

# The Nutrition Reporter™

© Jack Challem September 2003 Vol 14 No 9

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

## Research Confirms Glucosamine and Chondroitin Effective, Safe in Osteoarthritis

A new study has confirmed that glucosamine and chondroitin supplements safely reduce pain and lead to new joint cartilage in people with osteoarthritis. Meanwhile, a second study has found that glucosamine supplements do not affect blood sugar levels and are likely safe for people with diabetes.

Jean-Yves Reginster, MD, PhD, of the University of Liege, Belgium, and his colleagues conducted an extensive, rigorous analysis of published clinical studies using glucosamine and chondroitin supplements. They narrowed 500 studies down to 36 and then to the 15 designed with the best scientific controls. The data was based on 1,020 patients treated with glucosamine and 755 treated with chondroitin.

Reginster found a "highly significant efficacy" with glucosamine supplements. Glucosamine increased joint cartilage, reduced the noncartilage space in knee joints, lessened pain (based on established methods of measuring osteoarthritic pain), and improved the flexibility of knees.

Similarly, chondroitin supplements reduced pain and improved leg mobility. However, no studies have been conducted on whether chondroitin increases the formation of knee cartilage.

"Concerning effects on symptoms, significant changes compared with baseline were observed in the chondroitin- and glucosamine-treated patients, whereas no placebo group showed significant improvement," Reginster and his colleagues wrote. They added that "recent studies have also suggested that glucosamine efficiently prevents the long-term progression of osteoarthritis."

In a separate study, Daren A. Scroggie, MD, and his colleagues at the Wilford Hall Medical Center, Lackland Air Force Base, Texas, investigated whether glucosamine supplements raised blood sugar levels.

Scroggie asked 26 elderly patients to take supplements containing 1,500 mg of glucosamine and 400 mg of chondroitin daily for 90 days. All of the subjects had both diabetes and osteoarthritis, which Scroggie noted frequently overlap. Patients were

already being treated with one or two glucose-controlling medications, but not insulin or glucocorticoids.

The patients' hemoglobin A1c (HbA<sub>1c</sub>) levels – a marker of glucose control – were measured at least twice before supplementation began and again after the study.

The supplement negligibly increased HbA<sub>1c</sub> from 6.45 to 6.50 percent, which the researcher noted was not significant. Patients taking placebos had a nonsignificant decrease in HbA<sub>1c</sub> from 6.25 to 6.09 percent.

"Since patients with diabetes are at risk for toxic effects from some of the current treatments for osteoarthritis (NSAIDs in particular), glucosamine may provide a safe alternative treatment for these patients," Scroggie wrote. "The present study has demonstrated that oral glucosamine supplementation does not adversely affect glycemic control when administered to patients with type 2 diabetes mellitus at doses recommended by the manufacturer."

Both glucosamine and chondroitin are natural substances found in joint cartilage.

References: Richey F, Bruyere O, Ethgen O, et al. Structural and symptomatic efficacy of glucosamine and chondroitin in knee osteoarthritis. *Archives of Internal Medicine*, 2003;163:1514-1522. Scroggie DA, Albright A, Harris MD. The effect of glucosamine-chondroitin on glycosylated hemoglobin levels in patients with type 2 diabetes mellitus. *Archives of Internal Medicine*, 2003;163:1587-1590. □

### Homeopathic Treatment May Help in Treating Childhood Diarrhea

Homeopathic treatments often leave people perplexed. The idea that minuscule amounts of a medicinal substance have a powerful effect runs completely counter to the conventional view that higher potencies yield a stronger therapeutic effect.

Controversial or not, a recent meta-analysis of

Continues on next page

three studies has found that homeopathic treatments do reduce diarrhea in children.

The analysis, conducted by Jennifer Jacobs, MD, MPH, of Edmonds, Washington, and her colleagues, looked at three clinical trials using homeopathic medicines to treat 242 children. The children, who ranged from age six months to five years, received either a homeopathic treatment or placebo after each "unformed stool" for five days.

The homeopathic medicines consisted of Podophyllum, Arsenicum album, Sulphur, Chamomilla, and Calcarea carbonica. They were prepared in accordance with the homeopathic pharmacopoeia of the United States.

Based on the analysis, the duration of diarrhea was about 20 percent shorter (3.3 days) among children taking the homeopathic medicine, compared with those taking placebos (4.1 days).

One potential explanation for homeopathy might rest in molecular biology, with minute dosages of substances influencing cell-signaling and gene expression. After all, a near-homeopathic daily dose of the B vitamin folic acid – 1/70,000<sup>th</sup> of an ounce – ensures normal methylation and gene expression in the body's 70 trillion cells.

Reference: Jacobs J, Jonas WB, Jimenez-Perez M, et al. Homeopathy for childhood diarrhea: combined results and meta-analysis from three randomized, controlled clinical trials. *Pediatric Infectious Diseases Journal*, 2003;22:229-234. □

## Lycopene, an Antioxidant in Tomatoes, Found Beneficial in Women's Health

Lycopene, the red antioxidant carotenoid found in tomatoes and watermelon, may provide health benefits specific to a woman's body.

In one study, Anna R. Giuliano, PhD, of the University of Arizona Cancer Center, Tucson, analyzed blood levels of carotenoids, different vitamin E fractions, folic acid, and vitamin B12 in 84 women infected with the human papillomavirus (HPV).

Persistent HPV infection is a risk factor for cervical cancer, though only a small number of infected women actually develop this cancer. Other factors, such as micronutrients, may protect against persistent HPV infection and cervical cancer.

Women with the highest blood levels of lycopene were almost three times more likely to quickly "clear" from an HPV infection.

On average, those who had the highest lycopene levels were clear of their HPV infection after about eight and a half months. In contrast, women with the lowest lycopene levels did not clear their infection for almost a year.

Considerable evidence supports the role in

lycopene in reducing the risk of prostate cancer.

"Lycopene may play a protective role in many cancers including lung, stomach, esophagus, oral cavity, pharynx, colorectal, pancreas, and prostate," Giuliano wrote.

In a separate study, J. B. Sharma, MD, and colleagues at the Maulana Azad Medical College, New Delhi, India, gave 251 women, all pregnant for the first time, either 2 mg of lycopene or placebos daily. Supplementation started between the 16<sup>th</sup> and 20<sup>th</sup> weeks of gestation, continuing until delivery.

Pre-eclampsia, a toxemia of pregnancy, occurred about half as much in the group of women taking lycopene (8.6 percent), compared with the group taking placebos (17.7 percent). Diastolic blood pressure was also lower among women taking lycopene supplements, 86.7 mmHg versus 99.2 mmHg. In addition, fetal weight and intrauterine growth during the pregnancy were greater in the lycopene group.

Previous studies have found that women with pre-eclampsia and eclampsia have low blood levels of lycopene.

References: Sedjo RL, Papenfuss, MR, Craft NE, et al. Effect of plasma micronutrients on clearance of oncogenic human papillomavirus (HPV) infection (United States). *Cancer Causes and Control*, 2003;14:319-326. Sharma JB, Kumar A, Kumar A, et al. Effect of lycopene on pre-eclampsia and intrauterine growth retardation in primigravidas. *International Journal of Gynecology and Obstetrics*, 2003;81:257-262. □

## Beta-Carotene Supplements May Reduce Risk of Recurrent Colon Cancer

If you don't smoke cigarettes or drink much alcohol, beta-carotene supplements can lower your risk of developing cancer of the colon or rectum. But if you smoke cigarettes and drink, the supplements will boost your risk, according to a recent study.

The findings parallel two clinical trials published in the mid-1990s, showing that beta-carotene supplements reduced the risk of lung cancer in former smokers. Those two studies also found that beta-carotene supplements increased the risk of lung cancer in subjects who both smoked and regularly drank alcohol.

In the latest study, John A. Baron, MD, of the Dartmouth Medical School, New Hampshire, and his colleagues followed the health of 707 men and women who had a cancerous colorectal adenoma removed and, when the study began, had no sign of polyps.

Some of the subjects took beta-carotene supplements (25 mg daily) or placebo, while others received a combination of vitamin C (1,000 mg daily) and vitamin E (400 mg daily) or placebo for several years.

People who took beta-carotene supplements, but did not smoke or drink, benefited from a 44 percent reduction in the risk of recurrent colorectal cancer. "Among subjects who neither smoked cigarettes nor drank alcohol, beta-carotene was associated with a marked decrease in the risk of one or more recurrent adenomas," the researchers wrote.

However, people who smoked had a slightly increased risk of developing a new cancer, and those who both smoked and had one or more alcohol drinks daily had double the risk of recurrent colorectal cancer.

The study found that beta-carotene supplements reduced the risk of recurrent colorectal cancers, but that they could not offset the health effects of smoking and alcohol.

Reference: Baron JA, Cole BF, Mott L, et al. Neoplastic and antineoplastic effects of beta-carotene on colorectal adenoma recurrence: results of a randomized trial. *Journal of the National Cancer Institute*, 2003;95:717-722. □

### Triple-Antioxidant Supplementation Benefits People with Diabetes

A combination of vitamin E, vitamin C, and alpha-lipoic acid can improve both established and novel markers of glucose control in diabetes.

Michael D. Coleman, MD, and his colleagues at Aston University, England, asked eight subjects with type 1 (insulin-dependent) diabetes to take 200 IU of vitamin E, 250 mg of vitamin C, and 90 mg of alpha-lipoic acid daily for six weeks. The subjects, four men and four women, were in their twenties and had no diabetic complications. Eight nondiabetic subjects, matched for age and sex, took the same supplements.

Coleman and his colleagues measured the subjects' glycosylated hemoglobin (HbA<sub>1c</sub>) levels before supplementation, after three and six weeks supplementation, and four weeks after supplementation ended. They also measured the levels of methaemoglobin, a relatively new marker of oxidative stress. Methaemoglobin levels decrease when a person is under oxidative (free radical) stress – that is, when not consuming adequate antioxidant levels.

Throughout the study, methaemoglobin levels were lower in diabetics than in nondiabetics. However, methaemoglobin levels did improve in the diabetics, and after three weeks the difference between diabetics and nondiabetics was not significant.

In addition, the triple-antioxidant combination enabled the diabetic subjects to better maintain their glutathione antioxidant levels, and the overall antioxidant capacity of their blood improved as well.

After six weeks of supplementation, HbA<sub>1c</sub>

levels in the diabetic subjects decreased significantly, from 9.5 percent to 6.6 percent, indicating greatly improved glucose control. But four weeks after supplementation ended, HbA<sub>1c</sub> levels returned to their original levels and methaemoglobin levels began to decline.

Reference: Coleman MD, Fernandes S, Khanderia L. A preliminary evaluation of a novel method to monitor a triple antioxidant combination (vitamins E, C and alpha-lipoic acid) in diabetic volunteers using in vitro methaemoglobin formation. *Environmental Toxicology and Pharmacology*, 2003;14:69-75. □

### Problem with Folic Acid-Processing Gene Increases Likelihood of Depression

Low levels of the B-vitamin folic acid are intertwined in severe and prolonged depression, as well as poor response to conventional treatment. But new research points not to low folic acid levels per se but to a variation in the gene governing how the body uses folic acid.

Ingvar Bjelland, MD, and colleagues from the University of Bergen, Norway, measured the severity of depression in 5,948 men and women in their 40s and 70s. The test, the Hospital Anxiety and Depression Scale, is an accepted clinical diagnostic tool.

Bjelland also measured the subjects blood levels of homocysteine, folic acid, and vitamin B12. Elevated homocysteine is a marker of low folic acid and vitamin B12 levels. In addition, the researchers identified which subjects had a common variation, or polymorphism, in the gene that programs methylenetetrahydrofolate reductase. This variation reduces the activity of the enzyme and folic acid, increasing the risk of heart disease, cancer, and Alzheimer's disease.

Bjelland found that people with elevated homocysteine levels – higher than 15 mmol/L – were almost twice as likely to be depressed, compared with people who had normal levels. And those who had the genetic variation were more than two-thirds more likely to be depressed.

In general, low vitamin levels were not associated with depression, except for low folic acid levels in middle-age women. The results suggested that poor processing of folic acid, more than low folic acid levels per se, may be a factor in depression.

Folic acid plays a key role in methylation, a fundamental molecule-building process in the body. The inability to efficiently use folic acid and other B vitamins may limit the body's production of key neurotransmitters

Reference: Bjelland I, Tell GS, Vollset SE, et al. Folate, vitamin B12, homocysteine, and the MTHFR 677C→T polymorphism in anxiety and depression. *Archives of General Psychiatry*, 2003;60:618-626. □

## Quick Reviews of Recent Research

### • People with asthma have high free-radical levels

Free radicals stimulate the release of pro-inflammatory cells and molecules, and several small studies have found that people with asthma (an inflammatory disease of the airways) experience elevated levels of free radicals. In this study, researchers analyzed several markers of free radicals in 38 patients with asthma and 23 healthy subjects. Patients with asthma had higher levels of free radicals in their white blood cells, which are involved in inflammation. The researchers suggested that antioxidant supplements might be of benefit, a finding confirmed in other studies.

Nadeem A, et al. *Journal of Allergy and Clinical Immunology*, 2003;111:72-78.

### • L-carnitine lowers lipoprotein(a) levels

Lipoprotein(a) is a cholesterol fraction and an independent risk factor for coronary artery disease. Researchers asked 94 men and women with type 2 diabetes and elevated cholesterol levels to take 1 gram of L-carnitine twice daily or placebos for six months. Subjects taking L-carnitine had a significant decrease in their Lp(a) levels, compared with the placebo group.

Derosa G, et al. *Clinical Therapeutics*, 2003;25:1429-1439.

### • Beta-carotene protects against sunburn

Researchers exposed human skin cells to six different concentrations of beta-carotene, then exposed the cells to ultraviolet (UV) rays. UV rays activate the heme oxygenase 1 (HO-1) gene, which also promotes inflammation. Beta-carotene inhibited the activity of the HO-1 gene, with higher doses having a greater effect.

Trekli MC, et al. *Free Radical Biology & Medicine*, 2003;34:456-464.

### • Vitamin C cream reverses sun damage to skin

Researchers asked women with sun-damaged skin on their lower neck area and arms to apply either a cream with or without vitamin C daily for six months. Assessments were performed by the researchers, subjects, and by skin biopsies at the end of the study. Women using the vitamin C cream had significant improvements in skin structure and a decrease in wrinkles.

Humbert PG, et al. *Experimental Dermatology*, 2003;12:237-244.

### • Omega-3 fatty acids reduce pain

Numerous clinical trials have found that omega-3 fish oils can alleviate pain in rheumatoid arthritis and irritable bowel disease, as well as lead to improvements in heart disease, multiple sclerosis, and

depression. It works in part by inhibiting pro-inflammatory chemicals in the body. According to this paper, the omega-3 fatty acids may reduce pain by directly attenuating pain-related processes in the brain.

Shapiro H. *Prostaglandins, Leukotrienes and Essential Fatty Acids*, 2003;68:219-224.

### • Herbs hold promise for lowering cholesterol

Researchers analyzed 25 controlled clinical trials involving the use of 11 herbal remedies used to lower cholesterol levels. The highest quality studies focused on guggul, fenugreek, red yeast rice, and artichoke, and others included Panax ginseng, yarrow, eggplant, holy basil, and milk thistle. In general, the use of individual herbal remedies lowered blood cholesterol levels from 10 to 33 percent. The researchers felt that the evidence was promising, though not conclusive for the herbs.

Thompson-Coon JS, Ernst E. *Journal of Family Practice*, 2003;52:468-478.

### • Vitamin E reduces heart damage during surgery

Ischemia-reperfusion injury occurs when blood flow is stopped then resumed during heart surgery. Much of the damage to heart cells is related to the generation of large numbers of free radicals. Studies have shown that oral antioxidants can reduce ischemia-reperfusion injury. In this study, researchers sprayed either a water-soluble vitamin E/saline solution or a plain saline solution into the arteries of 30 patients undergoing coronary artery bypass surgery. Patients receiving the vitamin E spray had significantly lower levels of several markers of ischemia-reperfusion injury.

Canbaz S, et al. *Thoracic and Cardiovascular Surgeon*, 2003;51:57-61.

The Nutrition Reporter™ (ISSN 1079-8609) is published monthly except for August and December and is distributed only by prepaid subscription. This issue, Vol 14 No 9, © September 2003 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 CND 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 85715-0246 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