

Whitehall-Robins Supplement

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A selection of recent findings in the field of nutrition

Effect of a multivitamin and mineral supplement on infection and quality of life.

A randomized, double-blind, placebo-controlled trial.

It is known that nutrition can influence immune function. Most of the research on vitamin and mineral supplementation focused on its effects on immunity and infectious diseases. Several studies suggest that vitamin supplementation may improve various immunologic factors, however, higher consumption of certain nutrients might impair immunologic responses. This randomized, double-blind, placebo-controlled trial, investigated the effect of a standard multivitamin and multimineral supplement on infection, infection-associated absenteeism and general physical and mental well-being. The study comprised of 130 adults stratified by age and presence of type 2 diabetes mellitus. The participants took either a multivitamin and mineral supplement or placebo daily for 1 year. In this study, more infectious illness was reported among participants receiving placebo than did participants receiving multivitamin and mineral supplements. Infection-related absenteeism was also higher in the placebo group than in the treatment group. The beneficial effect of supplementation was almost entirely observed in participants with diabetes. This effect could be explained by the ability of supplementation to correct for micronutrient deficiencies, which are more likely encountered in individuals with diabetes mellitus. There was no difference found between the treatment and placebo groups in physical and mental well-being measures. The authors conclude "Multivitamin and mineral supplements are convenient and relatively inexpensive. If our results are confirmed in a larger trial, the widespread implementation of this preventive measure could have a substantial economic impact and could ease the burden of suffering in our society".

[Barringer TA, et al. *Ann Intern Med* 2003;138:365-371]

Plasma folate, vitamin B6, vitamin B12, homocysteine, and the risk of breast cancer.

Folate, vitamins B6 and B12, have several biological roles that potentially make them important in cancer. These vitamins can also reduce high homocysteine, which is considered a risk factor for vascular disease. Several studies have suggested that adequate folate intake may be important in the prevention of breast cancer, particularly among women who consume alcohol. There is early suggestion that lower plasma levels of vitamin B12 were associated with increased risk of breast cancer among postmenopausal women, however, such an association was not observed with vitamin B6. This study investigated the association between plasma folate, vitamins B6 and B12 with breast cancer in a prospective, nested case-control study with a large number of case patients in the ongoing Nurses' Health Study. These associations were also examined according to alcohol intake. This study comprised of 712 breast cancer case patients, who were matched to 712 control subjects. In this study, higher plasma folate levels were associated with a lower risk of breast cancer. This association was particularly strong among women who consumed moderate amounts of alcohol (at least one drink per day). There was an inverse association between plasma vitamin B6 levels and risk of breast cancer, which was much stronger for postmenopausal women than premenopausal women. Higher plasma vitamin B12 levels were associated with lower risk of breast cancer among premenopausal women, however, this particular finding needs further confirmation in future studies. Plasma homocysteine was not associated with risk of breast cancer among either premenopausal or postmenopausal women. The authors conclude "The findings from this study suggest that folate and vitamin B6 may have the potential to be chemopreventative against breast cancer and that ensuring adequate circulating levels of folate and vitamin B6 by consuming foods that are rich in these nutrients, such as oranges, orange juice, and fortified breakfast cereals, or vitamin supplements, may contribute to a reduction in the risk of breast cancer. Adequate folate levels may be particularly important for women who are at a higher risk of breast cancer because of higher alcohol consumption".

[Zhang SM, et al. *J Natl Cancer Inst* 2003; 95:373-380]

Multivitamin supplements are inversely associated with risk of myocardial infarction in men and women- Stockholm Heart Epidemiology Study (SHEEP).

There is strong evidence from epidemiologic studies indicating that a diet high in fruits and vegetables (rich sources of antioxidants) is inversely associated with the risk of cardiovascular disease. Although observational studies suggest an inverse association between intake of specific antioxidants and risk of cardiovascular disease, intervention trials using high doses of antioxidant supplements have been largely disappointing. However, epidemiologic data relating multivitamin supplement use containing low to moderate levels of several nutrients to the risk of cardiovascular disease are sparse and inconsistent. The association between self-selected use of low dose multivitamin supplements and the risk of myocardial infarction (MI) was investigated in a large population-based, case-control study of men and women 45-70 years residing in Sweden. Sweden is a country in which intake of fruits and vegetables is relatively low compared with other populations, and foods are not fortified with folic acid. The study included 1296 cases with a first nonfatal MI and 1685 controls. Among controls, 57% of the women and 35% of the men used dietary supplements. Corresponding figures for the cases were 42% and 27% respectively. Of those taking supplements, 80% used multivitamin preparations. In this study, the intake of multivitamin supplements was inversely associated with the risk of nonfatal MI. This association

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persisted after adjustments for major risk factors for cardiovascular disease as well as adjustment for potentially confounding variables. The authors explain their findings by arguing that multivitamin/multimineral supplements contain potentially protective micronutrients, which can reduce the risk of MI, such as antioxidants, B-vitamins and some minerals. The strongest evidence is for the B-vitamins, particularly folic acid. The authors conclude, "Findings from this study, indicate that use of low dose multivitamin supplements may aid in the primary prevention of MI".

[Holmquist C, et al. *J Nutr* 2003;133: 2650-2654]

Diet in midpuberty and sedentary activity in prepuberty predict peak bone mass.

Peak bone mass, which is reached by the third decade of life, is an important determinant of the risk of osteoporosis. Several studies showed that calcium supplementation increases bone density in children and adolescents, but none of these studies followed subjects to young adulthood. A calcium intake of 1,300 mg is currently recommended for North American adolescents aged 9-18 years. This study assessed 693 black and white women aged 21-24 years who participated in this 10-year prospective study. The objective of this study was to investigate: 1) whether there is a stage of puberty when dietary calcium is more strongly related to peak bone mass, as indicated by young adult bone mass (YABM); 2) whether dietary calcium intake >1000 mg/day in adolescence is associated with higher YABM; 3) whether race affects any of these associations between dietary calcium and YABM. A secondary aim of this study was to evaluate the relations between sedentary activity and YABM. The main results of this study were that: 1) dietary calcium was most strongly associated with YABM in midpuberty; 2) calcium intake > 1000mg/day was associated with higher YABM, but this association was not significant at all skeletal sites; 3) race did not affect the observed relation between calcium and YABM; 4) sedentary activity in prepuberty was inversely associated with YABM. The authors conclude that "interventions should focus on ensuring adequate calcium intake in midpuberty and on minimizing sedentariness in prepuberty".

[Wang MC, et al. *Am J Clin Nutr* 2003;77:495-503]

Suggested Readings

Serum retinol levels and the risk of fractures.

[Michaelsson K, et al. *N Engl J Med* 2003;348:287-294]

Serum Lycopene concentrations and carotid atherosclerosis: the Kuopio Ischaemic Heart Disease Risk Factor Study.

[Rissanen TH, et al. *Am J Clin Nutr* 2003;77:133-138]

Normalizing calcium intake: projected population effects for body weight.

[Heaney, RP. *J Nutr* 2003;133:268S-270S]

Low vitamin D status: a contributing factor in the pathogenesis of congestive heart failure.

[Zittermann A, et al. *J Am Coll Cardiol* 2003;41:105-112]

n-3 polyunsaturated fatty acids, fatal ischemic heart disease, and nonfatal myocardial infarction in older adults: the Cardiovascular Health Study.

[Lemaitre R, et al. *Am J Clin Nutr* 2003;77:319-325]

Dietary intake of antioxidant nutrients and the risk of incident Alzheimer Disease in a biracial community study.

[Morris MC, et al. *JAMA* 2002;287:3230-3237]

Incidence of open neural tube defects in Nova Scotia after folic acid fortification.

[Persad VL, et al. *CMAJ* 2002;167:241-245]

Maternal fever, multivitamin use, and selected birth defects: evidence of interaction.

[Botto LD, et al. *Epidemiology* 2002;13:485-488]

Homocysteine and risk of ischemic heart disease and stroke. A meta-analysis.

[The Homocysteine Studies Collaboration. *JAMA* 2002; 288:2015-2022]