USANA Technical Bulletin

Coenzyme Q10

Technical Background

- Coenzyme Q_{10} is an energy coenzyme that plays an essential role in mitochondrial electron transport. As such, it is fundamental for energy production in our cells.
- Coenzyme Q_{10} is also an antioxidant. Its ability to quench free radicals helps to maintain the structural integrity and stability of cell membranes (including intracellular membranes). It further serves to reduce oxidation of low density lipoprotein (LDL) cholesterol.[1]
- Evidence suggests that the most important antioxidant activity of Coenzyme Q_{10} involves regeneration of Vitamin E. It has been proposed that reduction of the Vitamin E phenoxyl radical by ubiquinol (the reduced form of Coenzyme Q_{10}) is the mechanism responsible for this effect.[1]
- Highest levels of Coenzyme Q_{10} are found in the heart, liver, kidney and pancreas.[2]
- CoQ_{10} supplementation has been shown to have therapeutic benefits for several diseases. Among the best documented effects involve cases of heart failure, ischemic heart disease, certain muscular dystrophies, hypertension, and periodontal disease.[3]

Sources and Recommended Intake

- CoQ_{10} is synthesized in all cells of the body, especially in liver cells.
- It is also absorbed from the foods we eat. Major sources of dietary CoQ_{10} include meats, fish, and vegetable oils particularly soybean, sesame, and rapeseed oils[4]. Vegetables are generally low in CoQ_{10} with the exception of spinach and broccoli.
- As aging occurs, the body's ability to synthesize CoQ_{10} diminishes. Deficiencies may also result from reduced assimilation from dietary sources.[5]
- Coenzyme Q_{10} supplements are available and safe. The compound is best absorbed by the body when taken with foods. The usual maintenance dose is 10-30 mg per day, although higher doses are used to treat heart and blood vessel disease.[5]

Abstracts

Langsjoen P, Willis R, Folkers K. Treatment of essential hypertension with coenzyme Q10. Mol Aspects Med 1994;15 Suppl:S265-72. A total of 109 patients with symptomatic essential hypertension presenting to a private cardiology practice were observed after the addition of CoQ10 (average dose, 225 mg/day by mouth) to their existing antihypertensive drug regimen. In 80 per cent of patients, the diagnosis of essential hypertension was established for a year or more prior to starting CoQ10 (average 9.2 years). Only one patient was dropped from analysis due to noncompliance. The dosage of CoQ10 was not fixed and was adjusted

according to clinical response and blood CoQ10 levels. Our aim was to attain blood levels greater than 2.0 micrograms/ml (average 3.02 micrograms/ml on CoQ10). Patients were followed closely with frequent clinic visits to record blood pressure and clinical status and make necessary adjustments in drug therapy. Echocardiograms were obtained at baseline in 88% of patients and both at baseline and during treatment in 39% of patients. A definite and gradual improvement in functional status was observed with the concomitant need to gradually decrease antihypertensive drug therapy within the first one to six months. Thereafter, clinical status and cardiovascular drug requirements stabilized with a significantly improved systolic and diastolic blood pressure. Overall New York Heart Association (NYHA) functional class improved from a mean of 2.40 to 1.36 ($P < 0.001$) and 51% of patients came completely off of between one and three antihypertensive drugs at an average of 4.4 months after starting CoQ10. Only 3% of patients required the addition of one antihypertensive drug. In the 9.4% of patients with echocardiograms both before and during treatment, we observed a highly significant improvement in left ventricular wall thickness and diastolic function.

Baggio E, Gandini R, Plancher AC, Passeri M, Carmosino G. Italian multicenter study on the safety and efficacy of coenzyme Q10 as adjunctive therapy in heart failure. CoQ10 Drug Surveillance Investigators. Mol Aspects Med 1994;15 Suppl:s287-94. Digitalis, diuretics and vasodilators are considered the standard therapy for patients with congestive heart failure, for which treatment is tailored according to the severity of the syndrome and the patient profile. Apart from the clinical seriousness, heart failure is always characterized by an energy depletion status, as indicated by low intramyocardial ATP and coenzyme Q10 levels. We investigated safety and clinical efficacy of Coenzyme Q10 (CoQ10) adjunctive treatment in congestive heart failure which had been diagnosed at least 6 months previously and treated with standard therapy. A total of 2664 patients in NYHA classes II and III were enrolled in this open noncomparative 3-month postmarketing study in 173 Italian centers. The daily dosage of CoQ10 was 50-150 mg orally, with the majority of patients (78%) receiving 100 mg/day. Clinical and laboratory parameters were evaluated at the entry into the study and on day 90; the assessment of clinical signs and symptoms was made using from two-to seven-point scales. The results show a low incidence of side effects: 38 adverse effects were reported in 36 patients (1.5%) of which 22 events were considered as correlated to the test treatment. After three months of test treatment the proportions of patients with improvement in clinical signs and symptoms were as follows: cyanosis 78.1%, oedema 78.6%, pulmonary rales 77.8%, enlargement of liver area 49.3%, jugular reflux 71.81%, dyspnoea 52.7%, palpitations 75.4%, sweating 79.8%, subjective arrhytmia 63.4%, insomnia 662.8%, vertigo 73.1% and nocturia 53.6%. Moreover we observed a contemporary improvement of at least three symptoms in 54% of patients; this could be interpreted as an index of improved quality of life.

References

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