consumer nutrition and health supplement

June 2012 – Volume 16, Number 2

Formerly The Whitehall Robins Supplement

A Selection of Recent Findings in the Field of Nutrition

Folic acid supplements in pregnancy and severe language delay in children.

Randomized controlled trials and other studies have reported that periconceptional use of folic acid supplementation reduces the risk of birth defects. It was recently suggested that folic acid supplementation may have beneficial effects on other aspects of neurodevelopment. None of the above mentioned clinical trials have followed up to investigate whether folic acid supplementation have effects on neurodevelopment after birth. Human and animal studies have reported that folic acid is important for cell proliferation and repair of central nervous system cells. The Norwegian Mother and Child Cohort Study examined the associations between mothers' use of prenatal folic acid supplements and risk of severe language delay in their children at age 3 years. Maternal use of folic acid supplements within the interval from 4 weeks before to 8 weeks after conception was the exposure. Children's language competency at age 3 years was measured by mothers using a 6-point ordinal language grammar scale. Among 38,954 children in this study, 204 (0.5%) had severe language delay. In this study, maternal use of folic acid containing supplements within 4 weeks before to 8 weeks after conception was associated with a significant reduction in risk of severe language delay in children at age 3 years. The authors did not find an association between maternal use of folic acid and significant delay in gross motor skills at age 3 years. The authors conclude "Among this Norwegian cohort of mothers and children, maternal use of folic acid supplements in early pregnancy was associated with a reduced risk of severe language delay in children at age 3 years".

[Roth C, et al. JAMA 2011; 306:1566-1573]

Randomized vitamin E supplementation and risk of chronic lung disease in the Women's Health Study.

Chronic obstructive pulmonary disease (COPD) is manifested with a progressive irreversible airflow limitation and comprises a significant public health burden. The prevalence and incidence of COPD is increasing worldwide. The prevalence of COPD in the US adult population is 3-4% and 10% worldwide. In 2010, COPD is expected to be the third leading cause of death in the US due to aging of the population and the cumulative exposure to cigarette smoke which is the leading risk factor for COPD. Other risk factors include obesity, dietary patterns, environmental and occupational exposures. There is growing evidence that diet plays a role in the etiology of COPD. The lung oxidant/antioxidant balance might contribute to the risk of COPD. Observational studies of diet or nutritional status consistently reported that higher antioxidant status was associated with lower risk of COPD, however, there is limited evidence from randomized controlled trials. Using data from the Women's Health Study (WHS), a large clinical trial of healthy women aged ≥ 45 years, the investigators tested the hypothesis that supplementation with 600 IU of vitamin E (as α-tocopherol) every other day decreases the rate of occurrence of COPD. During 10 years of follow-up, 600 IU of vitamin E reduced the risk of the disease by approximately 10%. There was no significant difference in the magnitude of the effect of vitamin E by age, smoking, Aspirin® use, multivitamin use, or history of asthma. The protective effect was slightly stronger in women consuming >1 alcoholic drink. The authors conclude "In this large randomized trial, assignment to 600 IU vitamin E led to a 10% reduction in the risk of chronic lung disease in women".

[Agler AH, et al. Thorax 2011;66:320-325]

The effect of coffee on blood pressure and cardiovascular disease in hypertensive individuals: a systemic review and meta-analysis.

The association between coffee consumption and blood pressure (BP) among normotensive individuals has been widely investigated. Most studies reported that caffeine intake is associated with an acute increase in both systolic and diastolic blood pressure in the hours after caffeine intake. The effect of coffee and caffeine on BP and cardiovascular disease (CVD) in hypertensive individuals is unclear. This study summarized and reviewed the effects of acute and long-term coffee and caffeine intake on BP and the association between habitual coffee consumption and risk of CVD in hypertensive individuals. The main finding of this study was that, in hypertensive individuals, caffeine intake of 200 to 300 mg (equivalent to 1.5-2 cups of filtered coffee) produced an increase in BP. There was a mean increase of 8.1 mm Hg in systolic BP and 5.7 mm Hg in diastolic BP. This increase was observed in the first 60 minutes after intake and persisted up to 180 minutes afterwards. However, drinking coffee for 2 weeks did not appear to increase BP. The cohort studies reviewed in this analysis, found no evidence of an association between habitual coffee consumption and a higher risk of CVD. The authors conclude "In hypertensive individuals, caffeine intake produces an acute increase in BP for ≥ 3h. However, current evidence does not support an association between longer-term coffee consumption and increased BP or between habitual coffee consumption and an increased risk of CVD in hypertensive subjects".

[Mesas AE, et al. Am J Clin Nutr 2011; 94:1113-1126]

Vitamin D3 is more potent than vitamin D2 in humans.

Since the discovery of vitamin D until recently, the principal approach to quantify the biopotency of vitamin D2 (ergocalciferol) and vitamin D3 (cholecalciferol) was bioassay, which is generally regarded as a semiquantitative approach. Earlier assumptions were that the two were equally potent. With the release of the Dietary Reference Intakes (DRIs) for vitamin D, serum 25-hydroxyvitamin D [25(OH)D], was defined as the functional indicator of vitamin D status. Since then, several studies have reported that vitamin D3 is superior to vitamin D2 in elevating or sustaining serum 25(OH)D concentration, although at least one study reported that the two were essentially equipotent. To clarify this issue, the investigators of this study tested the hypothesis that vitamin D3 is superior to vitamin D2 in a randomized, controlled trial as demonstrated by change in total serum 25(OH)D as the primary outcome, and change in adipose tissue fat content of the calciferols as the secondary outcome. The trial involved 33 healthy adults and calciferols were dosed at 50,000 IU/ week for 12 weeks. The results of this study showed that vitamin D3 produces a substantially larger effect than vitamin D2, based on the effect on serum 25(OH)D and by fat storage of the vitamin. The various measures employed in this study showed that vitamin D3 was from 56 to 87% more potent than vitamin D2 in raising serum 25(OH)D, and more than three times as potent in increasing fat calciferol content. The authors conclude "D3 is approximately 87% more potent in raising and maintaining serum 25(OH)D concentrations and produces 2-to 3-fold greater storage of vitamin D than does equimolar D2. For neither was there evidence of sequestration in fat, as has been postulated for doses in this range. Given its greater potency and lower cost, D3 should be the preferred treatment option when correcting vitamin D deficiency".
[Heaney RP, et al. J Clin Endocrinol Metab 2011; 96:E447-E452]

Suggested readings:

Reduction of common cold symptoms by encapsulated juice powder concentrate of fruits and vegetables: a randomized, double-blind, placebo-controlled trial.
[Roll S, et al. Br J Nutr 2011; 105:118-122]

Update on vitamin D and type 2 diabetes.
[Maxwell CS, et al. Nutr Rev 2011;69 :291-295]

Dietary B vitamins and methionine intakes and breast cancer risk among Chinese women.
[Shrubsole MJ, et al. Am J Epidemiol 2011;173:1171-1182]

Serum 25-hydroxyvitamin D is a predictor of serum 1, 25-dihydroxyvitamin D in overweight and obese patients.
[Lagunova Z, et al. J Nutr 2011; 141; 112-117]

The 2011 report on Dietary Reference Intakes for calcium and vitamin D from the Institute of Medicine: what clinicians need to know.
[Ross AC, et al. J Clin Metab 2011;96;53-58]

Athocyanins in cardiovascular disease.
[Wallace TC. Adv Nutr 2011;2;1-7]

The role of iron in learning and memory.
[Fretham SJB, et al. Adv Nutr 2011;2;112-121]

Artificial food dyes and attention deficit hyperactivity disorder.
[Kanarek RB. Nutr Rev 2011; 69:385-391]

Evaluation, treatment, and prevention of vitamin D deficiency: an Endocrine Society Clinical Practice Guideline.
[Holick MF, et al. J Clin Endocrinol Metab 2011;96:1911-1930]

Prospective study of alcohol consumption quantity and frequency and cancer-specific mortality in the US population.
[Breslow RA, et al. Am J Epidemiol 2011;174:1044-1053]

Association between biomarker-quantified antioxidant status during pregnancy and infancy and allergic disease during early childhood: a systematic review.
[Patelarou E, et al. Nutr Rev 2011;69:627-641]

Human obesity: Is insufficient calcium/dairy intake part of the problem?
[Tremblay A, et al. J Am Coll Nutr 2011;30:449S-453S]

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