

HYPOMAGNESEMIA IS A SIGNIFICANT PREDICTOR OF ALL-CAUSE AND CARDIOVASCULAR MORTALITY IN MAINTENANCE HEMODIALYSIS PATIENTS

G.Selim, O.Stojceva-Taneva, P.Dzekova-Vidimliski, L.Trajceska, G.Severova-Andeevska, Z. Petronievic, L.Tozija
University Clinic of Nephrology, University "Sts. Cyril and Methodius" Skopje, R. Macedonia



INTRODUCTION AND AIMS

■ Although hypomagnesemia is a risk for cardiovascular (CV) diseases in the general population, there is significant controversy on the relationship between serum magnesium (Mg) and mortality and morbidity in hemodialysis (HD) patients.

■ We examined the association between serum Mg levels categorized into three groups and all-cause and CV mortality in HD patients in a five year follow-up analysis.

METHODS

❖ We studied a cohort of 261 prevalent HD patients receiving thrice-weekly HD treatment, with a dialysate Mg concentration of 1.00 mmol/l.

❖ Patients were categorized into three groups according the serum Mg levels (lower Mg group, Mg < 1.1 mmol/l; intermediate Mg group, Mg between ≥ 1.1 to < 1.29 mmol/l and higher Mg group, Mg ≥ 1.30 ml/l). Study outcomes were five-year all-cause and cardiovascular mortality.

RESULTS

■ During the 5-year follow-up, 117 out of 261 patients (44.8%) had died, most from CV diseases (63.2%).

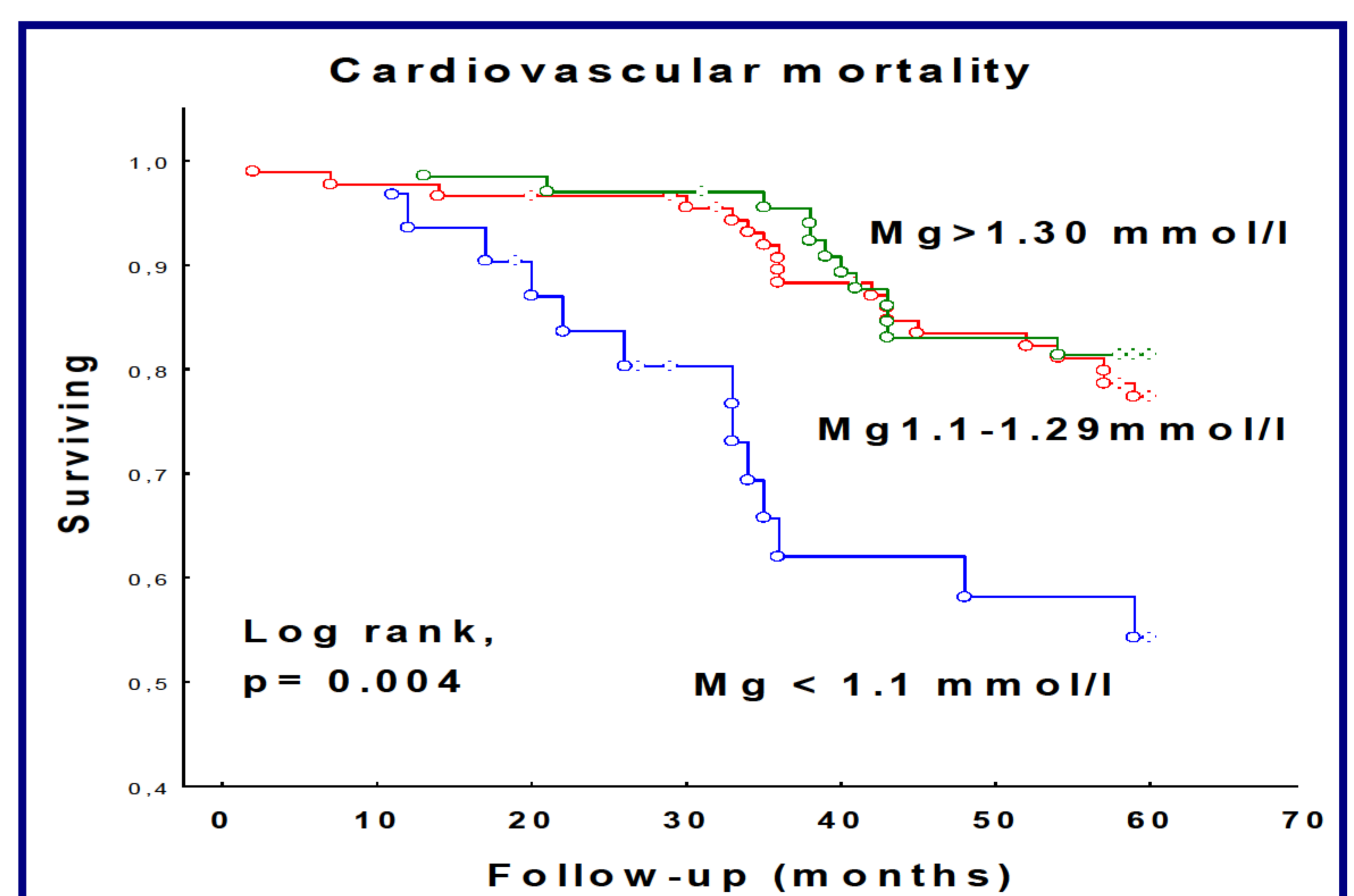
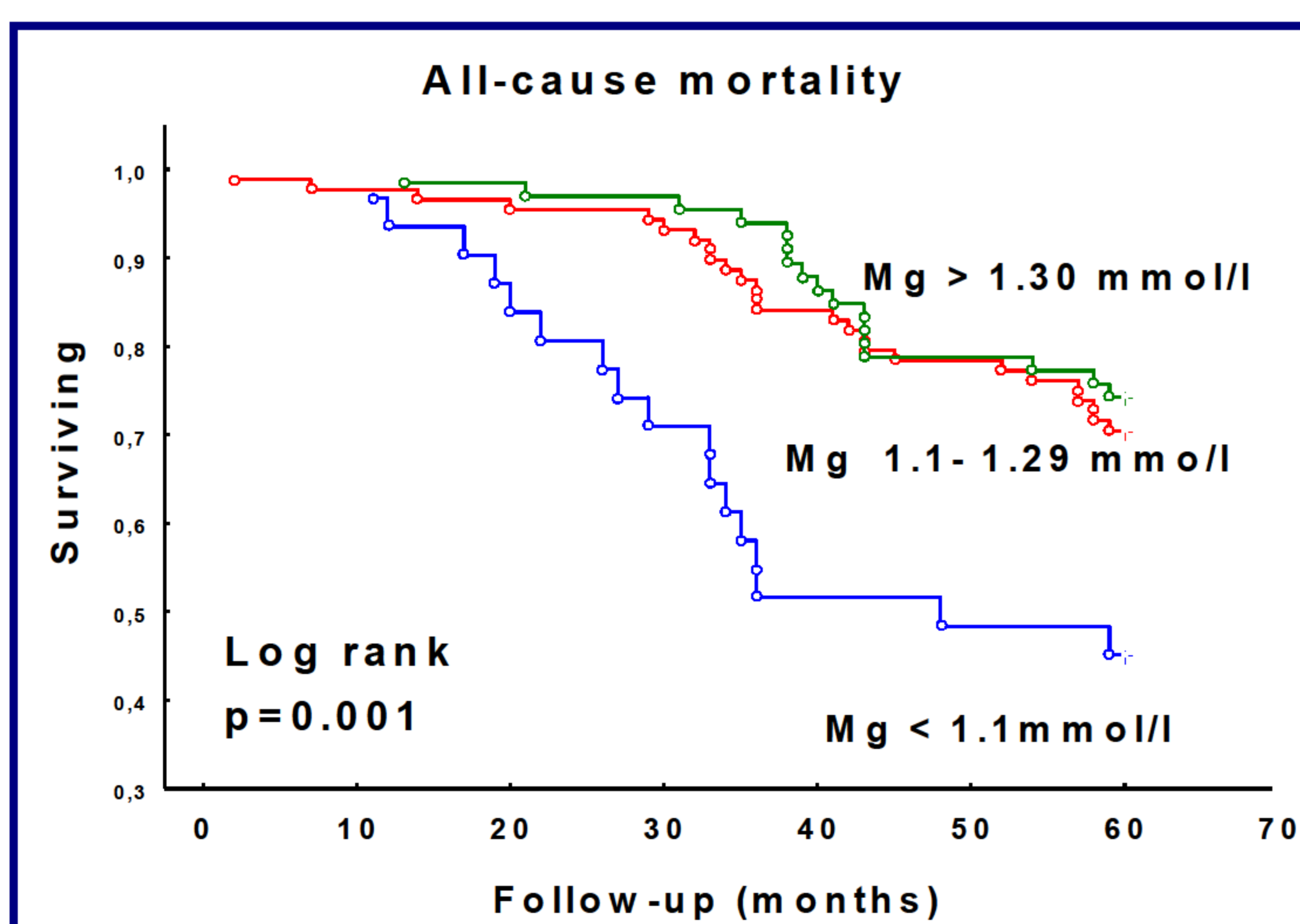
■ The mean serum Mg level was 1.23±0.15 mmol/L (0.83-1.73mmol/L), Among the patients 16.7% were in the lower, 47.6 % in the intermediate and 35.7% in the higher Mg group.

■ Patients with Mg < 1.1 mmol/l, Mg between ≥ 1.1 to < 1.29 mmol/l and Mg ≥ 1.30 mmol/l are significantly different with haemoglobin, serum creatinine, C-reactive protein, brain natriuretic peptide and left ventricular mass index. (Tabl. 1)

■ Mortality analyses between three groups showed that all cause (log rank, p=0.001) and CV mortality (log rank, p=0.004) were significantly higher in the lower Mg group (< 1.1 mmol/L), compared to that in the intermediate Mg group (between ≥ 1.1 to < 1.29 mmol/l) and higher Mg group (≥ 1.30 mmol/l).

Tabl 1. Characteristics of the hemodialysis patients according to serum magnesium concentration

	Mg < 1.1 mmol/l	Mg ≥ 1.11 - < 1.29 mmol/l	Mg ≥ 1.30 mmol/l	P
Hemoglobin / g/l/	98.28 ± 14.31	108.78 ± 10.25	108.43 ± 10.99	0,000
Creatinine / μmol/l/	850.80 ± 236.15	925.02 ± 199.07	956.48 ± 161.52	0.041
CRP / mg/l/	32.17 ± 40.54	14.84 ± 34.97	16.81 ± 26.45	0.003
Brain natriuretic peptide / pg/ml/	4822.91 ± 9293.05	1305.83 ± 1375.73	1394.42 ± 1469.21	0.001
LVMI / g/m ² /	164.41 ± 77.79	134.14 ± 46.17	139.01 ± 42.79	0.005



This study showed that hypomagnesemia (Mg level < 1.11 mmol/l) was significantly associated with an increased risk of all-cause and cardiovascular mortality in HD patients.

Clearly, the effects of magnesium on the cardiovascular system in uremic patients may be more beneficial than anticipated and there's a need for more studies on this issue.

References: 1. Y. Sakaguchi, N. Fujii, T. et al. Hypomagnesemia is a significant predictor of cardiovascular and non-cardiovascular mortality in patients undergoing hemodialysis. *Kidney Int.* 2014; 2. J. Cunningham, M. Rodriguez and P. Messa. Magnesium in chronic kidney disease Stages 3 and 4 and in dialysis patients. *Clin Kidney J.* 2012. 3. M. Alhosaini, J. S. Walter, S. Singh et al. Hypomagnesemia in Hemodialysis Patients: Role of Proton Pump Inhibitors. *Am J Nephrol* 2014

