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Incidence and risk factors for postoperative delirium after primary total joint arthroplasty in elderly patients: A systematic review and meta-analysis

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ADMINISTRATIVE INFORMATION**Support** - None.**Review Stage at time of this submission** - Completed but not published.**Conflicts of interest** - None declared.**INPLASY registration number:** INPLASY202570015**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 3 July 2025 and was last updated on 3 July 2025.**INTRODUCTION**

Review question / Objective This study aims to comprehensively assess the incidence of delirium following primary TJA in elderly patients and identify its associated risk factors through a meta-analytic approach.

Condition being studied The proportion of elderly patients undergoing total joint arthroplasty (TJA) is increasing annually. Postoperative delirium (POD) is a common and serious complication among elderly patients following surgery. However, the incidence and risk factors of POD after primary TJA in this population remain unclear.

METHODS

Search strategy ("deliri"[Title/Abstract] OR "confus"[Title/Abstract] OR "POCD"[Title/Abstract] OR (("postoperative period"[MeSH Terms] OR ("postoperative"[All Fields] AND "period"[All Fields]) OR "postoperative period"[All Fields] OR ("post"[All Fields] AND "operative"[All

Fields]) OR "post-operative"[All Fields]) AND "cognitive disorder"[Title/Abstract] OR "acute confusional state"[Title/Abstract] AND ("risk"[MeSH Terms] OR "risk"[All Fields] OR ("predictor"[All Fields] OR "predictors"[All Fields] OR ("factor"[All Fields] OR "factor s"[All Fields] OR "factors"[All Fields])) AND ("knee"[MeSH Terms] OR "knee joint"[MeSH Terms] OR "hip"[MeSH Terms] OR "joints"[MeSH Terms]).

Participant or population Elderly patients aged ≥ 60 years undergoing primary unilateral total hip arthroplasty (THA) or total knee arthroplasty (TKA).

Intervention Clear distinction between an exposed group (patients developing POD).

Comparator Patients without POD.

Study designs to be included Prospective cohort studies, or retrospective cohort studies.

Eligibility criteria Study was included if they met:
(1) Participants: elderly patients aged ≥ 60 years

undergoing primary unilateral total hip arthroplasty (THA) or total knee arthroplasty (TKA); (2) Group setting: clear distinction between an exposed group (patients developing POD) and a control group (patients without POD); (3) Outcomes: reporting of delirium incidence and identification of potential risk factors; and (4) Study design: eligible epidemiological studies, including prospective cohort studies, or retrospective cohort studies.

Information sources The literature search was primarily conducted in the PubMed, Embase, Web of Science, and Cochrane Library databases.

Main outcome(s) Reporting of delirium incidence and identification of potential risk factors.

Quality assessment / Risk of bias analysis

Additionally, both reviewers independently assessed the quality of the included studies using the Newcastle-Ottawa Scale (NOS). This scale evaluates studies across three domains: selection, comparability, and outcome, with total scores ranging from 0 to 9 stars.

Strategy of data synthesis This study employed a random-effects model to conduct a systematic analysis of the incidence of POD in elderly patients undergoing TJA. To enhance comparability across studies, the original data were log-transformed based on their distributional characteristics. Restricted maximum likelihood estimation was utilized during model fitting to improve the accuracy of parameter estimation. The effect sizes of risk factors for POD occurrence are expressed as odds ratios (ORs) with their corresponding 95% confidence intervals. These were pooled using the random-effects model to fully account for potential heterogeneity among studies.

Subgroup analysis Stratified subgroup analyses of POD incidence in the TJA population were performed based on publication year, study design type, geographical location, TJA surgical site, POD assessment method, and study quality.

Sensitivity analysis The stability and reliability of the results were evaluated through a leave-one-out sensitivity analysis.

Country(ies) involved China.

Keywords Incidence; risk factors; postoperative delirium; total joint arthroplasty; meta-analysis.

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