

Magnesium and C-reactive protein in heart failure: An anti-inflammatory effect of magnesium administration?

Dorit Almozni-Sarafian^a, Sylvia Berman^b, Anat Mor^c, Miriam Shteinshnaider^a, Oleg Gorelik^a, Irma Tzur^a, Irena Alon^a, David Modai^b, Natan Cohen^a

Departments of ^aInternal Medicine “F”, ^bNephrology and ^cClinical Chemistry, Assaf Harofeh Medical Center, Zerifin, 70300, affiliated to Sackler School of Medicine, Tel Aviv University, Tel Aviv, Israel.

Background: Little is known about the relationship between serum magnesium (Mg) and C-reactive protein (CRP) in heart failure (HF).

Aim of the study: To investigate the relationship, if any, between serum Mg and CRP in HF patients and, concomitantly, to test a hypothesis that Mg supplementation might affect serum CRP levels.

Methods: Serum Mg and CRP were evaluated in 68 patients with chronic systolic HF and 65 controls. Following 5 weeks, serum Mg, CRP and intracellular Mg were reevaluated in 17 HF patients after administration of oral Mg citrate 300 mg/day (group A), and 18 untreated HF patients (group B). In order to obtain Gaussian distribution, logarithmic transformation of CRP was performed.

Results: Inverse correlation was found between serum Mg and log CRP ($r=-0.28$, $P=0.002$). Compared to controls, patients with HF demonstrated higher baseline CRP levels, independent of coexisting conditions, and lower serum Mg values. Following Mg treatment, log CRP decreased from 1.4 ± 0.4 to 0.8 ± 0.3 in group A ($P<0.001$). No significant changes in log CRP were demonstrable in group B. Serum Mg (mmol/l) rose significantly in group A (0.74 ± 0.04 to 0.88 ± 0.08 , $P<0.001$), and to a lesser extent in group B (0.82 ± 0.08 to 0.88 ± 0.08 , $P=0.04$). Intracellular Mg significantly increased only in Mg-treated group A ($P=0.01$).

Conclusions: Oral Mg supplementation to HF patients significantly attenuates blood levels of CRP, a biomarker of inflammation. Targeting the inflammatory cascade by Mg administration might prove a useful tool for improving the prognosis in HF.

