

NUTRITION

Heart supplements reach the myocardium

By Kylie Taggart

ATLANTA – Physicians with patients who take supplements containing carnitine, coenzyme Q10 (CoQ10) and taurine for congestive heart failure can rest assured the supplements actually make it to where they are needed: the myocardium.

In a study presented here, Canadian researchers found taking the supplements also had a significantly reduced left end diastolic volume compared to patients on a placebo. "In heart failure we recognize that patients are under neurohormonal stress and hemodynamic stress. We would postulate that patients are also under nutritional stress and we should add (these supplements) to the treatment arm of these patients," said Dr. Farida Jeejeebhoy, lead investigator and staff cardiologist at the William Osler Health Centre Memorial Campus in Brampton, Ont.

The proteins are essential for normal cell function, and previous studies have found heart failure patients are depleted of these proteins in their myocytes. CoQ10 is essential for the flow of electrons through the mitochondria, carnitine is essential for fatty acid transport and glucose oxidation, and taurine is essential for calcium homeostasis.

"If the cell is depleted of carnitine and CoQ10, which are essential for energy production, you can imagine the cell is not as capable of producing as much energy," explained Dr. Jeejeebhoy.

Increasing the level of these proteins in the myocardium could potentially improve myocardial function. Until this study it was not known if taking oral supplements of these proteins led to increased concentrations in the myocardium.

Dr. Jeejeebhoy and colleagues examined 41 patients with congestive heart failure and an ejection fraction less than 40%. All patients were scheduled to have aortocoronary artery bypass surgery and myocardium biopsies were taken during surgery.

Patients were randomized to either a Myovive supplement or a placebo. The daily dose of Myo-vive given to the patients contained 3 g carnitine, 150 mg CoQ10 and 3 g taurine. Patients took the supplement for an average of 30 days before the biopsy was taken during surgery.

When the biopsies were compared, those who took Myovive had significantly higher concentrations of CoQ10, taurine and carnitine compared to patients who were on the placebo.

"We've proven the first very important physiological point with regard to the whole hypothesis of how these supplements work and that is if you take it, it gets into your myocytes," Dr. Jeejeebhoy said.

The supplement was well tolerated, with no significant difference in adverse events between the placebo and supplement group. The supplement group did have some increase in minor gastrointestinal upsets such as nausea, diarrhea and vomiting.

There was an increase in creatinine level in the supplement group, but Dr. Jeejeebhoy said she thinks this is due to substrates of the other ingredients of Myovive, and not an indication of poor kidney function.

Left ventricular diastolic volume was measured at baseline and prior to surgery. It increased in the placebo group, but decreased in the patients taking Myovive. These results suggest the supplements could improve prognosis of heart failure patients.

Whether the supplements improved long-term outcomes in heart failure patients could not be evaluated in this trial, Dr. Jeejeebhoy said. "The short- and long-term significance of this needs to be proven in larger studies." Further studies are planned. Dr. Lee Erret will lead a 300-patient trial at St. Michael's Hospital in Toronto evaluating Myovive supplements in surgery patients. A six-month followup is planned. Another trial in heart failure patients is planned in the U.K.

Dr. Jeejeebhoy presented the results here last month as part of the scientific sessions of the American College of Cardiology.