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Omega-3s may improve health of blood vessels: Meta-analysis

By Stephen Daniells, 29-Mar-2012

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Supplements of omega-3 fatty acids may improve the function of blood vessels and support vascular health, says a new meta-analysis of 16 studies.

Daily supplements of omega-3s for an average of 56 days were associated with a 2.3% improvement in flow-mediated dilation (FMD), a measure of a blood vessel's healthy ability to relax, according to findings published in *Atherosclerosis*.



The doses used in the studies ranged from 0.45 to 4.5 grams per day, and researchers from the Chinese Academy of Medical Sciences & Peking Union Medical College report that, at the lower to medium levels, a dose-dependent effect was observed, meaning the greater the dose, the greater the effect on FMD.

Such effects were not observed at the high doses of omega-3s, however.

The potential benefits of the fatty acids were also limited to people with cardiovascular disease or its risk factor, said the researchers, with no benefits observed in healthy participants.

"It could be partly explained that healthy individuals may already have sound endothelial function and the improvement by omega-3 supplements was limited," they said.

Heart health

The study adds to an ever-growing body of science supporting the potential cardiovascular health benefits of omega-3 fatty acids.

The heart health benefits of fish oil, and the omega-3 fatty acids it contains, are well-documented, being first reported in the early 1970s by [Dr Jorn Dyerberg](#) and his co-workers in *The Lancet* and *The American Journal of Clinical Nutrition*.

To date, the polyunsaturated fatty acids (PUFAs) have been linked to improvements in blood lipid levels, a reduced tendency of thrombosis, blood pressure and heart rate improvements, and improved vascular function.

The new meta-analysis supports this last point, with the data indicating that omega-3 supplements do indeed boost vascular function.

Meta-analysis

The Chinese reviewers included data from 16 studies, which provided data from

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901 participants.

FMD was found to improve by 2.3% in people taking omega-3 supplements, compared to placebo. FMD is said to be a measure of endothelium-dependent vasodilation (EDV), which relates to the cells lining the blood vessels (endothelium).

On the other hand, no effects were observed for endothelium-independent vasodilation (EIV), which indicated that omega-3s benefit the cells lining the blood vessels directly.

Commenting on the potential mechanism, the reviewers note that this is still unknown, but point to a potential role for omega-3s to reduce levels of inflammatory biomarkers that are involved in damage to cells called soluble adhesion molecules, particularly vascular cell adhesion molecule-1 (VCAM-1) and inter-cellular adhesion molecule-1 (ICAM-1).

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This is in agreement with recent studies published in the *American Journal of Clinical Nutrition* that reported omega-3 may counter the atherosclerotic and carcinogenic effects of ICAM.

Clinical efficacy?

"Although positive association was identified between omega-3 FAs and endothelial function, the evidence for a clinical efficacy is not strong enough to make final recommendations concerning to a specific doses or the durations of intakes for different populations," said the researchers.

"Future well-designed studies are warranted to identify the target population for omega-3 FAs supplementation and determine the optimal dose."

Support for omega-3

Harry Rice, VP of scientific and regulatory affairs for GOED, the omega-3 trade association, told NutraIngredients-USA that the significant heterogeneity between studies makes it difficult to determine to what degree EPA & DHA affect endothelial function.

"While the results from the meta-analysis leave many questions unanswered, as well as raising others, they do support a roll for the long-chain omega-3s in improving endothelial health in those with cardiovascular issues. The present results don't suggest a benefit for maintenance of endothelial health, but I suspect that is due to a floor effect. A long-term (i.e. years) intervention trial in healthy subjects should resolve that issue."

"While it's important to understand the mechanism of action, what's most important to know is that the long-chain omega-3s decrease cardiovascular, as well as all-cause, mortality," added Dr Rice.

Source: [Atherosclerosis](#)

April 2012, Volume 221, Issue 2, Pages 536-543, doi: 10.1016/j.atherosclerosis.2012.01.006

"Effect of omega-3 fatty acids supplementation on endothelial function: A meta-analysis of randomized controlled trials"

Authors: Q. Wang, X. Liang, L. Wang, X. Lu, J. Huang, J. Cao, H. Li, D. Gu

Keywords: omega-3, vascular health, supplements

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