 minutes of exercise at an intensity of 50% predicted maximal oxygen consumption.

Results showed that both groups lost about four kilograms and there were no differences in breathing between the groups. However, the vitamin C group had significantly lower heart rates during exercise, compared with the control group.

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In addition, the Ratings of Perceived Exertion (RPE) were also significantly reduced in the vitamin C group. Perceived fatigue was also reduced.

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"[Perceived exertion] is typically correlated to heart rate and blood lactate concentrations and is considered a gauge for muscular effort, fatigue, and muscle aches," explained Johnston and her co-workers.

"The RPE during the 60-min walk was decreased 10% in the VC group and increased 1% in the CON group at week 4 compared with baseline. Because heart rate is a contributing factor to perceived effort, the significant decrease in the exercising heart rate noted for the VC participants may have influenced the reported RPE values."

"These data provide preliminary evidence that vitamin C supplementation decreases feelings of fatigue and perceptions of exertion during moderate exercise in obese individuals. Because strategies to improve adherence to exercise protocols are needed, further investigations of the impact of vitamin C status on perceptions of effort during exercise are warranted," they concluded.

Source: [Nutrition](#)

Published online ahead of print, doi: 10.1016/j.nut.2012.01.021

"Vitamin C status and perception of effort during exercise in obese adults adhering to a calorie-reduced diet"

Authors: C.J. Huck, C.S. Johnston, B.L. Beezhold, P.D. Swan

Keywords: heart rate, exertion, vitamin C

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