Low serum magnesium concentrations predict increase in left ventricular mass over 5 years independently of common cardiovascular risk factors.

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Abstract

OBJECTIVE: Left ventricular hypertrophy (LVH) is a significant predictor of adverse cardiovascular events. Experimental studies suggest a pathophysiological role of magnesium (Mg(2+)) in the development of arterial hypertension and LVH.

METHODS: In subjects with complete echocardiographic data from the population-based longitudinal "Study of Health in Pomerania" (n=1348), the difference in left ventricular mass (LVM) over 5 years (echocardiography) was analyzed in relationship to serum Mg(2+) at baseline.

RESULTS: Mg(2+) at baseline (0.790 ± 0.003 mmol/l, mean ± SEM) inversely correlated with the difference in LVM over 5 years (p<0.0001, females: p<0.002, males: p<0.024). In the lowest Mg(2+)-quintile (Mg(2+)<=0.73 mmol/l), LVM (187.4 ± 3.1 g at baseline) increased by 14.9 ± 1.2 g, while in the highest Mg(2+)-quintile (Mg(2+)>0.85 mmol/l) LVM (186.7 ± 3.4 g at baseline) decreased by -0.5 ± 2.8 g (p<0.0001 between quintiles). By multivariable analysis including several cardiovascular risk factors and antihypertensive treatment, serum Mg(2+) was associated with the increase in LVM at a statistically high significant level (p<0.0001). LVM after 5 years was significantly higher in subjects within the lower Mg(2+)-quintiles. This association remained highly significant after adjustment for several cardiovascular risk factors including arterial hypertension and diabetes mellitus.
CONCLUSIONS: Hypomagnesemia is one of the strongest predictors of gain in LVM over the following 5 years.

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