

# The NUTRITION REPORTER™

THE INDEPENDENT NEWSLETTER THAT REPORTS VITAMIN AND MINERAL THERAPIES © OCTOBER 1998 VOL 9 NO 10 BY JACK CHALLEM

## Zinc Supplements Can Boost Immunity, Improve Sense of Taste Some of the Time

Zinc supplements can improve resistance to infections, but zinc lozenges per se may not reduce cold symptoms in children, according to recent reports.

The essential dietary mineral plays numerous roles in the immune system and, as a consequence, helps the body fight infections. Zinc is required for normal synthesis of deoxyribonucleic acid (DNA), needed to produce new immune cells. It also promotes the activity of specific immune cells, such as neutrophils, natural killer cells, and T-cell lymphocytes.

In one recent study, Indian researchers gave 609 children, ages six months to three years, daily supplements of zinc gluconate (containing 10 mg elemental zinc) or a low-potency multivitamin without the mineral. The objective of Sunil Sazawal, MB, PhD, of the All India Institute of Medical Sciences, was to determine whether supplemental zinc could reduce the incidence of acute lower respiratory infections, predominantly pneumonia.

After four months of supplementation, zinc levels increased in the children receiving the mineral, whereas zinc levels declined in the other group.

Among children receiving zinc, "there was a reduction of 45 percent in the incidence of acute lower respiratory infections," Sazawal wrote in the journal *Pediatrics*.

Other researchers have studied the use of zinc lozenges (which are dissolved in the mouth rather than swallowed) in easing common cold symptoms, but findings have been mixed, sometimes showing benefits and at other times not. A couple years ago, Michael L. Macknin, MD, of the Cleveland Clinic, found that zinc lozenges significantly decreased the symptoms and duration of colds among adults.

In the most recent study along these lines, Macknin had 209 children, ages 1-12, take zinc lozenges (10 mg elemental zinc) at the onset of cold symptoms. But what worked for adults in Macknin's previous study didn't work for children in the latest investigation, he reported in the *Journal of the American Medical Association*. According to his article, the zinc lozenges failed to reduce the childrens' cold symptoms.

Macknin couldn't explain the difference in benefits between adults and children, though he did note that the children received a supplement that was about one-

third less potent than that previously given to adult subjects.

Zinc supplements, however, may help patients with head and neck cancer maintain normal taste sensitivity after undergoing radiation therapy, according to Carla Ripamonti, MD, of the National Cancer Institute of Milan, Italy. Zinc deficiency has long been known to decrease the sense of taste.

In a study of 18 patients, Ripamonti noted that nearly all had experienced alterations in their taste before receiving radiation therapy. She then asked the patients to take either three 45 mg zinc sulfate tablets or placebos daily if they noticed reduced taste sensitivity, a loss of taste sensation, or a distortion of taste while undergoing radiation therapy.

Patients taking the placebos had more serious declines in taste acuity during radiation treatment, compared with those getting zinc. "One month after [radiation] was terminated, the patients receiving zinc sulfate had a quicker recovery of taste acuity than those receiving placebo," Ripamonti wrote in the journal *Cancer*.

References: Sazawal S, Black RE, Jalla S, et al., "Zinc supplementation reduces the incidence of acute lower respiratory infections in infants and preschool children: a double-blind, controlled study," *Pediatrics*, 1998;102:1-5. Macknin ML, Piedmonte M, Calendine C, et al., "Zinc gluconate lozenges for treating the common cold in children," *JAMA*, 1998;279:1962-1967. Ripamonti C, Zecca E, Brunelli C, et al., "A randomized, controlled clinical trial to evaluate the effects of zinc sulfate on cancer patients with taste alterations caused by head and neck irradiation," *Cancer*, 1998;82:1938-45. □

## Yes, It's in the Toenails: Selenium Reduces Prostate Cancer Risk

In a study of almost 34,000 male physicians, researchers at Harvard University Medical School and the School of Public Health reported that high intake of selenium – from diet or supplements – was associated with a two-thirds reduction in the risk of prostate cancer.

Edward Giovannucci, MD, and his colleagues analyzed the dietary habits of the physicians, as well as selenium levels in the toenails of their subjects. Toenails, like many other body tissues, reflect overall mineral

Continues on next page

levels in the body. Several years later, 181 new cases of prostate cancer were diagnosed among the men.

Selenium levels in toenails reflected intake of the mineral from diet and supplements. "The selenium content of foods is largely dependent on the selenium content of the soil where the food or animal feed was grown," Giovannucci noted.

Men with the highest selenium levels had a 0.35 odds ratio of developing prostate cancer – in other words, a 65 percent lower risk compared with men who had low selenium levels.

The essential nutrient is required for the antioxidant enzyme glutathione peroxidase, which protects genes against free radical damage. Two years ago, researchers at the University of Arizona reported that men taking 200 mcg of selenium daily were 63 percent less likely to develop prostate cancer compared with men who did not take the supplement.

Reference: Yoshizawa K, Willett WC, Morris SJ, et al., "Study of prediagnostic selenium level in toenails and the risk of advanced prostate cancer," *Journal of the National Cancer Institute*, 1998;90:1219-1224. □

## "High Rates" of Vitamin C Deficiency, Researchers Find

Two teams of researchers recently reported serious nutritional deficiencies among large numbers of American adults and children.

In one study, vitamin C levels were measured in the blood of almost 500 consecutive patients at a health maintenance organization in Phoenix. Based on the analyses, 30 percent of the patients were judged "vitamin C depleted" and 6 percent were seriously deficient in the vitamin, according to Carol S. Johnston, PhD, of Arizona State University, Tempe.

"This study showed that vitamin C deficiency was present at surprisingly high rates among generally healthy patients visiting a health care facility for routine health exams, gynecological exams, and pregnancy exams," wrote Johnston. "The poor vitamin C status of subjects may be a result of inadequate consumption of fruits and vegetables."

Patients diagnosed with vitamin C deficiency had blood levels of the vitamin ranging from 3.1 to 11.2 micromoles per liter (mm/l). The "normal" range is 20-45 mm/l when vitamin C intake is about 60 mg daily.

In the other study, researchers from the Mary Imogen Bassett Research Institute, Cooperstown, N.Y., assessed the diets of 168 children ages two to five for one week. Overall, children consumed about 80 percent of the recommended daily servings of fruit, but only 25 percent of the recommended servings of vegetables, according to Barbara A. Dennison, MD.

On closer analysis, none of the children consumed

the five combined government-recommended daily servings of fruits and vegetables. Most of the children ate less than half of a single serving of vegetables and two servings of fruit per day. Furthermore, 54 percent of the fruit servings and 42 percent of all fruit/vegetable servings were in the form of juice, which tends to be high in sugars and low in fiber.

References: Johnston CS and Thompson LL, "Vitamin C status of an outpatient population," *Journal of the American College of Nutrition*, 1998;17:366-370. Dennison BA, Rockwell HL, Baker SL, "Fruit and vegetable intake in young children," *Journal of the American College of Nutrition*, 1998;17:371-378. □

## Milk Thistle Very Popular, Often Helpful in Liver Disease

The herb milk thistle (*Silybum marianum*), an herb related to daisies and artichoke, has been used medicinally for almost 2,000 years. The Greek herbalist Dioscorides recommended milk thistle for snake bites, but most uses have been to treat diseases of the liver or biliary tract. Its active ingredient is silymarin, a complex of antioxidants.

In a recent survey of patients at a hepatology clinic, Kenneth Flora, MD, of Oregon Health Sciences University, discovered that 31 percent of patients were using over-the-counter remedies in addition to those prescribed by Flora and his colleagues. Milk thistle or its silymarin extract were the most common of these remedies. More than half of the patients said that these herbal supplements improved their symptoms.

In a review of milk thistle in the *American Journal of Gastroenterology*, Flora cited research showing that silymarin protects the liver from free radical damage and promotes the synthesis of DNA in liver cells, which is needed to produce new cells.

Numerous studies have demonstrated that silymarin can decrease the complications and speed recovery in patients with acute viral hepatitis. It can also protect the liver from damaging toxins, including alcohol and *Amanita* mushroom poisoning. In one study described by Flora, silymarin normalized liver enzyme levels among alcoholics.

Reference: Flora K, Hahn M, Rosen H, et al., "Milk Thistle (*Silybum marianum*) for the therapy of liver disease," *American Journal of Gastroenterology*, 1998;93:139-143. □

## Choline Gets Classified as an Essential Nutrient

The B-vitamin choline was classified earlier this year by the National Academy of Sciences as an essential nutrient, and the recommended daily intake for it was set at 550 mg daily for adult men and 425 mg/day for women.

Choline fits the original definition of a “vital amine,” a term that later became “vitamin,” according to Jan Krzysztof Blusztajn, PhD, of the Boston University School of Medicine. In a recent article, Blusztajn noted that choline “is an amine (nitrogen-containing) and for normal health must be consumed in the diet, even though humans can biosynthesize small amounts.”

Choline is a precursor to phosphatidylcholine and other phospholipids, which are needed for the integrity of cell membranes and for cell communications. The vitamin can spare folic acid while helping resynthesize methionine (a dietary amino acid) from homocysteine.

It also plays a key role in brain development. In one study described by Blusztajn, pregnant rats were given either choline or a choline-free diet. The different diets resulted in life-long behavioral changes in their offspring. The offspring of choline-fed rats “were more adept at tasks that measured spatial and temporal memory and attention. If the mother had received no choline, the animals were impaired in attentional and certain memory tasks,” Blusztajn wrote in *Science*.

In conclusion, he wrote that “optimal dietary choline early in life may improve human cognitive development and slow cognitive declines associated with aging.”

Reference: Blusztajn JK, “Choline, a vital amine,” *Science*, 1998;281:794-795. □

## Antioxidant Supplements Protect Lungs Against Air Pollution

Ozone and other components of urban air pollution can cause or aggravate a variety of respiratory problems. These substances generate free radicals, which promote inflammation in lung tissues. But according to a recent study, antioxidant supplements may confer significant protection and improve lung function.

Isabelle Romieu, MD, ScD, of the Centers for Disease Control and Prevention, Atlanta, and colleagues from Mexico and The Netherlands, gave antioxidant supplements to 47 street workers in Mexico City, one of the most polluted cities in the world.

During the first phase of the study, about half of the men took daily supplements containing 75 mg vitamin E, 650 mg vitamin C, and 15 mg beta-carotene for two and one-half months. The other men took a placebo during this time. During the second phase of the “crossover” study, researchers switched supplements and placebos between the two groups.

Also during the study, researchers assessed lung function among all the subjects twice each week. They used standard measures, including FEV<sub>1</sub> (forced expiratory volume in one second), FVC (forced vital capacity), and FEF<sub>25-75</sub> (forced expiratory flow, from 25 to 75 percent of FVC).

Among men taking the placebo, lung function

decreased when ozone levels were high. In contrast, men taking the supplements had improvements in all three measures of lung function. The differences between the two groups in FEV<sub>1</sub> and FVC were significant. Romieu estimated that the supplements lessened the effect of ozone on FEV<sub>1</sub> by as much as 7.4 percent and FEF by 16.6 percent.

“Our results suggest that supplementation above the recommended allowance may provide additional protection against the acute effect of high ozone exposure on lung functions,” she wrote. In addition, supplement takers had some residual benefits from the antioxidants after they began taking placebos.

Reference: Romieu I, Meneses F, Ramirez M, “Antioxidant supplementation and respiratory functions among workers exposed to high levels of ozone,” *American Journal of Critical Care Medicine*, 1998;158:226-232. □

## Alpha-Lipoic Acid Reverses Age-Related Vitamin C Decline

The efficiency of most biological processes, such as the production of hormones and energy, declines with age. But according to new research, alpha-lipoic acid may be able to reverse some age-associated changes.

While at the University of California, Berkeley, Jens Lykkesfeldt, PhD, and his colleagues measured vitamin C levels in the liver cells of old and young rats. They found that vitamin C levels in old rats were 54 percent lower than those in young rats. In addition, old rats were significantly less efficient in recycling oxidized vitamin C back to unoxidized (or “fresh”) vitamin C. As a consequence, old rats are less able to respond to free radicals and oxidative stress.

When some of the old rats were placed on a diet containing 0.5 percent of the “R” form of alpha-lipoic acid for two weeks, vitamin C levels in liver cells increased by 127 percent – “completely restoring the levels to those found in cells from untreated young rats,” Lykkesfeldt explained in the *FASEB Journal*. Even young rats benefited from supplemental R-alpha-lipoic acid. Their vitamin C levels increased by 44 percent.

The implications? Many researchers believe that the aging process begins with free radical damage to mitochondria, cellular structures that burn food for energy. Both vitamin C and alpha-lipoic acid protect mitochondria from free radical damage, and high levels of these nutrients may improve cellular function and slow the aging process. (Note: Alpha-lipoic acid supplements consist of 50 percent of the “R” form.)

Reference: Lykkesfeldt J, Hagen TM, Vinarsky V, and Ames BN, “Age-associated decline in ascorbic acid concentration, recycling, and biosynthesis in rat hepatocytes – reversal with (R)-alpha-lipoic acid supplementation,” *FASEB Journal*, 12:1183:1189. □

## Quick Reviews of Recent Research

### • Beta-carotene enhances immune cells

Men who had been taking beta-carotene supplements – 50 mg every other day for 12 years – had natural-killer (NK) cells that were 42 percent more active than NK cells from men not taking supplements.

Santos MS, et al., *American Journal of Clinical Nutrition*, 1998;68:164-170.

### • More evidence that carotenoids protect eyes

In a study of more than 36,000 male physicians, researchers found that men consuming the largest amounts of lutein and zeaxanthin were 18 percent less likely to develop cataracts. Spinach, broccoli, corn, and tomato sauce were the most protective foods.

Brown L, et al., *American Journal of Epidemiology*, 1998;147:S54 (Abstract #213).

### • Antioxidants helpful to smokers

Smoking tobacco generates large numbers of free radicals, which increase the risk of coronary heart disease. Researchers asked 39 smokers to drink a daily glass of tomato juice for four weeks. For another four weeks, half of the subjects consumed a daily glass of tomato juice fortified with 400 IU of vitamin E, 30 mg of beta-carotene, and 600 mg of vitamin C. The vitamin-fortified juice reduced free radical activity and slowed the oxidation of the low-density lipoprotein form of cholesterol.

Steinberg FM and Chait A, *American Journal of Clinical Nutrition*, 1998;68:319-327.

### • Atrophic gastritis, vitamin B12 deficiency common

In a study of 105 apparently healthy elderly in The Netherlands, researchers found the incidence of atrophic gastritis to be 32.4 percent. The prevalence of severe atrophic gastritis, which interferes with nutrient absorption, was greatest among patients deficient in vitamin B12.

van Asselt DZB, et al., *American Journal of Clinical Nutrition*, 1998;68:328-334.

### • N-acetylcysteine (NAC) may influence life span

In an experiment with fruit flies, a common experimental model for longevity studies, researchers found that supplemental NAC extended life span by 30 percent.

Brack C, et al., *Cellular and Molecular Life Sciences*, 1997;53:960-966.

### • Vitamin E linked to lower-risk pregnancies

Hypertension during pregnancy increases the risk of developing preeclampsia, which can lead to complications in both mother and fetus. Several studies have found that women with preeclampsia have lower blood levels of antioxidants. In this study, researchers found that women with severe gestational hypertension and preeclampsia had low levels of vitamin E and high levels of lipid peroxides compared with healthy pregnant

women. Lipid peroxide levels in placental tissues were also higher in women with severe gestational hypertension or preeclampsia.

Gratacos E, et al., *American Journal of Obstetrics and Gynecology*, 1998;178:1072-6.

### • Alpha-tocopherol regulates gene activity

Proliferation of vascular smooth muscle cells increases the risk of coronary heart disease. In a cell-culture experiment, Swiss researchers compared various aspects of natural alpha- and beta-tocopherol on these cells. Although both forms of vitamin E are antioxidants, only alpha-tocopherol decreased the activity of the gene responsible for smooth muscle cell growth. This indicates that vitamin E can reduce the risk of heart disease by means unrelated to its antioxidant activity.

Azzi A, et al., *Zeitschrift fur Ernährungswissenschaft*, 1998;31 (Suppl 1):21-28.

### • Supplements may help in cystic fibrosis

Patients with cystic fibrosis have difficulty absorbing fat-soluble nutrients, which contributes to their health problems. Researchers gave beta-carotene supplements to children and teenagers with cystic fibrosis, then compared their blood levels of the nutrient and a marker of free radical activity. After twelve weeks, subjects taking beta-carotene had a 12 percent increase in total antioxidant capacity. Free radical activity also declined.

Rust P, et al., *International Journal of Vitamin and Mineral Research*, 1998;68:83-87.

### • Vitamins help with familial hypercholesterolemia

Elevated cholesterol increases the risk of coronary heart disease by interfering with the normal dilation, or relaxation, of blood vessels. In a study of people ages 6-21 with familial (inherited) hypercholesterolemia or familial hyperlipoproteinemia, supplements of vitamin E (800 IU/daily) and vitamin C (1,000mg/daily) improved blood vessel dilation by more than 200 percent.

Mietus-Snyder M, et al., *Journal of Pediatrics*, 1998;133:36-40.

THE NUTRITION REPORTER™ (ISSN 1079-8609) is published monthly except for August and December. This issue, Vol 9 No 10, © October 1998 by Jack ChalleM. All rights reserved. Reproduction without written permission is prohibited. Phone: (503) 642-1372. Fax: (503) 649-8948. Email addresses: Jack\_ChalleM@class.orednet.org or challeM@compuserve.com. This newsletter is strictly educational and not intended as medical advice. For diagnosis and treatment, consult your physician. Subscriptions are \$25 per year in the U.S.; either \$32 U.S. or \$48 CND for Canada; and \$38 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 5505  
Aloha, OR 97006-5505 USA

Editor and Publisher: **Jack ChalleM** Associate Publisher: **Renate Lewin**

#### Medical Advisors:

**Lendon H. Smith, MD** Portland, Oregon  
**Richard P. Huemer, MD** Lancaster, California  
**Ralph K. Campbell, MD** Polson, Montana  
**Peter Langsjoen, MD** Tyler, Texas  
**G. Edward Desaulniers, MD** The Shute Institute Medical Clinic London, Ontario  
**Marcus Laux, ND** Pacific Palisades, California