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Antioxidants Can Reduce Glare and Slow the Progression of Eye Disease

New studies have found that lutein and zeaxanthin supplements can reduce glare in healthy people, and that a combination of these and other antioxidants can improve vision in people diagnosed with the early stages of age-related macular degeneration.

Lutein and zeaxanthin are carotenoids, part of a family of antioxidants found in vegetables, fruits, and some seafoods. They form the macular pigment, located at the center of the retina, a region of the eye responsible for detailed vision. Although lutein is more common than zeaxanthin in foods, the body can convert some of the former to the latter.

In the first study, James M. Stringham, PhD, and Billy R. Hammond, PhD, of the University of Georgia, Athens, asked 40 men and women, ages 17 to 41 years old, to take 10 mg of lutein and 2 mg of zeaxanthin supplements daily for six months. At the beginning of the study, and at the end of the first, second, fourth, and sixth months, the researchers exposed the subjects to bright artificial lights – intended to mimic the effects of headlights, sunlight, and computer screens.

After six months of supplementation, 38 of the 40 subjects showed substantial resistance to glare and faster recovery times after being exposed to glare. Their macular pigment had thickened by an average of 40 percent, which significantly reduced the effect of glare in the tests. Stringham and Hammond wrote that the subjects "could tolerate 58 percent more intense glaring light" before they lost the ability to identify an object in the center of the light. Furthermore, the subjects taking supplements quickly regained their ability to see after the glare exposure.

In the second study, Vincenzo Parisi, MD, of the Fondazione G. B. Bietti-Istituto di Ricovero e Cura a Carattere Scientifico, in Rome, Italy, and his colleagues, asked 15 patients with "nonadvanced age-related macular degeneration" to take antioxidant supplements for one year. Twelve similar patients, in their late 60s or early 70s, served as a control group and took no supplements during this time.

The antioxidants consisted of 10 mg of lutein, 1 mg of zeaxanthin, 180 mg of vitamin C, 30 mg of vitamin E, 22.5 mg of zinc, and 1 mg of copper.

After a year of taking the antioxidant supplements, patients had significant improvements in the central retina of their eyes, where lutein and zeaxanthin are concentrated, but no improvement in the outlying areas of the retina.

Parisi wrote that the "normal concentration of lutein and zeaxanthin seems to have a protective role against the development of age-related macular degeneration...these pigments prevent the light-induced damage, shielding the retina from the harmful effects of blue [ultraviolet] light."

Age-related macular degeneration, which is characterized by a thin macular pigment and free radical damage to fats in the eye, is the leading cause of blindness in Western nations.

References: Stringham JM, Hammond BR. Macular pigment and visual performance under glare conditions. *Optometry and Vision Science*, 2008;85:82-88. • Parisi V, Tedeschi M, Gallinaro G, et al. Carotenoids and antioxidants in age-related maculopathy Italian study. *Ophthalmology*, 2008;115:324-333. ❑

Perspectives

Science That Distorts Research

I was recently in England to lecture on nutrition and to sign copies of my book, *Stop Prediabetes Now*. While there, another negative study on vitamins was published, one that claimed vitamin supplements increased the risk of death. The study's findings were repeated there and around the world – uncritically. Some people were actually afraid to continue taking their vitamin supplements.

The study, by Goren Bjelakovic, MD, and published via what is known as the Cochrane Database, was a rehash of his highly criticized study last year in the *Journal of the American Medical*

Continues on next page

Association. It was old news – and bad science.

Bjelakovic's findings of a so-called significant increased risk of death from vitamins were not significant at all. The study wasn't even a study – it was a statistical machination of 67 previously published studies, many of which had shown clear benefits from vitamin supplements. Bjelakovic focused on studies in which deaths occurred, choosing to ignore more than 400 studies (from his original pool of research) in which no deaths occurred. In poker, this type of cheating is called stacking the deck. Many of the subjects in the studies were seriously ill or terminal, vitamin dosages varied greatly, and the duration of supplement use ranged from a month to years. Bjelakovic had no idea of the causes of death, which might have included car accidents and children suffocating their terminally ill parents.

During the same week, I happened to visit the food hall at Harrod's, the pricey London department store that prides itself on both quality and expensive goods. Curious, I looked at the ingredients list on tins of cookies. Incredibly, partially hydrogenated vegetable oils (i.e., trans fats) were the first or second ingredient in most of these products. Basically, Harrod's magnificent food halls have turned into a hall of the worst kinds of junk food. Trans fats are arguably the most dangerous ingredient in processed foods.

Bjelakovic would have provided a far greater service if he had focused on the dangers of artificial food ingredients, such as the trans fats in Harrod's cookies and hundreds of other common manufactured food products. When we take vitamin supplements, we do so in part as a "countermeasure" to protect ourselves against some of the harmful additives whose presence is often not questioned at all. –JC

Vitamin D May Have Analgesic Benefits in People with Diabetes

Vitamin D deficiency is common in people with type 2 diabetes, and two Australian physicians decided to investigate whether supplements of the vitamin might reduce neuropathic pain.

Paul Lee, MB, and Roger Chen, MB, of the Concord Repatriation General Hospital, New South Wales, Australia, treated 51 patients with type 2 diabetes and neuropathic pain, consisting of burning, tingling, numbness, throbbing sensations, or reduced sensitivity to touch. All of the patients were deficient in vitamin D when the study began.

The patients were given vitamin D_3 supplements – at an average dose of about 2,000 IU daily – for three months.

By the end of the study, the patient's neuropathic pain decreased significantly. Based on the patients' feedback and answers to a pain questionnaire, Lee and Chen found that pain decreased by an average of 40 to 50 percent.

"Because the treatment of diabetic neuropathic pain is generally unsatisfying for patients and is associated with significant adverse effects, we advocate a trial of vitamin D supplementation in vitamin D-insufficient patients with neuropathic pain," they wrote. "It is unlikely to have any harmful effects and may offer not only pain relief but also beneficial effects on bone health and glycemic control."

Reference: Lee P, Chen R. Vitamin D as an analgesic for patients with type 2 diabetes and neuropathic pain. *Archives of Internal Medicine*, 2008;168:771-772. ❑

Researchers Find that Green Tea May Protect Against Leukemia

Regular consumption of green tea may reduce the risk of developing leukemia, a collaboration of Chinese and Australian researchers has found.

C. D'arcy J. Holman, PhD, of the University of Western Australia, Perth, and Chinese researchers studied 107 Chinese patients, ranging from 16 to 81 years of age. They were asked to complete a dietary questionnaire within 12 months of their diagnosis. Their diets and health were compared with 110 orthopedic patients as controls.

Holman and his colleagues found a strong relationship between regular consumption of green tea and a low risk of leukemia, compared with people who were infrequent drinkers of tea.

People who regularly consumed green tea over the previous 20 years had an 80 percent lower risk of developing leukemia. Those who drank green tea daily, but not for as long, had about a 60 percent lower risk of leukemia.

Reference: Zhang M, Zhao X, Zhang X, et al. Possible protective effect of green tea intake on risk of adult leukemia. *British Journal of Cancer*, 2008;98:168-170. ❑

Low Magnesium Accelerates Cellular and Genetic Aging

The mineral magnesium plays hundreds of roles in the body, from serving as cofactor in biochemical reactions to being a constituent of bone. A lack of magnesium has been linked to many different diseases, including coronary heart disease, arrhythmias, high blood pressure, osteoporosis, muscle spasms, diabetes, and some cancers.

"Given the numerous functions of magnesium, a prolonged inadequacy would likely impair many metabolic pathways leading to decrements in cellular processes," David W. Killilea, PhD, and Bruce N. Ames, PhD, recently observed.

Disturbingly, more than half of Americans do not consume enough magnesium.

In recent experiments using human fibroblast cells, Killilea and Ames identified some of the detailed cellular and genetic changes associated with a lack of magnesium. Fibroblast cells produce the extracellular matrix of cells, which helps provide their structural support.

The magnesium-deficient cells appeared to survive and divide normally. However, based on several markers, they grew older faster, compared with cells grown with normal magnesium concentrations. The magnesium-deficient cells had increased levels of beta-galactosides, as well as increased activity of p16 and p21 genes and proteins – all signs of increased senescence, or age-related deterioration.

Significantly, the magnesium-deficient cells had a shortening of their telomeres, which are DNA sequences that protect the tips of chromosomes. Shortened telomeres are strongly associated with aging on a genetic level, and this study directly linked telomere damage with a lack of magnesium.

Reference: Killilea DW, Ames BN. Magnesium deficiency accelerating cellular senescence in cultured human fibroblasts. *Proceedings of the National Academy of Sciences*, 2008;105: 5768-5773. ❑

Chromium-Biotin Combination Improves Glucose in Diabetes

A combination of chromium and biotin supplements can lead to impressive reductions in blood sugar among overweight people who have poorly controlled type 2 diabetes. People with the highest blood sugar levels seemed to benefit the most.

Ira D. Goldfine, MD, of the University of California, San Francisco, and his colleagues analyzed data from 348 people who completed the study, in which they were given either a combination of 600 mcg chromium picolinate and 2,000 mcg of biotin or placebos daily for 90 days.

Fasting blood sugar levels decreased by an average of 9.8 mg/dl (or about 6 percent) among people taking the supplements, compared with an increase of 0.7 mg/dl in people taking placebos. Among people with the highest blood sugar levels at the start of the study, blood sugar levels went down by an average of almost 35.8 mg/dl among those taking the supplements, compared with 16.2 mg/dl among those taking placebos.

The subjects had substantial decreases in HbA_{1c} levels as well. HbA_{1c} is measured as "%" and provides an average blood sugar level over a six-week period.

Overall, people taking the supplements benefited from a decrease from 8.73% to 8.19%, a difference of 0.54%. People with the highest HbA_{1c} levels – more than 10% – had a significant decrease of 1.8% after taking the chromium and biotin supplements for 90 days. That decrease was almost three times greater than that of the placebo group.

"In over 34 clinical trials evaluating chromium picolinate, there has never been any evidence of hypoglycemia whether administered alone, or in combination with other prescription medications..." Goldfine wrote.

Reference: Albarracin CA, Fuqua BC, Evans JL, et al. Chromium picolinate and biotin combination improves glucose metabolism in treated, uncontrolled overweight to obese patients with type 2 diabetes. *Diabetes Metabolism Research and Reviews*, 2008;24:41-51. ❑

Cod Liver Oil Eases Arthritis Pain, Reduces Need for Medications

If you have rheumatoid arthritis and would like to cut back on the medications you take – after all, most analgesic drugs have serious side effects – start taking some supplemental cod liver oil. That's the finding of a team of researchers from Scotland.

Writing in the journal *Rheumatology*, Bernat Galarraga, MD, of Dundee University, noted that the side effects from nonsteroidal anti-inflammatory drugs (NSAIDs) tend to limit their use in the control of symptoms in people with rheumatoid arthritis.

Galarraga and his colleagues treated 97 men and women with either 10 grams of cod liver oil (containing 2.2 grams of omega-3 fats) or placebos daily for nine months. After 12 weeks, the patients were asked to gradually reduce their use of NSAIDs.

Of the patients completing the study, 39 percent of those taking cod liver oil were able to reduce their daily use of NSAIDs by about one-third or more, compared with just 10 percent of the people taking placebos.

Although the researchers could not document reductions in arthritic symptoms, the decreased use of NSAIDs suggested that patients did benefit from fewer aches and pains.

Galarraga noted that dietary fish oils, also called omega-3s, are precursors to inflammation-reducing hormone-like prostaglandins and leukotrienes.

Reference: Galarraga B, Ho M, Youssef HM, et al. Cod liver oil (n-3 fatty acids) as an non-steroidal anti-inflammatory drug sparing agent in rheumatoid arthritis. *Rheumatology*, 2008;47: 665-669. ❑

Quick Reviews of Recent Research

• Fermented soy high in vitamin K_2

Vitamin K occurs in several different forms. Vitamin K_1 is found mostly in plants. Vitamin K_2 occurs in two principal forms, MK-4 and MK-7. The MK-4 form, found in animal foods and supplements, can prevent and reverse osteoarthritis at dosages of 45 mg (not mcg) daily. The MK-7 form of vitamin K_2 may also have health benefits. A study of Japanese foods found that the MK-7 form of vitamin K_2 was abundant in natto, a type of fermented soybean food. According to the researchers, 1 ounce of natto provided about 264 mcg of MK-7.

Kamao M. *Journal of Nutrition Science and Vitaminology*, 2008;53:464-470.

• Lutein and zeaxanthin protect against AMD

Australian researchers analyzed data from a Wisconsin (United States) study on eating habits and the risk of age-related macular degeneration (AMD). People who consumed the most amount of these antioxidants from food had a 65 percent lower risk of neovascular AMD. High intake of zinc also reduced the risk of AMD by about 45 percent. The findings confirmed earlier studies.

Jan JSL. *Ophthalmology*, 2008;115:334-341.

• Low vitamin D common in osteoporosis

Vitamin D is needed for incorporating calcium into bone. Endocrinologists in Las Vegas, Nevada, measured vitamin D blood levels in 71 patients with osteoporosis who had been taking 800 IU of vitamin D and 1,200 mg of calcium. Of the patients, 18.3 percent were deficient in vitamin D and 22.5 percent were marginally deficient.

Singh H. Presented at the annual meeting of the American Association of Clinical Endocrinologists, Orlando, Florida, May 16, 2008.

• Niacin defect linked to schizophrenia

For almost 60 years, Canadian psychiatrist Abram Hoffer, MD, PhD, has successfully used high-dose niacin (vitamin B3) and vitamin C to treat schizophrenia. In a recent study, researchers from Johns Hopkins University, Baltimore, determined that a specific protein, known as HM74A, had significantly lower activity in schizophrenic patients. The protein is involved in the regulation of niacin in the brain, providing biochemical evidence to support the beneficial clinical role of niacin.

Miller CL. *Brain Research Bulletin*, 2008;doi:10.1016/j.brainresbull.2008.03.015.

• Bread may be just as bad as sugar

A team of researchers from Australia, Italy, and the United Kingdom investigated the impact of high-glycemic foods on the activity of "nuclear factor beta kappa (NFkB)," a transcription factor that prompts the activity of genes involved in inflammation. They found that glucose and white bread – both high glycemic – had essentially the same effect in boosting blood sugar, insulin, and NFkB in 10 young, thin, and healthy men and women. Glucose and bread had a similar impact on nitrotyrosine, a marker of inflammation and cell damage. Pasta, considered a low-glycemic food, had far less of an impact.

Dickinson S. *American Journal of Clinical Nutrition*, 2008;87:1188-1193.

• B vitamins injections improve mood

German physicians and researchers treated 1,430 men and women who had symptoms suggestive of low vitamin intake. They gave the patients, whose average age was 67 years, an average of eight intramuscular injections of B vitamins over four and one-half weeks. The mood and vitality of the patients improved significantly, with scores on a self-assessment improving by more than 50 percent. The improvements correlated with the number of injections.

Engels A. *MMW-Fortschritte de Medizin*, 2008;149 (Suppl): 162-166.

• Green tea extract may fight cancer

Epigallocatechin-3-gallate (ECGC) is the principal antioxidant found in green tea. Studies have strongly suggested that it may reduce the risk of cancer and heart disease. Researchers from the University of Texas implanted pancreatic tumors in laboratory mice, then included EGCG in the treatment of some of the mice. EGCG led to significant reductions in tumor size, proliferation, angiogenesis, and metastasis, leading to an overall arrest in tumor growth. They wrote that "EGCG... could be used for the management of pancreatic cancer prevention and treatment."

Shankar S. *Frontiers in Bioscience*, 2008;440-452.

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