



Special Interest Articles:

- Magnesium and CHF
- Insulin insensitivity and sleep
- Congestive heart failure
- CoQ₁₀, carnitine and CHF
- Arginine and congestive heart failure
- Hawthorn and CHF
- Congestive heart failure and thiamin

Vitamin B₁₂ and Aging

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, forgetfulness 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 (B₁₂) 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 and Cognition

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.

Magnesium and CHF

The survival rate was higher in the magnesium group (75.7% compared to 51.6% in the placebo group). Also, symptoms improved in 38.5% of the patients receiving magnesium, while 56.3% of the placebo group's symptoms became more severe.

Research that appeared in the *American Heart Journal* (June 1993;125:1645-1649) looked at the effect I.V. magnesium sulfate had on patients with congestive heart failure. Magnesium was given intravenously to patients with congestive heart failure, arrhythmia and in those with serum magnesium levels lower than 2.0 mg/dl. The patients all had at least 10 premature ventricular depolarizations per hour as determined by a six hour ambulatory electrocardiograph reading. There was a significant decrease in premature ventricular depolarizations from treatment with magnesium. A study that appeared in the *Journal of the American College of Cardiology* (1990;16 (4):827-831) found 19% of a sampling of 199 patients with congestive heart failure and low serum magnesium. Considering that serum magnesium is a poor way to determine deficiency, it would be interesting to see what RBC magnesium levels were in this group of patients.

Patients with congestive heart failure seem to benefit from magnesium supplementation. A double-blind, placebo-controlled study appeared in the *International Journal of Cardiology* (2009; 134(1): 145-7) that involved 79 patients with severe congestive heart failure. The subjects were randomly selected to receive either magnesium orotate or a placebo for one year. The survival rate was higher in the magnesium group (75.7% compared to 51.6% in the placebo group). Also, symptoms improved in 38.5% of the patients receiving magnesium, while 56.3% of the placebo group's symptoms became more severe.

Drugs that are used by heart patients may deplete magnesium. Research appearing in *Magnesium Bulletin* (1994;16(3):98-100) demonstrated that treatment with ACE inhibitors deplete magnesium.

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.

Congestive Heart Failure (CHF)

An article appearing in *The Lancet* (1998;352(Suppl. 1):39-41) notes that the incidence of heart failure has dramatically increased in the last three or four decades. The prevalence of heart failure increased by 70% between 1990 and 2000.

Statin use is on the rise, and during the decade between 1990 and 2000 statins really came into their own. CoQ₁₀ is a substance that is produced by every cell in the body and is necessary for the production of energy. Statins chemically block the formation of CoQ₁₀. There is a lot of research demonstrating that giving CoQ₁₀ to patients with CHF improves their cardiac function. Also, there is a tendency for people with CHF to have low levels of CoQ₁₀.

It is possible that one way to prevent the development of heart failure in patients taking statins is to supplement with CoQ₁₀. Statins deplete CoQ₁₀, low CoQ₁₀ is linked to heart failure, and the incidence of heart failure has been increasing as statin use increases. Also, the muscle pain that is associated with statin use is from rhabdomyolysis, which is the destruction of muscle. The heart happens to be made mostly of muscle. This is one reason that it is vital that you notify

your doctor if you begin to have muscle pain while taking statins. The connection between statin use and heart failure is not proven, there needs to be research to establish the connection. However, taking CoQ₁₀ seems like a reasonable precaution.

Diuretics are commonly prescribed for people with CHF. Furosemide (sold under the brand name Lasix) may deplete magnesium and thiamin. Thiamin and magnesium are two nutrients that also seem to be of benefit to patients with heart failure. Replacing those nutrients may something to discuss with your doctor.

Carnitine is another substance that has been studied and seems to benefit patients with congestive heart failure. It has not yet been incorporated into the standard treatment for congestive heart failure.

Congestive heart failure is one condition for which traditional medicine seems to lack an effective therapy. Fortunately, in some studies, it has responded to a number of nutrients. The studies have not been deemed conclusive, but this is a topic that is worth discussing with your doctor (since it is never a good idea to treat yourself).

Statins deplete CoQ₁₀, low CoQ₁₀ is linked to heart failure, and the incidence of heart failure has been increasing as statin use increases.

CoQ₁₀, Carnitine and CHF

Heart failure exists when the heart cannot pump enough blood to meet the body's needs. Congestive heart failure (CHF) develops gradually, as the pumping action of the heart grows weaker. It can be either right-sided or bilateral. When right-sided heart failure occurs, the heart cannot pump enough blood to the lungs to gain oxygen. It causes fluid to build up in the feet, ankles, legs, liver, abdomen and in the veins in the neck. When left-sided heart failure occurs, the heart cannot pump enough oxygen-rich blood to the remaining areas of the body; about 5.7 million Americans have heart failure, resulting in 300,000 deaths per year and 400,000 new cases diagnosed annually (source: NHLBI). Fatigue and shortness of breath are common symptoms.

There are many natural treatments that can improve the condition of those suffering from congestive heart failure. There is a lot of research showing that these patients can benefit from coenzyme Q₁₀. Research appearing in *Clinical Investigator* (1993;71:S 145-S 149) showed that 54% patients receiving three months of coenzyme Q₁₀ supplementation (between 50 and 150 milligrams per day) had improvements in at least three symptoms of heart failure. Large percentages of patients experienced improvements with 81% having less cyanosis, 76.9% with less edema, 54.% having less shortness of breath, 62% having less arrhythmia

and 73% having less vertigo. Also, the severity of symptoms correlated with low coenzyme Q₁₀ levels, according to research that appeared in the *International Journal of Tissue Reactions* (1990;12(3):155-162).

Carnitine is another supplement that seems to be of value to patients with congestive heart failure. Research that appeared in the *American Heart Journal* (February, 2000;139(2 Part 3):S120-S123) showed that carnitine supplementation over a period of nearly 34 months improved the survival rate of CHF patients. In the journal *Circulation* (January 1992;56:86-94) myocardial damage was able to be prevented in hamsters. Supplementation in 12 CHF patients improved exercise tolerance. In research appearing in *Acta Cardiology* (2007; 62(4): 349-54) showed that supplementing CHF patients with a combination of carnitine and coenzyme Q₁₀ produced favorable results in CHF patients. In the double-blind, placebo controlled study patients receiving coenzyme Q₁₀ and carnitine for a period of 12 weeks had lower levels of chemicals that indicate the presence of inflammation (interleukin-6 and TNF-alpha) and had less fatigue and shortness of breath when compared to controls.

Arginine and Congestive Heart Failure

A study that appeared in the *Journal of the American College of Cardiology* (November 1, 1995;26(5):1251-6) looked at the effect arginine had on patients with congestive heart failure. L-Arginine was given intravenously to 12 patients with either New York Heart Association class II or class III heart failure. The treatment produced significant increases in stroke volume and cardiac output. There was also a lowering of mean arterial blood pressure and systemic vascular resistance.

Other research appearing in *Clinical Cardiology* (2000;23:205-210) also found that an infusion

with L-arginine reduced arterial pressure, reduced heart rate (from an average of 88 beats per minute to 80 beats per minute), increased right arterial pressure, increased cardiac output and increased stroke volume. The treatment improved overall cardiac performance.

Results from a study that appeared in *Circulation* (August 1994;90(20):658-668) suggest that the benefit from L-arginine may be from an improvement of the release of nitric oxide from the endothelium.

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Hawthorn and CHF

Hawthorn (*Crataegus species*) has been used to treat heart disease since the 1st century. Traditional use of the berries include the treatment of heart problems ranging from irregular heartbeat, high blood pressure, chest pain, hardening of the arteries, and heart failure.

A double-blind, placebo-controlled study appeared in *Phytomedicine* (2003;10(5):363-9); it looked at the effectiveness of treatment with

Crataegus berries (Hawthorn) had on patients with heart failure. A total of 143 subjects, with a mean age of 64.8, participated in the study. They were treated with either a standardized extract of Crataegus berries or a placebo for a period of eight weeks. There was a greater improvement in exercise tolerance, and a reduction in both fatigue and shortness of breath in the supplemented group as compared to those receiving the placebo.

Congestive Heart Failure and Thiamin

"Happiness: a good bank account, a good cook and a good digestion."

—Jean Jacques Rousseau

Patients on the diuretic furosemide (sold under the brand name Lasix) tend to be deficient in thiamin. A study appearing in *The American Journal of Medicine* (1991;151-155) measured thiamin status in 23 patients with congestive heart failure who were taking furosemide. A high thiamin pyrophosphate effect, which indicates thiamin deficiency, was found in 21 of the 23 subjects. Thiamin deficiency was only found in two out of 16 controls. This result was confirmed by other research appearing in the *Journal of the American College of Cardiology* (2006; 47: 354-61), which found that 33% of 100 hospitalized patients with congestive heart failure were thiamin deficient. Only 12% of healthy controls were found to be thiamin deficient.

Beriberi is the disease of thiamin deficiency. Wet beriberi affects the cardiovascular system and is characterized by an enlarged heart, and congestive heart failure.

There is some research that indicates supplementation with thiamin may be of benefit to patients with congestive heart failure. A study appearing in *The American Journal of Medicine* (May 1995;98:485-490) looked at 30 patients with severe congestive heart failure who were also taking furosemide. In the double-blind study, the patients were given either IV thiamin (200 milligrams per day) or a placebo. The thiamin group experienced improvement in left ventricular ejection fraction--increasing by 22% in 27 patients who completed the full seven-week therapy. The authors of the study concluded that thiamin supplementation would be a beneficial addition to conventional therapy for congestive heart failure.

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