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IN THE
NEWS**L-Carnitine Reduces Fatigue, Improves Cognition in Centenarians**

L-carnitine supplementation improves energy levels and cognitive function in individuals 100 years of age and older, according to a new report.* Scientists have previously proposed that the age-related decline in L-carnitine, which plays a role in cellular energy metabolism, could be involved in the fatigue experienced by many older individuals.

Sixty-six adults aged 100 to 106 years who reported experiencing fatigue after even slight physical activity were randomized to receive 2,000 mg L-carnitine per day or a placebo for six months.

The carnitine group experienced a significant reduction of fat mass, gains in total muscle mass, a reduction in physical and mental fatigue and fatigue severity, and better cognitive function scores, compared with those who received a placebo. Additionally, walking capacity improved in the carnitine group.

L-carnitine may thus support healthy energy levels and cognition in older adults.

—Dayna Dye



Reference

* Malaguarnera M, Cammalleri L, Gargante MP, Vacante M, Colonna V, Motta M. L-Carnitine treatment reduces severity of physical and mental fatigue and increases cognitive functions in centenarians: a randomized and controlled clinical trial. *Am J Clin Nutr.* 2007 Dec;86(6):1738-44.

Healthy Lifestyle Could Prevent Most Heart Attacks in Women

A report published in *Archives of Internal Medicine* revealed that women who adopt a healthy lifestyle have a significantly reduced risk of heart attack compared with those who do not.*

Scientists in Stockholm analyzed questionnaires completed by 24,444 postmenopausal women on their intake of 96 foods. A healthy diet (characterized by a high intake of vegetables, fruits, whole grains, fish, and legumes) combined with moderate alcohol consumption, maintaining a healthy weight, being physically active, and not smoking, was associated with a dramatic 92% decreased risk of heart attack, compared with women who did not practice these healthy habits.

“These dietary behaviors together with a healthy lifestyle and body weight may prevent most myocardial infarction events,” the study authors concluded.

—Dayna Dye



Reference

* Akesson A, Weismayer C, Newby PK, Wolk A. Combined effect of low-risk dietary and lifestyle behaviors in primary prevention of myocardial infarction in women. *Arch Intern Med.* 2007 Oct 22;167(19):2122-7.

Do Anti-Inflammatory Drugs at Night Shorten Life Span?

For decades, calorie restriction has been known to extend life span in a variety of animals, including humans.¹⁻³ But the how of this life-extension effect has remained a matter of intense speculation.⁴

Emerging research suggests that calorie restriction may work, at least in part, by reducing body temperature.⁵ Genetically altered mice that experience a cooler body temperature at night have been shown to live longer than their ordinary counterparts.⁵ In humans, calorie restriction has also been shown to lower core body temperature.³

Furthermore, previous research has shown that taking nonsteroidal anti-inflammatory (NSAID) drugs at night raises core body temperature, by inhibiting prostaglandin synthesis. Prostaglandins are involved in the production of the potent antioxidant “sleep hormone,” melatonin, the regulation of body temperature, and the regulation of sleep.⁶ Use of NSAIDs, particularly at night, may therefore be counter-productive for individuals hoping to optimize life span.



—Dale Kiefer

Reference

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2. Kirkwood TB, Shanley DP. Food restriction, evolution and ageing. *Mech Ageing Dev*. 2005 Sep;126(9):1011-6.
3. Everitt AV, Le Couteur DG. Life extension by calorie restriction in humans. *Ann N Y Acad Sci*. 2007 Nov;1114:428-33.
4. Froy O, Miskin R. The interrelations among feeding, circadian rhythms and ageing. *Prog Neurobiol*. 2007 Jun;82(3):142-50.
5. Conti B, Sanchez-Alavez M, Winsky-Sommerer R, et al. Transgenic mice with a reduced core body temperature have an increased life span. *Science*. 2006 Nov 3;314(5800):825-8.
6. Murphy PJ, Myers BL, Badia P. Nonsteroidal anti-inflammatory drugs alter body temperature and suppress melatonin in humans. *Physiol Behav*. 1996 Jan;59(1):133-9.

Breakthrough in Cloning Stem Cells

For the first time, US scientists have successfully created embryonic stem cells from cloned embryos derived from the skin cells of an adult primate.*

Using a technique called somatic cell nuclear transfer (SCNT), the Oregon-based researchers successfully removed the genetic material from a monkey's egg cells. They then transplanted nuclei from a donor primate's skin cells into the nucleus-free eggs to produce embryos, from which the stem cells were generated.

The stem cells were genetically identical to the “donor,” a rhesus macaque monkey. In essence, the Oregon-based research team “reprogrammed” the donor animal's skin cells to become genetically identical stem cells, capable of becoming any kind of cell.

This has enormous therapeutic implications for humans, in particular removing some of the ethical dilemmas that have hampered such research in the past and providing patient-specific therapies that overcome the hurdle of tissue rejection.

—Dale Kiefer

Reference

- * Byrne JA, Pedersen DA, Clepper LL, et al. Producing primate embryonic stem cells by somatic cell nuclear transfer. *Nature*. 2007 Nov 22;450(7169):497-502.

Supplement Users Tend to Weigh Less, Experience Less Hunger

According to a recent report from the British Journal of Nutrition, men who use nutritional supplements weigh less than men who do not. Additionally, multinutrient supplements seem to produce an appetite-suppressive effect in women who follow a reduced-calorie diet.*



In this study, investigators compared characteristics of dietary supplement consumers and non-consumers, including diet, physical activity, resting energy expenditure, body weight, and body fat. Male supplement users demonstrated significantly lower weight, fat mass, and body mass index. These characteristics were also found among female participants, but were less pronounced.

In another arm of the study, 63 obese men and women were divided to receive a multinutrient supplement or a placebo during a 15-week weight-loss program. While the groups lost equivalent amounts of weight, women who used supplements reported a reduction in appetite.

“These results strengthen the plausible role for vitamins and minerals in the control of appetite and ultimately energy intake,” the authors wrote.

—Dayna Dye

Reference

* Major GC, Doucet E, Jacqmain M, St-Onge M, Bouchard C, Tremblay A. Multivitamin and dietary supplements, body weight and appetite: results from a cross-sectional and a randomised double-blind placebo-controlled study. *Br J Nutr.* 2007 Nov 1;1-11.

“Supermice” Run Faster, Live Longer

Scientists in Cleveland have created what is being touted in the media as the world’s first “supermice.”* The genetically modified rodents are literally stronger, faster, and “better” than their normal counterparts. They live longer than control mice, are more active, eat more, and weigh less. They’re capable of running up to 6 kilometers at a speed of 20 meters per minute; 30 times farther than ordinary mice.

This remarkable transformation is all the more amazing given that it’s due to a modification to a single metabolism gene shared with humans. The modification causes the mice to express in skeletal muscle an enzyme called phosphoenolpyruvate carboxykinase (PEPCK-C), which is normally found in liver and adipose tissue and is involved in energy metabolism. This “overexpression” promotes an unusually high concentration of mitochondria and triglycerides, which crowd within muscle cells, providing extraordinary muscular performance.

“Overexpression of PEPCK-C repatterns energy metabolism and leads to greater longevity,” researchers concluded.

—Dale Kiefer

Reference

* Hakimi P, Yang J, Casadesus G, et al. Over-expression of the cytosolic form of phosphoenolpyruvate carboxykinase (GTP) in skeletal muscle repatterns energy metabolism in the mouse. *J Biol Chem.* 2007 Nov 9;282(45):32844-55.

Lower Vitamin D Levels Linked to Greater Knee Arthritis Pain

Patients with osteoarthritis of the knee who also have low levels of vitamin D experience worse pain and decreased mobility, compared with patients who have higher levels of the “sunshine” vitamin, according to research presented at the American College of Rheumatology’s annual scientific meeting in Boston, Massachusetts.¹ The research was based on recent studies showing that vitamin D influences both musculoskeletal health and neuromuscular function.²⁻⁴

Investigators studied 100 men and women with osteoarthritis of the knee. On average, patients were in their mid-60s. Vitamin D levels, baseline knee pain, and initial mobility were assessed at the beginning of the study. The researchers found that nearly half of the study participants were vitamin D deficient, and this deficiency correlated with greater pain and decreased ability to walk. Previous research has shown that an alarmingly high percentage of American adults are either vitamin D deficient or have

Reference

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3. Dhesi JK, Jackson SH, Bearne LM, et al. Vitamin D supplementation improves neuromuscular function in older people who fall. *Age Ageing*. 2004 Nov;33(6):589-95.
4. Bischoff-Ferrari HA, Zhang Y, Kiel DP, Felson DT. Positive association between serum 25-hydroxyvitamin D level and bone density in osteoarthritis. *Arthritis Rheum*. 2005 Dec 15;53(6):821-6.
5. Holick MF. High prevalence of vitamin D inadequacy and implications for health. *Mayo Clin Proc*. 2006 Mar;81(3):353-73.

Vitamin E Halves Cardiovascular Events in At-Risk Diabetics

Supplementation with vitamin E may reduce the risk of adverse cardiovascular events by more than 50% among type 2 diabetics with a defective gene for an important antioxidant protein, according to a new report.*

Patients with a defective gene for haptoglobin, an important antioxidant protein, are at increased risk of oxidative damage to blood vessel walls. Approximately 2-3% of the general population has type 2 diabetes and carries the defective gene. Such patients are at increased risk of cardiovascular events, such as heart attack, stroke, and death, due to the defective protein.

Among these patients, supplementation with 400 IU of vitamin E/day for 18 months halved the risk of adverse events in a controlled clinical trial, compared with type 2 diabetic carriers of the defective gene who did not take vitamin E.

—Dale Kiefer



Reference

* Milman U, Blum S, Shapira C, et al. Vitamin E Supplementation Reduces Cardiovascular Events in a Subgroup of Middle-Aged Individuals With Both Type 2 Diabetes Mellitus and the Haptoglobin 2-2 Genotype. A Prospective Double-Blinded Clinical Trial. *Arterioscler Thromb Vasc Biol.* 2007 Nov 21 [Epub ahead of print].

Phosphatidylcholine Reduces Steroid Dependency in Ulcerative Colitis

A promising new study reveals that phosphatidylcholine treatment can help patients with the inflammatory bowel disease, ulcerative colitis, to be less dependent on steroid therapy.* Conventional treatment with immunosuppressants is usually recommended for this disease, but when these fail to work, there is a lack of suitable alternative therapy except long-term steroids.

As insufficient phosphatidylcholine in colonic mucus is thought to be a risk factor for ulcerative colitis, the German researchers in this study gave 500 mg of this supplement four times a day or a placebo to 60 ulcerative colitis patients who were on long-term steroid treatment, and in whom immunosuppressants had failed to work.

Up to 50% of the phosphatidylcholine group was able to successfully withdraw from steroid treatment and demonstrated improved clinical activity, compared with only 10% of the placebo group. Furthermore, 80% of the supplemented group was able to discontinue steroid therapy altogether without a worsening of the disease.

—Dayna Dye

Reference

* Stremmel W, Ehehalt R, Autschbach F, Karner M. Phosphatidylcholine for steroid-refractory chronic ulcerative colitis: a randomized trial. *Ann Intern Med.* 2007 Nov 6;147(9):603-10.

Omega-3s, Vegetables Reduce Alzheimer's Risk

Mounting evidence suggests that supplementation with the omega-3 fatty acid docosahexaenoic acid (DHA) as well as increased consumption of fruits and vegetables, significantly decreases the chances of developing dementia or Alzheimer's disease.¹⁻⁵

One new study published in *Neurology* monitored the health and dietary patterns of over 8,000 French men and women 65 years

and older, for at least four years.⁶ This study found that daily consumption of fruits and vegetables was associated with a decreased risk of dementia from all causes. Weekly fish consumption was associated with a reduced risk of all-cause dementia, including Alzheimer's disease in individuals lacking genes for apolipoprotein-E4 (apoE4). This genotype is an independent risk factor for developing Alzheimer's disease.

Additionally, researchers found that omega-6 oils, when not balanced by simultaneous consumption of omega-3 fatty acids, actually increased risk of dementia, even in the absence of the apoE4 genotype.⁶

—Dale Kiefer

Reference

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4. Cole GM, Frautschy SA. Docosahexaenoic acid protects from amyloid and dendritic pathology in an Alzheimer's disease mouse model. *Nutr Health.* 2006;18(3):249-59.
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6. Barberger-Gateau P, Raffaitin C, Letenneur L, et al. Dietary patterns and risk of dementia: The Three-City cohort study. *Neurology.* 2007;69:1921-30.

Fruits, Berries with Meals Offset After-Meal Oxidative Stress

The consumption of most meals increases oxidative stress, unless antioxidant-rich foods are included, according to scientists at a US Department of Agriculture research laboratory.* Investigators hypothesized that antioxidant-rich foods, such as fruits and berries, may increase antioxidant capacity following a meal, offsetting decreases in plasma antioxidant capacity associated with the consumption of fats, carbohydrates, and proteins.

To test the hypothesis, volunteers were enrolled in five clinical trials. Six to ten subjects consumed meals comprising fruits such as berries, grapes, kiwi, cherries, and strawberries, and/or a meal of carbohydrates, fats, and protein. Blood antioxidant capacity was assayed before and after meals. Consumption of blueberries, grapes, or kiwi with a meal preserved plasma antioxidant capacity, while a meal without one of these foods led to a decline in antioxidant capacity.



“Consumption of high-antioxidant foods with each meal is recommended in order to prevent periods of [after-meal] oxidative stress,” investigators concluded.

—Dale Kiefer

Reference

- * Prior RL, Gu L, Wu X, et al. Plasma antioxidant capacity changes following a meal as a measure of the ability of a food to alter in vivo antioxidant status. *J Am Coll Nutr.* 2007 Apr;26(2):170-81.

High Vitamin C Level Helps Prevent Stroke

Having a higher level of vitamin C in the bloodstream is associated with a lower risk of stroke, according to a large British study.*

Plasma levels of vitamin C were measured in 20,649 men and women, ages 40 to 79 years, recruited from the general population. The participants were then monitored for strokes over an average of 9.5 years. People with the highest levels of vitamin C had a 42% lower risk of stroke than those with the lowest vitamin C levels. The difference was not explained by variations in age, sex, smoking status, alcohol consumption, body mass index, blood pressure, cholesterol, exercise habits, diabetes, previous heart attack, social class, or use of dietary supplements.

The investigators noted that high vitamin C levels may reflect healthful behaviors that reduce the risk of stroke, such as fruit and vegetable consumption. Low levels may help identify persons at higher risk of stroke.

—Laura J. Ninger, ELS

Reference

* Myint PK, Luben RN, Welch AA, Bingham SA, Wareham NJ, Khaw KT. Plasma vitamin C concentrations predict risk of incident stroke over 10 y in 20 649 participants of the European Prospective Investigation into Cancer–Norfolk prospective population study. *Am J Clin Nutr.* 2008 Jan;87(1):64–9.

Healthy Lifestyle May Provide Extra 14 Years of Life

Individuals who practice just four healthy behaviors may live 14 years longer than those who don't, according to a just-released report.* More than 20,000 participants between the ages of 45 and 79 years were followed for an average of 11 years. Questionnaires awarded one point each for not smoking, being physically active, consuming alcohol in moderation, and having a plasma vitamin C level consistent with eating five servings of vegetables or fruit per day.

Those who scored no points on the questionnaires were four times more likely to die than those who scored four points, and those with a score of two were twice as likely to die. Participants whose score was zero had the same risk of dying as subjects who were 14 years older who had practiced all four healthy behaviors.

These findings indicate that combined behavioral factors significantly impact longevity.

—Dayna Dye



Reference

* Available at: <http://medicine.plosjournals.org/perlserv/?request=get-document&doi=10.1371/journal.pmed.0050012&ct=>. Accessed January 14, 2008.

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