

A selection of recent findings in the field of nutrition

Vitamins for chronic disease prevention in adults. Clinical Applications.

Two articles appeared in the same issue of the Journal of the American Medical Association. The first was a scientific review of clinically important vitamins and the second article summarized in this abstract, provided the clinical applications of vitamin use in chronic disease prevention. Although the North American diet is adequate in preventing the classic vitamin deficiencies such as scurvy and beriberi, sub-optimal intake of some vitamins even well above those causing deficiency syndromes increases the risk of several chronic diseases such as cardiovascular disease, cancer, and osteoporosis. For example, the authors point out that sub-optimal intake of folic acid, B6 and B12, increases the risk of cardiovascular disease, neural tube defects, and colon and breast cancer; inadequate intake of vitamin D contributes to osteopenia and fractures, and inadequate intake of vitamins A, E and C may increase the risk of several chronic diseases. There is compelling evidence that sub-optimal intake of most vitamins is highly prevalent in the general population, particularly the elderly. Food preparation, chilling, storage and reheating may decrease the activity of some vitamins such as vitamin C, folate, and vitamin B6. The authors recommend that all adults take a daily multivitamin. They recommended multivitamins rather than individual vitamins, because "multivitamins are simpler to take and cheaper than the individual vitamins taken separately and because a large proportion of the population needs supplements of more than one vitamin". The authors encourage physicians to inquire about vitamin use and to ensure that patients know about the vitamin supplements they should be taking. Lastly, the authors suggest that physicians ensure that their patients are not taking vitamins in large and potentially harmful doses.

[Fletcher RH, et al. JAMA 2002;287:3127-3129 and 3116-3126]

Secular trends in the body mass index of Canadian children

Obesity is a risk factor for several chronic diseases. There is a dramatic increase in the prevalence of obesity among children and adolescents. This Canadian study examined the secular changes in the body mass index (BMI) of Canadian children (7-13 years) between 1981 and 1996. The authors used nationally representative data from 3 Canadian surveys to assess the BMI secular trend for this age group. The result of their analysis provides strong indication that there was a progressive increase in BMI for Canadian children from 1981 to 1996. "The prevalence of overweight among boys increased from 15% in 1981 to 28.8% in 1996 and among girls from 15% to 23.6%. The prevalence of obesity in children more than doubled over that period, from 5% to 13.5% for boys and 11.8% for girls". Although more commonly seen among obese adults, obese children are increasingly being diagnosed with type 2 diabetes, hyperlipidemia and hypertension. Furthermore, an emotional aspect such as undesirable body image and low self-esteem is a concern. Because of the strong link of obesity to chronic disease there is a need to encourage the adoption of healthy nutrition and physical activity throughout childhood and adolescence.

[Tremblay MS, et al. CMAJ 2000;163:1429-1433]

Prospective study of dietary supplements, macronutrients, micronutrients, and risk of bladder cancer in US men.

Nearly 50% of mortality from bladder cancer could be explained by smoking, however, other risk such as diet might be important in the etiology of bladder cancer. The dietary link was researched in several studies but the results thus far have been inconclusive. This large prospective study of 51,529 male health professionals examined the association between intake of macronutrients and micronutrients and bladder cancer risk. In this study, 320 incident cases were diagnosed during 12 years of follow-up. The investigators found no relation between bladder cancer risk and total caloric or macronutrients intake, dietary intake of potassium, sodium, calcium, magnesium, phosphorus, iron, or water-soluble vitamins. Total vitamin E intake (from diet and supplements) and supplementary vitamin E intake in particular, were inversely associated with bladder cancer risk particularly with long-term use (10 or more years). A suggestive, inverse association was noted with vitamin C supplement use. The beneficial role of vitamin E



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could be explained by its antioxidant properties, inhibition of nitrosamines formation, and the capacity to keep selenium in the reduced state. The authors conclude, "More studies are needed to determine the role of vitamin E and C supplement intake in bladder carcinogenesis".

[Michaud DS, et al. *Am J Epidemiol* 2000;152:1145-1153]

Vitamin B12 and folate in relation to the development of Alzheimer's disease

Vitamin B12 deficiency and low serum vitamin B12 levels are found in subjects with Alzheimer's disease (AD), other dementias and with cognitive deficits, compared to controls. Low serum folate levels have been related to AD, all types of dementia, and to vascular diseases. This population-based longitudinal study explored the associations of low serum levels of vitamin B12 and folate with AD individually as well as the combined effects of the two vitamins with AD occurrence. A random sample of 370 nondemented persons, aged 75 years and older who were not taking folate or B12, was followed for 3 years to detect newly diagnosed cases of AD. As compared with subjects with normal levels of both vitamins, subjects with low levels of vitamin B12 or folate had double the risk of developing AD. This risk was even stronger in subjects with good cognition at the start of the study. The probable mechanisms could be explained by the fact that vitamin B12 is necessary for the conversion of homocysteine to methionine, and vitamin B12 or folate deficiency can increase homocysteine levels. Homocysteine has a neurotoxic effect that could lead to cell death or neurologic and psychiatric effects such as AD. Further research is needed in this area. The authors conclude, "monitoring serum B12 and folate concentration in the elderly may be relevant for prevention of AD".

[Wang H-X, et al. *Neurology* 2001;56:1188-1194]

Suggested readings

Use of vitamin-mineral supplements by female physicians in the United States.

[Frank E, et al. *Am J Clin Nutr* 2000;72:969-975]

Trends in the incidence of coronary heart disease and changes in diet and lifestyle in women.

[Hu FB, et al. *N Engl J Med* 2000;343:530-537]

Intake of specific carotenoids and risk of lung cancer in 2 prospective US cohorts.

[Michaud DS, et al. *Am J Clin Nutr* 2000;72:990-997]

Serum ferritin and death from all causes and cardiovascular disease: The NHANES II Mortality Study.

[Sempos Ct, et al. *Ann Epidemiol* 2000;10:441-448]

Food habits of Canadians: reduction in fat intake over a generation.

[Gray-Donald, K et al. *Can J Public Health* 2000;91:381-385]

Heavy coffee consumption and plasma homocysteine: a randomized controlled trial in healthy volunteers.

[Urgert R, et al. *Am J Clin Nutr* 2000;72:1107-1110]

Folate intake, lifestyle factors, and homocysteine concentrations in younger and older women.

[Rasmussen LB, et al. *Am J Clin Nutr* 2000;72:1156-1163]

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