

Association of Serum Magnesium Levels With Risk of Intracranial Aneurysm

A Mendelian Randomization Study

Susanna C. Larsson, PhD, and Dipender Gill, BMBCh, PhD

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Correspondence

Dr. Larsson

susanna.larsson@ki.se

Study Question

Is there an association between serum magnesium concentration and the risk of intracranial aneurysm?

What Is Known and What This Paper Adds

Serum magnesium concentrations have been implicated in regulating blood pressure and function of the vascular endothelium but whether increased serum magnesium concentrations affect the risk of intracranial aneurysm and related subarachnoid hemorrhage is not known. This investigation's results show that higher serum magnesium concentrations are associated with a reduced risk of intracranial aneurysm.

Methods

For this Mendelian randomization study, the investigators focused on 5 single-nucleotide polymorphisms (SNPs; rs4072037, rs7965584, rs3925584, rs13146355, and rs448378) that were associated with serum magnesium concentrations in a genome-wide association study involving 23,829 individuals of European ancestry. Genetic association estimates were obtained for intracranial aneurysm from a genome-wide association study involving 79,429 individuals of European ancestry (7,495 individuals with intracranial aneurysm and 71,934 control individuals) who belonged to 23 different cohorts. The inverse-variance weighted method was used in the primary analyses to obtain the causal estimates for serum magnesium concentrations and intracranial aneurysm.

Results and Study Limitations

Higher genetically predicted serum magnesium concentrations reduced the risk of intracranial aneurysm. The odds ratios per 0.1-mmol/L increment were 0.66 (95% confidence interval [CI], 0.49–0.91) for intracranial aneurysm in general, 0.57 (95% CI, 0.30–1.06) for unruptured intracranial aneurysm, and 0.67 (95% CI, 0.48–0.92) for aneurysmal

Table SNPs and Intracranial Aneurysm

SNP	β (standard error)
rs4072037	−0.038 (0.021)
rs7965584	−0.050 (0.022)
rs3925584	0.016 (0.022)
rs13146355	−0.026 (0.019)
rs448378	−0.036 (0.021)

Associations between SNPs and risk of intracranial aneurysm.

subarachnoid hemorrhage. The present study's limitations include the possibility that the genetic proxies for serum magnesium concentrations influence aneurysm risks through alternative pathways that may violate the requisite assumptions of the Mendelian randomization approach. Furthermore, the investigators lacked the necessary data for a bidirectional Mendelian randomization analysis to investigate whether mechanisms that predispose an individual to intracranial aneurysm also influence circulating magnesium concentrations.

Study Funding and Competing Interests

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A draft of the short-form article was written by M. Dalefield, a writer with Editage, a division of Cactus Communications. The corresponding author(s) of the full-length article and the journal editors edited and approved the final version.

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