INPLASY

Dexmedetomidine for the prevention of postoperative delirium in patients undergoing cardiac surgery: A systematic review and meta-analysis with trial sequential analysis

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ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - Preliminary searches.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 2 November 2024 and was last updated on 2 November 2024.

INTRODUCTION

Review question / Objective The effectiveness of dexmedetomidine in preventing postoperative delirium (POD) in patients undergoing cardiac surgery is controversial. The purpose of this systematic review and meta-analysis with trial sequential analysis is to confirm the benefits of dexmedetomidine on POD prevention in patients undergoing cardiac surgery.

Condition being studied Postoperative delirium (POD) is an acute brain dysfunction characterized by confusion of consciousness, impaired attention, cognitive function, and disrupted sleep-wake cycle. POD typically appears 2-5 days after surgery and may increase the risk of postoperative complications, prolong recovery time, and reduce the quality of life for patients. The mechanisms leading to POD are diverse, including neurotransmitter imbalance, stress response, inflammatory process, and disruption of circadian rhythm.

METHODS

Participant or population Patients undergoing cardiac surgery will be included.

Intervention Intravenous dexmedetomidine.

Comparator Placebo or positive control.

Study designs to be included Randomized controlled trials (RCTs) published in journals will be included. Trials were required to report statistical methods and accurate data.

Eligibility criteria RCTs about dexmedetomidine for postoperative delirium will be included.

Information sources Pubmed, CENTRAL, and Embase. The range of publication time is from the inception of each database to 1 November 2024. The language is limited to English and Chinese.

Main outcome(s) Incidence of POD.

Additional outcome(s) Incidence of postoperative atrial fibrillation.

Quality assessment / Risk of bias analysis The Cochrane Collaboration tool is used to assess the risk of bias of the selected studies. The following aspects are assessed independently by two reviews: random sequence generation, allocation concealment, blinding of participants and personnel, blinding of outcome assessment, incomplete outcome data, selective reporting, and other bias. Disagreements are analyzed by the third reviewer.

Strategy of data synthesis All analyses were conducted using RevMan 5.3 and Stata 13.0 software. Risk ratio (RR) is used for dichotomous outcomes. Heterogeneity is examined using the I2 test. If the I2 value is higher than 50%, the random effects model is used. Otherwise, fixed effects model is utilized. The confidence interval (CI) is established at 95%. $P<0.05$ were considered statistically significant.
A trial sequential analysis will be performed to confirm whether the evidence is conclusive or not.
The quality of evidence was examined with the recommendations from the Grading of Recommendations, Assessment, Development and Evaluation (GRADE).
If sufficient trials (≥10 trials) were included, publication bias was assessed by visual inspection of the funnel plot and the formal Egger's test.

Subgroup analysis We will conduct subgroup analysis based on different control methods and age of the patients.

Sensitivity analysis None.

Country(ies) involved China.

Keywords dexmedetomidine; postoperative delirium; cardiac surgery.

Contributions of each author
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