

INPLASY PROTOCOL

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Conflicts of interest:
None declared.

Association Between Air Pollution and the Prevalence of Allergic Rhinitis in Chinese Children: Protocol for a Systematic Review and Meta-analysis

Zhang, S¹; Fu, Q²; Jin, X³; Tan, J⁴; Li, X⁵; Zhang, Q⁶.

Review question / Objective: For Chinese children, to explore whether air pollution increases the incidence of allergic rhinitis in children.

Condition being studied: Allergic rhinitis (AR) is a common chronic inflammatory disease in the upper airways, causing nasal congestion, itching, runny nose, and sneezing. It has serious impacts on people's quality of lives, and affects economic growth indirectly. Epidemiological studies revealed that 10% to 40% of the population were suffering from AR worldwide. In addition, children are more likely to develop allergic rhinitis than adults. The prevalence of allergic rhinitis in children is 25% worldwide, and 4% ~ 31% in China.

Eligibility criteria: (1) Trials in which children were AR, and the diagnosis of "AR" was in line with the international guidelines. (2) Children's age was limited of 0-18 years, and they were born and lived in China and at least one year of exposure to air pollution. (3) Air pollutant concentration in the test was derived from the mean value of data provided by ambient air detectors. (Include NO₂, SO₂, O₃, PM₁₀, PM_{2.5}) (4) Literatures only include cross-sectional studies, cohort and case-control studies. (5) All of these articles provide data that allows us to calculate 95% confidence interval (CI) of the influence of air pollutants on AR. (6) Trials published in English only.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 25 October 2021 and was last updated on 25 October 2021 (registration number INPLASY2021100094).

INTRODUCTION

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METHODS

Search strategy: Articles will be searched from January 1st, 2010, to July 1st, 2021. Only includes English articles. The literature search will be conducted in the following databases PubMed, Springer, Web of science. The search strategy will use air pollution in China and Children with allergic rhinitis.

Participant or population: (1) Trials in which children were AR, and the diagnosis of "AR" was in line with the international guidelines. (2) Children's age was limited of 0-18 years, and they were born and lived in China and at least one year of exposure to air pollution. (3) Air pollutant concentration in the test was derived from the mean value of data provided by ambient air detectors. (Include NO₂, SO₂, O₃, PM₁₀, PM_{2.5}) (4) Literatures only include cross-sectional studies, cohort and case-control studies. (5) All of these articles provide data that allows us to calculate 95% confidence interval (CI) of the influence of air pollutants on AR. (6) Trials published in English only.

Intervention: Effect of air pollutant concentration on the prevalence of allergic rhinitis in Chinese children.

Comparator: Not applicable

Study designs to be included: Cross-section studies, the cohort and case-control.

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Information sources: Articles will be searched from January 1st, 2010, to July 1st, 2021. Only includes English articles. The literature search will be conducted in the following databases PubMed, Springer, Web of science. The search strategy will use air pollution in China and Children with allergic rhinitis.

Main outcome(s): Prevalence of allergic rhinitis in Chinese children.

Quality assessment / Risk of bias analysis: Two reviews independently evaluated the quality of the included cross-section studies according to the Cochrane cross-section study Evaluation tool. Normally, the quality of 6.0 ~ 7.0 is rated as grade A, 4.0 ~ 5.5 as grade B, and less than 4.0 as grade C. Newcastle Ottawa Scale (NOS) literature quality tool to evaluate the cohort and case-control which were included, and we consistently thought a scale of 5 to 9 for high-quality articles. The resulting disagreement was resolved by a third reviewer.

Strategy of data synthesis: The total participant data will be used to develop a combination of quantitative and qualitative. Our main outcomes calculate the incidence of allergic rhinitis at each air pollutant concentration. The data will be analyzed using Revman 5.3 software. Two researchers will participate in this process.

The discrepancy will be resolved by involving a third examiner.

Subgroup analysis: None.

Sensitivity analysis: After excluding the research with low methodological quality analyze again and compare the analysis results before and after. If the outcome indicators are in the same direction. it means that the analysis results are stable and the conclusions drawn are reliable: otherwise, the analysis results are unstable and the results The conclusion is not reliable. At the same time, it is possible to compare whether the comprehensive results under the fixed and random effect models are different. If the results of the fixed effect model cannot reverse results of the random effect model, the conclusion is reliable.

Language: English.

Country(ies) involved: China.

Keywords: Allergic rhinitis; Chinese children; Air pollution; Association; Systematic review.

Contributions of each author:

Author 1 - Speng Zhang - Author 1 coordinating the work of the team, countermeasure research and the drafting of the paper; training of evaluation norms for members of the research group; project planning, application and demonstration; project summary information and data analysis.

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