The Nutrition Reporter™

© Jack Challem April 2009 Vol 20 No 4

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

B-Complex Vitamin Supplements Reduce Risk of Macular Degeneration

Large supplemental amounts of three B-complex vitamins can significantly lower the risk of age-related macular degeneration (AMD) in women, according to a study by researchers at the Harvard Medical School.

AMD is the most common cause of blindness in seniors and is very difficult to treat. Smoking tobacco and low dietary intake of several nutrients, including lutein, zeaxanthin, and docosahexaenoic acid (an omega-3 fat) have previously been linked to a greater risk of AMD.

William G. Christen, ScD, and his colleagues asked 5,205 women to take either a combination of three B vitamins or placebos daily for an average of seven years. All of the women were at least 40 years of age, and they had been diagnosed with either cardiovascular disease or having at least three risk factors for cardiovascular disease.

The supplements contained 2,500 mcg (2.5 mg) of folic acid, 50 mg of vitamin B6, and 1,000 mcg (1 mg) of vitamin B12.

The researchers noted that the protective effect of the B vitamins appeared after two years and continued through the end of the study. Women taking the vitamin supplements had a 34 percent lower risk of developing AMD and a 41 percent lower risk of "visually significant" AMD.

In raw numbers, 55 women in the B-vitamin group developed some form of AMD, compared with 82 in the placebo group. In the B-vitamin group, 26 of the women developed a severe form of AMD, compared with 44 cases in the placebo group.

Christen noted the importance of the finding: "From a public health perspective, this is particularly important because persons with early AMD are at an increased risk of developing advanced AMD, the leading cause of irreversible vision loss in older Americans."

The researchers wrote that the B vitamins lower homocysteine levels, which might help maintain the integrity of blood vessels in the eyes.

In a separate study, researchers from Australia reported that relatively high blood levels of lutein, zeaxanthin, and lycopene were associated with a 33 percent lower risk of retinopathy, a type of eye disease, in people with type 2 diabetes.

References: Christen WG, Glynn RJ, Chew EY, et al. Folic acid, pyridoxine, and cyanocobalamin combination treatment and age-related macular degeneration in women. *Archives of Internal Medicine*, 2009;169:335-341. Brazionis L, Rowley K, Itsiopoulos C, et al. Plasma carotenoids and diabetic retinopathy. *British Journal of Nutrition*, 2009;101:270-277. ❑

Perspectives

The Mind-Body Connection

Many people remain skeptical of a clear body-mind connection – that our life experiences and emotions can have a profound effect on our hard-wired biology. While animal studies have clearly shown that a mother's style of nurturing can affect her offspring's lifelong behavior and physical health, scientific studies showing a clear mind-body link in people have been limited.

Now, researchers have clearly shown that the behavior of some genes can be permanently changed by psychological factors during childhood.

Researchers from McGill University in Montreal compared two groups of brain cells. Some cells were obtained from people who had been abused as children and later committed suicide, and other brain cells came from people who had committed suicide but who had not been abused as children.

The researchers, writing in *Nature Neuroscience* (2009; doi 10.1038/nn.2270), explained how they investigated specific stress-response genes and cell receptors for cortisol on brain cells. When people are stressed – as in the case of children who are being abused – their levels of cortisol, a key stress hormone, swell.

In most people, the brain increases the activity of

More research summaries on next page

stress-response genes and the number of cell receptors involved in clearing cortisol from the brain. However, these genes were roughly 40 percent less active in cells from people who had been abused as children. In other words, being abused permanently changed the activity genes that would have helped buffer the effects of stress later in life.

The biological explanation for this mind-body connection lies in the science of "epigenetics." Every one of our bodies' cells contains about 20,000 genes, which can be considered our "hardware." Epigenetics is more like our modifiable genetic "software." Nutrition, stress, and toxins are among the key modifiers of our epigenetic programming, which turns genes on and off. Amazingly, epigenetic changes caused by nutrition and experience can be passed from one generation to the next. *–JC*

Calcium Consumption Seems to Reduce Risk of Cancer

A study of almost 300,000 men and 200,000 women has found that high dietary intake of calcium appears related to a relatively low risk of developing cancer.

Yikyung Park, ScD, of the National Cancer Institute in Bethesda, Maryland, analyzed data from a major dietary and health study. Information on dietary and supplement habits was obtained through a food questionnaire, and the subjects' health was tracked over an average of seven years.

Park reported that women with high intakes of calcium from food and supplements had a significantly lower overall risk of many different types of cancer. The benefits increased with the daily amount of calcium up to 1,300 mg daily, compared with women who consumed less than about 500 mg daily. Intake of calcium above 1,300 mg daily provided no further benefits.

Men did not have any overall benefits in reduced cancer risk from high calcium intake. However, both men and women did have a lower risk of digestive tract cancers if they had consumed adequate calcium.

Reference: Park Y, Leitzmann MF, Subar AF, et al. Dairy food, calcium, and risk of cancer in the NIH-AARP diet and health study. *Archives of Internal Medicine*, 2009;169:391-401.❑

Alkaline-Yielding Supplement Helps Preserve Bone and Muscle

One of the least appreciated aspects of nutrition involves the body's acid-alkaline balance, or pH. Some foods, such as grains and meats, lead to an acidic pH. Other foods, including all fresh fruits and vegetables lead to either a neutral or slightly alkaline pH, which is the ideal state.

The problem is that the typical American diet leads to low-grade "metabolic acidosis," and the body responds by breaking down bone and muscle to buffer the acidity. In time, that breakdown leads to weaker bones and a loss of muscle.

In a recent study, Lisa Ceglia, MD, of Tufts University, Boston, and her colleagues, asked 19 healthy men and women, ages 52-82 years, to eat low-protein or high-protein diets during a 41-day study. The low-protein diet included 1.1 pounds of protein daily, whereas the high-protein diet contained 2.2 pounds of protein daily.

The subjects were also given supplements of potassium bicarbonate (an alkalizing compound also found in fruits and vegetables) or placebos.

Urinary excretion of nitrogen, a marker of muscle breakdown, was higher when the subjects ate the high-protein diet. However, when they took the potassium bicarbonate supplements, urinary nitrogen decreased by almost 50 percent. In addition, the potassium bicarbonate supplements increased calcium absorption.

The alkalizing benefits of potassium bicarbonate supplements can be achieved by consuming fruits and vegetables as about 35 percent of the diet.

Ceglia L, Harris SS, Abrams SA, et al. Potassium bicarbonate attenuates the urinary nitrogen excretion that accompanies an increase in dietary protein and may promote calcium absorption. *Journal of Clinical Endocrinology & Metabolism*, 2009; 94:645-653. ❑

High Levels of Vitamin D Protect Against Common Cold and Flu

A century ago, spending time in the sun – a great way to make vitamin D – was one of the main treatments for tuberculosis. Three years ago, researchers identified the mechanism – vitamin D is needed to make a potent infection fighting immune compound called cathelicidin.

Now researchers have found that the benefits of vitamin D may extend to protection against the common cold and influenza.

Adit A. Ginde, MD, of the Children's Hospital, Boston, and his colleagues analyzed blood levels of vitamin D and the risk of upper respiratory tract infections (URTIs) in 18,883 men, women, and teenagers. Twenty-four percent of people with very low vitamin D levels had reported recent URTIs, and 20 percent of those with marginal levels had URTIs. Seventeen percent of those with normal vitamin D levels reported URTIs.

Overall, low levels of vitamin D were associated with a 36 percent greater risk of URTIs. However, people with chronic obstructive lung disease and low

vitamin D levels had a twice the risk of developing URTIs. In addition, people with asthma and low vitamin D levels had almost a six-time greater risk of URTIs.

Ginde noted that exposure to sunlight is the primary determinant of vitamin D in people. "Vitamin D supplementation may reduce the incidence of URTI and exacerbations of respiratory tract diseases," he wrote.

Reference: Ginde AA, Mansbach JM, Camargo CA. Association between serum 25-hydroxyvitamin D level and upper respiratory tract infection in the third national health and nutrition examination survey. *Archives of Internal Medicine*, 2009;169:384-390. ❑

DHA Reduces Inflammation in Men with Heart Risk Factor

One of the principal omega-3 fats, docosahexaenoic acid (DHA), can lower several markers of inflammation in men with elevated triglyceride levels.

Both high levels of inflammation and triglycerides are established risk factors for heart disease.

Darshan S. Kelley, PhD, of the University of California, Davis, and his colleagues asked 17 middle-age men to take either 3 grams of DHA or placebos daily for 90 days. The placebos consisted of olive oil capsules, which may have also had a modest anti-inflammatory effect.

The DHA was derived from algae, a vegetarian source.

By the end of the study, men taking DHA had a 15 percent decrease in C-reactive protein (CRP), a decrease of 23 percent in interleukin-6, and a 1.5 percent decrease in circulating white blood cells. In addition, levels of metalloproteinase-2, an anti-inflammatory marker, increased by 7 percent.

Kelley wrote that "a reduction in the concentration of C-reactive protein in response to DHA is comparable to the 15-25 percent reduction in CRP caused by statins. Furthermore, we anticipate a larger reduction in CRP with continued intake of DHA."

Reference: Kelley DS, Siegal D, Fedor D, et al. DHA supplementation decreases serum C-reactive protein and other markers of inflammation in hypertriglyceridemic men. *Journal of Nutriton*, 2009;139:495-501. ❑

Fish Oil Intake Associated with Lower Risk of Depression

High intake of fish and two key omega-3 fats, eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), are associated with a significantly lower risk of depression, according to a new study of 3,317 men and women.

Laura A. Colangelo, MS, of the Feinberg School of Medicine, Chicago, and her colleagues assessed 3,317 white and African-American men and women. The subjects ranged from 18 to 30 years of age at the beginning of the study.

The subjects' diets were assessed during the seventh year of the study. During the 10th year of the study, Colangelo and her colleagues also measured the subjects' scores on standardized tests for depression, as well as their use of anti-depressant medications.

Overall, high intake of fish, EPA, and DHA were associated with a lower risk of depression, though the benefits were more pronounced in women. Women with the highest fish consumption were 25 percent less likely to feel chronically depressed. Similarly, women with the highest consumption of EPA or DHA were 34 percent less likely to be depressed.

Reference: Colangelo LA, He K, Whooley MA, et al. Higher dietary intake of long-chain omega-3 polyunsaturated fatty acids is inversely associated with depressive symptoms in women. *Nutrition*, 2009; epub ahead of print. ❑

Supplements Increase Gene Repair in Breast Cancer Patients

A daily supplement containing several nutrients can enhance normal repair of genes and inhibit abnormal gene activity in women with breast cancer.

Panchanatham Sachdanandam, PhD, of the University of Madras, India, and his colleagues treated 84 breast cancer patients who were receiving 10 mg of tamoxifen twice daily. Tamoxifen is an estrogen-blocking drug used to reduce the risk of tumor recurrence.

Half of the women received a daily supplement containing 100 mg of coenzyme Q10 (CoQ10), 10 mg of vitamin B2, and 50 mg of vitamin B3. The other half received only tamoxifen.

Women receiving the supplements had an increase in poly (ADP-ribose) polymerase, or PARP, activity. PARP, which is built on vitamin B3, is a gene repair enzyme, and the increase in PARP indicated improved gene repair in normal cells. In addition, women taking the supplement had a complete disappearance of a particular type of abnormal gene behavior, known as RASSF1A methylation.

PARP also helps maintain overall gene stability and enhances the cancer-suppressing p53 gene.

Reference: Premkumar VG, Yuvaraj S, Shanthi P. Coenzyme Q10, riboflavin and niacin supplementation on alteration of DNA repair enzyme and DNA methylation in breast cancer patients undergoing tamoxifen therapy. *British Journal of Nutrition*, 2008;100:1179-1182. ❑

More research summaries on next page

Quick Reviews of Recent Research

• Vitamin D affects muscle strength in girls

British researchers investigated blood levels of vitamin D and several measures of muscle strength in 99 girls ages 12-14. Muscle strength was assessed through a series of jumps and hops. Girls with higher vitamin D levels had significantly greater jumping power, jumping height, and jumping velocity.

Ward KA. *Journal of Clinical Endocrinology & Metabolism*, 2009;94:418-420.

• Meal sizes have grown over 70 years

Researchers from Cornell University in Ithaca, N.Y., tracked the changes in calories over the past 70 years by analyzing selected recipes in the book, *Joy of Cooking*. Since the 1930s, the recipes increased in calorie count by almost 40 percent, according to the researchers. The increases translated to roughly 77 more calorie per meal. The higher calorie counts were related to larger portion sizes and changes in ingredients.

Wansink B. *Annals of Internal Medicine*, 2009;150;291-292.

• Vitamin K_2 may decrease heart disease risk

Researchers from University Medical Center Utrecht, The Netherlands, studied 564 post-menopausal women and their intakes of vitamin K_1 and vitamin K_2, based on dietary questionnaires. High intake of vitamin K_2 was associated with 20 percent less coronary calcification, also known as hardening of the arteries. Intake of vitamin K_1 was not related to coronary calcification.

Beulens JWJ. *Atherosclerosis*, 2008; epub ahead of print

• Nutrients protect against diabetes

Researchers from the Harvard School of Public Health analyzed the relationship between calcium and vitamin D and C-peptide levels in 1,940 women and 888 men. C-peptide is often used to measure insulin levels and the risk of prediabetes. (Proinsulin splits into one molecule of insulin and one molecule of C-peptide.) Women with high intake of calcium had C-peptide levels 20 percent lower than in women with low calcium intake. Men with high blood levels of vitamin D had C-peptide levels 20 percent lower than in men with low vitamin D levels. The relationship between high calcium and low C-peptide levels was especially strong in men and women with hypertension.

Wu T. *Journal of Nutrition*, 2009;139:547-554.

• Low lipoic acid activity found in diabetes

The antioxidant alpha lipoic acid has been used to successfully improve insulin function and nerve disease in people with diabetes. In this study, American researchers investigated the activity of lipoic acid synthase (LASY) gene and enzyme, which are involved in the body's production of lipoic acid. Using laboratory animals, the researchers found that low activity of the LASY gene and enzyme led to increases in inflammation, insulin resistance (prediabetes), and abnormal changes in mitochondria (the sections of cells that break down food for energy). Treatment with lipoic acid increased the activity of the LASY gene and enzyme, which reduced inflammation and normalized mitochondrial function. The researchers also reported that people with type 2 diabetes had lower LASY activity, which would justify the use of lipoic acid supplements in treating type 2 diabetes.

Padmalayam I. *Diabetes*, 2009;58:600-608.

• Lutein helps eyes of computer users

Several studies have found that the antioxidant lutein can improve visual acuity, though it does not affect near- or far-sightedness. In this study, researchers from Peking University in Beijing, China, gave 37 healthy men and women 6 mg or 12 mg of lutein or placebos daily for 12 weeks. All of the subjects were long-term computer users. People taking lutein had improvements in contrast sensitivity, and those taking 12 mg also had improvements in visual acuity.

Ma L. *British Journal of Nutrition*, 2009; epub ahead of print.

• Magnesium helps seniors with depression

Researchers from Mexico treated 23 elderly patients with type 2 diabetes, depression, and low magnesium levels. They were given either the equivalent of 450 mg of magnesium or 50 mg of the drug imipramine daily for 12 weeks. The researchers reported that magnesium was as effective as the drug in relieving symptoms of depression.

Barragan-Rodriguez L. *Magnesium Research*, 2008;21: 218-223.

The Nutrition Reporter™ newsletter (ISSN 1079-8609) publishes full monthly issues except for August and December and issuess distributed only by prepaid subscription. This issue, Vol 20 No 4, © April 2009 by Jack Challem. All rights reserved. Reproduction without written permission is prohibited. Phone: (520) 529.6801. Email: nutritioncomment@cs.com. The Nutrition Reporter™ is strictly educational and not intended as medical advice. For diagnosis and treatment, consult your physician. Subscriptions are $28 per year in the U.S.; either $34 US or $40 CND for Canada; and $42 for all other countries, payable in U.S funds through a U.S. bank. The Nutrition Reporter™ is a trademark 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