INPLASY PROTOCOL

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None declared.

Meta-analysis of magnetic resonance spectroscopy in children with attention deficit hyperactivity disorder

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Review question / Objective: What are the differences in magnetic resonance spectroscopy studies between patients with attention deficit hyperactivity disorder and healthy subjects. (P) Patients -Children or adolescents diagnosed as attention deficit hyperactivity disorder（diagnostic criteria release by DSM OR ICD,or meet diagnostic criteria for ADHD-related scales） (I) Intervention -Comparison of magnetic resonance spectroscopy results in children with attention deficit hyperactivity disorder and healthy subjects (C) Control -Corresponding healthy controls (O) Outcomes -Values of metabolites of relevance to the study subject that can be obtained directly or indirectly (S) Studies design -Cross-sectional studies.

INTRODUCTION

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Condition being studied: Attention Deficit Hyperactivity Disorder (ADHD) is a common, early-onset, and persistently developing psychiatric disorder in children and adolescents, with attention deficit and/or hyperactivity and impulsivity as the core symptoms, which easily and negatively affects learning, behavior, emotions and socialization of children and adolescents, and is one of the most common neurodevelopmental disorders in children and adolescents.The current diagnosis for ADHD is mainly based on behavioral observations and semi-structured interviews and lacks other objective evidence, in addition to differentiation from autism and tic disorders.

METHODS

Search strategy: We will search the following electronic databases:PubMed, The Cochrane Library, Embase, Web of Science, China National Knowledge Infrastructure (CNKI), CBM (China Biology Medicine), The Wan fang Database, and Technology Periodical Database (VIP) databases.We combined Medical Subject Headings (MeSH) and free text words related to magnetic resonance spectroscopy study of ADHD patients.We manually searched reference lists of included articles for additional eligible studies.Grey literatures were also be reviewed.

Participant or population: Inclusion: (a)cross-sectional study;(b) the case group is children or adolescents with a clear diagnosis of ADHD according to the Diagnostic and Statistical Manual of Mental Disorders (DSM) or the International Classification of Diseases (ICD), or who meet the diagnostic criteria of the ADHD-related scale, aged 4-17 years;(c) outcome indicator:values of metabolites of relevance to the study subject that can be obtained directly or indirectly;(c) brain areas and magnetic field strengths are not limited.Exclusion:(a) Non-research articles

such as overviews, letters, reviews, etc.;(b) Studies without a healthy control group;(c) repeated articles, non-English articles and articles with no access to full text and data.

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Intervention: Comparison of magnetic resonance spectroscopy results in children with attention deficit hyperactivity disorder and healthy subjects.

Comparator: Corresponding healthy controls.

Study designs to be included: Cross-sectional studies.

Eligibility criteria: (P) Patients -Children or adolescents diagnosed as attention deficit hyperactivity disorder (diagnostic criteria release by DSM OR ICD,or meet diagnostic

criteria for ADHD-related scales) (I) Intervention -Comparison of magnetic resonance spectroscopy results in children with attention deficit hyperactivity disorder and healthy subjects(C) Control -Corresponding healthy controls(O) Outcomes -Values of metabolites of relevance to the study subject that can be obtained directly or indirectly(S) Studies design -Cross-sectional studies.

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Main outcome(s): Values of metabolites of relevance to the study subject that can be obtained directly or indirectly.

Quality assessment / Risk of bias analysis: The quality of the included literature was evaluated by two researchers independently using the Newcastle-Ottawa quality assessment scale (NOS) assessment tool for cross-sectional studies in non-randomised studies. (2 points) and 3 entries for outcome measures (3 points), for a total score of 9 points. Low quality literature was scored <4, moderate quality 4-6 and high quality ≥7. Where there was disagreement in the evaluation process, this was agreed upon by negotiation. Translated with http://www.DeepL.com/Translator (free version).

Strategy of data synthesis: Egger's test and Begg's test in STATA 12.0 were used to evaluate the publication bias of the included literature and to conduct sensitivity analysis. If a study had publication bias, it was analysed by Trim and Fill to determine whether the publication bias had an impact on the results.

Subgroup analysis: Subgroup analysis of metabolites according to different brain regions (frontal vs. temporallobe).

Sensitivity analysis: Egger's test and Begg's test in STATA 12.0 were used to evaluate the publication bias of the included literature and to conduct sensitivity analysis. If a study had publication bias, it was analysed by Trim and Fill to determine whether the publication bias had an impact on the results.

Country(ies) involved: China.

Keywords: Attention deficit hyperactivity disorder; child; teenager; Magnetic resonance spectroscopy; brain area; brain metabolites; cross-sectional study; Meta-analysis.

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