

A recent meta-analysis has shown that supplementation with high doses of vitamin C may improve blood vessel health and function in adults at risk for cardiovascular disease.

## Vitamin C supplementation improves endothelial function in adults with cardio-metabolic disorders

Previous observational studies have suggested that a higher intake of vitamin C is associated with a reduced risk of cardiovascular disease, primarily through effects on the endothelium (a thin layer of cells lining the interior of blood vessels). The endothelium has many important functions that include maintaining the flexibility of blood vessels and modulating the activity of certain white blood cells that are a significant part of the immune system.

Despite this conclusion, studies examining the effect of vitamin C on endothelial function (EF) have not always been consistent. In a recent meta-analysis published in the journal *Atherosclerosis*, researchers sought to determine the effect of vitamin C supplementation on EF in adults, and whether the outcome differed by health status, study duration, dose and route of administration.

The study included 44 clinical trials and 1,129 adult participants. Supplemental vitamin C at oral doses of more than 500 mg was associated with significant improvement of endothelial function in subjects with cardio-metabolic disorders. The benefits of supplementation were primarily limited to people with atherosclerosis, diabetes, and heart failure. The study design, duration of supplementation, route of administration and baseline plasma vitamin C did not appear to significantly affect the outcome. There was a significant positive association between dosages greater than 500 mg/day and improvement in endothelial function.

The researchers noted that in addition to its effects on oxidative stress, vitamin C may positively affect nitric oxide, a potent vasodilator, reducing vascular inflammation. The results of this study indicate that vitamin C supplementation may improve endothelial function, especially in adults with a higher cardiovascular risk. Vitamin C supplementation, therefore, could potentially be a useful tool for the secondary prevention of cardiovascular diseases.

Ashor AW, Lara J, Mathers JC, Siervo M. Effect of vitamin C on endothelial function in health and disease: A systematic review and meta-analysis of randomised controlled trials. *Atherosclerosis*. 2014 Jul;235(1):9-20.