INPLASY PROTOCOL

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Bronchial asthma and risk of cardiovascular disease and cardiovascular mortality: a systematic review and meta-analysis

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Review question / Objective: The aim of this paper is to systematically classify and summarize the epidemiological evidence on asthma and the risk of cardiovascular diseases (CVD), while it remains unclear whether asthma increases the risk of cardiovascular mortality (CVM).

Eligibility criteria: 1). The study population was asthmatic patients, aged >18 years. 2). The control or reference group of the study was non-asthmatic patients. 3). The endpoint of the study was the occurrence of cardiovascular disease. 4). The study type is limited to cohort or case-control studies. 5). Studies provided maximum covariate-adjusted risk ratios (RRs), odds ratios (ORs), hazard ratios (HRs), and corresponding 95% confidence intervals (CIs).

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 20 February 2022 and was last updated on 20 February 2022 (registration number INPLASY202220083).

INTRODUCTION

Review question / Objective: The aim of this paper is to systematically classify and summarize the epidemiological evidence on asthma and the risk of cardiovascular diseases (CVD), while it remains unclear whether asthma increases the risk of cardiovascular mortality (CVM).

Condition being studied: Relevant studies have been searched from PubMed and Embase databases from the inception to December 1st, 2021.

METHODS

Search strategy: PubMed 1. Search: (("Asthma"[Mesh])) OR (((Asthmas) OR

(Bronchial Asthma)) OR (Asthma, Bronchial))

- 2. Search: ("Cardiovascular Diseases"[Mesh]) OR (((Cardiovascular Disease) OR (Disease, Cardiovascular)) OR (Diseases, Cardiovascular))
- 3. Search: ("Cohort Studies"[Mesh]) OR Cohort)) OR (Study, Cohort)) OR (Concurrent Studies)) OR (Studies, Concurrent)) OR (Concurrent Study)) OR (Study, Concurrent)) OR (Closed Cohort Studies)) OR (Cohort Studies, Closed)) OR (Closed Cohort Study)) OR (Cohort Study, Closed)) OR (Study, Closed Cohort)) OR (Studies, Closed Cohort)) OR (Analysis, Cohort)) OR (Cohort Analysis)) OR (Analyses, Cohort)) OR (Cohort Analyses)) **OR (Historical Cohort Studies)) OR (Cohort** Study, Historical)) OR (Historical Cohort Study)) OR (Study, Historical Cohort)) OR (Cohort Studies, Historical)) OR (Studies, Historical Cohort)) OR (Incidence Studies)) OR (Incidence Study)) OR (Studies, Incidence)) OR (Study, Incidence))
- 4. 1 and 2 and 3 1702 Embase
- 1. 'asthma'/exp
- 2. asthma AND bronchiale OR (asthma AND pulmonale) OR (asthma, AND bronchial) OR asthmatic OR (asthmatic AND subject) OR (bronchial AND asthma) OR (bronchus AND asthma) OR (childhood AND asthma) OR (chronic AND asthma) OR (lung AND allergy)
- 3. #1 OR #2
- 4. 'cardiovascular disease'/exp
- 5. angiocardiopathy OR (angiocardiovascular AND disease) OR (cardiovascular AND complication) OR (cardiovascular AND diseases) OR (cardiovascular AND disorder) OR (cardiovascular AND disturbance) OR (cardiovascular AND lesion) OR (cardiovascular AND syndrome) OR (cardiovascular AND syndrome) OR (cardiovascular AND vegetative AND disorder) OR (complication, AND cardiovascular) OR (disease, AND cardiovascular) OR (major AND adverse AND cardiovascular AND event)
- 6. #4 OR #5
- 7. 'cohort analysis'/exp
- 8. analysis, AND cohort OR (cohort AND fertility) OR (cohort AND life AND cycle) OR

(cohort AND studies) OR (cohort AND study) OR (fertility, AND cohort) OR prospective OR retrospective OR cohort 9. #7 OR #8

10. #3 AND #6 AND #9 8560.

Participant or population: 1). Asthmatic patients.

Intervention: The study population was asthmatic patients, aged >18 years.

Comparator: The control or reference group of the study was non-asthmatic patients.

Study designs to be included: cohort or case-control studies.

Eligibility criteria: 1). The study population was asthmatic patients, aged >18 years. 2). The control or reference group of the study was non-asthmatic patients. 3). The endpoint of the study was the occurrence of cardiovascular disease. 4). The study type is limited to cohort or case-control studies. 5). Studies provided maximum covariate-adjusted risk ratios (RRs), odds ratios (ORs), hazard ratios (HRs), and corresponding 95% confidence intervals (CIs).

Information sources: Relevant studies were searched from PubMed and Embase databases from the inception to December 1st, 2021

Main outcome(s): The risk of related cardiovascular disease.

Quality assessment / Risk of bias analysis:

The quality of the study was assessed by the Newcastle-Ottawa Scale (NOS), with an overall score of 9 points. Specifically, studies with a NOS score over than 6 stars were considered high-quality studies, whereas studies with a NOS score less than 6 stars were considered low-quality studies.

Strategy of data synthesis: All pooled results were expressed as RRs and their 95%CI.

Subgroup analysis: Subgroup analysis could not be conducted due to limited number of included studies.

Sensitivity analysis: Sensitivity analyses were performed by eliminating one study at a time to examine its impact on the combined results.

Language: None restriction.

Country(ies) involved: China.

Keywords: asthma; cardiovascular

disease; cardiovascular mortality.

Contributions of each author:

Author 1 - Minglei Hua.

Author 2 - Ling Li.

Author 3 - Linlin Diao.