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A Selection of Recent Findings in the Field of Nutrition

Association of marine omega-3 fatty acid levels with telomeric aging in patients with coronary heart disease.

There is growing evidence demonstrating higher survival rates in patients with coronary heart disease consuming a high dietary intake of marine omega-3 fatty acids. The American Heart Association recommends increasing omega-3 fatty acids intake (from diet and/or supplements) for the primary and secondary prevention of coronary heart disease. The mechanisms underlying this protective effect are poorly understood, but it is thought to include, anti-inflammatory, antiplatelet, anti-hypertensive, antiarrhythmic, and triglyceride-lowering properties. Telomeres are tandem repeat DNA sequences which form a protective cap at the end of chromosomes. Telomere length is emerging as a novel marker of biological age, which reflects cumulative life-time burden of genetic and environmental factors independent of chronological age. Some studies in different populations reported that short telomere length was associated with cardiovascular morbidity and mortality. Considering the cardioprotective effects of omega-3 fatty acids, the authors investigated whether omega-3 fatty acid levels were associated with changes in leukocyte telomere length over 5 years in a prospective cohort of outpatients with coronary heart disease. Leukocyte telomere length was measured at baseline and again after 5 years of follow-up. In this prospective study, the baseline levels of omega-3 fatty acids were associated with decelerated telomere attrition over 5 years. This association was linear and remained after adjusting for potential confounders. These findings suggest that omega-3 fatty acids may protect against cellular aging in patients with coronary heart disease. The authors conclude "Among this cohort of patients with coronary artery disease, there was an inverse relationship between baseline blood levels of marine-omega-3 fatty acids and the rate of telomere shortening over 5 years".

[Farzaneh-Far R, et al. JAMA 2010; 303:250-257]

An estimate of the economic burden and premature deaths due to vitamin D deficiency in Canada [Review].

There is a strong and growing body of scientific evidence linking vitamin D deficiency to many diseases ranging from bone diseases, cardiovascular disease, some cancers, infections and autoimmune diseases. Almost all the Canadian population lives north of 43°N which means that for at least 4-5 months of the year, it is impossible to produce vitamin D from solar ultraviolet irradiation. Furthermore, the Canadian diet provides on average 200 IU of vitamin D from food, which is not sufficient to maintain serum 25-hydroxyvitamin D levels [25 (OH) D]. Serum 25 (OH) D is the main indicator of vitamin D sufficiency. Most of the above mentioned health benefits were reported with serum 25(OH) D at least 100 nmol/L. Canadians are at a higher risk of vitamin D deficiency as reflected by the high prevalence of low serum 25(OH) D. Canadians have a mean serum 25(OH) D of 67 nmol/L. The objective of this study is to estimate the burden of disease associated with vitamin D deficiency and to estimate the economic burden and premature death rate in Canada attributable to low serum 25(OH) D. The authors searched for journal articles reporting disease outcomes and dose-response relationships for vitamin D. The researched studies ranged from randomized controlled trials, meta-analyses, observational, cross-sectional and ecological studies. The estimated benefits were based on increasing the current Canadian mean serum 25(OH) D to 105 nmol/L. The authors estimated that with such an increase, the death rate could fall annually by 37,000 deaths, which represents a 16.1% reduction in death rate. The economic burden would be reduced by 6.9% or \$14.4 billion. The authors conclude "It is recommended that Canadian health policy leaders consider measures to increase serum 25(OH) D levels for all Canadians".

Longitudinal association of vitamin B-6, folate, and vitamin B-12 with depressive symptoms among older adults over time.

Depression is one of the most common mental disorders. In the US, the annual costs associated with depression have been estimated at \$44 billion. Depression is very common in the elderly as the prevalence of clinically relevant depression is estimated to range from a low of 7% to as much as 49%. Depression is a risk factor for several health outcomes including mortality. There is a suggestion that insufficient intakes of B vitamins are associated with depression, however, most of the suggested evidence was from cross-sectional studies with little prospective studies investigating this association. Therefore, the authors of this study examined whether dietary intake of vitamins B-6, folate, or vitamin B-12 were predictive of depressive symptom in 3,505 community-based US adults aged ≥ 65y who were followed an average of 7.2 y. In this study, higher total intake (from diet and supplements) of vitamin B-6 and B-12 were associated with a decreased risk of depressive symptoms over an average of 7.2 y of follow-up and after adjustments of several confounding variables. It was estimated that each additional 10 mg of vitamin B-6 and 10 mcg of vitamin B-12 were associated with 2% lower odds of depressive symptoms per year. Folate intake was not associated with depression, a finding explained by the authors as due to folic acid fortification of grains in the US which drastically reduced the prevalence of serum folate deficiency to < 1%. The authors conclude "Our results support the hypotheses that high total intakes of vitamin B-6 and B-12 are protective of depressive symptoms over time in community-residing older adults".

[Skarupski KA, et al. Am J Clin Nutr 2010;92:330-335]



Protective effect of periconceptual folic acid supplements on the risk of congenital heart defects: a registry-based case-control study in the northern Netherlands.

Congenital heart defects (CHDs) are one of the most common birth defects. CHDs are estimated to affect between 0.6-1.9 in 100 newborns worldwide. It is well established that periconceptual use of folic acid supplements reduce the risk of neural tube defects (NTD) in infants. There is suggested evidence that maternal periconceptual use of folic acid may protect against the occurrence of CHDs. If this association is substantiated, this will have an important public health impact worldwide. The authors of this study, investigated the potential protective effect of periconceptual folic acid use on the risk of CHDs relative to other non-folate related malformation, based on data from a large European congenital anomalies registry. In this large population-based case-control study, periconceptual folic acid use was associated with a reduced risk for CHDs relative to other non-folate congenital malformation. Women who reported using folic acid in the appropriate period had approximately 20% lower risk of having infants with any type of heart defect. This protective effect varied and appeared to be particularly strong for septal heart defects, which included ventricular septal defects and secundum type atrial septal defects. The authors conclude "Our results support the hypothesis that additional periconceptual folic acid use reduces CHD risk in infants. Use of periconceptual folic acid supplements was related to ~ 20% reduction in the prevalence of any CHD. Given the relatively high prevalence of CHD worldwide, our findings are important for public health".

[Van Beynum IM, et al. *Eur Heart J* 2010; 31: 464-471]

Suggested readings:**Dose effects of dietary phytosterols on cholesterol metabolism: a controlled feeding study.**

[Racette SB, et al. *Am J Clin Nutr* 2010;91:32-38]

A prospective study of dairy intake and the risk of uterine leiomyomata.

[Wise LA, et al. *Am J Epidemiol* 2010;171:221-232]

A bifidobacterium probiotic strains and its soluble factors alleviate chloride secretion by human intestinal epithelial cells.

[Heuvelin E, et al. *J Nutr* 2010; 140; 7-11]

Low zinc status: a new risk factor for pneumonia in the elderly?

[Barnett JB, et al. *Nutr Rev* 2010; 68:30-37]

Relationship of 25-hydroxyvitamin D with all-cause and cardiovascular mortality in older community-dwelling adults.

[Semba RD, et al. *Eur J Clin Nutr* 2010;64:203-209]

Meta-analysis of prospective cohort studies evaluating the association of saturated fat with cardiovascular disease.

[Siri-Tarino PW, et al. *Am J Clin Nutr* 2010; 91:535-546?]

A prospective study of magnesium and iron intake and pancreatic cancer in men.

[Kesavan Y, et al. *Am J Epidemiol* 2010;171:233-241]

Fetal programming: link between early nutrition, DNA methylation, and complex disease.

[Chmurzynska A. *Nutr Rev* 2010; 68:87-98]

Caffeine intake and semen quality in a population of 2,554 young Danish men.

[Jensen TK, et al. *Am J Epidemiol* 2010; 171:883-891]

Use of herbal products and potential interactions in patients with cardiovascular diseases.

[Tachjian A, et al. *J Am Coll Cardiol* 2010; 55:515-525]

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