

## **SUPPLEMENTAL UBIQUINOL IN PATIENTS WITH ADVANCED CONGESTIVE HEART FAILURE**

P H Langsjoen<sup>1</sup>, \*A M Langsjoen<sup>2</sup>

<sup>1</sup>East Texas Medical Center and Trinity Mother Francis Hospital,  
Texas, USA

<sup>2</sup>Coenzyme Q<sub>10</sub> Laboratory, Inc., Tyler, Texas, USA

\*Correspondence: [alilangsjoen@cs.com](mailto:alilangsjoen@cs.com)

### **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 Q<sub>10</sub> (CoQ<sub>10</sub>) levels on supplemental ubiquinone at dosages up to 900 mg/day. These patients often have plasma total CoQ<sub>10</sub> 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 CoQ<sub>10</sub> absorption. Of the three published controlled trials of supplemental CoQ<sub>10</sub> in congestive heart failure that failed to show significant benefit, one study by Permanetter et al. [1] failed to measure CoQ<sub>10</sub> levels and the other two controlled studies demonstrated sub-therapeutic plasma CoQ<sub>10</sub> levels on therapy. The study by Watson et al. [2] demonstrated a mean plasma CoQ<sub>10</sub> 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 CoQ<sub>10</sub> 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 CoQ<sub>10</sub> levels with mean level of 1.4 µg/ml on an average dose of 450 mg of ubiquinone (oxidized form of CoQ<sub>10</sub>) daily. All seven of these patients were changed to 450 mg/day of ubiquinol (reduced form, H<sub>2</sub>CoQ<sub>10</sub>, of CoQ<sub>10</sub>) with follow-up plasma total CoQ<sub>10</sub> levels, clinical status, and ejection fraction measurements by echocardiography.

### **Results**

Follow-up data to date have shown an increase in mean plasma CoQ<sub>10</sub> 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 CoQ<sub>10</sub> levels is associated with both clinical improvement and improvement in measurement of left ventricular function.

### **References**

1. Permanetter B, Rossy W, Klein G, Weingartner F, Seidl KF, Blomer H. Ubiquinone (coenzyme Q10) in the long-term treatment of idiopathic dilated cardiomyopathy. *European Heart J* 1992 Nov; **13** (11):1528-33.

2. Watson PS, Scalia GM, Galbraith A, Burstow DJ, Bett N and Aroney CN. Lack of effect of coenzyme Q on left ventricular function in patients with congestive heart failure. *J. Am Coll Cardiol* 1999;**33**:1549-1552.
3. Khatta M, Alexander BS, Krichten CM, Fisher ML, Freudenberger R, Robinson SW and Gottlieb SS. The effect of coenzyme Q<sub>10</sub> in patients with congestive heart failure. *Annals of Internal Medicine* 2000;**132**:641-648.