

SUPPLEMENTAL UBIQUINOL IN PATIENTS WITH ADVANCED CONGESTIVE HEART FAILURE

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Introduction

Patients with advanced congestive heart failure (New York Heart Association Class IV and ejection fraction of less than 35%) often fail to achieve adequate plasma total coenzyme Q₁₀ (CoQ₁₀) levels on supplemental ubiquinone at dosages up to 900 mg/day. These patients often have plasma total CoQ₁₀ levels of less than 2.0 µg/ml and respond poorly if at all with very little improvement in ejection fraction. It is postulated that the intestinal and hepatic edema in these critically ill patients may impair CoQ₁₀ absorption. Of the three published controlled trials of supplemental CoQ₁₀ in congestive heart failure that failed to show significant benefit, one study by Permanetter et al. [1] failed to measure CoQ₁₀ levels and the other two controlled studies demonstrated sub-therapeutic plasma CoQ₁₀ levels on therapy. The study by Watson et al. [2] demonstrated a mean plasma CoQ₁₀ level of only 1.7 µg/ml in the treatment group with only two of 30 patients having a level greater than 2.0 µg/ml. Finally, the trial by Khatta et al. [3] demonstrated a mean plasma CoQ₁₀ level of 2.2±1.2 µg/ml indicating that some patients on treatment had levels as low as 1.0 µg/ml.

Methods

We have identified seven patients with advanced congestive heart failure (mean ejection fraction 22%) with sub-therapeutic plasma total CoQ₁₀ levels with mean level of 1.4 µg/ml on an average dose of 450 mg of ubiquinone (oxidized form of CoQ₁₀) daily. All seven of these patients were changed to 450 mg/day of ubiquinol (reduced form, H₂CoQ₁₀, of CoQ₁₀) with follow-up plasma total CoQ₁₀ levels, clinical status, and ejection fraction measurements by echocardiography.

Results

Follow-up data to date have shown an increase in mean plasma CoQ₁₀ levels from 1.5 µg/ml up to 4.1 µg/ml in six patients with follow-up measurements. Mean ejection fraction has improved from 24% up to 45% in the four patients who have had follow-up echocardiograms to date and clinical improvement has been remarkable.

Conclusions

It is our preliminary observation that ubiquinol has improved gastrointestinal absorption in patients with severe heart failure and that the improvement in plasma CoQ₁₀ levels is associated with both clinical improvement and improvement in measurement of left ventricular function.

References

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3. Khatta M, Alexander BS, Krichten CM, Fisher ML, Freudenberger R, Robinson SW and Gottlieb SS. The effect of coenzyme Q₁₀ in patients with congestive heart failure. *Annals of Internal Medicine* 2000;**132**:641-648.