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Contrary to Common Opinion, Do Sunlight and Vitamin D Lower Risk of Skin Cancer?

Many people shun the sun as a way of reducing their risk of melanoma, a particularly deadly type of skin cancer. But new research suggests that melanoma patients are more likely to survive their cancer if they have had a history of regular sun exposure. A separate study found that sun exposure was associated with a lower risk of developing non-Hodgkin lymphoma, another type of cancer.

The incidence of skin cancer among Caucasians has increased over the past 50 years. The reasons have been attributed to excessive sun bathing, as well as to the use of sunscreens, which might encourage a sense of complacency about tanning.

At the same time, vitamin D has emerged in recent years as a key anti-cancer "nutrient," and breast and some other cancer types have been associated with low vitamin D levels. Vitamin D is actually a steroid hormone, and 15-30 minutes exposure to the summer sun without sunscreen prompts the body to produce about 10,000 IU of it.

In the first study, Marianne Berwick, PhD, of the University of New Mexico, Albuquerque, and her colleagues tracked 528 patients who had been diagnosed with invasive melanoma of the skin. The patients were assessed for their level of sun exposure, a type of noncancerous skin damage called solar elastosis, and personal awareness of changes to skin.

Berwick found that sunburn, high intermittent sun exposure, solar elastosis, and overall skin awareness "statistically significantly" reduced the risk of death from melanoma. Awareness of skin changes (which might lead to early diagnosis) was associated with half the risk of death over five years. Similarly, greater solar elastosis (sun damage to the elastic tissues of the skin) was associated with a 60 percent lower risk of death.

The researchers offered two ideas to account for why sunlight might reduce the risk of death from melanoma. One is that sunlight increases production of vitamin D, which is known to curb the proliferation of cancer and to induce apoptosis (cell suicide) in

cancer. The other is that sunlight leads to less aggressive melanoma by darkening the skin and increasing DNA repair activities in skin cells.

In the other study, Karin Ekstom Smedby, MD, of the Karolinska Institute, Stockholm, Sweden, compared sun exposure in 3,740 patients who had either nonHodgkin lymphoma or Hodgkin lymphoma with 3,187 people who did not have either disease. Most researchers have believed that the increasing worldwide incidence of nonHodgkin lymphoma is related to increased sun exposure.

Smedby found that frequent sun bathing around age 20, as well as 5 to 10 years before being interviewed for the study, was actually associated with a 30 to 40 percent lower risk of nonHodgkin lymphoma. People who sunbathed four or more times a week at age 20 had a 30 percent lower risk of developing nonHodgkin lymphoma, and those who had two or more sunburns annually at age 20 were 20 percent less likely to develop lymphoma.

"A history of high ultraviolet exposure was associated with reduced risk of non-Hodgkin lymphoma," Smedby wrote. Sun exposure was also related to a lower risk of Hodgkin lymphoma.

In a related editorial in the *Journal of the National Cancer Institute*, William J. Blot, PhD, noted that these two studies "provide intriguing new evidence that solar radiation may have a beneficial influence in both the incidence and outcome of cancer."

Other research published in recent years has found that high intake of antioxidants, such as beta-carotene, can reduce redness and skin damage associated with sunburn. That suggests that antioxidants might also protect against skin cancer.

Reference: Berwick M, Armstrong BK, Ben-Porat L, et al. Sun exposure and mortality from melanoma. *Journal of the National Cancer Institute*, 2005;97:195-199. Smedby KE, Hjalgrim H, Melbye M, et al. Ultraviolet radiation exposure and risk of malignant lymphomas. *Journal of the National Cancer Institute*, 2005;97:199-209. □

Perspectives...**Nutrition as a Religious Belief System**

Strange as it might sound, some people argue nutrition with the intensity of religion and politics. If you doubt me, just think about how strident some people are when it comes to expressing their opinions of low-carb diets, supplements, and vegetarian diets.

Believe me, I intend no offense here. But listening to different nutrition views sometimes leaves me feeling like I'm sitting in a religious or political crossfire.

Conventional physicians and dietitians have long argued nutrition philosophies with, shall I say, the "left wing" of the nutrition establishment. Their education becomes the cornerstone of a belief system, and most people don't take kindly to having their beliefs challenged. Many are stuck in a 30- to 50-year-old time warp promulgating antiquated views because they haven't bothered keeping up with recent research. A few "beliefs" are driven by special interests – such as the junk food companies that help finance the American Dietetic Association.

But the relatively new study of nutritional genetics – how nutrients and our genes interact – may very well change all that. Nutritional genetics, or nutrigenomics, is based on molecular biology. As sciences go, it's "harder" than much of physics and much more difficult to quibble with.

What's emerging is that some common genetic variations significantly increase our requirements for certain nutrients, such as B vitamins or vitamin D. At the same time, extra amounts of these (or other) nutrients improve how our genes function. The scientific foundation supporting nutritional genetics is solid – and growing – and it reinforces the importance of eating quality foods. –JC

High Folic Acid Intake Can Offset Some of the Genetic Risk for Breast Cancer

Several studies have found that adequate intake of folic acid (folate) may lower the risk of breast cancer and, conversely, that low intake of the vitamin may increase the risk of this disease. A new study has found that women with particular genetic variations are particularly susceptible to breast cancer when they don't obtain much dietary folic acid.

Jia Chen, ScD, of the Mount Sinai School of Medicine, New York City, and colleagues, studied the folic acid intake and genes of 1,481 women with breast cancer and 1,518 women without the disease. The researchers focused on variations in the MTHFR gene, which programs for an enzyme that plays a crucial role in how the body uses folic acid.

That enzyme is needed to properly use folic acid

to make and repair DNA. Inadequate folic acid disrupts this process, increasing the risk of genetic aberrations that can set the stage for cancer.

Chen found that "suboptimal folate metabolism increases the susceptibility to breast cancer, especially among those with insufficient folate intake; however, such enhanced risk may be reduced by increasing folate consumption."

Overall, women who had the greatest dietary intake of folic acid were 39 percent less likely to develop breast cancer.

Women who had a particular variation in the MTHFR gene, known as 677TT, were 37 percent more likely to develop cancer. But if these women also had a low intake of folic acid, they had a 71 to 83 percent greater risk of developing breast cancer.

"From a public health perspective, it is important to identify risk factors, such as low B vitamin consumption, that may guide an effective prevention strategy against the disease," Chen wrote.

Reference: Chen J, Gammon MD, Chan W, et al. One-carbon metabolism, MTHFR polymorphisms, and risk of breast cancer. *Cancer Research*, 2005;65: 1606-1614. □

Alpha-Lipoic Acid Supplements May Benefit Patients with Multiple Sclerosis

Very high doses of alpha-lipoic acid, an antioxidant, may help quell some of the inflammation involved in multiple sclerosis. That's according to a study by Dennis N. Bourdette, MD, chairman of the neurology department at Oregon Health Sciences University, Portland.

Studies have found that alpha-lipoic acid is an effective treatment for the animal form of multiple sclerosis. So Bourdette and his colleagues treated 37 multiple sclerosis patients with one of four regimens: 600 mg of lipoic acid twice daily, 1,200 mg once daily, 1,200 mg twice daily, and placebos for 14 days.

The patients' blood levels of two substances, metalloproteinase-9 (MMP-9) and soluble intercellular adhesion molecule-1 (sICAM-1) were tracked during the study. Adhesion molecules such as sICAM-1 help immune cells move across the blood-brain barrier, where they can attack the central nervous system. Activated immune cells produce MMP-9 and other substances that break down protective barriers to the central nervous system.

Levels of sICAM-1 declined consistently as the supplemental dose of alpha-lipoic acid increased among the patients – indicating reduced inflammation. MMP-9 levels decreased among patients who had the highest blood levels of alpha-lipoic acid.

Absorption of alpha-lipoic acid varied considerably among individuals in the study.

Bourdette wrote, "In summary, oral LA [alpha-lipoic acid] represents a promising therapy for MS and warrants further investigation."

Reference: Yadav V, Marracci G, Lovera J, et al. Lipoic acid in multiple sclerosis: a pilot study. *Multiple Sclerosis*, 2005;11:159-165. □

Lycopene and Other Carotenoids Protect Against Prostate Cancer

Studies of Europeans and Americans have found that the antioxidant lycopene and lycopene-rich foods can reduce the risk of prostate cancer. Now, a team of Australian and Chinese researchers has found the same to be true with Asians.

Andy H. Lee, PhD, of the Curtin University of Technology, Perth, Australia, led a team of researchers who studied the dietary habits of 130 Chinese men with prostate cancer and 274 hospitalized men without the disease.

They found that men with the highest intake of lycopene had an 88 percent lower risk of prostate cancer. High intake of beta-carotene was associated with a 57 percent lower risk, alpha-carotene with a 66 percent lower risk, and cryptoxanthin with an 85 percent lower risk.

Overall, men with prostate cancer ate about one-third fewer fruits and vegetables. High intake of tomatoes, pumpkin, spinach, watermelon, and citrus fruits also appeared to protect against prostate cancer.

Reference: Jian L, Du CJ, Lee AH, et al. Do dietary lycopene and other carotenoids protect against prostate cancer? *International Journal of Cancer*, 2005;113:1010-1014. □

L-Arginine Supplements May Help in Weight Loss and Blood Sugar Control

Supplements of L-arginine may be helpful in losing weight as well as in reducing the risk of diabetes and heart disease. That's according to an animal study conducted at Texas A&M University, College Station, Texas.

Guoyao Wu, PhD, and colleagues tested the effects of L-arginine on laboratory rats genetically prone toward obesity and diabetes. Some of the rats were given supplemental L-arginine in their drinking water, and "control" rats were given a neutral amino acid for 10 weeks.

Amino acids are the building blocks of protein. L-arginine is the precursor to nitric oxide, a regulatory molecule that benefits cardiovascular function and blood vessel tone.

Although supplemental L-arginine did not reduce food or water intake, it did lead to a 16 percent decrease in body weight, compared with the control rats. Body fat was reduced by 45 percent

among the rats given L-arginine, while the relative weight of muscle, heart, and brain increased.

L-arginine supplements also led to a 25 percent decrease in blood sugar levels and a 23 percent decrease in triglyceride levels.

The L-arginine supplements increased the activity of four key genes, including the gene that programs nitric oxide synthase, which converts L-arginine to nitric oxide.

Wu noted the implications of the study for people: "Arginine supplementation may become a promising solution to reduce obesity, improve insulin sensitivity, and improve health in type-2 diabetic subjects."

Nutritionally oriented physicians sometimes recommend L-arginine supplements at a daily dosage of 1,000 mg, taken between meals.

Reference: Fu WJ, Haynes TE, Kohli R, et al. Dietary L-arginine supplementation reduces fat mass in Zucker diabetic fatty rats. *Journal of Nutrition*, 2005;135:714-721. □

Drinking Green Tea May Reduce DNA Damage from UV Rays in Sunburn

The antioxidants in green tea may help prevent DNA damage from the ultraviolet rays in sunburn.

Alison Curnow, PhD, of the Royal Cornwall Hospital, England, and her colleagues conducted two experiments. In one, she exposed lung and skin cells to epigallocatechin gallate (EGCG), the principal antioxidant found in green tea. All of the cells tested suffered less DNA damage after being exposed to EGCG and ultraviolet rays.

In the other experiment, Curnow took blood samples from 10 people before and after they drank a large cup of green tea. She extracted white blood cells from the blood and exposed them to ultraviolet rays. Cells obtained after the subjects drank green tea were more resistant to DNA damage.

Reference: Morley N, Clifford T, Salter L, et al. The green tea polyphenol epigallocatechin gallate and green tea can protect human cellular DNA from ultraviolet and visible radiation-induced damage. *Photodermatology, Photoimmunology & Photomedicine*, 2005;21:15-22. □

Skip Breakfast and You're Likely to Gain Weight, Have Higher Cholesterol Levels

Many people skip breakfast either because they don't have enough time to eat or because they think it will help them lose weight. But skipping breakfast might actually increase the risk of heart disease – and promote weight gain.

Hamid R. Farshchi, PhD, and his colleagues at

Continues on next page

Quick Reviews of Recent Research

• Low vitamin E common in depressed patients

Depressed patients appear to consume adequate dietary amounts of vitamin E, yet they seem to have lower than normal levels of the vitamin. Australian researchers analyzed dietary intake and blood levels among 49 depressed patients. According to the researchers, depressed patients have blood levels of vitamin E that were about 17 percent lower than those in nondepressed patients.

Owen AJ, et al. *European Journal of Clinical Nutrition*, 2005;59:304-306.

• B vitamins might help in depression

Studies have shown that a particular genetic variation, known as MTHFR 677CT, increases the risk of depression. This genetic variation reduces the activity of a key enzyme involved in neurotransmitter production. Increased intake of folic acid and vitamin B12 improve the activity of the enzyme, and the researchers recommended that depressed patients routinely be given 800 mcg of folic acid and 1,000 mcg of vitamin B12 to "improve treatment outcome."

Coppen A, et al. *Journal of Psychopharmacology*, 2005;19:59-65.

• Beta-carotene linked to lower death risk

A study of 672 subjects found that low blood levels of beta-carotene were associated with higher levels of two pro-inflammatory compounds,

interleukin-6 and C-reactive protein. Men with low levels of beta-carotene were almost four times more likely to have high rates of inflammation. In addition, low beta-carotene levels were associated with an increased risk of death from all causes.

Hu PF, et al. *Journals of Gerontology*, 2004;59: 848-854.

• C-reactive protein generates free radicals

C-reactive protein is a marker of inflammation, and high levels are associated with a substantially increased risk of heart attack. In experiments, a Canadian researcher found that C-reactive protein led to the increased release of free radicals by white blood cells. Free radicals are known to damage cells, accelerate the aging process, and increase the risk of age-related degenerative diseases.

Prasad K. *Journal of Cardiovascular Pharmacology and Therapeutics*, 2004;9:203-209.

• Vitamin K benefits bones and heart

In a review article, a team of British, French, and German researchers discussed recent studies on the health benefits of vitamin K, which is found primarily in leafy green vegetables. Studies have found that as many as 15 percent of people may be deficient in vitamin K. The vitamin is needed in bone formation and appears to work in conjunction with vitamin D and calcium. Supplemental intake of vitamin K reduces the risk of bone fractures. The vitamin also prevents calcification of major blood vessels, and it can protect against hardening of the arteries.

Reference: Vermeer G, et al. *European Journal of Nutrition*, 2004;43:325-335.

• Trans fats promote inflammation

A study of 730 women in the Nurses' Health Study found that consumption of trans fats was associated with substantially higher levels of C-reactive protein and other markers of inflammation.

Lopez-Garcia E, et al. *Journal of Nutrition*, 2005; 135:562-566.

Skiping Breakfast Affects Weight...

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the University of Nottingham, England, asked 10 healthy and thin women, 19 to 38 years old, to follow two dietary regimens. One plan included eating breakfast each morning over two weeks, and the other involved skipping breakfast for two weeks.

Skiping breakfast resulted in a rapid increase in total cholesterol and the "bad" low-density lipoprotein (LDL) form of cholesterol. Overall, total cholesterol levels increased by 8.5 percent and LDL levels jumped by 15 percent.

In addition, insulin resistance – a prediabetic sign – increased among the women when they skipped breakfast.

If that wasn't enough bad news, the women who skipped breakfast actually ended up eating more calories overall, which the researchers noted would lead to weight gain if the pattern continued.

Reference: Farshchi HR, Taylor MA, Macdonald IA. Deleterious effects of omitting breakfast on insulin sensitivity and fasting lipid profiles in healthy lean women. *American Journal of Clinical Nutrition*, 2005;81:388-396. □

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