INPLASY

Accuracy of microRNAs for the long-term prediction of childhood asthma: A systematic review and meta – analysis

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ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - Preliminary searches.

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 04 September 2023 and was last updated on 04 September 2023.

INTRODUCTION

Review question / Objective In recent studies, microRNAs have attracted much attention of the researchers. In addition, studies have shown that miRNA might have a certain predictive value for the future occurrence of childhood asthma and the response to glucocorticoids in the long-term asthma treatment. However, there is still a lack of evidence-based proof for the specific quantified value in prediction. Therefore, we carried out this systematic review and meta - analysis to reveal the miRNA profiles of childhood asthma and the predictive effects.

Condition being studied MicroRNA (miRNA) is a small single-stranded non-coding RNA containing 21 to 25 nucleotides. In recent studies, due to the importance of microRNAs (miRNAs) in the pathophysiology and their potential as a biomarker in liquid biopsy of allergic diseases, microRNAs have attracted much attention of the researchers. In addition, studies have shown that miRNA might have a certain predictive value for the future occurrence of childhood asthma and the response to glucocorticoids in the long-term asthma treatment.

METHODS

Participant or population The research population for our systematic review is children.

Intervention The exposure factor of our system is high expression of microRNAs.

Comparator The exposure factor of our system is low expression of microRNAs.

Study designs to be included The original research types included in our system include cohort studies, case-control studies, and cross-sectional studies.

Eligibility criteria Inclusion criteria: (1) English study on miRNA and the prediction of childhood

asthma ; (2) The complete data of fourfold table for diagnostic test can be obtained directly or indirectly; (3) There is no restriction on gender, age and region.Exclusion criteria: (1) The language used in the literature is non- English or the research is an in-vitro study; (2) Conference abstract; (3) Whether the research subject is children or adult is not clearly illustrated; (4) It is impossible to directly or indirectly extract True Positives (TP), False Positives (FP), False Negatives (FN) and True Negatives (TN) from the studies.

Information sources PubMed, EMBase, the Cochrane Library, and Web of Science.

Main outcome(s) The only outcome indicators of our system are sensitivity, specificity, positive likelihood ratio, negative likelihood ratio, diagnostic odds ratio, and SROC.

Quality assessment / Risk of bias analysis The quality of the included studies will assesse by using the NOS scale (Newcastle-Ottawa Scale) for cohort study from the participant selection (4 items), comparability (1 items), and outcome evaluation (3 items). The study can be scored up to 1 point for each item in participant selection and outcome evaluation and up to 2 points in comparability, with a total of 9 points. The studies scored 7-9 points were considered as high-quality research.

Strategy of data synthesis In this meta-analysis, Stata15.0 (StataCorp LLC, College Station, TX) was used for data analysis. The bivariate mixed effects model, a model for the diagnostic meta-analysis, will use in this study. The effect size of the model included heterogeneity (I2), sensitivity, specificity, positive likelihood ratio, negative likelihood ratio, diagnostic odds ratio and 95% confidence interval (95% CI), and the estimated area under the curve of summary receiver operating characteristic (SROC). Publication bias was assessed using Deek's funnel plot. The result was considered as statistically significant if $P<0.05$.

Subgroup analysis None.

Sensitivity analysis We will use bivariate mixed effects model in our meta-analysis, which will not be suitable for sensitivity analysis during the research process.

Country(ies) involved China.

Keywords microRNAs, micRNAs, childhood asthma, prediction, systematic review, meta-analysis.

Contributions of each author

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