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IN THE NEWS

Lutein and Zeaxanthin Improve Vision in Healthy People Too

Scientists have long known that higher intakes of the carotenoids lutein and zeaxanthin may help prevent age-related macular degeneration, a common cause of blindness.[1,2] Now, investigators at the University of Georgia have discovered that the compounds may also improve visual performance in healthy young people with normal vision exposed to glaring light conditions.[3]

The researchers gave 12 mg supplemental lutein and zeaxanthin to 40 subjects each day for six months. The subjects demonstrated improved visual performance under glaring light conditions over the course of the test period compared with baseline.[3] The scientists believe that lutein and zeaxanthin helped improve visual function by increasing macular pigment optical density.

Macular pigment, which consists of lutein, zeaxanthin, and a related pigment, meso-zeaxanthin, is responsible for reducing discomfort and maintaining visual performance under glaring light conditions.[4]

These findings complement an earlier placebo-controlled study showing that lutein/zeaxanthin supplementation improved visual performance under low light conditions.[5]

—Dale Kiefer

Reference

1. Mozaffarieh M, Sacu S, Wedrich A. The role of the carotenoids, lutein and zeaxanthin, in protecting against age-related macular degeneration: a review based on controversial evidence. Nutr J. 2003 Dec 11;2:20.
2. Guymer RH, Chong EW. Modifiable risk factors for age-related macular degeneration. Med J Aust. 2006 May 1;184(9):455-8.
3. Stringham JM, Hammond BR. Macular pigment and visual performance under glare conditions. Optom Vis Sci. 2008 Feb;85(2):82-8.
4. Stringham JM, Hammond BR Jr. The glare hypothesis of macular pigment function. Optom Vis Sci. 2007 Sep;84(9):859-64.
5. Kvansakul J, Rodriguez-Carmona M, Edgar DF, et al. Supplementation with the carotenoids lutein or zeaxanthin improves human visual performance. Ophthalmic Physiol Opt. 2006 Jul;26(4):362-71.

New Study Sheds Light on Vitamin D's Cancer-Protective Role

While scientists now know that adequate levels of vitamin D protect the body from numerous cancers, a new study helps explain just how the "sunshine vitamin" may prevent cancer in the human prostate.*

Since many cancers may be triggered by oxidative stress and the build-up of damaging free radicals, the investigators hypothesized that vitamin D might fight cancer through antioxidant effects. In the laboratory, they exposed prostate epithelial cells to the most biologically active form of vitamin D: 1,25-dihydroxyvitamin D3.

Their findings revealed that the active form of vitamin D acts on a gene known as G6PD to increase activity of the antioxidant enzyme, glucose-6-phosphate dehydrogenase. The enzyme mopped up free radicals in the prostate cells, protecting them against oxidative stress-induced injury and death.

The scientists believe that vitamin D's potent antioxidant effects contribute to its cancer-preventive effects.

—Dale Kiefer

Reference

* Bao BY, Ting HJ, Hsu JW, Lee YF. Protective role of 1 alpha, 25-dihydroxyvitamin D3 against oxidative stress in nonmalignant human prostate epithelial cells. Int J Cancer. 2008 Jun 15;122(12):2699-706.

Children Need Ten Times More Vitamin D

In a recent study, vitamin D3 supplementation was safe in children at a dose of 2,000 IU/day, which is 10 times higher than the current recommendation of 200 IU/day.*

The study tested the safety of high-dose vitamin D3 versus placebo in children aged 10 to 17 years. In a short-term study, 25 children took vitamin D3 at 14,000 IU/week for eight weeks. In a long-term study, 340 children took low-dose (1,400 IU/week) or high-dose (14,000 IU/week) vitamin D3 for one year.

Supplementation equivalent to 2,000 IU/day achieved targeted increases in blood levels of 25-hydroxyvitamin D to levels >30 ng/mL (75 nmol/L). There was no evidence of vitamin D overdose in any of the participants.

Given the high prevalence of vitamin D deficiency in children worldwide, the many health benefits of vitamin D in children and adults, and the safety of high-dose supplementation, the study authors advocate raising the recommended daily dose to 2,000 IU for children and adolescents to achieve optimal bone health.

—Laura J. Ninger, ELS

Reference

* Maalouf J, Nabulsi M, Vieth R, et al. Short term and long term safety of weekly high dose vitamin D3 supplementation in school children. J Clin Endocrinol Metab. 2008 July;93(7):2693-701

SAMe May Combat Neurodegeneration

Supplemental S-adenosyl-methionine (SAMe) shows promise in combating age-related neurodegeneration, especially in cases where folate levels have been compromised by dietary or genetic factors, a new study reports.[1] Folate deficiency results in declining levels of SAMe, a major methyl donor in the body.

In a rodent study, scientists found that oxidative stress and folate deficiency led to cognitive impairment and declining acetylcholine levels. Acetylcholine is a key neurotransmitter, which declines as Alzheimer's disease progresses.

Supplementation with SAMe restored acetylcholine to normal levels. Acetylcholine restoration was accompanied by a return of healthy cognitive performance in test animals, and a reduction in aberrant (aggressive) behavior associated with acetylcholine deficit.[1] These improvements occurred even in the absence of folate.

Previous research by the team has demonstrated that folate deficiency may be related to cognitive impairment in a rodent model of Alzheimer's disease. Those findings similarly support a role for SAMe supplementation in Alzheimer's disease therapy.[2]

—Dale Kiefer

Reference

1. Chan A, Tchantchou F, Graves V, Rozen R, Shea TB. Dietary and genetic compromise in folate availability reduces acetylcholine, cognitive performance and increases aggression: critical role of S-adenosyl-methionine. J Nutr Health Aging. 2008 Apr;12(4):252-61.
2. Tchantchou F, Graves M, Ortiz D, Chan A, Rogers E, Shea TB. S-adenosyl-methionine: A connection between nutritional and genetic risk factors for neurodegeneration in Alzheimer's disease. J Nutr Health Aging. 2006 Nov-Dec;10(6):541-4.

Flavonols Help Prevent Colorectal Cancer

High intake of flavonols as part of a dietary intervention inhibited the regrowth of colorectal cancer polyps, according to a recent study.* Flavonols are a subclass of flavonoids found in high concentrations in beans, onions, apples, and tea.

Adults with precancerous colorectal adenomas (average 61 years old) were randomly assigned to a dietary intervention (958 participants) or control group (947 participants). The study diet was low in fat and high in fiber, fruit, and vegetable intake. Researchers evaluated the participants' intake of 29 different flavonoids as well as the regrowth of colorectal adenomas.

After four years of follow-up, high intake of flavonols was significantly associated with less likelihood of advanced adenoma recurrence. Patients with the highest intake of flavonols (compared with the lowest) had a 76% lower risk of adenoma recurrence. Protection was achieved only with flavonol intake higher than is common in the Western diet.

—Laura J. Ninger, ELS

Reference

* Bobe G, Sansbury LB, Albert PS, et al. Dietary flavonoids and colorectal adenoma recurrence in the polyp prevention trial. Cancer Epidemiol Biomarkers Prev. 2008 Jun;17(6):1344-53.

Creatine Improves Strength and Mobility in Older Women

A recent study has found that creatine, which plays an important role in energy production, may improve the functional strength of older women.[1] This age group is particularly susceptible to reduced strength and muscle mass and increased risks of falls, fractures, and functional dependency as a result.

In this study, researchers from Hawaii first evaluated baseline strength, endurance, and balance using a variety of tests in 30 women between 58 and 71 years old. They then assigned the subjects to receive either creatine monohydrate (0.3 grams per kg of body mass) or placebo and retested them over a seven-day period.

The creatine-treated group showed significant improvements in measures of muscle strength and mobility and increased their fat-free mass by an average of 0.52 kg, while no significant changes were seen in the placebo group. The researchers concluded that "short-term creatine supplementation resulted in an increase in strength, power, and lower-body motor functional performance in older women without any adverse side effects."

This study also supports earlier research of the benefits of creatine in increasing muscle mass in the elderly.[2,3]

—Will Brink

Reference

1. Gotshalk LA, Kraemer WJ, Mendonca MA, et al. Creatine supplementation improves muscular performance in older women. Eur J Appl Physiol. 2008 Jan;102(2):223-31.
2. Candow DG, Chilibeck PD. Effect of creatine supplementation during resistance training on muscle accretion in the elderly. J Nutr Health Aging. 2007 Mar-Apr;11(2):185-8.
3. Chilibeck PD, Chrusch MJ, Chad KE, Shawn Davison K, Burke DG. Creatine monohydrate and resistance training increase bone mineral content and density in older men. J Nutr Health Aging. 2005 Sep-Oct;9(5):352-3

Green Tea May Help Protect the Brain During Sleep Apnea

Green tea's antioxidant properties could help prevent the cognitive deficits associated with obstructive sleep apnea, according to a new report.* Obstructive sleep apnea occurs when airway collapse or blockage periodically interrupts breathing during sleep, temporarily depriving the brain of oxygen.

For 14 days, scientists intermittently deprived 106 male rats of oxygen, while control animals received regular room air. Half the oxygen-deprived rats received green tea extract in their drinking water during this period. Water maze testing was conducted to evaluate spatial learning and memory, and brain tissue was analyzed for markers of oxidative stress and inflammation.

Oxygen-deprived rats that received green tea extract demonstrated better performance in a memory-related test than those that received plain drinking water. While the oxidative stress marker malondialdehyde doubled in untreated rats that underwent oxygen deprivation compared with control rats, tea polyphenol administration reduced malondialdehyde by 40%.

"Because oxidative processes underlie neurocognitive deficits associated with intermittent hypoxia, the potential therapeutic role of green tea polyphenols in sleep-disordered breathing deserves further exploration," the authors concluded.

—Dayna Dye

Reference

* Burckhardt IC, Gozal D, Dayyat E, et al. Green tea catechin polyphenols attenuate behavioral and oxidative responses to intermittent hypoxia. Am J Respir Crit Care Med. 2008 May 15;177(10):1135-41.

Antioxidant Vitamins Prevent Post-Meal Memory Problems Among Diabetics

A new study suggests that memory is impaired in type 2 diabetics after the consumption of a high-fat meal, but taking the antioxidant vitamins C and E with such meals erases those deficits.*

To study the effects of post-meal oxidative stress on memory and cognition, researchers worked with 16 patients with type 2 diabetes of average age 63.5 years. Subjects were assigned to receive a high-fat meal, a high-fat meal plus vitamin C (1,000 mg) and vitamin E (800 IU), or water only on three separate occasions. The subjects underwent a battery of cognitive performance tests, at one hour and again 105 minutes after each test meal.

While water consumption resulted in no observable changes in cognitive performance, ingestion of the high-fat meal resulted in deficits in verbal recall and working memory at 105 minutes. But subjects who ate the high-fat meal plus vitamin supplements experienced no such deficits.

These findings suggest that oxidative stress contributes to after-meal memory impairment in adults with type 2 diabetes, and that consuming antioxidants with meals may offer protective effects.

—Dale Kiefer

Reference

* Chui MH, Greenwood CE. Antioxidant vitamins reduce acute meal-induced memory deficits in adults with type-2 diabetes. Nutr Res. 2008 Jul; 28 (7) 423-9.

Curcumin May Offer Protection Against Diabetes

Curcumin, a compound found in the curry spice turmeric, shows protective effects against the development of diabetes in two mouse models of diabetes and obesity, according to new findings.*

Scientists studied male mice fed high-fat diets to induce obesity along with genetically obese female mice deficient in the satiety hormone leptin. Normal, lean mice fed low-fat diets served as controls. The animals were divided to receive diets containing a

high dose of a curcumin extract or no curcumin for five weeks.

Mice given high-dose curcumin were less susceptible to the development of diabetes, based on blood glucose level and glucose and insulin tolerance test results. They also experienced a small reduction in body fat and weight and had less inflammation in liver and fatty tissue compared with animals that did not receive the compound.

The researchers suggest that curcumin may help reduce some of obesity's adverse effects and that it may help prevent diabetes by reducing the inflammation that occurs in obesity.

—Dayna Dye

Reference

* Weisberg SP, Leibel R, Tortoriello DV. Dietary curcumin significantly improves obesity-associated inflammation and diabetes in mouse models of diabesity. Endocrinology. 2008 Jul;149(7):3549-58.

IN THE NEWS

Lifestyle Changes Alter Gene Expression in Men with Prostate Cancer

Lifestyle improvements have a beneficial effect on gene expression in men with prostate cancer, according to a pilot study published in the *Proceedings of the National Academy of Sciences*.*

Thirty men with low-risk prostate cancer who had opted for active surveillance of their disease in lieu of surgery or radiation treatment participated in the study. For three months, participants consumed a whole food, plant-based, low-fat diet (<10% of daily calories as fat); exercised six days/week; and practiced daily stress management. Diets were supplemented daily with tofu (from soy), soy protein, 3,000 mg fish oil, 200 mcg selenium, 2,000 mg vitamin C, and 100 IU vitamin E.

Gene expression in initial prostate biopsies was compared with samples obtained after three months of the lifestyle changes. Forty-eight genes, including those with disease-preventive effects, were found to be up-regulated, and 453 genes, including genes involved in cancer and other diseases, were down-regulated following the intervention. Body mass index, blood pressure, lipids, waist circumference, and mental health also significantly improved.

“Intensive nutrition and lifestyle changes may modulate gene expression in the prostate,” the authors concluded.

—Dayna Dye

Reference

* Ornish D, Magbanua MJ, Weidner G, et al. Changes in prostate gene expression in men undergoing an intensive nutrition and lifestyle intervention. Proc Natl Acad Sci U S A. 2008 Jun 17;105(24):8369-74.

Artichoke Leaf Extract Reduces Cholesterol

Artichoke leaf extract reduced cholesterol levels after three months of supplementation in adults.* Extracts of artichoke leaf contain flavonoids, which are known to reduce the risk of cardiovascular disease by preventing the accumulation of fatty deposits in the arteries. Artichoke extracts are used in Europe to improve digestion.

In this study, 73 volunteers with relatively high cholesterol but otherwise good health took 1,280 mg of the extract or placebo daily for 12 weeks. At study end, total cholesterol was significantly lower in the supplemented group, with an average decrease of 4% compared with the placebo group, which experienced an average increase of 2%.

—Laura J. Ninger, ELS

Reference

* Bundy R, Walker AF, Middleton RW, Wallis C, Simpson HC. Artichoke leaf extract (Cynara scolymus) reduces plasma cholesterol in otherwise healthy hypercholesterolemic adults: a randomized, double blind placebo controlled trial. Phytomedicine. 2008 Apr 16.

Milk Thistle May Impede Atherosclerosis

In a recent study, milk thistle fruit extract inhibited the oxidation of low-density lipoprotein (LDL) in a cell-culture assay.* Milk

thistle is the source of silymarin complex, often used to treat liver diseases. Oxidation of LDL is an important first step in atherosclerosis.

LDL oxidation was induced chemically in cell cultures, and milk thistle extract was added to determine its effect. Milk thistle extract (silymarin) inhibited LDL oxidation by up to 86% compared with no treatment. Further, a specific milk thistle component called silibinin inhibited the adhesion of cells (monocytes) to oxidized LDL. Both effects were dose-dependent, meaning that higher doses offered a greater benefit.

If these results are verified in animals and humans, they offer great promise in the treatment of cardiovascular disease. The authors conclude, “it is possible that the extract prepared from the fruits of an easily accessible plant could be useful to prevent the progression of atherosclerotic events.”

—Laura J. Ninger, ELS

Reference

* Wallace S, Vaughn K, Stewart BW, et al. Milk thistle extracts inhibit the oxidation of low-density lipoprotein (LDL) and subsequent scavenger receptor-dependent monocyte adhesion. J Agric Food Chem. 2008 Jun 11;56(11):3966-72.

Time to Take on Time

To significantly reduce disease, we must slow the aging process, according to experts reporting in the *British Medical Journal*.[1,2]

“The change in strategy we are calling for requires a systematic attack on aging itself,” they write. “Evidence… suggests that all living things, including humans, possess biochemical mechanisms that influence how quickly we age and that they are adjustable.”[1]

Due to a greater life expectancy in developed countries, the increased incidence of diseases related to aging has dramatically increased health care costs. If an extended life span is combined with health, it could result in a number of economic, social, and other benefits. Further research is needed to increase knowledge of the aging process and its relationship to disease processes.[1]

The Alliance for Aging Research has called on Congress to invest three billion dollars annually into research that would increase our understanding of the biology of aging. “To those who ask, ‘Can we afford to invest more in such research?’ ”Professor Colin Farrelly writes, “We can reply: ‘Can we really afford not to tackle aging?’ The answer clearly is no.”[2]

—Dayna Dye

Reference

1. Butler RN, Miller RA, Perry D, et al. New model of health promotion and disease prevention for the 21st century. BMJ. 2008 Jul 8;337:a399.
2. Farrelly C. Has the time come to take on time itself? BMJ. 2008 Jul 8;337:a414.

Green Tea Improves Endothelial Function

Drinking green tea improves endothelial function in men and women, according to a new study.* Dysfunction of the endothelial cells lining blood vessels is a critical event in the development of atherosclerosis, which can lead to heart attack and stroke.

Scientists administered green tea, caffeine, or hot water (placebo) to 14 healthy participants with an average age of 30 years on three separate occasions. Half of the subjects were smokers.

Endothelial function was evaluated using flow-mediated dilatation of the brachial artery before the intake of each substance and at 30, 90, and 120 minutes.

Caffeine and hot water did not yield significant effects, but there was a 4% peak increase in endothelium-dependent brachial artery dilatation 30 minutes after the subjects consumed green tea.

“Green tea consumption has an acute beneficial effect on endothelial function,” the authors concluded. “This may be involved in the beneficial effect of tea on cardiovascular risk.”

—Dayna Dye

Reference

* Alexopoulos N, Vlachopoulos C, Aznaouridis K, et al. The acute effect of green tea consumption on endothelial function in healthy individuals. Eur J Cardiovasc Prev Rehabil. 2008 Jun;15(3):300-5.

Low Vitamin D Levels Associated with Premature Mortality

Low blood levels of vitamin D are associated with an increased risk of premature death, according to research published in the *Archives of Internal Medicine*.* An estimated 50% of older individuals in North America do not have satisfactory vitamin D status.

Researchers measured more than 3,000 participants’ vitamin D levels and followed them for approximately eight years. Compared with those who had the highest blood levels of vitamin D, those with the lowest levels were much more likely to die from cardiovascular disease and from all causes.

Researcher Harald Dobnig, MD, of Medical University of Graz, Austria, told *Life Extension* that since submitting their study for publication, his group has performed additional analyses on their data. “We were able to demonstrate that low vitamin D status had other significant negative effects in terms of incidence of cancer, stroke, sudden cardiac death, and death of heart failure,” said Dr. Dobnig.

Based on their findings, the researchers recommend a serum 25-hydroxyvitamin D level of ≥20 ng/mL (50 nmol/L) for general health maintenance.

—Marc Ellman, MD

Reference

* Dobnig H, Pilz S, Scharnagl H, Renner W, et al. Independent association of low serum 25-hydroxyvitamin d and 1,25-dihydroxyvitamin d levels with all-cause and cardiovascular mortality. Arch Intern Med. 2008 Jun 23;168(12):1340-9.

DHA Improves Children’s Cognitive Function

Docosahexaenoic acid (DHA) supplementation in healthy children improves measures of cognitive function, according to a multicenter US study.* DHA, an omega-3 fatty acid found in the brain, is crucial for development.

In this study, 175 healthy four-year-old children were recruited from 11 different sites and randomly assigned to receive DHA 400 mg/day or placebo for four months. Four tests of cognitive function were performed before and after supplementation.

At study end, the DHA level in the blood rose 300% in the treated group. Statistical analysis showed a significant association between a higher level of DHA in the blood and better performance on the Peabody Picture Vocabulary Test, which measures listening comprehension and vocabulary. For each increase of 1% in blood DHA, percentile rank on the cognitive test improved by up to nine points.

The findings suggest that boosting children's DHA levels may help promote optimal cognitive function.

—Laura J. Ninger, ELS

Reference

* Ryan AS, Nelson EB. Assessing the effect of docosahexaenoic acid on cognitive functions in healthy, preschool children: a randomized, placebo-controlled, double-blind study. Clin Pediatr (Phila). 2008 May;47(4):355-62.