ASK THE DOCTOR

Answers to Your Health Questions

Heart Health & COQ10

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CoQ10—Heart disease

More than 40% of all deaths in the U.S. are from cardiovascular disease (CVD). You have a greater chance of dying from heart disease than from cancer, AIDS, diabetes, and accidents combined. More than 2,600 Americans die each day of CVD—an average of 1 death every 33 seconds. One in 5 men and women have some form of CVD. If all forms of major CVD were eliminated, life expectancy would rise by almost 7 years.[1]

One of the most—if not the most—important things people can do to improve their overall health and life expectancy is to improve their heart health. Diet, exercise, and the wise use of dietary supplements can improve heart health dramatically.[2] One dietary supplement that's extremely beneficial to heart health is coenzyme Q10 (CoQ10).[3]

Q. What is CoQ10?

A. CoQ10 is a natural, fat-soluble nutrient present in virtually all cells. CoQ10 also is known as ubiquinone. That's because CoQ10 is ubiquitous and exists everywhere there is life. CoQ10 is vital to adenosine triphosphate (ATP) production.[4] ATP is the energy-rich compound used for all energy-requiring processes in the body. Although CoQ10 is produced by the body and exists in some dietary sources, these levels may be insufficient to meet the body's requirements. CoQ10 levels diminish with age and as a result of dietary inadequacies and various disease states.[4-6] Also, some drugs, especially a group of cholesterol-lowering prescription drugs known as "statins," (Pravachol®, Zocor®, Lipitor®, etc.) significantly reduce CoQ10 levels in the body.[7,8]

Q. For what health conditions is CoQ10 used?

A. CoQ10 is beneficial in treating and preventing CVD and conditions such as high blood pressure,[9] atherosclerosis (hardening of the arteries),[10] angina,[11] and congestive heart failure (CHF).[12] It's been shown that heart attacks tend to occur when CoQ10 levels are low in the body.[13] In addition, CoQ10 is beneficial for diabetes,[14] immune dysfunction,[15] cancer,[16] periodontal disease,[17] prostate cancer,[18] and neurological disease.[19]

Q. Why is CoQ10 especially important to heart health?

A. The heart is one of the most metabolically active tissues in the body. In the average person, the heart propels 2,000 gallons of blood through 65,000 miles of blood vessels by beating 100,000 times each day.[20] Thus, it requires large amounts of uninterrupted energy. Heart cells have a greater number of mitochondria, and subsequently, more CoQ10 than any other type of cell.[21,22] Each heart cell can have thousands of mitochondria to meet these energy demands.[23]

Mitochondria are highly specialized structures within each cell and are often referred to as cell powerhouses. These tiny energy-producers produce 95% of the energy the body requires. The number of mitochondria in a cell depends on its function and energy needs. A cell's ATP production is dependent on adequate amounts of CoQ10.[21,22]

Heart disease patients are commonly CoQ10 deficient. Correcting such deficiencies often can produce amazing results.[24] The presence of supplemental

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CoQ10 is a key to the heart's optimum performance.[25]

In people who have had a heart attack (myocardial infarction), CoQ10 assists in repairing the heart muscle and restoring heart function. This is due to increased ATP production.[26]

Q. What studies support this fact?

A. A 1998 study found CoQ10 can provide rapid protective effects in patients with a heart attack if administered within three days of the onset of symptoms. The study focused on patients admitted to the hospital with an acute myocardial infarction (AMI) diagnosis. Seventy-three patients received CoQ10 (120 mg/d). The study's control group consisted of 71 similarly matched patients with acute AMI. After treatment, angina pectoris (severe chest pain signifying interrupted blood flow to the heart), total arrhythmias (dangerously irregular heartbeats), and poor function in the left ventricle (the essential chamber of the heart) were significantly reduced in the CoQ10 group compared to the placebo group. Total deaths due to sudden cardiac failure and nonfatal heart attacks also were significantly reduced in the CoQ10 group compared with the placebo group.[27]

In another study, CoQ10 was studied in 109 patients with high blood pressure (hypertension). The patients were given varying doses of supplemental CoQ10 with the goal of attaining a certain blood level (greater than 2.0 mcg/l). Most patients were on medications to treat hypertension. Half the patients were able to stop taking one to three anti-hypertensive drugs at an average of 4.4 months after starting CoQ10. Only 3% of patients required the addition of one antihypertensive drug. The 9.4% of patients who had echo cardiograms, performed both before and during treatment, experienced a highly significant improvement in heart wall thickness and function. This improvement was directly attributed to CoQ10 supplementation.[28]

Congestive heart failure (CHF) is a debilitating disease that affects 5 million people in the U.S. It causes edema, difficult breathing, and impaired circulation. In another study, CoQ10 restored healthy heart function in CHF patients. Patients received 100 mg of CoQ10 or a placebo twice daily for 12 weeks. Before and after the treatment period, the investigators introduced a catheter into the right ventricle of patients' hearts to determine the degree of CHF damage to the heart muscle. The patients' heart muscles at rest and work improved significantly. The researchers concluded CHF patients would greatly benefit from adjunctive CoQ10 treatment.[29]

Q. I've heard that CoQ10 can also help people who have neurological diseases. Is this true?

A. Yes, it is. CoQ10 has been studied for its ability to improve the health of individuals with amotrophic lateral sclerosis (ALS),[30] Parkinson's disease,[31] and Huntington's disease.[32] A recently completed study sponsored by the National Institutes of Health showed that CoQ10 caused a slowing of the progression of Huntington's disease, a devastating and degenerative disease that is always fatal. In fact, no other medication, drug, or nutritional supplement has ever been shown to cause a decline in the progression of this terrible disease.

The study compared CoQ10 against remacemide (an investigational HD drug made by AstraZeneca Pharmaceuticals), in 347 HD patients who were in the early stages of the disease. Remacemide blocks glutamate, the neurotransmitter scientists think may cause the death of brain cells that occurs in Huntington's disease.[33] While remacemide had no effect on the progression of HD, CoQ10 showed a trend toward slowing the disease by an average of 15%. This meant the HD group taking CoQ10 was able to handle every day activities of life a little longer than the patients taking remacemide or a placebo. They also were able to focus their attention better, were less depressed, and less irritable. The 15% slowing of decline means that CoQ10 can result in about one more year of independence for HD patients.[32] Needless to say, the gift of an additional year of health in the lives of HD patients is incredibly significant.

Because of these impressive results with HD, researchers are hopeful that the studies of CoQ10 in those with ALS and Parksinson's disease will similarly have a positive effect on the symptoms and/or progression of these neurological disorders, too.

Q. Why is it crucial for a CoQ10 supplement to cross the blood-brain barrier?

A. The brain's blood vessels are composed of cells with extremely tight junctions. These junctions form the blood-brain barrier, which restricts what can pass from the bloodstream into the brain. While this barrier protects the brain, it can be a significant obstacle to central nervous system disorder therapy. To leave the bloodstream and reach the brain cells, a substance must pass through the tightly connected cells of the capillary walls. Only substances with unique solubilities or those with a transport system can cross the blood-brain barrier to a significant degree.[34-36] As a result, crossing the blood-brain barrier presents a significant challenge to supporting neurological health.

While most CoQ10 supplements enter the bloodstream and increase blood serum levels, only special forms of CoQ10 have been shown to cross the blood-brain barrier.[37] For CoQ10 to enter the mitochondria within the brain, CoQ10 must first cross the blood-brain barrier to produce significant neurosupportive clinical results.

Q. How can one supplement have applications for neurological diseases, heart health, and even the immune system?

A. Supplements often have more than one function, especially when it's a substance like CoQ10, which is present in all parts of the body. All nucleated cells

(most cells other than red blood cells) have mitochondria and all cells require energy to function. CoQ10 is vital to ATP production.[21,22] Thus, CoQ10 has applications not only in neurological (neurons or nervous system cells) and cardiac health (myocardium or heart tissue), but also for the immune system.[38]

Q. Are all CoQ10 supplements created equal? Doesn't CoQ10 just have to get into the bloodstream to be effective?

A. There are some important distinctions among CoQ10 products, as they vary greatly in quality and absorbability. It's crucial to find a CoQ10 product that's:

1. Scientifically shown to absorb through the digestive tract, cross cellular membranes, and increase mitochondrial levels of CoQ10. Chewable forms of CoQ10 provide rapid bioavailability and absorption. Serum level determination of CoQ10 in the bloodstream is not necessarily the most important measure of efficacy. For a CoQ10 supplement to be fully effective, it must cross the cellular barrier and raise intracellular CoQ10 levels. A key indicator of effective CoQ10 supplementation is its presence in cell mitochondria.[37]

2. The natural form of CoQ10. The natural process uses living organisms. CoQ10 also can be synthesized by a chemical process, which produces a distinctly different product that contains chemical compounds not found in the natural form.

3. Formulated with ingredients that provide the transport system CoQ10 needs to cross cellular membranes and the blood-brain barrier. Not all forms of CoQ10 have been scientifically proven to cross cell membranes and the blood-brain barrier.[37] Some prestigious groups that have investigated this issue include researchers at Massachusetts General Hospital and Harvard Medical School.[37]

4. Studied by respected organizations, with research published in peer-reviewed journals by reputable scientists.

Q. How much CoQ10 should I take?

A. Take 100 to 200 mg of CoQ10 daily, depending on your family history of heart disease and personal heart disease experience.

CoQ10's safety has been evaluated. Dosages in studies have ranged from 100 mg to 1,200 mg per day. To date, no toxicities have been reported.[39,40] Occasional mild stomach upset may occur. Taking CoQ10 with meals usually alleviates this rare effect.

Q. What are some other heart-friendly supplements?

A. CoQ10 is an excellent supplement for overall cardiovascular health, as is L-carnitine. L-carnitine is the naturally occurring form of carnitine that's found in food and synthesized in the body. Much of the body's L-carnitine is found in the heart and skeletal muscle, tissues that rely on fatty acid oxidation for most of their energy. Nearly 70% of the energy needed for heart function is derived from fatty acid breakdown.[41] Proper L-carnitine supplementation transports fatty acids into cell mitochondria, where it's burned for energy. L-carnitine is an excellent addition to CoQ10, especially for people with heart disease, and has been shown to improve many symptoms associated with CVD. In one study, people who had experienced one heart attack received either L-carnitine or placebo. The L-carnitine group had a statistically significant reduction in second heart attacks, and improved overall survival.[42]

Q. What supplements support healthy blood pressure and cholesterol?

A. In addition to maintaining overall cardiovascular health, it's also important to address your essential fats/lipids levels and healthy circulation/blood pressure.[2] Fish oil supplements can significantly reduce blood pressure, cholesterol, and homocysteine levels.[43-52] Choose a supplement that's a rich source of EPA and DHA, omega-3 fatty acids naturally obtainable in fish oil. Find a product that's been clinically studied and purified to ensure it contains the beneficial active constituents of the whole oil, while removing any dioxins, DDT, PCBs, or heavy metals, toxins present in some commercial fish oil preparations.[53] An enteric-coated garlic product that provides a minimum of 5,000 mcg of beneficial allicin supports healthy blood pressure and circulation. And magnesium, niacin, vitamin E, folic acid, hawthorn extract, and L-cysteine provide overall nutritional support to the heart and vascular system.

Conclusion

CoQ10 is not the only answer to the complex issues of heart disease, neurological diseases, or immune dysfunction; however, research indicates that it's a bigger piece of the puzzle than physicians and scientists ever imagined. The more we study this naturally occurring compound, the more benefits we find.

The key to this supplement is the manufacturing quality. For safety and overall effectiveness, use a CoQ10 product that's supported by product-specific research from reputable institutions. Choose tested products from a well-respected company to increase your potential to achieve and maintain heart and blood vessel health.

Supplementation with clinically studied products can have a major impact on your heart's health and strength. However, no supplement replaces the need to eat a healthful diet low in refined foods (especially sugar), and saturated fats, and to exercise your most important muscle—your heart—on a regular basis.

CoQ10 has been shown to restore healthy heart function in congestive heart failure patients, to reduce the likelihood patients needed to take high blood pressure medication, and to provide rapid protective effects in patients with a heart attack if administered within 3 days of the onset of symptoms.

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