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In The NEWS

Vitamin D Supplements Decrease Risk of Premature Death



The evidence base supporting the use of vitamin D continues to grow with a recent study revealing that supplementation lowers the risk of death from any cause over the course of six years.*

In this meta-analysis, researchers examined 18 randomized, controlled clinical trials involving supplementation in 57,311 men and women, who received 300 to 2,000 IU (average: 528 IU) of vitamin D.

The study revealed that vitamin-D recipients had a 7% lower risk of death from any cause compared with those who did not receive supplementation. Furthermore, in those tested, blood levels of vitamin D were 1.4 to 5.2 times greater among participants who received vitamin D supplements than in those who did not.

Vitamin D's ability to prevent premature death may arise from its ability to inhibit cancer cell proliferation, improve blood vessel function, and boost the immune system.

—Dayna Dye

Reference

* Autier P, Gandini S. Vitamin D supplementation and total mortality: A meta-analysis of randomized controlled trials. *Arch Intern Med.* 2007 Sep 10;167(16):1730-7.

High Homocysteine Linked with Mild Cognitive Impairment

High levels of circulating homocysteine are associated with an increased risk of mild cognitive impairment, according to a recent report.¹ Mild cognitive impairment is a known risk factor for the development of dementias, including Alzheimer's disease. Elevated blood homocysteine is already generally accepted as a risk factor for cardiovascular disease,^{2,3} but the link with cognitive impairment has been considered controversial.

More than 1,200 elderly subjects (aged 60–85 years) in this Korean study were assessed for mild cognitive impairment according to standardized criteria.¹ The study revealed that plasma homocysteine levels were higher in subjects diagnosed with mild cognitive impairment, and their odds of being

diagnosed increased with increasing levels of homocysteine, regardless of other potential risk factors, such as age or sex. The findings underscore the importance of testing for the presence of elevated plasma homocysteine, and, if identified, taking steps to reduce these levels.

—Dale Kiefer

Reference

1. Kim J, Park MH, Kim E, Han C, Jo SA, Jo I. Plasma homocysteine is associated with the risk of mild cognitive impairment in an elderly Korean population. *J Nutr.* 2007 Sep;137(9):2093-7.
2. van Guldener C, Stehouwer CD. Homocysteine and large arteries. *Adv Cardiol.* 2007;44:278-301.
3. Sydow K, Böger RH. Homocysteine, endothelial dysfunction and cardiovascular risk: pathomechanisms and therapeutic options. *Z Kardiol.* 2001 Jan;90

Pectin Induces Self-Destruction in Prostate Cancer Cells



Pectin, a plant-produced compound used in the preparation of homemade jellies, may protect men from prostate cancer, according to a report in the journal *Glycobiology*.*

“Treatment options for androgen-independent prostate cancer cells are limited,” noted the study’s research team. “Therefore, it is critical to identify agents that induce death of both androgen-responsive and androgen-insensitive cells.” Pectin, produced by plant cell walls, appears to fit the bill.

Researchers added commercially obtained pectin to prostate cancer cell cultures in the laboratory. Fractionated pectin powder caused a 40-fold increase in apoptosis, or programmed cell death, of androgen-responsive and androgen-insensitive human prostate cancer cells.

The study therefore highlights the importance of consuming adequate amounts of fruits and vegetables in protecting against prostate cancer.

—Dale Kiefer

Reference

*Jackson CL, Dreaden TM, Theobald LK, et al. Pectin induces apoptosis in human prostate cancer cells: correlation of apoptotic function with pectin structure. *Glycobiology*. 2007 Aug;17(8):805-19.

Curcumin Reduces Inflammation, Improves Exercise Performance



Curcumin reduces exercise-related inflammation and improves running performance recovery in mice, according to a recent study.* Intensive exercise can result in muscle fiber damage, delayed-onset muscle soreness, and inflammation.

Animals received either curcumin or placebo and were assigned to run either uphill or downhill on a treadmill for 2.5 hours. Two or three days later, animals were placed on a treadmill and allowed to run to fatigue. In a second experiment, voluntary running on an activity wheel was monitored in another subset of animals, while a third experiment analyzed muscle tissue for inflammatory cytokines after the forced running exercises in additional mice.

The research team found that downhill running increased inflammatory cytokines, decreased voluntary activity, and shortened the animals’ run time to fatigue, but that curcumin offset these effects. “These results support the hypothesis that curcumin can reduce inflammation and offset some of the performance deficits associated with...exercise-induced muscle damage,” concluded researchers.

—Dale Kiefer

Reference

*Davis JM, Murphy EA, Carmichael MD, et al. Curcumin effects on inflammation and performance recovery following eccentric exercise-induced muscle damage. *Am J Physiol Regul Integr Comp Physiol*. 2007 Jun;292(6):R2168-73.

Soft-Drink Sweetener Linked to Diabetes

High-fructose corn syrup, a sweetener commonly found in non-diet soft drinks and baked goods, may contribute to the development of diabetes, particularly in children, according to a report presented at the 234th meeting of the American Chemical Society in Boston.¹ Rutgers University scientists found that carbonated beverages containing the common sweetener contained high levels of highly reactive compounds known as carbonyls.

Carbonyls have previously been linked to cellular and tissue damage implicated in triggering diabetes, and/or contributing to some of its complications.²⁻⁴ Italian researchers have previously noted that, "Carbonyl groups...in tissues and plasma [are] a relatively stable marker of oxidative damage."⁵

"People consume too much high-fructose corn syrup in this country," noted the lead scientists of the Rutgers study. They added that: "It's in way too many food and drink products and there's growing evidence that it's bad for you."

Research also indicates that carnosine helps protect the body's proteins against damaging carbonyl reactions.⁶

—Dale Kiefer

Reference

1. Available at: <http://acswebapplications.acs.org/applications/ccs/application/index.cfm?pressreleaseid=2846&categoryid=37>. Accessed September 17, 2007.
2. Ellis EM. Reactive carbonyls and oxidative stress: potential for therapeutic intervention. *Pharmacol Ther*. 2007 Jul;115(1):13-24.
3. Pennathur S, Ido Y, Heller JI, et al. Reactive carbonyls and polyunsaturated fatty acids produce a hydroxyl radical-like species: a potential pathway for oxidative damage of retinal proteins in diabetes. *J Biol Chem*. 2005 Jun 17;280(24):22706-14.
4. Konuko Iu D, Kemerli GD, Sabuncu T, Hatemi HH. Protein carbonyl content in erythrocyte membranes in type 2 diabetic patients. *Horm Metab Res*. 2002 Jul;34(7):367-70.
5. Odetti P, Garibaldi S, Noberasco G, et al. Levels of carbonyl groups in plasma proteins of type 2 diabetes mellitus subjects. *Acta Diabetol*. 1999 Dec;36(4):179-83.
6. Aldini G, Facino RM, Beretta G, Carini M. Carnosine and related dipeptides as quenchers of reactive carbonyl species: from structural studies to therapeutic perspectives. *Biofactors*. 2005;24(1-4):77-87.

Calcium Supplements Reduce Fracture Risk



Elderly adults over 50 years can reduce their risk of bone fractures by about 25% with daily doses of calcium supplements, Australian researchers noted recently.*

Researchers at the University of Western Sydney conducted a meta-analysis involving 63,000 people taking calcium or calcium and vitamin D supplements. Calcium supplements were linked to a 12% lower risk of all types of fractures. In addition, greater compliance, reflected in consistent daily intake, doubled this risk reduction. Furthermore, a daily dose of 1,200 mg of calcium with 800 IU of vitamin D was associated with the greatest benefits.

"The efficacy of calcium supplements in reducing the risk of fractures later in life is comparable to more established preventative medicines such as aspirin and statins, which are widely taken to reduce the risk of cardiovascular events such as strokes and heart attacks," study leader Dr. Benjamin Tang noted.

—Cathy Burke

Reference

- *Tang BM, Eslick GD, Nowson C, Smith C, Bensoussan A. Use of calcium or calcium in combination with vitamin D supplementation to prevent fractures and bone loss in people aged 50 years and older: a meta-analysis. *Lancet*. 2007 Aug 25;370(9588):657-66.

High Homocysteine Doubles Heart Disease Risk



A high level of homocysteine in the blood is an “independent and important risk factor” for coronary artery disease in a high-risk population, roughly equal to the risk posed by elevated cholesterol and triglyceride levels, report Chinese researchers.*

Scientists studied 237 patients admitted for coronary angiography, an imaging procedure to identify blockages in the arteries supplying blood to the heart. Patients were divided into two groups: 138 who had been diagnosed with existing coronary disease, and 99 who were found to be normal. They were then assessed for a wide range of potential cardiovascular disease

risk factors, including: blood pressure, cholesterol levels, triglycerides, high-sensitivity C-reactive protein (hs-CRP), and plasma homocysteine.

The study revealed that high homocysteine levels roughly doubled a patient’s risk of coronary artery disease. Furthermore, statistical analysis showed hs-CRP, total cholesterol, and systolic blood pressure to be independent risk factors for coronary artery disease, while high-density lipoprotein (HDL) had a protective effect.

—Dale Kiefer

Reference

*Ni M, Zhang XH, Jiang SL, Zhang Y. Homocystinemia as an independent risk factor in the Chinese population at a high risk of coronary artery disease. *Am J Cardiol.* 2007 Aug 1;100(3):455-8.

Ground Flaxseed Reduces Hot Flashes



Consuming flaxseed can help reduce uncomfortable hot flashes in postmenopausal women who are not using estrogen replacement therapy, according to a pilot study conducted at the Mayo Clinic.*

Twenty-nine women who suffered from hot flashes consumed 40 g (4 tablespoons) of crushed flaxseed per day for six weeks. The participants had not used any hormones, soy, or herbal supplements for the preceding four weeks.

In 21 women who completed the study, hot flash frequency was cut in half and the overall “hot flash score” diminished by an average of 57%. The women reported improved mood, reduced joint or muscle pain, fewer chills, and less sweating.

“Not only does flaxseed seem to alleviate hot flashes, but it appears to have overall health and psychological benefits as well,” noted the lead author.

—Dayna Dye

Reference

* Available at: <http://www.mayoclinic.org/news2007-rst/4208.html>. Accessed September 18, 2007.

Vitamin E Supplementation Helps Prevent Venous Thromboembolism



Supplementing with vitamin E may reduce the risk of venous thromboembolism among women, according to a recent report.* The condition occurs when a blood clot formed in the veins becomes dislodged and travels through the bloodstream, threatening life by blocking circulation to the brain, heart, or lungs.

Scientists reviewed data from a randomized trial of 39,876 women who received 600 IU vitamin E or placebo every other day for an average of 10 years. Women who received vitamin E experienced a 21% reduced risk of developing venous thromboembolism. For unprovoked venous thromboembolism (not caused by trauma, surgery, or cancer), vitamin E supplementation was associated with a 27% reduction in risk. Women with a history of venous thromboembolism or a genetic predisposition to the condition experienced even greater benefit, with a 44-49% reduction in risk in those taking vitamin E.

—Dayna Dye

Reference

* Glynn RJ, Ridker PM, Goldhaber SZ, Zee RY, Buring JE. Effects of random allocation to vitamin E supplementation on the occurrence of venous thromboembolism. Report From the Women's Health Study. *Circulation*. 2007 Sep 10; [Epub ahead of print].

Lutein and Zeaxanthin Reduce Macular Degeneration Risk



Lutein and zeaxanthin protect against age-related macular degeneration,* a condition that occurs when the eye's macula deteriorates, leading to visual impairment and blindness.

Scientists evaluated the diets of 4,519 participants aged 60 years and above. Retinal photographs were used to divide the subjects into five categories of macular disease severity, and dietary questionnaires were analyzed for nutrient intake.

Participants whose intake of lutein and zeaxanthin was the greatest had a significantly lower risk of age-related macular degeneration than those whose intake was the least, and were also less likely to have large or numerous intermediate drusen, the deposits on the retina or optic nerve that characterize the disease.

"Lutein and zeaxanthin may be considered as useful agents in food or supplement-based interventions designed to reduce the risk of [macular degeneration]," the researchers concluded.

—Dayna Dye

Reference

* Age-Related Eye Disease Study Research Group. The relationship of dietary carotenoid and vitamin A, E, and C intake with age-related macular degeneration in a case-control study: AREDS Report No. 22. *Arch Ophthalmol.* 2007 Sep;125(9):1225-32.

High-Dose Folic Acid Improves Endothelial Function



Folic acid supplements improve endothelial function in a dose-dependent fashion, according to a recently published meta-analysis.* Endothelial dysfunction is one of the key processes underlying cardiovascular disease.

Scientists analyzed data collected from 14 randomized, double-blind, placebo-controlled trials involving a total of 732 subjects. All studies assessed endothelial function by measuring the change in brachial artery flow-mediated dilation after folic acid supplementation, compared with the change following administration of a placebo.

Folic acid supplementation improved endothelial function, with higher doses yielding greater improvements. In addition, participants at greater risk of cardiovascular disease tended to have larger

Folic acid's ability to improve endothelial function may be mediated by its ability to lower homocysteine, a cardiovascular risk factor that impairs arterial health.

The authors concluded, "This study indicates that high doses of folic acid improve endothelial function, which could potentially reduce the risk of cardiovascular disease."

—Dayna Dye

Reference

*de Bree A, van Mierlo LA, Draijer R. Folic acid improves vascular reactivity in humans: a meta-analysis of randomized controlled trials. *Am J Clin Nutr.* 2007 Sep;86(3):610-7.

Bone Osteocalcin Regulates Energy Metabolism



A new study published in the scientific journal *Cell* is the first to establish a relationship between the vitamin K-dependent hormone, osteocalcin, and regulation of insulin.* The findings establish the skeleton as an endocrine organ that controls energy metabolism, which has important implications for the treatment of obesity and diabetes.

Using genetically altered mice, investigators determined that osteocalcin, a hormone secreted by osteoblasts (a type of bone cell), is capable of stimulating insulin secretion and improving insulin sensitivity. The findings indicate that the skeleton helps regulate energy metabolism in a feedback-loop fashion.

“Our results add further credence to the concept that bone and energy metabolisms exert reciprocal regulations,” wrote the authors. “By revealing that the skeleton exerts an endocrine regulation of sugar homeostasis this study expands the biological importance of this organ and our

understanding of energy metabolism,” they concluded.

—Dale Kiefer

Reference

*Lee NK, Sowa H, Hinoi E, et al. Endocrine regulation of energy metabolism by the skeleton. *Cell*. 2007 Aug 10;130(3):456-69.

Eye Diseases Linked to Increased Mortality Risk

Individuals with visual impairment from eye diseases such as cataracts or age-related macular degeneration appear to have a higher likelihood of premature death compared with similar individuals without these conditions, Australian researchers reported.*

Researchers followed over 3,600 participants for an average of 11 years. Participants with any visual impairment, those with cataracts, and those with age-related macular degeneration were all more likely to die during the study period than those without these conditions.

It is not clear whether the link between visual impairment and death is a direct one, or if another factor is involved. “The implications of these findings also remain uncertain: whether such an association indicates that visual impairment, age-related eye disease, or both are markers of aging and frailty or whether these ocular conditions accelerate aging, thus leading to relatively earlier death in older persons,” the researchers wrote.

—Marc Ellman, MD

Reference

* Cugati S, Cumming RG, Smith W, Burlutsky G, Mitchell P, Wang JJ. Visual impairment, age-related macular degeneration, cataract, and long-term mortality: the Blue Mountains Eye Study. *Arch Ophthalmol*. 2007 Jul;125(7):917-24.

Colorful Anthocyanins Fight Colon Cancer

Anthocyanins—compounds that give red, violet, and blue plants their color—offer powerful colon cancer-fighting ability, according to recent research.*

Various extracts containing anthocyanins were tested on cultured human colon cancer cells. Using extracts from grapes, radishes, purple corn, chokeberries, bilberries, purple carrots, elderberries, and other plants, scientists determined the amount needed from each to decrease the growth of the cancer cells by half. Purple corn extract was the most potent, followed by chokeberry and

bilberry. Anthocyanins from radish and black carrots slowed the growth of cancer cells anywhere from 50% to 80%; however,

anthocyanins from purple corn and chokeberries completely stopped the cancer growth, as well as killing 20% of the cancerous cells. In rats, anthocyanins from bilberries and chokeberries reduced the signs of colon tumors by 70% and 60%, respectively.

“All fruits and vegetables that are rich in anthocyanins have compounds that can slow down the growth of colon cancer cells,” the authors concluded.

—Dayna Dye

Reference

* Available at: http://www.eurekalert.org/pub_releases/2007-08/osu-ctc081507.php. Accessed August 27, 2007.

Calcium, Vitamin D Protect Against Breast Cancer

Women with a higher intake of calcium enjoy a lower risk of developing breast cancer, according to two recent epidemiological studies involving large groups of women.^{1,2} A protective effect is also correlated with vitamin D intake.¹

One study, conducted in France, considered calcium obtained from dairy products. Results showed that women with the highest intake of dairy calcium enjoyed a 45% reduction in breast cancer risk. The risk reduction reached 65% for premenopausal women. “Our data support the hypothesis that dairy products, through calcium content or a correlated component, might have a negative association with the risk of breast cancer, particularly among premenopausal women,” wrote the researchers.²

Similarly, an American study found that premenopausal women with the highest intakes of calcium and vitamin D reduced their risk of developing breast cancer by nearly 40%.¹

—Dale Kiefer

Reference

1. Lin J, Manson JE, Lee IM, Cook NR, Buring JE, Zhang SM. Intakes of calcium and vitamin D and breast cancer risk in women. *Arch Intern Med.* 2007 May 28;167(10):1050-9.

2. Kesse-Guyot E, Bertrais S, Duperray B, et al. Dairy products, calcium and the risk of breast cancer: results of the French SU.VI.MAX prospective study. *Ann Nutr Metab.* 2007;51(2):139-45.

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