Clin Res Cardiol. 2014 Nov;103(11):938-49. doi: 10.1007/s00392-014-0735-x. Epub 2014 Jun 8.

Clinical and echocardiographic correlates of serum copper and zinc in acute and chronic heart failure.

Alexanian I[1], Parissis J, Farmakis D, Athanaselis S, Pappas L, Gavrielatos G, Mihas C, Paraskevaidis I, Sideris A, Kremastinos D, Spiliopoulou C, Anastasiou-Nana M, Lekakis J, Filippatos G.

Author information

Abstract

AIM: Emerging evidence suggests a pathophysiological role of micronutrient dyshomeostasis in heart failure, including promotion of adverse remodeling and clinical deterioration. We sought to evaluate serum copper (Cu) and zinc (Zn) levels in acute (AHF) and chronic (CHF) heart failure.

METHODS: We studied 125 patients, 71 % male, aged 69 ± 11 years, 37 % with preserved left ventricular ejection fraction (LVEF ≥40 %) (HFPEF), including 81 with AHF and 44 with CHF; 21 healthy volunteers served as controls. Serum Cu and Zn levels were determined using air-acetylene flame atomic absorption spectrophotometry.

RESULTS: Serum Cu levels were significantly higher in AHF ($p = 0.006$) and CHF ($p = 0.002$) patients compared to controls after adjusting for age, gender and comorbidities, whereas they did not differ between AHF and CHF ($p = 0.840$). Additionally, serum Cu in patients with LVEF <40 % was significantly higher compared to both controls ($p < 0.001$) and HFPEF patients ($p = 0.003$). Serum Zn was significantly lower in AHF ($p < 0.001$) and CHF ($p = 0.039$) compared to control after adjusting for the above-mentioned variables. Moreover, serum Zn was significantly lower in AHF than in CHF ($p = 0.015$). In multiple linear regression, LVEF ($p = 0.033$) and E/e ratio ($p = 0.006$) were independent predictors of serum Cu in total heart failure population, while NYHA class ($p < 0.001$) and E/e ratio ($p = 0.007$) were independent predictors of serum Zn.

CONCLUSION: Serum Cu was increased both in AHF and CHF and correlated with LV systolic and diastolic function. Serum Zn, in contrast,

was decreased both in AHF and CHF and independently predicted by clinical status and LV diastolic function.

PMID: 24908339 DOI: 10.1007/s00392-014-0735-x

[Indexed for MEDLINE]

Publication type, MeSH terms, Substances

LinkOut - more resources

PubMed Commons

PubMed Commons home

0 comments

How to join PubMed Commons