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## Omega-3 again linked to lower inflammation: Study

By Stephen Daniells, 28-Nov-2011

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**Increased blood levels of omega-3s are associated with lower levels of compounds linked to inflammation and heart disease, says a new study that strengthens the heart health benefits of the fatty acids.**

Levels of C-reactive protein (CRP), a well-established marker of inflammation, decreased as levels of omega-3 fatty acids, and particularly docosapentaenoic acid (DPA) and docosahexaenoic acid (DHA), increased in the blood, according to a study with 1,395 health Finnish men.



However, no relationship was observed for eicosapentaenoic acid (EPA) levels or alpha-linolenic acid (ALA), report researchers from the University Amsterdam and the University of Eastern Finland in the *European Journal of Clinical Nutrition*.

#### Heart health and beyond

Chronic inflammation is brought about by an over-expression or lack of control of the normal protective mechanisms.

Omega-3 fatty acids are amongst the most extensively studied for their potential anti-inflammatory benefits. For example, a study by Professor Manohar Garg from the University of Newcastle in New South Wales found that increased blood levels of the omega-3s DHA (docosahexaenoic acid) and EPA (eicosapentaenoic acid) were associated with reduced levels of CRP (*European Journal of Clinical Nutrition*, 2009, Vol. 63, pp.1154-1156).

Elevated levels of C-reactive protein have been reported to indicate an increased risk of coronary heart disease, according to a study published in the *New England Journal of Medicine* (2004, Vol. 351, pp. 2599-2610).

The mechanism of omega-3 anti-inflammatory effects is reportedly linked to its ability to inhibit arachidonic acid (AA) metabolism to inflammatory compounds. DHA and EPA are also reported to produce compounds that are less inflammatory than those produced from AA or that are anti-inflammatory.

#### Study details

The new study also analyzed the effects of mercury levels, measured as methylmercury in hair, and found no relationship with CRP levels.

Led by Jyrki Virtanen from the University of Eastern Finland, the researchers analyzed blood levels of omega-3 fatty acids, CRP, as well as methylmercury levels in the hair of Finnish men aged between 42 and 60.

Results showed that as omega-3 levels increased, CRP levels decreased, with "statistically significant inverse associations were also observed with the total serum long-chain n-3 PUFA concentration and with the individual long-chain n-3 PUFAs docosapentaenoic acid and docosahexaenoic acid, but not with eicosapentaenoic acid or with the intermediate-chain n-3 PUFA alpha-linolenic acid".

Commenting on the mechanism, Dr Virtanen and his co-workers note that the anti-inflammatory properties of omega-3 may be linked to the compounds' unsaturated double bonds.

"These bonds may inactivate reactive oxygen species and prevent their interaction with, for example, nuclear factor-kB," they wrote. "Indeed, fish oil has been associated with anti-inflammatory gene expression, for example, with decreased expression of nuclear factor-kB."

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Source: *European Journal of Clinical Nutrition*  
Published online ahead of print, doi: 10.1038/ejcn.2011.195  
"Association of serum n-3 polyunsaturated fatty acids with C-reactive protein in men"  
Authors: I. Reinders, J.K. Virtanen, I.A. Brouwer, T-P. Tuomainen

Keywords: omega-3, inflammation, CRP

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