

# INPLASY

## Correlation between eczema/allergic rhinitis and lung cancer: A systematic review and meta-analysis

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### ADMINISTRATIVE INFORMATION

**Support** - This study was funded by the Jilin Provincial Scientific and Technological Development Program.

**Review Stage at time of this submission** - Preliminary searches.

**Conflicts of interest** - None declared.

**INPLASY registration number:** INPLASY2024110086

**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 20 November 2024 and was last updated on 20 November 2024.

### INTRODUCTION

**Review question / Objective** The relationship between allergic diseases such as eczema, allergic rhinitis, and lung cancer is uncertain, so we conducted a meta-analysis to investigate the relationship between eczema/allergic rhinitis, and lung cancer.

**Condition being studied** In our systematic review, we aim to explore the intricate relationship between allergic diseases, specifically eczema, allergic rhinitis, and other related conditions, with the risk of developing lung cancer. This meta-analysis delves into the healthcare domain where allergic disorders and respiratory malignancies intersect, seeking to uncover potential associations and underlying mechanisms. Eczema and allergic rhinitis are prevalent chronic conditions characterized by inflammation and hypersensitivity reactions, often manifesting in early life. These diseases significantly impact patients' quality of life, necessitating ongoing management and, in

some cases, long-term pharmacological interventions. Concurrently, lung cancer remains a leading cause of cancer-related mortality worldwide, with complex and multifactorial etiology involving both genetic and environmental factors. Our study focuses on synthesizing existing evidence from observational studies, clinical trials, and epidemiological investigations to a.

### METHODS

**Search strategy** We conducted a systematic search of databases, including PubMed, Cochrane Library, EMBASE, and Web of Science, spanning the period from the inception of each database to October 8, 2024, without language restrictions. The search employed medical subject headings (MeSH) and keywords such as "eczema," "allergic rhinitis," "hay fever," "lung cancer," and "lung tumor." Furthermore, we manually examined the references of included studies, as well as other published systematic reviews and relevant

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bibliographies, to identify further pertinent research.

**Participant or population** People with eczema or allergic rhinitis, and lung cancer patients.

**Intervention** Eczema or allergic rhinitis, lung cancer.

**Comparator** Healthy people.

**Study designs to be included** Cohort studies, case-control studies and cross-sectional study.

**Eligibility criteria** The inclusion criteria for this study were as follows: (1) cohort studies or case-control studies; (2) investigations exploring the association between allergic diseases such as eczema and AR and the risk of lung cancer, with lung cancer risk considered as the outcome; and (3) providing adjusted odds ratios (OR) along with their 95% confidence intervals (CI). When a study presents multiple results, it is recommended to prioritize those that are associated with the longest follow-up time or the largest number of participants. The exclusion criteria included conference abstracts, study protocols, duplicate publications, and studies lacking relevant outcomes.

**Information sources** Search PubMed, EMBASE, and the Cochrane Library from inception to October 2024, with no restrictions. Use subject headings (Emtree in Embase, MeSH in PubMed) and relevant keywords. Search terms include words related to eczema, allergic rhinitis, and lung cancer and its variants. Also checked the reference lists of retrieved studies and previous meta-analyses to identify other potentially eligible studies.

**Main outcome(s)** Risk of lung cancer.

**Additional outcome(s)** None.

**Quality assessment / Risk of bias analysis** This study employed the Newcastle-Ottawa Scale (NOS) to evaluate the quality of the included cohort and case-control studies. The NOS assesses studies across three domains: selection, comparability, and outcomes (for cohort studies) or exposure (for case-control studies). Based on NOS scores, we classified study quality into three categories: low quality (0-3 points), moderate quality (4-6 points), and high quality (7-9 points). Each study's quality was independently evaluated by two reviewers, with any discrepancies resolved through consensus discussion.

**Strategy of data synthesis** Stata and reman software were used to conduct normal analysis on the collected data of People with eczema or allergic rhinitis and lung cancer. The fixed effect model was used for normal distribution, while the random effect model was used for inconsistent distribution.

**Subgroup analysis** Perform subgroup analyses by gender, region, and type of allergy.

**Sensitivity analysis** Sensitivity analyses were performed to ascertain the robustness of the findings, and publication bias was examined through visual inspection of funnel plots as well as Egger's regression test.

**Country(ies) involved** China.

**Keywords** eczema;allergic rhinitis;allergic diseases;lung cancer.

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