International Platform of Registered Systematic Review and Meta-analysis Protocols

INPLASY

Risk factors for venous thromboembolism after lumbar fusion: a Meta-analysis

INPLASY2025120088

doi: 10.37766/inplasy2025.12.0088

Received: 25 December 2025

Published: 25 December 2025

Yang, R; Yin, JB; Shao, JN; Liu, YL; Xia, G; Ma, HP; Li, XL; Kong, QL.

Corresponding author:
Qingli Kong

kql20242024@163.com

Author Affiliation:
Chuxiong People's Hospital.

ADMINISTRATIVE INFORMATION

Support - Not applicable.

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY2025120088

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 25 December 2025 and was last updated on 25 December 2025.

INTRODUCTION

Review question / Objective Identifying the risk factors associated with VTE after lumbar fusion is crucial for developing effective prevention strategies.

Condition being studied Venous thromboembolism (VTE), encompassing deep vein thrombosis (DVT) and pulmonary embolism (PE), is a serious complication that can occur following lumbar fusion surgery.

METHODS

Search strategy “spinal fusion”, “lumbar fusion”, “lumbar interbody fusion”, “lumbar spinal fusion”, “venous thromboembolism”, “venous thrombosis”, “pulmonary embolism”, “VTE”, “DVT”, “PE”.

Participant or population Patients diagnosed with VTE after lumbar fusion due to degenerative diseases, trauma, tumors, malformations, etc.

Intervention Not applicable.

Comparator Not applicable.

Study designs to be included Case-control and cohort studies.

Eligibility criteria The inclusion criteria were as follows: the study design is a case-control or cohort study; Patients diagnosed with VTE after lumbar fusion due to degenerative diseases, trauma, tumors, malformations, etc; studies reporting the risks for venous thromboembolism after lumbar fusion; and the language is limited to English. Studies involving both single-level and multi-level lumbar fusion procedures were eligible. In addition, studies that included various surgical approaches—such as anterior lumbar interbody fusion (ALIF), posterior lumbar fusion (PLF), transforaminal lumbar interbody fusion (TLIF), and extreme lateral interbody fusion (XLIF)—were also considered for inclusion.
Exclusion criteria included studies that did not report relevant risk factors, studies focusing

exclusively on elderly subjects, duplicate publications, research without full text, incomplete information, or an inability to conduct data extraction, animal experiments, and reviews and systematic reviews.

Information sources Pubmed, Embase, Cochrane Library.

Main outcome(s) Blood transfusion volume, blood loss, spinal advancement, D-dimer level, surgical approach.

Data management Odds ratios (OR) with 95% confidence intervals (95%CI) were utilized for analyzing the risk factors of cardiovascular and cerebrovascular disease subtypes.

Quality assessment / Risk of bias analysis Two researchers independently conducted quality assessments of the literature using the Newcastle-Ottawa Scale (NOS) 13 for cohort and case-control studies. In cases of discordant opinions, resolution was achieved through discussion or consultation with a third party. The meta-analysis adhered to the relevant guidelines outlined in the Preferred Reporting Items for Systematic Reviews and Meta-analysis statement (PRISMA statement).

Strategy of data synthesis Odds ratios (OR) with 95% confidence intervals (95%CI) were utilized for analyzing the risk factors of cardiovascular and cerebrovascular disease subtypes.

Subgroup analysis Not applicable.

Sensitivity analysis By doing a Meta-analysis, we found that all the Meta-analyses did not have much effect on the results of the Meta-analysis.

Country(ies) involved USA, China, Japan.

Keywords Venous thromboembolism; deep vein thrombosis; pulmonary embolism; lumbar fusion; meta-analysis; risk factors.

Contributions of each author

Author 1 - Rong Yang - Author 1 drafted the manuscript.
Author 2 - Jianbin Yin - Author 2 drafted the manuscript.
Author 3 - Jiannan Shao - Jiannan Shao participated in literature screening.
Author 4 - Yingliang Liu - Yingliang Liu participated in literature screening.
Author 5 - Gushang Xia - Gushang Xia, Haiping Ma and Qingli Kong participated in data extraction.
Author 6 - Haiping Ma - Haiping Ma and Qingli Kong participated in data extraction.
Author 7 - Xianglin Li - The author read, provided feedback and approved the final manuscript.
Author 8 - Qingli Kong - The author read, provided feedback and approved the final manuscript.