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Association of Kawasaki disease with intellectual disability, attention deficit hyperactivity disorder, and autism: a systematic review and meta-analysis

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ADMINISTRATIVE INFORMATION

Support - Currently none.

Review Stage at time of this submission - Formal screening of search results against eligibility criteria.

Conflicts of interest - The authors report no financial interests or potential conflicts of interest.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 05 May 2024 and was last updated on 05 May 2024.

INTRODUCTION

Review question / Objective The risk of intellectual disability, attention deficit hyperactivity disorder, and autism after Kawasaki disease.

Condition being studied Kawasaki disease is a rare, multisystem vasculitis that primarily affects blood vessels, particularly the coronary arteries. Intellectual disability, attention deficit hyperactivity disorder, and autism, on the other hand, are neurodevelopmental disorders largely associated with brain function and development. However, research is ongoing to explore potential indirect associations between these conditions. Some studies have suggested that certain individuals with autism may have immune system dysregulation, and Kawasaki disease is an immune-related condition. There is unclear evidence to suggest a heightened risk due to a history of Kawasaki disease.

METHODS

Participant or population Participants with a diagnosis of Kawasaki disease or healthy controls.

Intervention No.

Comparator No.

Study designs to be included Cohort or case-control studies.

Eligibility criteria The inclusion criteria were as follows: (1) Cohort or case-control studies; (2) Studies including both participants diagnosed with Kawasaki disease and healthy controls; (3) Studies reporting the occurrence of intellectual disability,

attention deficit hyperactivity disorder, and autism among participants following their diagnosis of Kawasaki disease. Moreover, Intellectual assessment measures, such as intelligence tests, were considered additional indicators for cognitive outcomes. Conversely, exclusion criteria included: (1) Letters to the editor or editorial commentary; (2) Studies exclusively involving participants diagnosed with Kawasaki disease without healthy controls; (3) Studies reporting only symptom scale scores rather than diagnoses ; (4) Studies potentially utilizing duplicate data, such as those from single-center, multicenter, or national registry studies conducted within the same country. Smaller sample sizes will be excluded.

Information sources PubMed and Embase databases.

Main outcome(s) Primary outcomes were incidence of intellectual disability, attention deficit hyperactivity disorder, and autism diagnoses. Many studies utilized hazard ratios as outcome measures for the risk of neurodevelopmental disorders, hence, hazard ratio data were extracted where available.

Additional outcome(s) Intelligence assessment scales, as indicators of cognitive function, have also been considered as alternative outcomes for intellectual disability in this study.

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

Strategy of data synthesis Effect sizes were calculated using hazard ratios (HRs) with 95% confidence intervals (CIs) for the risk of intellectual disability, attention deficit hyperactivity disorder, and autism. Mean differences (MDs) were employed for dichotomous outcomes such as intelligence test scores comparisons.

Subgroup analysis No.

Sensitivity analysis No.

Language restriction No.

Country(ies) involved Taiwan.

Keywords ADHD; ASD; IQ; KD; mental retardation.

Contributions of each author

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