

# Difference of Baseline Serum Copper Levels Between Groups of Patients with Different One Year Mortality and Morbidity and Chronic Heart Failure

Málek F.<sup>1</sup>, Dvořák J.<sup>2</sup>, Jirešová E.<sup>1</sup>, Špaček R.<sup>1</sup>

<sup>1</sup> Dept. of Medicine III - Cardiology, University Hospital Vinohrady, Prague

<sup>2</sup> National Institute of Public Health, Prague, Czech Republic

## SUMMARY

**Background:** Serum copper concentrations as indicators of non-specific inflammatory response are higher in patients with severe heart failure than in patients with mild to moderate cardiac insufficiency and correlate with acute phase protein concentrations. The aim of this study was to find out if baseline serum copper concentrations are higher in patients with chronic heart failure and higher one year mortality and morbidity and whether serum copper concentrations correlate with prognostic indicators.

**Methods and results:** Baseline serum copper concentrations were determined in 64 patients with chronic heart failure, functional classification NYHA II-IV (NYHA - New York Heart Association), caused by ischemic heart disease, with severe left ventricular dysfunction (ejection fraction 35%). 30 patients died or were admitted to the hospital because of worsening heart failure (group A) within 12 months since their examination. 34 patients did not die and hospitalisation was not necessary within 12 months (group B). Retrospectively the presence of differences in serum copper concentrations and in prognostic indicators was assessed between both groups. Statistically significant differences between both groups were found in these parameters: baseline serum copper concentrations ( $p < 0.001$ ), ejection fraction of left ventricle ( $p < 0.05$ ), baseline heart rate ( $p < 0.01$ ) and cardiothoracic ratio ( $p < 0.01$ ). Serum copper concentrations significantly correlate with heart rate ( $p < 0.01$ ), inverse correlation with left ventricular ejection fraction and positive correlation with cardiothoracic ratio are not statistically significant.

**Conclusions:** Baseline serum copper concentrations are significantly higher in patients with chronic heart failure, also correlating with higher one-year mortality and morbidity. Serum copper levels significantly correlate with baseline heart rate. Relation of serum copper concentrations with left ventricular ejection fraction and cardiothoracic ratio is not statistically significant.

**Key words:** chronic heart failure, serum copper concentrations, left ventricular ejection fraction, heart rate, cardiothoracic ratio

**Address for correspondence:** F. Málek, Dept. of Medicine III - Cardiology, University Hospital Vinohrady, 3rd Medical Faculty, Charles University, Šrobárova 50, 100 34 Prague, Czech Republic. E-mail: malek@fnkv.cz, filip.malek@centrum.cz, kardsekr@fnkv.cz