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Good Food and Supplements Can Help Keep Your Brain Younger and Sharper

Several new studies highlight the importance of good nutrition and supplementation in maintaining mental fitness.

Zaldy S. Tan, MD, MPH, of the University of California, Los Angeles, and his colleagues studied 1,575 men and women with average age of 67 years. They analyzed the subjects' red blood cell levels of omega-3 fats, conducted a battery of cognitive tests, and used magnetic resonance imaging (MRI) technology to measure the size of their brains.

People with low blood levels of docosahexaenoic acid (DHA), one of the two key omega-3s fats found in fish, were more likely to have smaller brain sizes and poorer thinking processes, compared with people who ate more fish. People with low DHA levels also had more "white matter hyperintensity," a sign of blood vessel damage in the brain. All of these factors are usually preludes to Alzheimer's disease.

The cognitive tests found that people with low DHA levels had poorer scores on decision making ability, abstract thinking, and visual memory.

Only a small number of people in the study had been taking fish oil capsules. The subjects' omega-3 levels generally reflected the amount of fatty fish in their diets.

In a separate study, Natalie Grima, PhD, of Monash University, Australia, and her colleagues analyzed 10 previously published studies on multivitamins and memory. The studies involved 3,200 people who had taken multivitamin supplements for at least one month.

Grima reported that multivitamin use was associated with an improvement in immediate recall, but not other aspects of memory.

Meanwhile, Andrew Pengelly, PhD, and his colleagues from the herbal medicine department at the Tai Sophia Institute, Maryland, studied the effect of rosemary on cognition. Rosemary (*Rosmarinus officinalis*) is a common culinary herb.

The study involved 28 people with an average age

of 75 years. On different days, they were given various doses of dried rosemary leaf (750 mg, 1,500 mg, 3,000 mg, or 6,000 mg) or placebos. The subjects then were given cognitive tests from one to six hours after taking the supplement.

The lowest dose of rosemary led to a statistically significant increase in "speed of memory" – that is, the time to retrieve information from memory. However, the highest dose led to significantly impaired memory.

"The positive effect of the dose nearest normal culinary consumption points to the value of further work on effects of low doses over the longer term," wrote Pengelly and his colleagues.

References: Tan ZS, Harris WS, Beiser AS, et al. Red blood cell omega-3 fatty acid levels and markers of accelerated brain aging. *Neurology*, 2012;78:658-664. Grima NA, Pase MP, Macpherson H, et al. The effects of multivitamins on cognitive performance: a systematic review and meta-analysis. *Journal of Alzheimer's Disease*, 2012: epub ahead of print. Pengelly A, Snow J, Mills SY, et al. Short-term study on the effects of rosemary on cognitive function in an elderly population. *Journal of Medicinal Food*, 2012;15:10-17. □

Perspectives

The Science of Mice and Men

Much of the nutrition science published is based on cell experiments and mouse studies. Part of the reason is these studies cost far less to conduct compared with the millions of dollars needed to fund human clinical trials. But sometimes it's difficult to accurately extrapolate from such research – that is, to make the jump from a dish of cells or laboratory bred mice to the complexity of human biology.

A study published last month in *Nature Medicine* illustrates the risks of extrapolation. In that study, Japanese researchers conducted experiments on laboratory mice and determined that vitamin E interfered with the development of bone.

Do I think the finding amounts to a warning

More research summaries on next page

against vitamin E supplementation? No, I do not. And I have two reasons for holding this opinion.

First, if vitamin E supplements reduced bone formation and increased the risk of osteoporosis, the effect would have shown up years ago in clinical findings and human studies. After all, vitamin E supplements have been used since the 1940s.

Second, human genetics and biochemistry are far more complex than those of mice or isolated cells. Nutrients interact with each other, and vitamins D and K, along with calcium, magnesium, and other minerals, function as a biochemical symphony in the development and maintenance of healthy bone. And of course, exercise influences bone density.

It's often a challenge to determine which cell or mouse study is likely to have implications for people. But in my opinion, this particular vitamin E study has little or nothing to do with people. *-JC*

Cognitive Impairment Linked to Low Vitamin E Levels

Low levels of vitamin E may be a factor in mild cognitive impairment and Alzheimer's disease, according to a new study.

Francesca Mangialasche, MD, of the Karolinska Institute, Stockholm, Sweden, and her colleagues studied 168 people with Alzheimer's disease, 166 with mild cognitive impairment (a prelude to Alzheimer's), and 187 cognitively normal people.

Mangialasche measured blood levels of both families of vitamin E molecules, tocopherols and tocotrienols. Both groups of vitamin E consist of four specific molecules.

People with Alzheimer's disease and mild cognitive impairment had lower levels of total vitamin E, total tocopherols, and total tocotrienols. People with either of the diseases were 85 to 94 percent less likely to have high concentrations of vitamin E in their blood.

In addition, people with Alzheimer's disease and mild cognitive impairment had higher levels of "damaged" vitamin E in their blood.

Reference: Mangialasche F, Xu W, Kivipelto M, et al. Tocopherols and tocotrienols plasma levels are associated with cognitive impairment. *Neurobiology*, 2011: epub ahead of print. □

High Vitamin D Strengthens Bones of Adolescent Girls

Young girls who consume adequate amounts of vitamin D from food or supplements have a substantially lower risk of developing stress

fractures, especially if they are regularly engaged in high-impact activities, such as running or gymnastics.

Kendrin R. Sonneville, ScD, RD, of Children's Hospital, Boston, and her colleagues tracked 6,712 girls ages nine to 15 years old at the beginning of the study. The subjects' intake of dairy, calcium, and vitamin D were assessed with food-frequency questionnaires every 12 to 24 months over seven years.

When the study began, the girls' average intake of calcium and vitamin D was below the Recommended Dietary Allowance.

During the study, almost 4 percent of the girls developed stress fractures.

Girls with the highest intake of vitamin D had half the risk of developing stress fractures. The protective effect of vitamin D was most clear among girls who participated in high-impact sports.

Neither dairy nor calcium intake seemed to influence the risk of stress fractures.

Reference: Sonneville KR, Gordon CM, Kocher MS, et al. Vitamin D, calcium, and dairy intakes and stress fractures among female adolescents. *Archives of Pediatric and Adolescent Medicine*, 2012: doi 10.1001/archpediatric.2012.5. □

High-Dose Vitamin D May Ease Menstrual Pain, But with Caveat

Italian researchers have reported that a single, very high dose of vitamin D, can significantly reduce menstrual pain. Painful menstrual periods affect almost half of all menstruating women.

Antonio Lasco, MD, of the University of Messina, and his colleagues gave either a single dose of 300,000 IU of vitamin D or placebos to 40 women, who ranged from 18 to 40 years of age. The women had experienced at least four painful periods during the previous six months. They were not taking vitamin D, calcium, or drugs, except for analgesics.

Women who had taken vitamin D benefited from a significant reduction of menstrual pain over the two month study. "The greatest reduction of pain score was seen in women with severe pain at baseline in the vitamin D group," wrote Lasco and his colleagues.

Editor's comment: This dose of vitamin D is six times more than the highest single dose physicians usually describe. Do *not* take this amount of vitamin D unless it is prescribed by a physician. Instead, take 5,000 to 10,000 IU daily.

Reference: Lasco A, Catalano A, Benvenga S. Improvement of primary dysmenorrhea caused by a single oral dose of vitamin D: results of a randomized, double-blind, placebo-controlled study. *Archives of Internal Medicine*, 2012;172:366-369. □

Fish Oils, Vitamin A Helpful in Slowing Retinitis Pigmentosa

Doctors have for many years treated retinitis pigmentosa with 15,000 IU of pure vitamin A (not beta-carotene) daily. The disease is typically preceded by night blindness and tunnel vision, leading to near complete blindness by age 60.

Some research indicates that the omega-3 fats protect against another eye disease, macular degeneration. So researchers at the Harvard Medical School investigated whether high dietary intake of fish oils, combined with vitamin A would slow the progression of retinitis pigmentosa.

Eliot L. Berson, MD, and his colleagues analyzed data from three previously published studies in which people with retinitis pigmentosa were treated with 15,000 IU of vitamin A palmitate daily for four to six years. The researchers looked at whether diets high or low in the omega-3s would impact the decline of visual acuity.

Berson and his colleagues determined that people consuming the largest amounts of omega-3s, salmon salmon and other fatty coldwater fish, had an average 40 percent slower yearly decline in the acuity of their distant vision. People consuming omega-3s also maintained better central vision sensitivity.

According to the researchers, the slower decline would result in vision for an extra 18 years, compared with people who consumed small amounts of omega-3s.

Reference: Berson EL, Rosner B, Sandberg MA, et al. Omega-3 intake and visual acuity in patients with retinitis pigmentosa receiving vitamin A. *Archives of Ophthalmology*, 2012; doi 10.1001/archophthalmol.2011.2580. □

Some Dietary Flavonoids Linked to Lower Risk of Ischemic Stroke

Fruits and vegetables are rich in flavonoids, a colorful family of antioxidants. Some of these flavonoids may reduce the risk of ischemic stroke – the type caused by a blood clot in the brain.

Aedin Cassidy, PhD, of the Norwich Medical School, England, collaborated in the study with researchers at Harvard University. They focused on 69,622 women participating in the ongoing Nurses' Health Study. Every four years, the women completed a dietary questionnaire.

Over 14 years of follow up, women consuming a subcategory of flavonoids, called flavanones, had a 19 percent lower risk of stroke. Flavanones are found chiefly in citrus fruits, and women consuming large amounts of these fruits and juices had a 10 percent lower risk of stroke.

Studies have found that other types of flavonoids, such as anthocyanidins, also lower the risk of stroke.

Addressing the larger picture of fruit and vegetables consumption, Cassidy and his colleagues wrote, "Increased consumption of fruits and vegetables has been associated with a reduced risk of stroke. In a meta-analysis of existing cohort studies, those consuming three to five servings/day and more than five servings/day had an 11 percent and 25 percent reduction in risk of stroke, respectively, compared with those consuming less than three servings/day."

Reference: Cassidy A, Rimm EB, O'Reilly EJ, et al. Dietary flavonoids and risk of stroke in women. *Stroke*, 2012; doi 10.1161/strokeaha.111.637835. □

Boosting Protein Intake Helps Lower Blood Pressure

Increasing protein intake can help lower blood pressure, according to a study by Dutch researchers.

Karianna F.M. Teunissen-Beekman, PhD, of Maastricht University, and her colleagues studied 94 people who were asked to consume a high-protein drink or a maltodextrin-rich drink with each meal for four weeks. The subjects were overweight and had elevated blood pressure, but were not being treated for hypertension.

The protein drink provided about 25 percent of calories in the form of protein, which was derived from pea, soy, egg, and milk.

Systolic blood pressure decreased an average of 4.9 mm Hg and diastolic blood pressure decreased 2.7 mm Hg among people consuming the protein drinks.

The researchers wrote that increasing protein consumption to 25 percent of calories was feasible with normal foods.

Reference: Teunissen-Beekman KFM, Doppeide J, Geleijnse JM, et al. Protein supplementation lowers blood pressure in overweight adults: effect of dietary proteins on blood pressure (PROPRES), a randomized trial. *American Journal of Clinical Nutrition*, 2012;doi 10.3945/ajcn.111.029116. □

New Combination of Nutrients Helps Ease Knee Osteoarthritis

Adding quercetin, an antioxidant found in the skins of apples and onions, to a commonly used supplement for osteoarthritis seems to ease knee pain.

Noriyuki Kanzaki, MD, of Suntory Wellness, collaborated with researchers at Juntendo University and other institutions in Japan. They asked 40 men and women to take a placebo or a supplement containing 1200 mg of glucosamine hydrochloride,

Quick Reviews of Recent Research

• Vitamin C might aid brain cancer treatment

Glioblastoma multiforme (GBM) is a type of brain cancer that has a poor prognosis because it is resistant to chemotherapy and radiation treatments. In a study using GBM cells obtained from patients and mice, researchers from New Zealand found that very large amounts of vitamin C enhanced radiation's ability to destroy GBM cells. The amount of vitamin C used was comparable to that given intravenously to patients by some nutritionally minded alternative medicine physicians and cannot be achieved with oral supplementation alone.

Herst PM. *Free Radical Biology and Medicine*, 2012, 2012; doi 10.1016/j.freeradbiomed.2012.01.021.

• Low vitamin D linked to all-cause death

Researchers from Germany analyzed 12 previously published studies on vitamin D levels and the risk of death. The studies included 32,142 patients, mostly elderly; 6,921 died during follow up. The researchers found that higher blood levels of vitamin D were associated with a 8 percent lower risk of death from any cause.

Schottker B. *Aging Research Reviews*, 2012: epub ahead of print.

Knee Osteoarthritis...

Continues from previous page

60 mg of chondroitin sulfate, and 45 mg of quercetin daily for 16 weeks. All of the patients had been previously diagnosed with osteoarthritis of the knees and were experiencing pain.

Conventional treatments for osteoarthritis typically rely on prescription drugs, such as Cox-2 inhibitors. Kanzaki and his colleagues wrote, "there are accumulating data showing that any of these pharmaceutical drugs frequently produce insufficient benefit, with an associated risk of untoward side effects. It is therefore no wonder that patients with osteoarthritis have embrace complementary and alternative approaches to management of osteoarthritis symptoms, particularly pain."

By the 16th week of the study, subjects were able to walk and climb up or down stairs with significantly less pain. However, they did not have any reduction in swelling or improvement in their range of motion.

Reference: Kanzaki N, Saito K, Maeda A, et al. Effect of a dietary supplement containing glucosamine hydrochloride, chondroitin sulfate and quercetin glycosides on symptomatic knee osteoarthritis: a randomized, double-blind, placebo-controlled study. *Journal of the Science of Food and Agriculture*, 2012;92:862-869. □

• Another study links vitamin D and death risk

Doctors at the University of Kansas Medical Center analyzed data from 10,889 adults, 70 percent of whom had either marginal or deficient blood levels of the vitamin. People deficient in vitamin D were far more likely to have diabetes and various cardiovascular diseases, including hypertension, coronary artery disease, and cardiomyopathy. Deficiencies were associated with a three-fold greater risk of dying from any cause, whereas "Vitamin D supplementation was significantly associated with better survival, specifically in patients with documented deficiency, according to the researchers."

Vacek JL. *American Journal of Cardiology*, 2012;109: 359-363.

• L-Leucine supplements boost muscle

L-leucine, one of the three branched chain amino acids, is an essential nutrient and has been shown to increase muscle in seniors. Researchers at the University of Texas, Galveston, supplemented the meals of seniors with L-leucine supplement for two weeks. The subjects consumed 4 grams of L-leucine with each of three meals daily, while the meals contained relatively small amounts of protein. The supplements improved synthesis of muscle protein.

Casperson SL. *Clinical Nutrition*, 2012: epub ahead of print.

• Pepper compound promotes fat burning

"Brown adipose tissue" can burn calories far more efficiently than white adipose (regular fat) tissue. In a Japanese study, researchers tested the effects of capsinoids, which are nonpungent compounds in hot peppers, on 18 healthy young men. They found that the capsinoids increased thermogenesis – calorie burning – in the men's brown adipose tissue, as well as their whole-body energy expenditure.

Yoneshiro T. *American Journal of Clinical Nutrition*, 2012; doi 1.3945/ajcn.111.018606.

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