

The Nutrition Reporter™

© Jack Challem July 2004 Vol 15 No 7

The independent newsletter that reports vitamin, mineral, and food therapies

Elevated Homocysteine, Low B Vitamins Linked to Osteoporosis and Fractures

Two large studies have found a strong association between high blood levels of homocysteine and the risk of bone fractures in people with osteoporosis. Elevated homocysteine levels, which are known to increase the risk of heart disease and stroke, result from an inadequate intake of folic acid and other B-complex vitamins.

In the first study, Douglas P. Kiel, MD, of the Hebrew Rehabilitation Center for Aged Research and Training Institute, Boston, and his colleagues studied 825 men and 1,174 women, ranging from 59 to 91 years of age. The men's health was tracked for 12 years and the women's for 15 years.

Men with the highest blood levels of homocysteine at the start of the study were almost four times more likely to suffer a hip fracture, compared with those with the lowest levels. Women with the highest homocysteine levels had almost twice the risk of having a hip fracture.

In the other study, Joyce B. J. van Meurs, PhD, of the Erasmus Medical Center, Rotterdam, the Netherlands, and her colleagues tracked the health of 2,405 subjects who were 55 years of age or older when the study began. The subjects' health was tracked for periods ranging from 2.7 to 8.1 years.

In this study, van Meurs found that elevated homocysteine levels were associated with double the risk of any type of osteoporotic fracture, including fractures of the hip, wrist, arm, leg, and ankle.

Furthermore, van Meurs reported that the risk of bone fracture appeared unrelated to the subjects' bone density. In other words, the likelihood of a fracture was related more to homocysteine (and low B vitamins) than to low bone density.

Kiel and his colleagues wrote that "homocysteine concentrations can be effectively and easily modified by dietary intake of folic acid and vitamins B6 and B12." Folic acid is found in leafy green vegetables, such as spinach, and vitamins B6 and B12 are found in animal foods.

In a related editorial in the *New England Journal*

of Medicine, Lawrence G. Raisz, MD, of the University of Connecticut Health Center, Farmington, wrote that experimental studies have found that homocysteine interferes with the normal crosslinking of collagen fibers, which strengthens bone and other tissues.

However, another factor may be involved. Folic acid and other B vitamins are involved in the body's production of deoxyribonucleic acid (DNA), which is needed to make new bone cells and other types of cells.

References: McLean RR, Jacques PF, Selhub J, et al. Homocysteine as a predictive factor for hip fracture in older persons. *New England Journal of Medicine*, 2004;350:2042-2049. van Meurs JBJ, Dhonukshe-Rutten RAM, Pluijm SMF, et al. Homocysteine levels and the risk of osteoporotic fracture. *New England Journal of Medicine*, 2004;350:2033-2041. □

Homocysteine, B Vitamins May Also Affect Susceptibility to Hearing Loss

High blood levels of homocysteine and low levels of folic acid and vitamin B12 appear to be involved in noise-induced hearing loss, according to a study by Turkish researchers.

Uzeyir Gok, MD, and his colleagues at Firat University, in the city of Elazig, wrote that elevated blood levels of homocysteine may damage blood vessels and ear cells much the way homocysteine injures arteries in the heart.

Gok studied 28 men with noise-induced hearing loss and compared them with 32 men without the disorder. The men, who were in their 30s and 40s, worked at a nearby hydroelectric power plant and were regularly exposed to high noise levels.

Men with hearing loss had homocysteine levels 16 percent higher than those in men with normal hearing. In addition, the men with hearing loss had 9.3 percent lower folic acid levels and 38 percent lower vitamin B12 levels.

Continues on next page

Gok noted that homocysteine generates free radicals, which can damage blood vessels and cells in the ear. In addition, low levels of folic acid are involved in neurological disorders.

It is possible that men with low intake of folic acid and vitamin B12, leading increased homocysteine levels, were more susceptible to noise-induced stresses and hearing loss.

Reference: Gok U, Halifeoglu I, Canatan H. Comparative analysis of serum homocysteine, folic acid and vitamin B12 levels in patients with noise-induced hearing loss. *Auris Nasus Larynx*, 2004;31: 19-22. □

Low Vitamin C Levels May Boost Women's Risk of Gestational Diabetes

Pregnant women who do not consume much vitamin C may have a substantially higher risk of developing gestational diabetes.

Gestational diabetes refers to the development of diabetes during pregnancy. Although it generally subsides after delivery, it is associated with an increased long-term risk of diabetes.

Michael A. Williams, ScD, of the Swedish Medical Center, Seattle, and her colleagues compared vitamin C consumption and blood levels of the nutrient in 67 women with gestational diabetes and 260 women without the disease.

Women with gestational diabetes consumed 10 percent less vitamin C and had 31 percent lower blood levels of the vitamin, compared with women without diabetes.

After adjusting for potential variables, such as age and weight, Williams found that women with the lowest blood levels of vitamin C were almost 13 times more likely to develop gestational diabetes.

Vitamin C may reduce the risk of gestational diabetes by protecting insulin function from free-radical damage, according to Williams.

Reference: Zhang C, Williams MA, Frederick IO, et al. Vitamin C and the risk of gestational diabetes mellitus. *Journal of Reproductive Medicine*, 2004;49: 257-266. □

Researchers Confirm Benefits of Chondroitin Sulfate in Osteoarthritis

Although glucosamine and chondroitin are frequently combined in supplements to treat osteoarthritis, most human studies have focused on glucosamine. These studies have shown that glucosamine supplements can promote the growth of new cartilage in joints.

Now, a study by Daniel Uebelhart, MD, of University Hospital Zurich, and his collaborators in Belgium, France, and the United States, has

unequivocally confirmed the benefits of chondroitin in osteoarthritis on the knees.

Uebelhart's study focused on 110 patients who were asked to take either 800 mg of chondroitin sulfate supplements or placebos over a year-long period. The chondroitin or placebos were taken for three months, skipped for the next three months, and then taken again for three months. Researchers tracked the status of patients for 12 months, even though they did not take either chondroitin or placebos during the study's final three months.

Several criteria were used to assess the patients, including x-rays of the knees, clinical symptoms, and the amount of analgesic drugs used by the patients.

One of the clinical tests, which measured knee function, found that patients taking chondroitin had a 36 percent reduction in symptoms, compared with only a 23 percent reduction in the placebo group, after 12 months. People taking chondroitin also had less pain and took fewer analgesics compared with those in the placebo group.

In addition, people taking chondroitin had significant improvements in walking time after six months. Finally, x-ray analysis of knee tissue found that chondroitin maintained cartilage thickness, whereas it decreased in the placebo group.

Uebelhart noted that despite the "intermittent" use of chondroitin, supplements did have a "prolonged" benefit.

Reference: Uebelhart D, Malasie M, Marcolongo R, et al. Intermittent treatment of knee osteoarthritis with oral chondroitin sulfate: a one-year, randomized, double-blind multicenter study versus placebo. *Osteoarthritis and Cartilage*, 2004;12:269-276. □

Dietary Fiber and Vitamin E Reduce C-Reactive Protein Levels in Two Studies

People who consume diets rich in fiber are likely to have relatively low levels of C-reactive protein (CRP), a marker of inflammation and heart disease risk.

Umed A. Ajani, MD, MPH, of the Centers for Disease Control and Prevention, Atlanta, analyzed dietary and health data from almost 4,000 people participating in the latest National Health and Nutrition Examination Survey.

He found that people who consumed the most dietary fiber generally had the lowest blood levels of CRP. This finding is consistent with other research showing that dietary fiber may reduce the disease of heart disease.

In a separate study, Ross T. Murphy, MD, of the Heart Hospital, London, asked 110 people with heart disease and elevated CRP levels to take 400 IU of natural vitamin E or placebos daily for six months.

The only significant change occurred in smokers. In this subgroup, vitamin E supplements led to an impressive 28 percent reduction in CRP levels.

Reference: Ajani UA, Ford ES, Mokdad AH. Dietary fiber and C-reactive protein: findings from the national health and nutrition examination survey data. *Journal of Nutrition*, 2004;134:1181-1185. Murphy RT, Foley JR, Tome MT, et al. Vitamin E modulation of C-reactive protein in smokers with acute coronary syndromes. *Free Radical Biology & Medicine*, 2004;36:959-965. □

Nutritional Supplements Enhance the Heart-Protective Benefits of Exercise

A study in mice has confirmed what many people have long suspected: moderate, graduated exercise protects the heart from cardiovascular disease, but the addition of several nutritional supplements enhances the benefits of exercise.

Louis J. Ignarro, PhD, of the University of California, Los Angeles, studied mice bred to develop high cholesterol levels. The mice were fed a high-fat diet and then were exercised daily starting with 10 minutes of swimming, with swimming time increasing in 10-minute increments up to 60 minutes daily. Another group of mice was allowed to be sedentary for 15 weeks.

Mice that exercised had lower blood levels of cholesterol and fewer cholesterol deposits on their arteries, compared with sedentary animals.

But when exercising mice received extra vitamins E and C and the amino acid L-arginine, they developed fewer cholesterol deposits than any of the other mice.

Ignarro wrote that the “synergistic long-term effects of moderate physical exercise, vitamin E, vitamin C, and L-arginine may reduce atherogenesis.”

Reference: Napoli C, Williams-Ignarro S, de Nigris F, et al. Long-term combined beneficial effects of physical training and metabolic treatment on atherosclerosis in hypercholesterolemic mice. *Proceedings of the National Academy of Sciences*, early online edition, May 24-28, 2004. □

Supplements of Siberian Ginseng Help Relieve Moderate Fatigue

Different types of ginseng—the name actually refers to more than one species of herb—are widely considered adaptogens. They are often recommended to help people adapt to stress and reduce fatigue.

Although many physicians dismiss the health benefits of herbs, a recent study supports the use of Siberian Ginseng (*Eleutherococcus senticosus*) in treating some cases of fatigue.

Arthur J. Hartz, MD, of the University of Iowa College of Medicine, and his colleagues treated 76 men and women with moderate to severe fatigue. Most of the subjects were middle age or elderly, and the cause of their fatigue could not be determined.

Hartz asked the subjects to take either 2,000 mg of a standardized Siberian ginseng supplement or placebos daily for two months. After this time, all of the subjects were given Siberian ginseng capsules as a “reward” for participating in the study and also to help the researchers evaluate its long-term effect.

Overall, people taking either Siberian ginseng or placebos improved, and those taking the Siberian ginseng had a slight but not statistically significant improvement over those in the placebo group. Changes were noted using the four-question Rand Vitality Index, a clinical test to determine the severity of fatigue.

However, in an analysis of subgroups, Hartz found that people with more moderate fatigue (as opposed to chronic fatigue syndrome) improved significantly after taking Siberian ginseng.

Reference: Hartz AJ, Bentler S, Noyes R, et al. Randomized controlled trial of Siberian ginseng for chronic fatigue. *Psychological Medicine*, 2004;34: 51-61. □

Selenium Lowers Prostate Cancer Risk, Especially When PSA Levels Are High

Several clinical studies have found that men who take selenium supplements, or have high intake of selenium, are less likely to develop prostate cancer.

In the latest study along these lines, a long-term study has confirmed that men with high blood levels of selenium have about half the risk of developing prostate cancer, compared with men who have low selenium levels.

Haojie Li, MD, PhD, of the Harvard Medical School, and colleagues, tracked the health of men participating in the Physicians’ Health Study. They focused on 586 men who were diagnosed with prostate cancer during 13 years of follow up, comparing them with 577 subjects without the disease.

Some of the men were diagnosed with prostate cancer before the prostate-specific antigen (PSA) test for cancer became common. In this group, men with high selenium levels had a 48 percent lower risk of being diagnosed with advanced prostate cancer.

Among men tested after PSA testing became common, high selenium levels were associated with a 51 percent reduction in the risk of prostate cancer – but only among men who had elevated PSA levels.

Li concluded by writing that the study “suggests that higher levels of selenium may slow

Continues on next page

Quick Reviews of Recent Research

• Air pollution leads to DNA mutations

Researchers have long known that mutations (or changes) in DNA, the molecule that stores our genetic information, can lead to cancer and other diseases. In a recent study with mice, researchers found that air pollution led to genetic mutations that affected subsequent generations. In the experiment, researchers housed one group of mice outdoors near a busy highway and steel mills. A second group of mice was similarly located, but they breathed filtered air. Two other groups of mice, with and without air filters, were located in rural areas. The researchers found that mice housed in areas with unfiltered air pollution developed significantly more DNA mutations than the other mice. Furthermore, these mutations were inherited by offspring.

Somers CM, et al. *Science*, 2004;304:1008-1010.

• Lutein esters lead to improved eye pigment

Lutein appears essential for the normal development and maintenance of the macular pigment, which improves visual acuity and filters out harmful blue wavelengths of light. Two forms of lutein are sold as supplements: pure lutein and lutein esters, both extracted from marigold petals. Researchers asked seven patients with early age-related maculopathy (AMD) and six healthy subjects to take 20 mg of lutein esters daily for 18-20 weeks. After eight weeks, the macular pigment of subjects in both groups increased by about one-third.

Koh HH, et al. *Experimental Eye Research*, 2004;79:21-27.

• Carotenoids and fats may affect breast cancer risk

Researchers compared dietary intake of antioxidant carotenoids and essential fatty acids in 414 women with breast cancer and 429 women without cancer. High intake of beta-carotene was linked to a 43 percent lower risk of breast cancer in women who had never used hormone-replacement therapy. High

Selenium and Prostate Cancer...

Continues from previous page

prostate tumor progression."

Selenium is an essential component of glutathione peroxidases, antioxidant enzymes made by the body to protect against free-radical damage. Other studies have shown that selenium can induce self-destruction of cancer cells and inhibit the growth of cancer cells.

Reference: Li H, Stampfer MJ, Giovannucci EL, et al. A prospective study of plasma selenium levels and prostate cancer risk. *Journal of the National Cancer Institute*, 2004;96:696-703. □

intake of total carotenoids and omega-3 fats (found in fish) was associated with a 48 percent lower risk of breast cancer among postmenopausal women. However, a high intake of carotenoids and omega-6 fats (found in most cooking oils and many processed foods) was associated with a higher risk of breast cancer.

Nkondjock A, et al. *American Journal of Clinical Nutrition*, 2004;79:857-864.

• Vitamin C deficiencies are common

Researchers analyzed vitamin C levels in the blood of 15,769 people, ages 12 to 74 years of age, who participated in the Third National Health and Nutrition Examination Survey. Overall, 14 percent of men and 10 percent of women were deficient in vitamin C. Men were more likely than women to be deficient. In addition, vitamin C "depletion" (i.e., near deficiency) was more common in men. Vitamin C depletion affected 23 percent of men ages 25 to 44 years old and 20 percent of women in the same age group. Overall, either outright vitamin C deficiency or depletion affected an average of 29 percent of the population and 40 percent of men ages 25-44 years.

Hampel JS, et al. *American Journal of Public Health*, 2004;94:870-875.

• Refined carbs linked to obesity and diabetes

In an analysis of dietary changes from 1909 to 1997, researchers identified a strong relationship between increases in corn syrup consumption and decreases in fiber intake with the risk of developing type 2 diabetes. While carbohydrate consumption remained relatively consistent (except for a reduction in the 1950s), the amount of carbohydrate from fiber (e.g., whole grains, fruits, and vegetables) has declined substantially since the 1960s. During this time, the prevalence of obesity and diabetes has increased significantly.

Gross LS, et al. *American Journal of Clinical Nutrition*, 2004;79:774-779.

The Nutrition Reporter™ (ISSN 1079-8609) is published monthly except for August and December and is distributed only by prepaid subscription. This issue, Vol 15 No 7, © July 2004 by Jack Challem. All rights reserved. Reproduction without written permission is prohibited. Phone: (520) 529-6801. Fax: (520) 529-6840. Email addresses: Jchallem@aol.com or jack@thenutritionreporter.com. The Nutrition Reporter™ is strictly educational and not intended as medical advice. For diagnosis and treatment, consult your physician. Subscriptions are \$26 per year in the U.S.; either \$33 U.S. or \$48 CAD for Canada; and \$40 for other countries, payable in U.S. funds through a U.S. bank. The Nutrition Reporter is a trademark(TM) of Jack Challem.

THE NUTRITION REPORTER™

Post Office Box 30246 • Tucson AZ 85751-0246 USA

Editor and Publisher: **Jack Challem**

Copy Editor: **Mary E. Larsen**

Medical and Scientific Advisors:

Richard P. Huemer, MD Lancaster, California

Ralph K. Campbell, MD Polson, Montana • **Peter Langsjoen, MD** Tyler, Texas
Marcus Laux, ND San Francisco, California • **James A. Duke, PhD** Fulton, Maryland