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Prevalence and risk factors of postoperative neurologic complications in spine surgery: a systematic review and proportional meta-analysis

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ADMINISTRATIVE INFORMATION

Support - HKU Seed Fund (#200011025).

Review Stage at time of this submission - The review has not yet started.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202450103

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 22 May 2024 and was last updated on 22 May 2024.

INTRODUCTION

Review question / Objective What are the overall incidence rate and risk factors of postoperative neurologic complications in spine surgery?

Rationale This systematic review is aimed at identifying the targeted articles and investigating the association between surgical procedures and postoperative NCs to enhance awareness in minimizing surgery-related neurologic deficits among surgeons.

Condition being studied The publications will be searched on online databases such as Pubmed, Embase, the Cochrane Library, Scopus, Web of Science, Science Direct, and Medline. All studies included are observational studies, including cohort studies and case-control studies published in English in the last twenty years, whereas reviews, reference books, research protocols, case

reports, and letters to the editor, abstract-only articles will be excluded during the study identification.

METHODS

Search strategy The search terms include “spinal cord injury” OR “neurologic deficit” OR “neurological complication” OR “neurologic complication” AND “spine surgery” OR “spinal surgery” should be used to identify the targeted articles.

Participant or population Adult patients who underwent spine surgery were included in publications.

Intervention The number of observations with postoperative neurologic deficits.

Comparator The number of observations without postoperative neurologic deficits.

Study designs to be included Observational studies including cohort studies and case-control studies.

Eligibility criteria 1. All observational studies, including cross-sectional studies, cohort studies, and case-control studies published in English in the last twenty years.
2. Studies with observations of iatrogenic spinal cord injury, postoperative neurologic deficits, or postoperative neurologic complications.
3. Observations with complete medical records shown in the article are included.

Information sources Electronic databases such as Pubmed, Embase, the Cochrane Library, Scopus, Web of Science, Science Direct, and Medline.

Main outcome(s) It is expected that about 15 to 20 articles will be analyzed in the meta-analysis section. The incidence and risk factors of postoperative neurologic complications can be evaluated by proportional meta analysis and subgroup analysis respectively.

Additional outcome(s) Not applicable.

Data management The studies with observations of postoperative neurologic deficits were identified as targeted articles. The number of the study population, cases of postoperative neurologic deficits and risk factors mentioned in the studies will be recorded.

Quality assessment / Risk of bias analysis The risk of bias assessment will be evaluated using the Joanna Briggs Institute(JBI) Critical Appraisal Checklist for Prevalence Studies.

Strategy of data synthesis The meta-analysis will be conducted and managed using StataMP 18.0.

Subgroup analysis Type of surgical techniques and types of risk factors.

Sensitivity analysis The sensitivity analysis will be evaluated by the heterogeneity among the studies with I² value.

Language restriction All selected articles are written in English.

Country(ies) involved Hong Kong, China.

Other relevant information Not applicable.

Keywords spine surgery;postoperative neurologic complication; meta analysis; risk factors;incidence.

Dissemination plans The article will be submitted to high-impact journal such as SPINE.

Contributions of each author

Author 1 - Yam Wa Man - Author 1 drafts the manuscript and finishes the article identification and screening.

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Author 2 - Yui Shing Lui - Author 2 helps to screen and review the selected articles.

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