Flax Seed and Heart Health

Omega-3 Levels & Coronary Heart Disease

Theory:
Despite positive findings around the connection between omega-3 polyunsaturated fatty acids (PUFAs) and coronary heart disease (CHD) risk, concerns remain around the applicability of these studies. In particular, many interventions were strictly with supplemental intake of seafood-derived omega-3s, leading to questions about long-term dietary intake of seafood and plant-derived omega-3s, as well as how to appropriately measure the impact in a healthy population. Could a broader review of available studies with appropriate biomarkers and ascertained incident CHD offer insight into the future possibilities?

Parameters:
The Fatty Acids and Outcomes Research Consortium (FORCe) developed a standardized analysis protocol and narrowed the population in target studies to those without a prior history of myocardial infarction (MI), angina, coronary revascularization or stroke, and in which fatty acid biomarker levels were included in the analysis. This yielded 19 prospect (cohort, nested case-control) or retrospective studies with 45,637 unique individuals, that measured circulating or tissue omega-3 biomarkers and ascertained CHD. Main outcomes were incident total CHD, fatal CHD and nonfatal MI.

Outcome:
Pooled results revealed in participants without prevalent CHD, habitual consumption of seafood and plant-based omega-3 PUFAs was associated with a modestly lower risk of fatal CHD. Associations were stronger in phospholipids and total plasma measures.

Specifically, biomarkers for alpha-linolenic acid (ALA), docosapentaenoic acid (DPA) and docosahexaenoic acid (DHA) were associated with a lower risk of fatal CHD.

- ALA levels had a relative risk of 0.91
- DPA levels had a relative risk of 0.90
- DHA levels had a relative risk of 0.90

DPA was also associated with a lower risk of total CHD, with a relative risk of 0.94.

AL% was associated with a significantly lower risk of nonfatal MI among African American individuals.

No significant differences in associations of biomarkers with incident CHD events were observed by age, sex or omega-6 PUFA concentrations.

Impact:
The World Health Organization (WHO) has estimated that cardiovascular disease is responsible for 10% of disability-adjusted life years (DALYS) lost in low- and middle-income countries and 18% in high income countries. Further, while thought of as a Western problem, more than 60% of the global burden of coronary heart disease (CHD) occurs in developing countries. Given the diverse global dietary sources of omega-3s and growing interest in plant-based nutrition, understanding the impact of plant-based omega-3s on CHD is of considerable interest. Expanding the options for addressing heart health through both seafood and plant-based omega-3 PUFAs as part of a regular diet could have a beneficial long-term impact on global populations.
