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Low Levels of Coenzyme Q10 May Be Factor in Fatigue and Depression

Coenzyme Q10 may have an odd name – but this vitamin-like substance is essential for life. It plays a crucial role in energy production, and it was the basis of the 1978 Nobel prize in chemistry.

CoQ10, as it's commonly known, helps shuttle around energy-containing electrons in cells. In the 1970s and 1980s, Japanese and American cardiologists began using CoQ10 supplements to treat cardiomyopathy and heart failure, two diseases caused by a lack of energy in heart cells. Cholesterol-lowering statin drugs block the body's production of CoQ10, contributing to the muscle pain and other side effects caused by these drugs.

Now, a team of doctors from Belgium have reported that low levels of CoQ10 are strongly associated with chronic fatigue syndrome (CFS), depression, and death from cardiovascular disease.

Michael Maes, MD, PhD, and his colleagues at the Maes Clinic in Antwerp measured blood levels of CoQ10 in 58 patients with CFS (which is sometimes described as myalgic encephalomyelitis) and 22 people without the disease. All of the CFS patients had below normal levels of CoQ10, and almost half of them had CoQ10 levels below the lowest level found in normal patients.

Maes wrote that the fatigue and cognitive symptoms associated with CFS may be caused by a lack of CoQ10. In addition, CFS patients died of chronic heart failure an average of 25 years earlier than people in the general population – which would also be suggestive of CoQ10 deficiency.

In a second report, Maes compared CoQ10 levels in 35 patients with depression and 22 healthy subjects. Again, he found that the patients with depression also had lower levels of CoQ10 than the healthy people, and that half of them had extremely low CoQ10 levels. He wrote that “depressed patients may benefit from CoQ10 supplements.”

As in his other article, Maes noted that low CoQ10 levels may be a factor in chronic heart

failure, as well as in treatment-resistant depression and CFS. He added that people taking statin drugs may be at a greater risk of developing these other health problems related to low CoQ10 levels.

References: Maes M, Mihaylova I, Kubera M, et al.

Coenzyme Q10 deficiency in myalgic encephalomyelitis /chronic fatigue syndrome (ME/CFS) is related to fatigue, autonomic and neurocognitive symptoms and is another risk factor explaining the early mortality in ME/CFS due to cardiovascular disorder.

Also: Lower plasma Coenzyme Q10 in depression: a marker for treatment resistance and chronic fatigue in depression and a risk factor to cardiovascular disorder in that illness. *Neuroendocrinology Letters*, 2009;30: epub ahead of print. □

Perspective Food Addictions and Overweight

Each new year prompts millions of people to go on diets and sign up for gym memberships to lose weight and get back into shape. Within a month or two, most people resume their former eating and sedentary habits, leading to an annual weight gain.

Why are the vast majority of Americans now overweight or obese? There are many reasons, including the lipogenic effects of high-fructose corn syrup, trans fats, and simply eating too many empty calories, most of which are cheap mass-produced carbohydrates and fats.

A commentary in the *Canadian Medical Association Journal* focused on what I have long believed: that unrecognized food addictions are a major factor in overweight and obesity. The concept of food addictions, the authors wrote, is controversial – but there are many similarities to drug and alcohol addictions. Powerful cravings and withdrawal symptoms are signs of food addictions. And interestingly enough, anti-opioid drugs seem to reduce food cravings.

There are many factors behind food addictions. Some foods, such as wheat and dairy, contain trace amounts of natural opioids. Sweet foods stimulate

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the brain's production of its own opioids. Some foods lead to increased dopamine levels – one of the brain's pleasure neurotransmitters.

Breaking food addictions is like dealing with any other addiction: It's going to be rough for a little while. But once an addiction is broken, most people gain a renewed sense of well being. During this process, it certainly helps to be mindful of what you put into your mouth – and to stop rationalizing that a little bit of this and a little bit of that won't hurt. Just as a little bit of tobacco, alcohol, or cocaine will sabotage some people, little bits of problematic foods will reestablish food addictions. – *JC*

Omega-3 Fish Oils Protect the Brain from Sensory Overload

If you sometimes feel overwhelmed by too much noise or activity going on around you, there's a chance that you're not consuming enough omega-3 fish oils.

It turns out that the omega-3 fats help prevent sensory overload, according to a recent study by researchers at the National Institutes of Health in Bethesda, Maryland.

Norman Salem Jr., PhD, and his colleagues fed pregnant laboratory mice and their offspring one of four diets: lacking omega-3s, high in alpha-linolenic acid (ALA), low in ALA, and high in eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA).

In the experiment, all of the animals were exposed to a soft tone first, to prepare them for a sudden loud noise. The animals fed DHA and EPA had calmer nerves and were less reactive to loud noises. However, the omega-3 deficient mice and those eating ALA reacted with a strong startle when exposed to loud noises.

Although ALA is the "parent molecule" of the omega-3s, only about 1 percent of it gets converted to the more active forms, DHA and EPA.

Reference: Fedorova I, Alivheim AR, Hussein N, et al. Deficit in prepulse inhibition in mice caused by dietary n-3 fatty acid deficiency. *Behavioral Neuroscience*, 2009;123:1218-1225. □

Quercetin Supplements May Boost Exercise Performance

Several studies have found that quercetin, an antioxidant flavonoid found in onions and apple skins, slightly increases performance in trained athletes. In a recent study, untrained men receiving quercetin supplements were able to increase their exercise performance after just two weeks.

David C. Nieman, DrPH, of Appalachian State

University, Boone, North Carolina, and his colleagues asked 30 men between age 18 and 28 to take either 1,000 mg of quercetin or placebos daily for two weeks. Then the placebos and quercetin were switched, so the researchers could more accurately gauge the effects of quercetin.

The men ran for 12 minutes on a treadmill at the beginning and end of each phase of the study. When they took quercetin supplements, they had a modest 3 percent increase in running distance. When they took placebos, they had a 1.2 percent decrease in running distance – in effect, a 4.2 percent difference.

In addition, Nieman and his colleagues looked at changes in gene activity reflective of increased number of mitochondria. Mitochondria are the parts of cells that break down foods for energy, and typically exercise will increase the numbers of mitochondria in muscles. They found a slight increase in mitochondria after taking quercetin.

"Human subjects may require a higher quercetin dose to more consistently induce mitochondrial biogenesis," the researchers wrote.

Reference: Nieman DC, Williams AS, Shanelly RA, et al. Quercetin's influence on exercise performance and muscle mitochondrial biogenesis. *Medicine & Science in Sports & Exercise*, 2009; epub ahead of print. □

Dietary Habits Influence the Risk of Developing Depression

Eating habits are strongly associated with the odds of feeling depressed, according to a study by a team of researchers from England and France.

Tasnim N. Akbaraly, PhD, of University College London, and her colleagues noted that previous research has tended to focus on specific nutrients, such as B vitamins and fish oils, and the risk of depression. But in recent years, there has been a "move away from analyzing associations between isolated nutrients and health to consideration of the effects of dietary patterns."

The researchers studied 3,486 middle-age men and women living in England. The subjects completed a food questionnaire and were divided into two groups: whole-food eaters consumed mostly vegetables, fruits, and fish, whereas processed-food consumers ate a lot of chocolates, sweetened desserts, fried foods, processed meats, refined grains, cereals, and high-fat dairy products.

When contacted five years after completing the questionnaire, people eating a predominantly whole-foods diet were one-fourth less likely to have depression. Those who ate a lot of processed foods were more than 50 percent likely to feel depressed.

The whole-foods diet was richer in vitamins, minerals, and healthy fats, compared with the processed-food diet. In particular, the vegetables contain large amounts of folic acid, which is involved in the products of neurotransmitters and phospholipids.

Reference: Akbaraly TN, Brunner EJ, Ferrie JE, et al. Dietary pattern and depressive symptoms in middle age. *British Journal of Psychiatry*, 2009;195:408-413. □

Licorice Root Extract May Protect Against Some Types of Infections

Licorice root has a long history of use to treat cough, bronchitis, and gastritis. A new study indicates that it might also be useful in preventing infections in burn patients.

“Burn patients are particularly susceptible to infection with various pathogens. Burn wound infections in these patients escalate easily into sepsis,” wrote Fujio Suzuki, PhD, and his colleagues at the Shriners Hospitals for Children and the University of Texas in Galveston.

In experiments, Suzuki found that glycyrrhizin, an extract of licorice root, improved the skin’s production of infection-fighting peptides. These peptides puncture the cell membranes of infection-causing bacteria, such as *Pseudomonas aeruginosa*.

Suzuki found that mice that had suffered burns, but were treated with glycyrrhizin, made antimicrobial peptides in amounts comparable to those of normal mice. Burned but untreated mice did not make many of the antimicrobial peptides.

Editor’s note: Licorice inhibits the body’s breakdown of cortisol, and in large amounts it can increase the risk of hypertension.

Reference: Yoshida T, Yoshida S, Kobayashi M, et al. Glycyrrhizin restores the impaired production of beta-defensins in tissues surrounding the burn area and improves the resistance of burn mice to *Pseudomonas aeruginosa* wound infection. *Journal of Leukocyte Biology*, 2010;87:35-41. □

High Intake of Vitamins May Protect Against Bladder Cancer

People who consume large amounts of vitamin E and several other nutrients have a relatively low risk of developing bladder cancer, according to a study by an international team of researchers.

Maree T. Brinkman, PhD, of the Cancer Council Victoria, in Australia, and her colleagues compared the eating habits of 322 people with bladder cancer and 239 others without the disease. All of the study subjects were from the state of New Hampshire in the United States.

Overall, people consuming the largest amounts of

vitamin E, 193 IU or more daily, were 34 percent less likely to develop bladder cancer.

People who were heavy smokers also benefited when they consumed relatively large amount of nutrients. High intakes of vitamin E, carotenoids, and vitamin B3 were related to 42, 38, and 34 percent lower risk of bladder cancer, respectively.

Seniors are particularly susceptible to bladder cancer, but high intakes of vitamin E, carotenoids, vitamin B3, vitamin B1, and vitamin D were associated with a lower risk of the disease.

Approximately 71,000 cases of bladder cancer are diagnosed each year in the United States.

Reference: Brinkman MT, Karagas MR, Zens MS, et al. Minerals and vitamins and the risk of bladder cancer: results from the New Hampshire study. *Cancer Causes and Control*, 2009; doi 10.1007/s10552-009-9490-0. □

Magnesium Supplement Reduces Post-Meal Rise in Blood Fats

A post-meal spike in blood fats, such as triglycerides, increases the risk of coronary heart disease. But taking a hefty dose of magnesium blunts that increase in triglycerides.

Kazuo Kondo, MD, PhD, of Ochanomizu University, Japan, and his colleagues asked 16 healthy men to consume a little over an ounce of butter with or without supplemental magnesium. The procedure was then reversed, so all of the subjects consumed the butter with and without magnesium.

The amount of magnesium was 500 mg, and it was consumed in the form of bitter melon (*Nigari*, in Japanese), a type of sea or lake saltwater used in the making of tofu.

When the men took magnesium with the butter, it reduced the post-meal increase in triglycerides by almost 40 percent in both the blood and chylomicrons. Chylomicrons are one of the principal types of lipoproteins, along with high- and low-density lipoproteins, which transport fats in the bloodstream.

Reference: Kishimoto Y, Tani M, Uto-Kondo H, et al. Effects of magnesium on postprandial serum lipid responses in healthy human subjects. *British Journal of Nutrition*, 2009: epub ahead of print. □

Fish Oils Plus Glucosamine Brings Relief to People with Joint Pain

Glucosamine supplements are widely used to reduce pain from osteoporosis, but combining them with modest amounts of omega-3 fish oils brings significantly greater benefits.

Joerg Greunwald, PhD, of Analyze & Realize AG,

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Quick Reviews of Recent Research

• Trans fats boost risk of sudden cardiac death

Trans fats, found in hydrogenated vegetable oils and some types of interesterified fats, both of which are used in many processed foods, elevate blood sugar, promote weight gain, and increase the risk of heart attack. In a study of more than 86,000 nurses over 26 years, Harvard University researchers found that consumption of trans fats was strongly related to sudden cardiac death – literally dropping dead – among women with preexisting heart disease. Women who consumed the most trans fats had more than three times the risk of sudden cardiac death.

Chiuve SE. *American Heart Journal*, 2009;158:761-767.

• Vitamin C helpful in Barrett's esophagus

Researchers from St. James's Hospital in Dublin, Ireland, treated 25 patients with Barrett's esophagus, giving them 1,000 mg of vitamin C daily for four weeks. People with the precancerous condition have higher activity of "nuclear factor kappa beta (NFkB)," which promotes both inflammation and cancer growth. Eight (35 percent) of the patients receiving vitamin C benefited from lower NFkB activity. Levels of several other markers of inflammation also decreased.

Babar M. *Diseases of the Esophagus*, 2009: epub ahead of print.

Osteoarthritis...

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a German company that conducts clinical trials, asked 177 people with moderate-to-severe knee or hip arthritis to take either glucosamine sulfate supplements or a combination of glucosamine sulfate and omega-3 fish oils for 26 weeks.

The glucosamine supplements provided 1,500 mg daily, and the fish oils supplied 440 mg of oil with 200 mg of eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA).

The combination reduced morning stiffness by almost 50 percent, based on scores on the WOMAC test, a standard way of determining the severity of osteoarthritis. Glucosamine alone reduced morning stiffness by about 42 percent. The combination also lowered pain in the hips and knees by 56 percent, and the glucosamine worked almost as well.

In addition, about one-fourth more of the subjects responded to the combination of supplements, compared with those taking only glucosamine.

Reference: Greunwald J, Petzold E, Busch R, et al. Effect of glucosamine sulfate with or without omega-3 fatty acids in patients with osteoarthritis. *Advances in Therapy*, 2009;26:858-871. □

• Vinegar turns on fat-burning genes

A growing body of human studies has shown that vinegar, which contains acetic acid, can improve blood sugar and may contribute to weight loss. Japanese researchers recently conducted an experiment in which laboratory mice were given either water or acetic acid in water for six weeks. The acetic acid inhibited the accumulation of body fat and fats stored in the liver – without any changes in food consumption or muscle. Several genes involved in the burning of fats and proteins involved in thermogenesis increased in activity while the animals consumed the acetic acid.

Kondo T. *Journal of Agriculture and Food Chemistry*, 2009; 57:5982-5986.

• Vitamin B6 may reduce inflammation

Low levels of vitamin B6 have long been associated with rheumatoid arthritis, and some research has found that the vitamin can reduce symptoms of arthritis. Researchers at Tufts University, Boston, recently analyzed dietary intake of vitamin B6, blood levels of pyridoxyl-5-phosphate (the active form of the vitamin) and C-reactive protein levels (a marker of inflammation) in 2,686 people. People with high intake or high blood levels of vitamin B6 had relatively low levels of C-reactive protein.

Morris MS. *Journal of Nutrition*, 2010;140:103-110.

• Malnutrition factor in function among elderly

Researchers in Brazil analyzed 240 hospitalized seniors, finding that roughly one-third were malnourished, another third were borderline malnourished, and another third had adequate nutritional intake. Forty-three percent of the malnourished people were partly dependent on others, and 13 percent of them were completely dependent on others in their day-to-day activities.

Oliveira MR. *Nutrition Journal*, 2009;8:54.

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