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The efficacy of N-methyl-D-aspartate receptor antagonists on improving the postoperative pain intensity and satisfaction after remifentanil-based anesthesia in adults: a meta-analysis.

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Author information

Abstract

BACKGROUND: Remifentanil could induce opioid-induced hyperalgesia and tolerance, which would increase pain intensity after the operation. N-methyl-d-aspartate (NMDA) receptor antagonists have been used to prevent these adverse effects while the efficacy is still controversial. We evaluated the effectiveness of NMDA receptor antagonists in reducing postoperative pain and analgesic consumption after remifentanil-based anesthesia.

METHODS: Full published reports of randomized controlled trials on adults investigating the effects of intravenous administration of NMDA receptor antagonists compared with placebo for preventing remifentanil-induced postoperative hyperalgesia and tolerance were searched in PubMed, Embase, Springer, and the Cochrane Central Register of Controlled Trials. Postoperative pain scores, analgesic consumption, time to first analgesic request, satisfaction scores, and opioid-related and other adverse effects have been evaluated. Results were combined using fix or random-effects model when appropriate.

RESULTS: A total of 14 randomized controlled trials with 729 patients were included in the final analysis. Compared with placebo, NMDA receptor antagonists reduced the pain scores at 0, 4, 6, 8, 12, and 24 hours postoperatively ($P < .05$), reduced the cumulative analgesic consumption of 0-6, 0-24, and 0-48 hours after the operation ($P < .05$), prolonged the first time to request analgesic ($P < .05$), and promoted the satisfaction scores ($P < .05$). There was no difference in the incidence of postoperative nausea and vomiting, psychological adverse effects, and shivering. Subgroup analysis was conducted on different interventions (ketamine and magnesium); the results are in line with general results.

CONCLUSIONS: N-methyl-d-aspartate receptor antagonists can prevent the increase of analgesic consumption and pain intensity induced by remifentanil, and it can improve the postoperative satisfaction of patients.

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KEYWORDS: Meta-analysis; N-methyl-d-aspartate; Remifentanil-based anesthesia

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