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The association between magnesium intake and atherosclerotic cardiovascular disease

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Objectives: It has been reported that the incidence of diabetes, metabolic syndrome, and hypertension is lower in individuals with high dietary magnesium intake. However, previous studies regarding association between cardiovascular disease and dietary magnesium intake showed inconsistent results. We explored this issue in the general population from UK biobank cohort.

Methods: We analyzed 186,781 participants without requiring kidney replacement therapy (KRT). Key exclusion criteria were 1) kidney failure requiring KRT, 2) prior history of atherosclerotic cardiovascular disease (ASCVD) at enrollment, 3) missing data for 24-h recall food consumption recall survey, and 4) implausible daily estimated energy intake. The main predictor was energy-adjusted magnesium intake using residual method. The primary outcome was a composite of ASCVD. The ASCVD event was defined as a composite of acute coronary syndrome, coronary or other artery revascularization, peripheral arterial disease, stroke, or cardiovascular death.

Results: The average daily dietary magnesium intake amount of the participants was 332.6 ± 94.3 mg. During 2,110,525 person-years of follow-up (median 11.5 years), the ASCVD event occurred in 11,780 (6.3%) participants. The incidence rate (95% confidence intervals [95% CI]) of ASCVD was 6.23 (6.00–6.48), 5.65 (5.42–5.88), 5.32 (5.11–5.55), 5.32 (5.11–5.55), and 5.40 (5.19–5.63) per 1000 person-years from the lowest to the highest quintile of magnesium intake, respectively. In multivariable Cox regression, compared with quintile 3, the adjusted hazard ratios (95% CI) for the risk of ASCVD were 1.12 (1.04–1.21) for lowest quintile. Notably, the risk of ASCVD was similar in quintile 4 and 5 versus quintile 3. This association was consistent in the restricted cubic spline analysis showing significant association of lower magnesium intake with increased risk for ASCVD. In additional analyses with outcome of 3-point major adverse cardiovascular events and mortality, the results were similar.

Conclusions: In long-term cohort of UK population, lower magnesium intake is associated with increased risk for ASCVD.

Figure 1. Restricted cubic spline analysis. Lower magnesium intake is significantly associated with increased risk for ASCVD.