

INPLASY PROTOCOL

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None declared.

Risk factors for hospital-acquired pneumonia in hip fracture patients : A systematic review and meta-analysis

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Review question / Objective: What are the risk factors for hospital-acquired pneumonia among hip fracture patients?

Condition being studied: Hospital-acquired pneumonia (HAP) is the most common type of hospital-acquired infection, it is characterized by inflammation of the lung parenchyma caused by various biological internal factors and external factors of the hospital, which usually occurs 48 hours after admission. The development of HAP is suspected to result from an interaction among individual factors, preoperative factors, surgical factors and postoperative factors in hip fracture patients. However, the specific risk factors for hip fracture patients are still unclear. Therefore, this review aims to identify these risk factors of HAP in hip fracture patients.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 23 October 2022 and was last updated on 23 October 2022 (registration number INPLASY2022100091).

INTRODUCTION

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which usually occurs 48 hours after admission. The development of HAP is suspected to result from an interaction among individual factors, preoperative factors, surgical factors and postoperative factors in hip fracture patients. However, the specific risk factors for hip fracture patients are still unclear. Therefore, this

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METHODS

Search strategy: Search databases: PubMed, EMBASE, The Cochrane Library, Web Of Science, CNKI, CQVIP, Sinomed, and WAN FANG. The concrete searching strategy for PUBMED is as follows: (((("Pneumonia"[Mesh]) OR (((((((((((((((((((Lobar Pneumonia[Title/Abstract]) OR (Pneumonias[Title/Abstract])) OR (Lobar Pneumonias[Title/Abstract])) OR (Pneumonias, Lobar[Title/Abstract])) OR (Pneumonia, Lobar[Title/Abstract])) OR (Experimental Lung Inflammation[Title/Abstract])) OR (Experimental Lung Inflammations[Title/Abstract])) OR (Inflammation, Experimental Lung[Title/Abstract])) OR (Lung Inflammation, Experimental[Title/Abstract])) OR (Lung Inflammations, Experimental[Title/Abstract])) OR (Pneumonitis[Title/Abstract])) OR (Pneumonitides[Title/Abstract])) OR (Pulmonary Inflammation[Title/Abstract])) OR (Inflammation, Pulmonary[Title/Abstract])) OR (Inflammations, Pulmonary[Title/Abstract])) OR (Pulmonary Inflammations[Title/Abstract])) OR (Lung Inflammation[Title/Abstract])) OR (Inflammation, Lung[Title/Abstract])) OR (Inflammations, Lung[Title/Abstract])) OR (Lung Inflammations[Title/Abstract])) AND (((("Hip Fractures"[Mesh]) OR ("Femoral Neck Fractures"[Mesh])) OR

((((((((((((((((((((((Fractures, Hip[Title/Abstract]) OR (Trochanteric Fractures[Title/Abstract])) OR (Fractures, Trochanteric[Title/Abstract])) OR (Intertrochanteric Fractures[Title/Abstract])) OR (Fractures, Intertrochanteric[Title/Abstract])) OR (Subtrochanteric Fractures[Title/Abstract])) OR (Fractures, Subtrochanteric[Title/Abstract])) OR (Femoral Neck Fracture[Title/Abstract])) OR (Femur Neck Fractures[Title/Abstract])) OR (Femur Neck Fracture[Title/Abstract])))) AND (((((((((((((((((((relative[Title/Abstract]) OR (risk[Title/Abstract])) OR (relative risk[Title/Abstract])) OR (risks[Title/Abstract])) OR (association[Title/Abstract])) OR (Influencing factors[Title/Abstract])) OR (risk factors[Title/Abstract])) OR (risk factor[Title/Abstract])) OR (Cause[Title/Abstract])) OR (relevant factors[Title/Abstract])) OR (mortality[Title/Abstract])) OR (mortality[MeSH:noexp])) OR (risk[MeSH:noexp]))

Search restrictions: English and Chinese language papers

Search dates: Up to October 20, 2020.

Participant or population: Patients with hip fractures who have been hospitalized (including patients who agreed to or refused to undergo surgery during hospitalization).

Intervention: The review will focus on the individual factors, preoperative factors, surgical factors and postoperative factors that could promote the development of hospital-acquired pneumonia.

Comparator: Not applicable.

Study designs to be included: Cohort study or case-control study.

Eligibility criteria: The inclusion criteria were as follows: (1) Types of studies: Cohort study or case-control studies; (2) Types of participants: All the patients with hip fractures who have been hospitalized (including patients who agreed to or refused to undergo surgery during hospitalization); (3) Outcomes: The incidence of hospital-acquired pneumonia

as related to individual risk factors, preoperative factors, surgical factors and postoperative factors; (4) Data: Full text can be obtained and sufficient data were published for estimating an odds ratio (OR) or standardized mean difference (SMD) with 95 % confidence interval (95 % CI). The exclusion criteria were as follows: (1) Types of studies: those studies that are reviews, letters, comments, case reports, abstracts and animal trials; (2) Types of participants: Patients with hip fracture were hospitalized for less than 48 hours; (3) Outcomes: No interesting outcomes were reported; (4) Data: Duplicate data or unable to calculate odds ratio (OR) or standardized mean difference (SMD) with 95 % confidence interval (95 % CI).

Information sources: Search databases: PubMed, EMBASE, The Cochrane Library, Web Of Science, CNKI, CQVIP, Sinomed, and WAN FANG.

Main outcome(s): The incidence of hospital-acquired pneumonia as related to individual risk factors, preoperative factors, surgical factors and postoperative factors.

Quality assessment / Risk of bias analysis: Two reviewers (WY, XJS) will assess the quality of the included studies independently using the Newcastle-Ottawa Scale (NOS), and the NOS assesses studies on three major criteria: selection, comparability of the groups, and study-type outcome (cohort) vs. exposure (case-control) study design. The disagreements between the two authors will be resolved by discussion with the third author (WBD).

Strategy of data synthesis: We are going to estimate the pooled odds ratio (OR) or relative risk ratio (RR) for binary variable by the Mantel-Haenszel (M-H) method, and the pooled mean difference (MD) or standardized mean difference (SMD) for continuous variables by the inverse variance (IV) method. We will test the heterogeneity of the included studies by the I^2 statistic and the I^2 value. We are going to regard the I^2 value $> 50\%$ as an index of substantial heterogeneity, then the random effect model will be used to pool

the indicator of included studies, otherwise, the fixed effect model will be used. What's more, the publication bias will be evaluated by the funnel plot and Eggers' test using STATA Software.

Subgroup analysis: Subgroup analysis will be carried out when there are substantial heterogeneity among the included studies. In addition, if necessary, we will implement meta-regression to deal with heterogeneity using STATA Software.

Sensitivity analysis: If necessary, a sensitive analysis by excluding outlier study one by one was conducted in Review Manager version 5.3 (The Cochrane Collaboration, Oxford, UK) to investigate the sources for heterogeneity.

Country(ies) involved: China.

Keywords: risk factors, hospital-acquired pneumonia, hip fracture, systematic review, meta-analysis.

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