



Special Interest Articles:

- B₁₂ and sleep
- Omega-3 fatty acids and healthy arteries
- Omega-3 fatty acids and the heart
- B₁₂ and folic acid
- Curcumin and heart failure
- Can this improve the results of cardiac surgery?
- Is green tea good for your heart?

Insulin Insensitivity and Sleep

Research published in *Family Practice News* (April 1, 2005:1,4) looked at 44 healthy adults and their sleep patterns. Half of the group slept a normal amount of time each night (averaging 7 hours, 52 minutes of sleep each night) and half of whom were described as chronic "short sleepers", averaging only 5 hours and 16 minutes of sleep each night. Overall, the short

sleepers tended to have lower insulin sensitivity when compared to the group who slept normally. In general, obesity is inversely related to the amount of time spent sleeping. Sleep deprived individuals generally experienced improved results on glucose tolerance tests when they increase the amount of sleep they get.

Sesame, Blood Fats and Hormones

A study published in the *Journal of Nutrition* (2006; 136(5): 1270-5) looked at the effect the ingestion of powdered sesame seed had on postmenopausal women. The subjects of the randomized, placebo-controlled crossover study were 24 postmenopausal women. The women received either 50 grams of sesame seed powder or a placebo containing rice powder for a period of five weeks. The sesame seed powder contains a lignan, known as sesamin, which can be converted by bowel flora to a substance that has estrogenic activity (enterolactone). After a three-week washout period, the placebo group and the group that originally received the sesame seed powder switched roles.

The group receiving sesame seed powder had a 5% decrease in total

cholesterol, and a 10% decrease in the ratio between LDL ("bad") and HDL ("good") cholesterol. There was also an 18% decrease in DHEA (dehydroepiandrosterone sulfate), a 23% decrease in thiobarbituric acid reactive substances (TRARS) in oxidized LDL, a 72% increase in urinary 2-hydroxyesterone and a 15% increase in serum sex hormone binding globulin. There was also an increase in the ratios of gamma tocopherol and alpha tocopherol to total cholesterol in the group receiving sesame seed powder. In short, sesame seed powder may benefit blood lipids, and antioxidant status in postmenopausal women. It may be beneficial to hormone status as well.

B12 and Sleep

Patients were given 1.5 milligrams of vitamin B₁₂ three times per day. Symptoms improved in the patients with the sleep-wake rhythm disorder, in the patients with insomnia and in one of the patients with the delayed sleep-phase syndrome.

There are some small studies that show that vitamin B₁₂ supplementation may be beneficial to patients with problems sleeping. One study that appeared in the *Japanese Journal of Psychiatry and Neurobiology* (1991;45(1):165-166) looked at five patients between the ages of 14 and 60 with a variety of sleep problems, including insomnia, delayed sleep-phase syndrome, non-24-hour sleep-wake rhythm disorder and depression. The patients were successfully treated with 4.5 milligrams of vitamin B₁₂ per day, divided into three equal doses. Vitamin B₁₂ levels increased two to four fold during the therapy. Another study, that was presented at the 5th World Congress of Biological Psychiatry in 1991, had eight subjects between the ages of 12 and 63, with a variety of sleep-wake rhythm disorders. Two of the patients had 24-hour sleep-wake

rhythm disorder, four had delayed sleep-phase syndrome and two had insomnia. Patients were given 1.5 milligrams of vitamin B₁₂ three times per day. Symptoms improved in the patients with the sleep-wake rhythm disorder, in the patients with insomnia and in one of the patients with the delayed sleep-phase syndrome. In 1 case phototherapy was utilized at 2500 lux every morning for 2 hours when vitamin B₁₂ therapy was not beneficial during the first month. The light therapy produced a significant improvement in the sleep disorder. The authors of the second study noted that patients with sleep issues who respond to B₁₂ therapy are not necessarily deficient in vitamin B₁₂. It is also noted that the sleep-wake rhythm disorder relapsed several days or a few weeks after discontinuation of the medication.

Omega-3 Fatty Acids for Healthy Arteries

A population-based, cross-sectional study that was published in the *Journal of the American College of Cardiology* (2008; 52(6): 417-24) looked at the cardiovascular health of 281 Japanese men (born and living in Japan), 281 men of Japanese ancestry living in the U.S., and 306 Caucasian men living in the U.S. The subjects were all between the ages of 40 and 49 years. The native-born Japanese

men had the lowest incidence of atherosclerosis. The Caucasian Americans and the Japanese Americans had about the same level of atherosclerosis--ruling out genetics. The native born Japanese men consumed twice the amount of omega-3 fatty acids from fish.

Omega-3 Fatty Acids and the Heart

Previous research has shown an inverse relationship between levels of omega-3 fatty acids and the risk for sudden cardiac death. One article, published in *Cardiovascular Research* (2007; 73(2): 310-315), goes into great detail about the research that demonstrates the cardiac benefits of omega-3 fatty acids. They point out that there are literally thousands of studies that show the cardiac benefits of omega-3 fatty acids. The article cites four large-scale intervention studies that come to the conclusion that 1 gram per day of omega-3 fatty acids can prevent cardiovascular disease, and to treat cardiovascular disease after a heart attack. The authors of this article also believe that high EPA and DHA levels lower the risk of sudden cardiac death.

The *Journal of the American Medical Association* (November 1, 1995;274(17):1363-1367) published research that looked at omega-3 fatty acid consumption and the risk for sudden cardiac death. The study evaluated 334 subjects with primary cardiac arrest who were between the ages of 25 and 74. The researchers found that taking 5.5 grams per month of omega-3 fatty acids reduced the risk of primary cardiac arrest by 50%. An omega-3 fatty acid level of 3.3% compared to 5.0% of total fatty

acids in the red blood cell membrane was associated with a 70% reduction in the risk of primary cardiac arrest.

Research that appeared in the *Lancet* (2007; 369(9567)) looked at 18,645 Japanese patients with high cholesterol. It found that long term supplementation with EPA lowered the risk for heart attack and other coronary events.

Research appearing in *Upsala Journal of Medical Science* (2006; 111(2): 169-77) looked at the fatty acids in the blood of subjects who had been taking fish oil for six years and compared them to subjects who did not take fish oil. The researchers cite earlier studies that show that EPA (from fish oil) levels in the blood are inversely related to the risk for sudden cardiac death. This study demonstrated that a ratio between EPA and arachidonic acid (a fatty acid found in red meat) is an even better indicator. High arachidonic acid in relation to EPA increases the risk for sudden cardiac death.

Research supports the value of fish oil for heart health. In general, taking fish oil is a very inexpensive way to help lower the risk for cardiac problems.

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B12 and Folic Acid

A study, published in *Clinical Nutrition* (2006; 25(1): 60-7) looked at 224 patients who were newly admitted to a psychiatric hospital. The patients had significantly lower serum folate levels than healthy controls. Low serum folate correlates with depression. The same correlation did not exist between serum cobalamin levels and depression, but serum cobalamin is not necessarily a good indicator of vitamin B₁₂ status.

Testing for serum cobalamin may not be the best way to check for a B₁₂ deficiency. Research appearing in the *American Journal of Hematology* (1990;34:99-107) found that elevated homocysteine and elevated methylmalonic acid occurred in 95% of patients with cobalamin deficiency, whereas only 69% of these patients demonstrated a low serum cobalamin. The study reviews 419 cases of B₁₂ deficiency. The subjects were determined to have a B₁₂ deficiency based on symptoms. Vitamin B₁₂ deficiency was determined as a syndrome affecting the tongue, nervous system and/or hematopoietic system that responded to B₁₂. A dozen of the subjects had symptoms of B₁₂ deficiency, but serum cobalamin was higher than 200 pg/ml. The authors of the study concluded that measuring homocysteine or methylmalonic acid is a much better way to determine B₁₂ levels than serum cobalamin. Serum cobalamin is normal in a significant number of patients who are B₁₂ deficient. It should be noted that homocysteine may be elevated due to a folic acid deficiency, and that will not respond to B₁₂ alone.

Vitamin B₁₂ levels tend to decrease with age, this was verified by research appearing in the *Archives of Family Medicine* (October 1994;3:918-922).

Many problems with depression, cognition or other mental issues that are experienced by the elderly may be due to vitamin B₁₂ or folic acid deficiency. One study that appeared in the *European Journal of Clinical Investigation* (1994;24:600-606), looked at 296 elderly patients diagnosed with mental disease. Serum folate, homocysteine, and cobalamin were measured. Over 7% of these patients had normal serum cobalamin levels, but high homocysteine. Treatment of these patients with vitamin B₁₂ injections reduced homocysteine levels. Addition of folic acid to the treatment also lowered homocysteine in patients with low folate.

Vitamin B₁₂ does seem to help with cognitive function. A small pilot study, appearing in the *Journal of the American Geriatric Society* (February 1992;40(2):168-172) looked at 22 subjects with low serum B₁₂ levels in conjunction with cognitive dysfunction. The subjects received B₁₂ injections (1000 milligrams) daily for one week, weekly for four weeks then monthly for a period of six months. At the beginning of the study and after at least six months of therapy, the subjects were evaluated with the Mattis Dementia Rating Scale. Of the 18 patients who finished the study, 11 showed improvement. The amount of improvement experienced by the subjects correlated with the amount of time they had exhibited symptoms. The authors of this study believe that there is a narrow window of opportunity to treat patients with cognitive problems due to vitamin B₁₂ deficiency and that elderly patients should be regularly screened.

Curcumin and Heart Failure

Research, appearing in the *Journal of Clinical Investigation* (2008; 118(3): 879-893) was performed on heart muscle cells obtained from rats (in vitro) and their response to curcumin. Curcumin is an antioxidant found in turmeric. Heart muscle cells were incubated with curcumin for one hour before being exposed to phenylephrin (to increase cell size). The authors concluded that exposure to curcumin "attenuates cardiac hypertrophy in vitro." In short, exposing heart cells to curcumin reduces the type of enlargement that is seen in cardiomyopathy and in heart failure. Of course this information

is preliminary and more information is needed to be obtained from actual patients. The researchers also tested the effect curcumin had on live mice. Aortic banding (to produce cardiomyopathy) or sham operation was performed on live mice. Prior to the surgery (or sham operation) the mice were given either curcumin at a dose of 75 mg/kg per day or a placebo. The group of mice receiving the curcumin had less hypertrophy of the heart muscles. Curcumin also reduced cardiac hypertrophy in mice who were exposed to phenylephrin.

In short, exposing heart cells to curcumin reduces the type of enlargement that is seen in cardiomyopathy and in heart failure.

Can this Improve Results for Cardiac Surgery?

A small study appearing in *Heart Lung and Circulation* (2006; 15(3): 172-81) looked at recovery after cardiac surgery in 16 patients. For a period of 36 days prior to the surgery, the patients were given 300 milligrams of alpha-lipoic acid, 1200 milligrams of magnesium orotate, three grams of omega-3 fatty acids and 300 milligrams of coenzyme Q10 per day. The patients also received physical therapy, in the form of stretching and light exercise. The patients were also given stress reduction and music therapy over the 36 day period.

The patients were assessed for quality of life at the beginning of the study, prior to the operation and four weeks after the

surgery. Scores for overall quality of life, physical health and mental health improved in the period between baseline and immediately before the operation. The benefits of the combined therapy extended into the post operative period as well.

A second group that did not receive these therapies prior to surgery was also evaluated. They experienced declines in scores that evaluated physical and mental health, and quality of life. The group receiving the intervention also tended to have lower blood pressure and less oxidative stress.

Is Green Tea Good for Your Heart?

"When the solution is simple, God is answering."—
Albert Einstein

A study that appeared in *Clinical Research in Cardiology* (March 10, 2010, epublished), looked at the effect epigallocatechin-3-gallate (also called EGCG, which is an antioxidant extract [polyphenol] from green tea) had on patients with amyloidosis involving the heart. Amyloidosis is a disease that occurs when proteins accumulate abnormally in the organs. Amyloid protein is an abnormal protein that is produced by cells in the bone marrow. Amyloidosis affects different organs in different people and can affect the heart, liver, spleen, kidneys or nervous system. The disease begins in the bone marrow. One of the roles of bone marrow is to make antibodies, which are proteins that help protect against infection. In amyloidosis, the body has trouble breaking down

those proteins. The proteins accumulate and are deposited in various organs.

The subjects of the study were 59 patients who had amyloidosis, with cardiac involvement. The subjects were placed in one of two groups. One group consumed green tea, the other, acting as a control, did not. The group that consumed the green tea had a decrease in the thickening of the heart wall and a decrease in the size of the left ventricle. They also had improvement in cardiac efficiency (increase in the left ventricular ejection fraction). The control group enjoyed none of these improvements.

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