

INPLASY PROTOCOL

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None.

Efficacy and Safety of magnesium sulphate as an Adjuvant to neuromuscular blocking agent: a meta-analysis of randomized controlled trials

Sun, HY¹; Jin, T²; Wu, XP³; Duan, CP⁴; Liao, R⁵; Yang, L⁶; Fan, ZD⁷.

Review question / Objective: To assess the efficacy and safety of magnesium sulphate as an adjuvant to neuromuscular blocking agent, we conducted this meta-analysis.

Condition being studied: Magnesium sulphate; neuromuscular blocking agent; Adjuvant.

Information sources: Based on the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) Guidelines¹⁵ and the recommendations from the Cochrane Collaboration, a systematic search was performed on PubMed, Embase, Cochrane Library, Web of Science and Chinese databases [VIP database, Wan-Fang database, Chinese Biomedical Literature Database and China National Knowledge Infrastructure]. All these electronic databases will be searched from the commencement to the May 31, 2020 with no limitations of language. We will create a search strategy sample for PUBMED. We will also present similar search strategies for other electronic databases. Besides the above sources, we will also check grey literature through Google Scholar.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 19 June 2020 and was last updated on 19 June 2020 (registration number INPLASY202060070).

INTRODUCTION

Review question / Objective: To assess the efficacy and safety of magnesium sulphate

as an adjuvant to neuromuscular blocking agent, we conducted this meta-analysis.

Condition being studied: Magnesium sulphate; neuromuscular blocking agent; Adjuvant.

METHODS

Participant or population: 1 Randomized controlled trials; 2 general anesthesia in elective surgery received magnesium sulphate as an adjuvant to neuromuscular blocking agent in the immediate preoperative period or during the induction of anesthesia.

Intervention: Magnesium sulphate as an adjuvant to neuromuscular blocking agent.

Comparator: The same amount of saline or rocuronium prime or large-dose rocuronium or other narcotics such as ketamine.

Study designs to be included: Randomized controlled trials (RCT s) will be included.

Eligibility criteria: Studies were included if they met the following criteria: (1) RCT s; (2) receive magnesium sulphate as an adjuvant to neuromuscular blocking agent ; (3) the study included magnesium sulphate group and placebo (normal saline) group, at least; (4) availability of full-text publication and there were no language restrictions. Studies were excluded if they: (1) were abstracts, conference articles and protocols; (2) did not have complete data; (3) Animal studies and reviews.

Information sources: Based on the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) Guidelines¹⁵ and the recommendations from the Cochrane Collaboration, a systematic search was performed on PubMed, Embase, Cochrane Library, Web of Science and Chinese databases [VIP database, Wan-Fang database, Chinese Biomedical Literature Database and China National Knowledge Infrastructure]. All these electronic databases will be searched from the commencement to the May 31, 2020 with no limitations of language. We will create a search strategy sample for PUBMED. We will also present similar

search strategies for other electronic databases. Besides the above sources, we will also check grey literature through Google Scholar.

Main outcome(s): Effects of magnesium sulphate on the pharmacodynamics and pharmacokinetics of neuromuscular blocking agent.

Additional outcome(s): The secondary outcomes of this article include: 1 the surgeon's satisfaction with the operating conditions; 2 Incidence of magnesium sulphate related adverse reactions.

Quality assessment / Risk of bias analysis: We will evaluate the risk of bias from the entered studies using Cochrane risk of bias tool for RCTs, and all seven relevant fields of bias will be checked. Each one will be further identified as low, unclear or high risk of bias. Two authors will independently assess the risk of bias, and any discrepancies between two authors will be examined by a third author through discussion to make a decision.

Strategy of data synthesis: Review Manager 5.3 will be performed for statistical analysis. Continuous data will be pooled as mean difference or standard mean difference and 95% confidence intervals (CIs), and dichotomous data will be expressed as risk ratio and 95% CIs. We will apply I^2 statistic test to check heterogeneity among included trials. The values of $I^2 \leq 50\%$ are homogeneity, and a fixed-effects model will be utilized, while the values of $I^2 > 50\%$ are obvious heterogeneity, and a random-effects model will be employed. If sufficient data are collected from the eligible trials, we will conduct a meta-analysis when $I^2 \leq 50\%$. If substantial heterogeneity is identified, we will undertake subgroup analysis to explore the possible causes for obvious heterogeneity. If it is not possible to pool the data and carry out meta-analysis, we will report outcome results as a narrative summary.

Subgroup analysis: Subgroup analysis will be undertaken based on the different study and patient characteristics, study quality, treatments, controls, and outcomes.

Sensibility analysis: We will undertake sensitivity analysis to establish stability of outcome results by eliminating high risk of bias studies.

Country(ies) involved: China.

Keywords: Magnesium sulphate; neuromuscular blocking agent; adjuvant; general anaesthesia; meta-analysis, randomized controlled trials.

Contributions of each author:

Author 1 - Haiyan Sun - Conception and design the meta-analysis, Analysis and interpretation, Writing the article.

Author 2 - Tao Jin - Conception and design the meta-analysis, Analysis and interpretation, Writing the article.

Author 3 - Xiping Wu - Database Searching and data collection, critical revision of the article.

Author 4 - ChangPeng Duan - Database Searching and data collection, critical revision of the article.

Author 5 - Ren Liao - Conception and design the meta-analysis, critical revision of the article.

Author 6 - Lei Yang - Conception and design the meta-analysis, critical revision of the article.

Author 7 - ZhaoDi Fan - Analysis and interpretation, critical revision of the article.