

L-carnitine treatment for congestive heart failure--experimental and clinical study.

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To evaluate the therapeutic efficacy of l-carnitine in heart failure, the myocardial carnitine levels and the therapeutic efficacy of l-carnitine were studied in cardiomyopathic BIO 14.6 hamsters and in patients with chronic congestive heart failure and ischemic heart disease. BIO 14.6 hamsters and patients with heart failure were found to have reduced myocardial free carnitine levels (BIO 14.6 vs FI, 287 ± 26.0 vs 384.8 ± 83.8 nmol/g wet weight, p less than 0.05; patients with heart failure vs without heart failure, 412 ± 142 vs 769 ± 267 nmol/g p less than 0.01). On the other hand, long-chain acylcarnitine level was significantly higher in the patients with heart failure (532 ± 169 vs 317 ± 72 nmol/g, p less than 0.01). Significant myocardial damage in BIO 14.6 hamsters was prevented by the intraperitoneal administration of l-carnitine in the early stage of cardiomyopathy. Similarly, oral administration of l-carnitine for 12 weeks significantly improved the exercise tolerance of patients with effort angina. In 9 patients with chronic congestive heart failure, 5 patients (55%) moved to a lower NYHA class and the overall condition was improved in 6 patients (66%) after treatment with l-carnitine. L-carnitine is capable of reversing the inhibition of adenine nucleotide translocase and thus can restore the fatty acid oxidation mechanism which constitutes the main energy source for the myocardium. Therefore, these results indicate that l-carnitine is a useful therapeutic agent for the treatment of congestive heart failure in combination with traditional pharmacological therapy.

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