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Meta-analysis for influencing factors of female lung adenocarcinoma

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ADMINISTRATIVE INFORMATION

Support - No.

Review Stage at time of this submission - Data extraction.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202580033

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 11 August 2025 and was last updated on 11 August 2025.

INTRODUCTION

Review question / Objective This meta-analysis aimed to idenfity the influencing factors for female lung adenocarcinoma.

Condition being studied The incidence of lung adenocarcinoma in women has been increasing in recent years and has become an important issue seriously threatening women's health. However, the factors causing its onset are not very clear.

METHODS

Search strategy The PubMed, Web of Science and China National Knowledge Infrastructure (CNKI) databases were searched from database inception up to June 3, 2025 for relevant studies with following key words: risk, occurrence, incidence, lung adenocarcinoma, pulmonary adenocarcinoma and female. Meanwhile, a combination of subject terms and free words was applied.

Participant or population Female lung adenocarcinoma patients and healthy population as the control.

Intervention The occurrene of lung adenocarcinoma.

Comparator Influencing factors about the demography, health, lifestyle, behavior, environmental exposure, reproduction, endocrinology, genes and (or) molecular biology for the risk of lung adenocarcinoma in women were explored.

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

Eligibility criteria 1) influencing factors about the demography, health, lifestyle, behavior, environmental exposure, reproduction, endocrinology, genes and (or) molecular biology for the risk of lung adenocarcinoma in women were explored; 2) lung adenocarcinoma was pathologically diagnosed; 3) the odds ratios (ORs)

with 95% confidence intervals (CIs) were reported or enough data were provided to calculate them; 4) for duplicated or severely overlapped (>50%) data, only the most comprehensive or latest studies were included; 5) cohort or case-controlled studies; 6) full-texts were available; 7) studies were published in English or Chinese.

Information sources Following data were extracted from included studies: the first author, publication year, country, population source including the region and period, number of lung adenocarcinoma cases, study design, special characteristics, influencing factors and corresponding OR with 95% CI. ORs with 95% CIs were primarily extracted from the multivariate analysis if applicable.

Main outcome(s) In this meta-analysis, following five aspects of influencing factors were investigated: 1) demography and healthy: education degree, income, cancer family history, tuberculosis history, benign lung disease history, body mass index (BMI), chronic obstructive pulmonary disease (COPD), diabetes mellitus, lung cancer family history, cancer history, chronic bronchitis or tuberculosis history and combined chronic bronchitis; 2) lifestyle and behavior: cigarette smoking, drinking history, vitamin E intake, β-carotene intake, carrot consumption, cruciferous vegetable intake, fried meat intake, pickled food intake, statin use, vitamin C intake, personal residence area, residence and motor cycle for transport; 3) environmental exposure: cooking fumes exposure, environmental tobacco smoke exposure, coal heating, cooking times, fried and deep fried cooking, NO2 exposure, PM2.5 exposure, bad cooking habits, CO exposure, coal dust exposure, coal stove use, fuel exposure, PM10 exposure, SO2 exposure, solid fuel exposure and solid fuel heating; 4) reproduction and endocrinology: age of first menstruation, hormone replacement therapy history, number of births, age of first birth, contraceptive medicine use, menopause age, menstrual cycle, breastfeeding, human papillomavirus (HPV) infection history, menopause, number of miscarriage, oophorectomy history and pregnancy history; 5) genes and molecular biology: telomere length, cytochrome P4501A2 (CYP1A2) activity, NAT2 acetylator status, gene and microRNA polymorphism.

Quality assessment / Risk of bias analysis All included studies were case control or prospective cohort studies, thus the Newcastle-Ottawa scale (NOS) was applied to evaluate the quality and high-quality studies were defined as those with a NOS score>5.

Strategy of data synthesis All statistical analyses were conducted by STATA (version 15.0, StataCorp LLC, College Station, Texas, USA) software. For statistical heterogeneity, the I^2 statistic and Chi-square test (Q test) were applied. An I^2 value greater than 50% and (or) a P value<0.10 were defined as the substantial heterogeneity. However, the choice between fixed-effect and random-effects models was not based solely on above statistics. When the included studies were assessed to be clinically and methodologically homogeneous, and statistical heterogeneity was low ($I^2 \leq 50\%$ and $P \geq 0.10$), the fixed-effect model was applied, assuming a common true effect across studies. If substantial clinical or methodological heterogeneity was assessed, or if significant statistical heterogeneity was observed ($I^2 > 50\%$ or $P < 0.10$), a random-effects model was applied [2, 3]. The ORs and 95% CIs were combined to identify the association between influencing factors and risk of FLA.

Subgroup analysis Subgroup analyses based on the smoking status was performed if available.

Sensitivity analysis For parameters involving more than five included studies with statistically different results, the sensitivity analysis and publication bias detection were performed. Sensitivity analysis was conducted by excluding each included studies at one time.

Language restriction English or Chinese.

Country(ies) involved China - West China Hospital, Sichuan University.

Keywords Female; lung adenocarcinoma; influence factor; meta-analysis.

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