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Association between Magnesium Status and Autism Spectrum Disorder in Children: A Meta-Analysis

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ADMINISTRATIVE INFORMATION

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Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 25 September 2025 and was last updated on 25 September 2025.

INTRODUCTION

Review question / Objective Systematic review of the relationship between magnesium status and the occurrence of autism spectrum disorder (ASD) in children.

Condition being studied However, it remains difficult to explain the association between ASD and magnesium due to inconsistencies in results between studies.

METHODS

Participant or population Case-Control studies were identified to assess the relationship between ASD and magnesium levels, involving children aged 0 to 16 years.

Intervention High Magnesium Status.

Comparator LOW Magnesium Status.

Study designs to be included Observational study design.

Eligibility criteria Case-Control studies were identified to assess the relationship between ASD and magnesium levels, involving children aged 0 to 16 years, excluding studies that did not measure magnesium levels in control subjects and reported only magnesium levels in tissues of the case group. Inclusion criteria mandated the provision of exhaustive datasets from all selected investigations.

Information sources Electronic searches of PubMed, CNKI, Web of Science, and Scopus databases were conducted up to July, 2025.

Main outcome(s) A total of 19 case-control studies with 4536 children were included, including 2345 cases. The random effects model was used to conduct the meta-analyses, which showed that serum (standardized mean difference [SMD] = −0.54, 95% CI:−0.99~−0.10) and hair

(standardized mean difference [SMD] = −1.10, 95%CI: −1.85~−0.35) magnesium levels were negatively associated withASD.

Quality assessment / Risk of bias analysis Newcastle-Ottawa Scale.

Strategy of data synthesis The assessment encompassed the association between magnesium levels and ASD, employing the amalgamation of standardized mean difference (SMD) accompanied by 95% confidence intervals (95% CI).

Subgroup analysis A subgroup analysis was executed to explore potential origins of the observed heterogeneity.

Sensitivity analysis Eegg's test.

Country(ies) involved China.

Keywords Magnesium· ASD· Children· Meta-analysis.

Contributions of each author

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