

# The Nutrition Reporter™

© Jack Challem March 2007 Vol 18 No 3



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

## Folic Acid Supplements Can Protect Mental Function, May Reduce Alzheimer's Risk

Taking folic acid supplements can improve the minds of middle-age and elderly men and women, particularly if they don't get enough of the B vitamin from their diets.

Jane Durga, PhD, currently with Wageningen University, Netherlands, and her colleagues asked 818 men and women to take 800 mcg of folic acid daily or placebos for three years. The subjects ranged from 50 to 70 years of age, and all had elevated homocysteine levels, a sign of poor folic acid intake or utilization. The subjects' cognitive function – including memory, information-processing speed, and word fluency – was measured at the beginning and end of the study using five different tests.

After three years, people taking folic acid supplements fared better than those taking placebos on all of the cognitive tests – and significantly so when it came to memory, information-processing speed, and visual-processing speed.

In addition, among people taking folic acid supplements, blood levels of the vitamin increased by almost 600 percent, and homocysteine levels decreased by 26 percent. Elevated homocysteine levels are a risk factor for heart disease and stroke.

In a separate study, José A. Luchsinger, MD, of Columbia University Medical Center, New York, and his colleagues tracked the health of 965 men and women, ages 65 years and older, for an average of six years. During this time, 192 of the subjects were diagnosed with Alzheimer's disease.

Luchsinger analyzed dietary intake of several B vitamins and the subjects' risk of developing Alzheimer's disease. He found that people with the highest dietary intake of folic acid – on average more than 487 mcg daily – were 50 percent less likely to develop Alzheimer's disease during the study's time frame. Vitamins B6 and B12 were not associated with Alzheimer's risk.

References: Durga J, van Boxtel MPJ, Schouten EG, et al. Effect of 3-year folic acid supplementation on cognitive function in the FACIT trial: a random-

ized, double blind, controlled trial. *Lancet*, 2007; 369:208-216. Luchsinger JA, Tang MX, Miller J, et al. Relation of higher folate intake to lower risk of Alzheimer disease in the elderly. *Archives of Neurology*, 2007;64:86-92. □

### Perspectives...

#### Sorting Through Conflicting Research

Late in 2006 two separate teams of researchers, one American and the other British, analyzed multiple studies on the benefits of folic acid in cardiovascular diseases – and came to strikingly different conclusions.

The American team reported that folic acid supplements led to a slight reduction in stroke, but that it had no other cardiovascular benefits. Meanwhile, the British team calculated that folic acid supplements reduced the risk of ischemic heart disease by 17 percent and the risk of stroke by 21 percent. They also noted that people with common variations of a key folic acid-dependent gene benefited even more from folic acid, with a 21 percent reduction in ischemic heart disease and a 23 percent reduction in stroke.

Faced with opposing findings from respectable researchers, is it any wonder that people feel confused by the research?

To a great extent, the problem is in the nature of the research. Single-nutrient studies are by nature reductionist in that they try to isolate the effects of individual nutrients. This approach may work for pharmaceuticals, but nutrients always work in tandem with other nutrients.

No right-minded physician would treat or try to reduce the risk of disease with just one nutrient. Cardiovascular diseases are multifactorial, influenced by many different nutrients, as well as by weight, glucose tolerance, physical activity, tobacco use, and stress. Furthermore, giving folic acid (safe as it is) without testing patients' levels would be comparable

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to prescribing antibiotics to patients without first determining whether they had a bacterial infection.

A better approach would be to actually measure functional levels of nutrients and their markers (homocysteine, in the case of folic acid). Why? There would be little need to take folic acid supplements if blood levels of both homocysteine and folic acid were normal.

However, it would be important to supplement with any nutrients found to be deficient or marginal through such testing. This approach would be evidence based and individualized, instead of one-size-fits-all medicine. Imagine how much patients might benefit from such considered treatment! –JC

### **CoQ10 and Alpha Lipoic Acid May Help Reduce Migraine Headaches**

Previous research has found that “mitochondrial nutrients” may help reduce the frequency and severity of migraine headaches. Two new studies report benefits from taking supplements of coenzyme Q10 and alpha lipoic acid.

Mitochondria are cell structures that burn glucose and fat for energy. Many nutrients, including CoQ10 and alpha lipoic acid, play key roles in normal mitochondrial processes. Researchers increasingly believe that migraine headaches result from a disruption of normal energy production in brain or cerebrovascular cells.

In the first study, Andrew D. Hershey, MD, PhD, of the Cincinnati Children’s Hospital Medical Center, Ohio, and his colleagues measured CoQ10 levels in 1,550 children and teenagers with a history of migraines. Three-fourths of the patients had low CoQ10 levels, and one-third (of the total number of patients) were low enough to be considered deficient.

They were asked to take 1 to 3 mg of CoQ10 per kilogram of weight – roughly equivalent to 45 to 135 mg daily for a 100-pound child. The researchers used the “Q-Gel” form of CoQ10, they wrote, because of its “higher bioavailability.”

After supplementation for an average of three months, the subjects’ number of headaches decreased by about 35 percent, with overall measures of headache disability also improving by the same extent. Improvements in headache disability were based on an assessment that included headache frequency, severity, duration, and impact on quality of life.

In a separate study, Delphine Magis, MD, of the University of Liege, Belgium, and her colleagues, used alpha lipoic acid to treat 44 adults with a history of migraine headaches. The patients were given either 600 mg of alpha lipoic acid or placebos daily for three months. Alpha lipoic acid, an antioxidant, is also known as thioctic acid.

Magnis noted only a slight improvement among patients taking alpha lipoic acid compared to the placebo group. But when she conducted a “within-group analysis,” she noted significant before-and-after improvements among people taking alpha lipoic acid. The patients had a significant reduction in migraine attack frequency, the number of days with headaches, and the severity of headaches.

References: Hershey AD, Powers SW, Vockell ALB, et al. Coenzyme Q10 deficiency and response to supplementation in pediatric and adolescent migraine. *Headache*, 2007;47:73-80. Magis D, Ambrosini A, Sandor P, et al. A randomized double-blind placebo-controlled trial of thioctic acid in migraine prophylaxis. *Headache*, 2007;47:52-57. □

### **Selenium Supplements Found Helpful in Treating HIV Infections**

Back in 1989 – 18 years ago – Gerhard Schrauzer, PhD, and his colleagues were the first to report the benefits of selenium supplements in the treatment of HIV (human immunodeficiency virus) infections in people. Although conventional physicians have generally dismissed the use of selenium and other supplements in the treatment of HIV, a study published in an American Medical Association journal has confirmed the benefits of selenium.

Barry E. Hurwitz, PhD, of the University of Miami, Florida, and his colleagues asked 174 HIV-1 positive men and women to take either 200 mcg of selenium or placebos daily for nine months. The type of selenium is commonly known as high-selenium yeast and is sold in health food stores.

Patients who consistently took the selenium supplements had decreases in viral loads (numbers), according to Hurwitz’s report in the *Archives of Internal Medicine*. In contrast, those who took placebos or failed to consistently take selenium supplements had substantial increases in viral loads.

In addition, patients who consistently took selenium supplements had substantial increases in the numbers of protective CD4 immune cells, indicating improved immune function. In contrast, people who took placebos or did not regularly take selenium supplements had significant decreases in CD4 cell numbers.

Selenium is necessary for the production of glutathione peroxidase, a potent antioxidant that enhances immune function. Experiments have shown that selenium can suppress HIV replication.

Other research, by Ethan Will Taylor, PhD, previously found that HIV produces several selenium-dependent proteins. As the virus reproduces, it draws on the body’s reserves of selenium, in the process interfering with glutathione peroxidase

production. When ample selenium is present, such as from supplementation, HIV becomes less aggressive.

Reference: Hurwitz BE, Klaus JB, Llabre MM, et al. Suppression of human immunodeficiency virus type 1 viral load with selenium supplementation. *Archives of Internal Medicine*, 2007;167:148-154. □

## Low Vitamin D May Increase Risk of Depression and Alzheimer's

Low levels of vitamin D are strongly associated with a greater likelihood of being depressed and also developing Alzheimer's disease in elderly individuals.

Consuelo H. Wilkins, MD, of Washington University School of Medicine, St. Louis, Missouri, and her colleagues studied 80 seniors, of whom 40 had signs of dementia. She found that 58 percent of the subjects were deficient in vitamin D, with blood levels below 20 ng/ml.

People with low levels of vitamin D were almost 12 times more likely to suffer from depression, compared with people who had high levels of the vitamin. Wilkins noted that other research had found low vitamin D levels were associated with depression in people with seasonal affective disorder, or SAD.

In addition, low vitamin D levels were strongly associated with poor scores on two of four tests given to measure cognitive performance.

"This study provides additional support for the hypothesis that vitamin D deficiency is associated with affective and cognitive function in older adults," wrote Wilkins and her colleagues. "Vitamin D deficiency is common and often unrecognized and yet may be an important factor contributing to unsuccessful aging."

Reference: Wilkins CH, Sheline YI, Roe CM, et al. Vitamin D deficiency is associated with low mood and worse cognitive performance in older adults. *American Journal of Geriatric Psychiatry*, 2006;14:1032-1040. □

## Olive Oil Reduces Rate of DNA Damage, Hinting at Protective Mechanism

Olive oil itself – not the antioxidant phenols it contains – appears to reduce the rate of DNA and RNA damage. In turn, less damage to DNA and RNA may slow the aging process and lower the long-term risk of heart disease and cancer.

Henrik E. Poulsen, MD, of Copenhagen University Hospital, Denmark, and his colleagues looked at the rate of DNA and RNA oxidation, a type of damage, in 182 healthy young and middle-age men living in northern, central, and southern Europe. At the beginning of the study, he found that men from central and southern Europe, where olive oil con-

sumption is generally high, had fewer signs of DNA and RNA damage, compared with men from northern Europe.

Poulsen and his colleagues then asked the subjects to consume a quarter cup of olive oil over the course of a day, each day for three weeks. Some of the men consumed olive oil with high levels of antioxidant phenols, while others consumed olive oils with low and medium levels of phenols.

At the end of the study, Poulsen found that consuming the olive oil led to a 13 percent reduction in DNA and RNA damage. However, the concentrations of phenols in the different types of olive oil made no difference. That left monounsaturated fats as the most likely reason for lower rates of DNA and RNA damage.

"These findings support the idea that ingestion of olive oil is beneficial and can reduce the rate of oxidation of DNA," Poulsen and his colleagues wrote in *FASEB Journal*, published by the Federation of American Societies for Experimental Biology.

Reference: Machowetz A, Poulsen HE, Gruendel S, et al. Effect of olive oils on biomarkers of oxidative DNA stress in northern and southern Europeans. *FASEB Journal*, 2007;21:45-52. □

## Combination of Tomato and Broccoli Shows Promise in Prostate Cancer

A study in laboratory mice has shown that large amounts of tomato and broccoli can significantly reduce the size of prostate tumors.

John W. Erdman Jr., PhD, of the University of Illinois, Urbana, and his colleagues fed males rats diets including one of the following: 10 percent tomato, 10 percent broccoli, 5 percent tomato combined with 5 percent broccoli, 10 percent tomato combined with 10 percent broccoli, or added amounts of synthetic lycopene. One month after beginning these diets, the researchers implanted prostate tumors into the rats.

Over the next four months, diets containing a combination of 10 percent tomato and 10 percent broccoli had the greatest inhibition on tumor growth, leading to an average 52 percent decrease in prostate tumor weight.

Meanwhile, diets with 10 percent tomato reduced tumor weight by 34 percent, and 10 percent broccoli lowered tumor weight by 42 percent.

The reductions in tumor weight were associated with less cancer proliferation, as well as increased destruction of cancer cells.

Synthetic lycopene, even in large amounts, had a negligible effect on tumor weight. That finding suggested that the combination of nutrients in whole

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## Quick Reviews of Recent Research

### • Lavender and tea tree oils may affect some boys

Physicians and researchers reported three cases of gynecomastia – abnormally enlarged breasts – in three prepubescent boys. The cause was traced to the use of lotions, gels, shampoos, or scented soaps containing lavender oil, tea tree oil, or both. Lavender and tea tree oil contain estrogenic compounds. All three cases of gynecomastia resolved several months after use of the products was discontinued. However, the frequency of such problems remains unclear.

Henley DV, et al. *New England Journal of Medicine*, 2007;356:479-485.

### • High magnesium may protect against hypertension

In a study of 28,349 women, American researchers noted that those who consumed the greatest amount of magnesium from food had about a 13 percent lower risk of developing high blood pressure. The benefit was most clear for women who consumed a little over 400 mg of magnesium daily.

Song Y, et al. *American Journal of Cardiology*, 2006;98:1616-1621.

### • "Bear bile" compound may help in eye disease

Bear bile is used in 28 Chinese patent medicines, 15 of which are used to treat eye disorders. Portuguese and American researchers tested the effects of synthetic tauroursodeoxycholic acid (TUDCA), a principal constituent of bear bile on two breeds of laboratory mice prone to blindness. TUDCA prevented destruction of eye cells and preserved function in the photoreceptor cells of both breeds of mice, leading to a significant slowing of retinal degeneration. No actual bear products were used in the study. The researchers noted that TUDCA might have potential benefits in the treatment of age-related macular degeneration, retinitis pigmentosa, and glaucoma. They also pointed out that synthetic bile products are currently approved by the Food and

### Tomato and Broccoli in Cancer...

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tomatoes (or a natural whole tomato extract) is more important than lycopene alone.

The largest amounts of tomato were equivalent to a person eating a cup of tomato sauce or 1.5 cups of cherry tomatoes daily. Similarly, the most beneficial amount of broccoli translated to the human equivalent of eating 1.5 cups daily.

Reference: Canene-Adams K, Lindshield BL, Wang S, et al. Combinations of tomato and broccoli enhance antitumor activity in Dunning R3327-H prostate adenocarcinoma. *Cancer Research*, 2007; 67:836-843. □

Drug Administration for the treatment of liver diseases.

Boatright JH, et al. *Molecular Vision*, 2006;12: 1706-1714.

### • Coenzyme Q10 helpful in heart failure

Italian researchers treated 23 patients with moderate to severe heart failure using four different regimens, each lasting four weeks. The regimens consisted of 100 mg of CoQ10 three times daily, CoQ10 plus supervised exercise training, placebo, or placebo plus exercise. CoQ10 supplements improved heart function, cardiorespiratory activity, and blood vessel tone (endothelial function). The combination of CoQ10 and exercise increased blood levels of the vitamin-like substance above that of CoQ10 alone.

Belardinelli R, et al. *European Heart Journal*, 2006;27:2675-2681.

### • St. John's wort works as well as antidepressant drug

German researchers compared the effectiveness of a standardized extract of St. John's wort with paroxetine (Paxil) to treat and then prevent a relapse of depression in 133 adult patients. The dosages were either 900 or 1,800 mg of St. John's wort or 40 mg of paroxetine daily. Both the herb and drug were equally effective in promoting recovery and preventing a relapse of depression.

Anghelescu IC, et al. *Pharmacopsychiatry*, 2006; 39:213-219.

### • Low vitamin B6 increases risk of heart disease

Vitamin B6 works with folic acid in the biochemical reactions that control homocysteine levels. Researchers from Taiwan investigated levels of pyridoxyl-5-phosphate, the active form of vitamin B6, and the risk of coronary artery disease among 184 people with confirmed heart disease and 516 healthy subjects. Borderline low levels of pyridoxyl-5-phosphate were strongly associated with the risk of heart disease.

Lin PT, et al. *Nutrition*, 2006;22:1146-1151.

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