Reference:

Association Between Serum Levels of n-3 Polyunsaturated Fatty Acids and Coronary Plaque Detected by Coronary Computed Tomography Angiography in Patients Receiving Statin Therapy

Urabe, Y. et al., Circulation Journal (Japanese Circulation Society), in press, 2013

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Summary:

Despite the clinical use of statin treatment for lowering LDL-cholesterol levels and cardiovascular-related events and mortality as well as having favourable effects on coronary plaques, cardiovascular risks remain. CTA (computed tomography angiography) is used to study the degree of coronary atherosclerosis and the nature of coronary plaques which relates to their instability, vulnerability to rupture, and overall risk. It is known that so-called NCPs (non-calcified plaques) are strongly associated with serious cardiovascular events. In the present research, the investigators evaluated the relationship between the status of long-chain omega-3 fatty acids (EPA and DHA) in patients (172 subjects, average age being 68 years) receiving statin treatment for lowering circulating LDL-cholesterol levels and the burden of coronary plaques measured by CTA. The patients’ omega-3 status was assessed by determining the levels of EPA/DHA in their blood serum (which reflects their dietary intake of EPA/DHA – mainly from fish/seafood).

The researchers found a highly significant relationship between the circulating levels of EPA in the patients and the extent and severity of their coronary plaques (no relationship of coronary plaques to circulating DHA levels was found). The patients were distributed into two groups - a ‘low EPA’ or ‘high EPA’ group based on their blood levels. Interestingly, the ‘low EPA’ group exhibited a significantly higher plaque burden based on a higher incidence of both NCPs (74 % vs. 52 %) and extensive NCPs (56 % vs. 34 %) when compared to the ‘high EPA’ group.
Patients with lower summed levels of serum EPA plus DHA were also found to exhibit a more risky plaque burden. The present authors suggested that the reduced cardiac events found in clinical trials with supplementary EPA plus DHA or EPA alone may be due in part to the accumulation of EPA in the atherosclerotic plaques thereby reducing inflammatory processes and increasing plaque stability.

Dr. Holub’s Comments:

The present study adds support for yet another mechanism by which long-chain omega-3 fatty acids from fish/fish oils may reduce cardiac events. A reduction in the incidence and extent of NCPs (non-calcified plaques) is of considerable clinical significance since such plaques are prone to rupture thereby leading to serious and potentially fatal coronary events. The present findings also raise the possibility that, despite aggressive blood cholesterol control with statin medication, patients with a ‘risky’ coronary plaque burden may derive added benefit from supplementation with fish oil-derived omega-3 fatty acids enriched in EPA. Future intervention trials along these lines are most warranted considering that coronary patients in most countries have very low dietary intakes of EPA omega-3 (typically well below 100 mg/day).