Low serum magnesium is associated with coronary artery calcification in a Korean population at low risk for cardiovascular disease.

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BACKGROUND AND AIMS: Previous studies suggested an association between low serum magnesium levels and metabolic or cardiovascular disease. Additionally, several studies have shown that low serum magnesium is associated with vascular calcification, but there are no studies exploring its relation to coronary artery calcification (CAC). We investigated the relationship between low serum magnesium and CAC by using health examination data.

METHODS AND RESULTS: We cross-sectionally analyzed 34,553 participants who underwent coronary multi-detector computed tomography and serum magnesium level measurement in 2010-2012 as part of a health examination program at a tertiary hospital in Korea. CAC was defined as a coronary artery calcium score > 100. Participants were divided into three groups according to their serum magnesium level as follows: low < 1.9 mg/dL (n = 931), normal = 1.9-2.3 mg/dL (n = 32,341), and high > 2.3 mg/dL (n = 1281). The percentages of participants with CAC were 3.7, 1.5, and 2.3 in each group, respectively. According to multivariate analysis, low serum magnesium was associated with CAC after adjustment for age, sex, BMI, diabetes, hypertension, cardiovascular disease, systolic BP, LDL cholesterol, HDL cholesterol, eGFR, serum calcium and phosphorus, hsCRP, current smoking status, alcohol intake and vigorous exercise frequency. The odds ratio for CAC in the low serum magnesium group compared to the normal group was 2.10 (1.40-3.15, P < 0.001).

CONCLUSION: Low serum magnesium level is associated with CAC in a Korean population at low risk for cardiovascular disease. Further studies are needed to generalize this finding and to verify the causal relationship between low serum magnesium and CAC.

PMID: 26472514