

Fish Oils and Miscellaneous Disorders

Summaries of the latest research concerning fish oils and miscellaneous disorders

Fish oils help prevent macular degeneration

BOSTON, MASSACHUSETTS. Age-related macular degeneration (AMD) is a leading cause of blindness for which treatment options are limited. Note: The macula is responsible for detailed, fine central vision and is located at the center of the retina. Researchers at the Harvard Medical School have just released a major study that points to a close association between the development of AMD and the consumption of certain fats. The study involved 42,743 female nurses enrolled in 1984 and 29,746 male health professionals enrolled in 1986. The nurses completed 130-item food frequency questionnaires in 1984, 1986 and 1990 and the men completed them in 1986 and 1990. By 1996 a total of 567 study participants (351 women and 216 men) had developed AMD with visual loss of 20/30 or worse. The researchers found that women with a high fat intake (fifth quintile) had a 63 per cent greater risk of AMD than women with a low intake (first quintile). For men, the increased risk was 36 per cent. The major contributors to the increased risk were high intake of linolenic acid and trans-fatty acids. In contrast, a high intake of docosahexaenoic acid (DHA), a main component of fish oils, was found to lower the risk of AMD by about 30 per cent. More than one serving per week of beef, pork or lamb as a main dish was associated with a 35 per cent increased risk of AMD when compared to an intake of less than three servings per month. Fish, especially canned tuna, was found to have a protective effect, with the participants who ate fish more than four times per week having a 35 per cent lower risk of AMD than people eating fish three times per month or less. The researchers conclude that a high intake of linolenic acid may increase the risk of AMD. They caution though that their finding contradicts other studies that have shown that linolenic acid is protective against coronary heart disease. *Cho, Eunyoung, et al. Prospective study of dietary fat and the risk of age-related macular degeneration. American Journal of Clinical Nutrition, Vol. 73, February 2001, pp. 209-18/*

Fish consumption protects against macular degeneration

SYDNEY, AUSTRALIA. Age-related macular degeneration (maculopathy) is a leading cause of blindness in both Australia and the United States. There is some evidence that atherosclerosis and macular degeneration may both be related to a high intake of saturated fat and cholesterol. A large Australian study (Blue Mountain Eye Study) now confirms this connection. The study involved 3654 men aged 49 years or older who completed a 145-item, semi-quantitative food frequency questionnaire and also underwent a detailed eye examination including stereoscopic macular photography. Among the participants there were 240 cases (6.5%) of early-stage degeneration and 72 cases (2%) of late-stage disease. The study results confirmed that the incidence of late-stage macular degeneration was almost 3 times higher among the men with a daily cholesterol intake of 400 mg or more than among the men with an intake of 231 mg/day or less. Somewhat surprisingly there was also a strong correlation between the intake of monounsaturated fat (olive oil) and the incidence of early-stage macular degeneration. The men with an intake of 34 grams/day or more had a 48% greater incidence than the men with an intake of 25 grams/day or less. Regular fish consumption was found to be highly protective. The men who ate fish more than once a week had a 50% lower incidence of late-stage macular degeneration than did the men who ate fish less than once per month. *Smith, Wayne, et al. Dietary fat and fish intake and age-related maculopathy. Archives of Ophthalmology, Vol. 118, March 2000, pp. 401-04 /*

Fish oils (EPA) speed up healing of ligament injuries

WEST LAFAYETTE, INDIANA. Ligaments are tough bands of fibrous connective tissue (mainly collagen) that link two bones together at a joint. Injuries to ligaments are notoriously slow to heal. Researchers at Purdue University now report the results of an intriguing experiment which shows that eicosapentaenoic acid (the main component of fish tissue oils) materially speeds up the healing of "wounded" ligament cells /in vitro/. The experiment was carried out on three cultures of animal medial collateral ligament cells. The first culture was treated with arachidonic acid (an n-6 polyunsaturated fatty acid), the second with eicosapentaenoic acid (an n-3 polyunsaturated fatty acid), and the third served as a control. After four days the cells were analyzed to determine their fatty acid profile. The AA (arachidonic acid) treated cells were found to have an n-6 to n-3 ratio of 24.3 while the EPA (eicosapentaenoic acid) treated cells had a ratio of 1.1. This indicates that the two fatty acids were well-absorbed and incorporated into the cells. Next a "wound" was introduced into the surface layers of the cell cultures by streaking a sterile pipette across them. The rate at which ligament cells grew back into the "wound" was measured over a 72-hour period and taken as an indication of wound healing speed. Both the AA and EPA treated cultures showed a higher degree of regrowth in the wound area than did the control. However, while AA decreased the synthesis of collagen by the ligament cells, EPA markedly increased it. The researchers conclude that dietary supplementation with fish oils (n-3 polyunsaturated fatty acids) could be used to improve the healing of ligament injuries by enhancing the entry of new cells into the wound area and by speeding up collagen synthesis. *Hankenson, Kurt D., et al. Omega-3 fatty acids enhance ligament fibroblast collagen formation in association with changes in interleukin-6 production. Proceedings of the Society for Experimental Biology and Medicine, Vol. 223, January 2000, pp. 88-95/*

Atopic diseases linked to fatty acid ratio

TURKU, FINLAND. An atopic disease is a form of allergy where the hypersensitivity reaction occurs at a location different from the initial contact point between the body and the offending agent (allergen). For example, food taken by mouth may cause an allergic skin reaction - atopic dermatitis. The incidence of atopic diseases such as dermatitis, allergic rhinitis, and asthma is rising in industrialized countries and now affects about 20% of the population. A team of researchers from the University of Turku and Tufts University in Boston now report that the increase in atopic diseases is closely tied in with an increase in the consumption of omega-6 fatty acids (linoleic acid) which have pushed the ratio of omega-6 to omega-3 (alpha-linolenic, eicosapentaenoic, and docosahexaenoic acids) fatty acids in the diet to an unfavorably high level (10:1 or higher). An increasing dietary intake of linoleic acid has been linked to a rise in atopic diseases in both Germany and Japan. A recent study of Finnish and Swedish school children found that children with a high ratio of eicosapentaenoic acid to linoleic acid had a lower prevalence of atopic diseases while children with allergies tended to have a lower level of docosahexaenoic acid in their blood. The researchers point out that the metabolic products (eicosanoids) of omega-6 fatty acids promote inflammation while the metabolites of omega-3 acids dampens inflammation. They also point to several clinical trials which have shown that supplementation with fish oil or alpha-linolenic acid can reduce the symptoms of atopic dermatitis and asthma. They conclude that an increased intake of omega-3 fatty acids (fish oils and alpha-linolenic acid) may alleviate atopic diseases caused by an excessive intake of omega-6 fatty acids. *Kankaanpaa, Pasi, et al. Dietary fatty acids and allergy. Annals of Medicine, Vol. 31, 1999, pp. 282-87 [61 references] /*

Fish oil supplementation alleviates Raynaud's disease

ALBANY, NEW YORK. Raynaud's phenomenon is characterized by periods of disrupted blood flow to the fingers caused by exposure to cold or stress. The condition is relieved by warming the affected parts. It is estimated that about 4% of the US population suffer from the primary form of this phenomenon, the so-called Raynaud's disease. Secondary Raynaud's phenomenon occurs in association with connective tissue disease (progressive systemic sclerosis). Researchers at the Albany Medical College now report that supplementation with fish oils significantly reduces the symptoms of Raynaud's disease (primary Raynaud's phenomenon), but has no beneficial effects in secondary Raynaud's phenomenon. Their double-blind, placebo-controlled clinical trial involved 32 patients, 20 with primary disease and 12 with Raynaud's phenomenon secondary to progressive systemic sclerosis. The patients were exposed to a series of experiments which involved immersing their left hand into increasingly colder water baths for a five-minute period and then measuring the blood flow and systolic pressure in the index finger. Half the patients were given 12 1-gram fish oil capsules daily containing a total of 3.96 grams of eicosapentaenoic acid (EPA) and 2.64 grams of docosahexaenoic acid (DHA) while the other half received 12 olive oil capsules per day for a 12-week period. The fish oil supplementation was found to be highly effective in alleviating the symptoms of Raynaud's disease. At the 12-week checkup the systolic pressure measured after immersion in the 15o C water bath increased by 40 mm Hg in the fish oil group compared to a drop of 3 mm Hg in the placebo group. Five of 11 patients who developed symptoms before the start of the experiment could not be induced to develop symptoms at all when evaluated after 6 and 12 weeks of supplementation. The researchers conclude that fish oil supplementation is highly effective in alleviating symptoms of primary Raynaud's phenomenon, but has no effect in secondary Raynaud's phenomenon. / DiGiacomo, Ralph A., et al. Fish-oil dietary supplementation in patients with Raynaud's phenomenon: a double-blind, controlled, prospective study. *American Journal of Medicine*, Vol. 86, February 1989, pp. 158-64 / Coromega

Additional References 1. Gadek, J.E., et al. Effect of enteral feeding with eicosapentaenoic acid, gamma-linolenic acid, and antioxidants in patients with acute respiratory distress syndrome. **Critical Care Medicine**, Vol. 27, August 1999, pp. 1409-20 **Conclusion:** Tube-feeding EPA and GLA to critically ill patients is highly beneficial. 2. Ayala, A., and Chaudry, I.H. Dietary n-3 polyunsaturated fatty acid modulation of immune cell function before or after trauma. **Nutrition**, Vol. 11, Jan./Feb. 1995, pp. 1-11 **Conclusion:** Enteral (tube) feeding with n-3 PUFAs prior to and after surgery and other trauma prevents suppression of the immune system.

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