Pediatric Anesthesia and Critical Care Journal 2022;11(2):100-103
doi:10.14587/paccj.2023.13

PACCJ

Our experience with the use of dexmedetomidine in the postoperative period in surgical patients

E. K. Aghayev, A. B. Hasanov, E. M. Nasibova

Azerbaijan Medical University, Baku, Azerbaijan

Corresponding author: E. M. Nasibova, Azerbaijan Medical University, Baku, Azerbaijan.
Email: doc.nasibova.esmira@gmail.com

Keypoints

Dexmedetomidine is more effective and safer than trimeperidine for pain relief and sedation in patients after surgery.

Abstract

Introduction

The problem of treatment of postoperative pain syndrome remains very relevant, despite the large selection of analgesics of various types, as well as the development of various methods of pain relief. Providing complete pain relief after surgery remains a desirable but not always achievable goal. According to the literature, from 50 to 80% of patients who underwent surgery suffer from severe pain in the postoperative period.

Purpose of the study: To study the efficacy and safety of pain relief technique using intravenous prolonged infusion of dexmedetomidine in combination with NSAIDs and opioids in the early postoperative period in surgical patients.

Material and methods

The study was conducted in the surgical clinic of the AMU. The clinical study included 156 patients aged 10 to 35 years after elective abdominal surgery (cholecystectomy, hemicolectomy, etc.). To assess the adequacy of analgesia and the need for the introduction of narcotic analgesics, we used a visual analogue scale (VAS) of pain intensity.

Results

The criterion for the effectiveness of analgesia performed in the postoperative period was the reduction of pain according to VAS to 3 and below. The criterion for the introduction of opioids was considered to be an increase in the intensity of pain according to the VAS up to 6-7 points. Mean pain scores between groups at various stages are presented.

Conclusion

The use of prolonged intravenous infusion of dexmedetomidine in combination with non-narcotic analgesics in the early postoperative period in patients undergoing elective abdominal surgery can significantly reduce the need for repeated injections of both non-narcotic and narcotic analgesics, improves patient comfort and safety.

Keywords

Dexmedetomidine, cholecystectomy, hemicolectomy**.**

Introduction

The problem of treatment of postoperative pain syndrome remains very relevant, despite the large selection of analgesics of various types, as well as the development of various methods of pain relief. Providing complete pain relief after surgery remains a desirable but not always achievable goal. According to the literature, from 50 to 80% of patients who underwent surgery suffer from severe pain in the postoperative period. A significant proportion of patient's experience pain of moderate to

severe intensity and cannot be satisfied with the quality of postoperative pain relief. It has been proven that high-intensity pain after surgery is a factor that significantly increases the incidence of postoperative complications, and ineffective pain management prolongs the period of disability and increases the cost of treatment. Currently, the basis of postoperative analgesia is the administration of non-opioid analgesics (NSAIDs) in combination with opioid analgesics and adjuvants, which allow achieving more effective pain relief with a minimum incidence of side effects associated with the appointment of high doses of a single analgesic in monotherapy. The main result of this approach is the possibility of reducing the total dose of opioid analgesics and, as a consequence, the frequency of side effects, in particular respiratory depression, excessive sedation, nausea and vomiting.

In this regard, in order to increase the effectiveness of the treatment of postoperative pain syndrome in the early postoperative period, in combination with "comfortable" sedation and safe for the patient, we used the technique of administering non-opioid and opioid analgesics against the background of continuous intravenous infusion of dexmedetomidine. This choice was due to a number of its clinical features: dexmedetomidine has analgesic and anesthetic / analgesic saving effects, practically does not depress breathing, has a sedative effect similar to natural sleep, a feature of sedation is the preservation of the patient's response to voice stimulation, i.e. the contact of the patient with the staff and the opportunity to report on the intensity of pain is maintained. When using dexmedetomidine in elderly patients, as well as with impaired renal and hepatic function, dose adjustment is not required.

Purpose of the study. To study the efficacy and safety of pain relief technique using intravenous prolonged infusion of dexmedetomidine in combination with NSAIDs and opioids in the early postoperative period in surgical patients.

Material and Methods

The study was conducted in the surgical clinic of the AMU. The clinical study included 156 patients aged 10 to 35 years after elective abdominal surgery (cholecystectomy, hemicolectomy, etc.). All operations were performed under general anesthesia. The studied patients were divided into two groups: group I (n=78) patients of this group in the early postoperative period intravenously through a perfusor dexmedetomidine at a rate of 0.4 µg/kg/h and ketorolac 30 mg every 6 hours adult patients and 0.5 mg /kg children. In group II (n=78), in the postoperative period, adult patients received 30 mg, and children - 0.5 mg/kg of ketorolac and 0.5 mg/kg of midazolam and intravenous trimeperidine in the absence of effect from NSAIDs. In the course of the study, we assessed: the intensity of pain at stages 4, 8, 12 and 16 hours after the end of the operation; subjective satisfaction of the patient with the quality of postoperative analgesia (“satisfactory”, “I can’t decide” (indefinitely), “unsatisfactory”); number of patients requiring repeat administration of opioid analgesics. To assess the adequacy of analgesia and the need for the introduction of narcotic analgesics, we used a visual analogue scale (VAS) of pain intensity.

Results and discussion

There were no significant differences in age and sex characteristics. The criterion for the effectiveness of analgesia performed in the postoperative period was considered to be a decrease in pain according to VAS to 3 or lower. The criterion for the introduction of opioids was considered to be an increase in the intensity of pain according to the VAS up to 6-7 points. The average score on the pain rating scale between groups at various stages is presented in Table 1.

Postoperative stage	I group	II group
4 hours	2,68	4,24
8 hours	3,69	6,42
12 hours	2,21	3,21
16 hours	2,12	2,62

Table 1. Dynamics of pain assessment by VAS in the study groups

When evaluating the results obtained, it was found that in patients of group I, the need for repeated administration of opioids arose in 28.4%, and in group II - in 67.5% of patients.

Subjective assessment by patients of the adequacy of analgesia, the level of physical and psychological comfort is presented in table 2.

Subjective assessment	Group I (n=78)	Group II (n=78)
satisfactory	69 (88,5%)	44 (56,4%)
Indefinitely	6 (7,69%)	9 (11,5%)
unsatisfactory	3 (3,85%)	25 (32,4%)

Table 2. Subjective assessment of patient satisfaction

Based on the data obtained, it can be said that the severity of the pain syndrome, and, consequently, the need for repeated administration of opioids in patients of group I, who used dexmedetomidine, was significantly lower.

Conclusion

1. The use of prolonged intravenous infusion of dexmedetomidine in combination with non-narcotic analgesics in the early postoperative period in patients undergoing elective abdominal surgery can significantly reduce the need for repeated injections of both non-narcotic and narcotic analgesics, increases the comfort and safety of patients.
2. Dexmedetomidine is more effective and safer than trimeperidine for pain relief and sedation in patients after surgery.

Conflict of interest. The authors declare no conflict of interest.

References

1. Moller M. H., Alhazzani W., Lewis K., et al. Use of dexmedetomidine for sedation in mechanically ventilated adult ICU patients: a rapid practice guideline. ***Intensive*** Care Medicine . 2022;48(7):801–810. doi: 10.1007/s00134-022-06660-x.
2. Liu Z. X., Xu F. Y., Liang X., et al. Efficacy of dexmedetomidine on postoperative shivering: a meta-analysis of clinical trials. Canadian Journal of Anaesthesia . 2015;62(7):816–829. doi: 10.1007/s12630-015-0368-1.
3. Kaye A. D., Chernobylsky D. J., Thakur P., et al. Dexmedetomidine in enhanced recovery after surgery (ERAS) protocols for postoperative pain. Current Pain and Headache Reports . 2020;24(5):p. 21. doi: 10.1007/s11916-020-00853-z.
4. Fiorelli S., Creazzola F., Massullo D., et al. Dexmedetomidine sedation after tracheal surgery: a prospective pilot study. ***The Annals of Thoracic Surgery*** . 2019;108(1):256–261. doi: 10.1016/j.athoracsur.2019.01.047.
5. Jessen Lundorf L., Korvenius Nedergaard H., Møller A. M., Cochrane Anaesthesia, Critical and Emergency Care Group Perioperative dexmedetomidine for acute pain after abdominal surgery in adults. Cochrane Database of Systematic Reviews . 2016;2, article Cd010358 doi: 10.1002/14651858.CD010358.pub2.
6. Duan X., Coburn M., Rossaint R., Sanders R. D., Waesberghe J. V., Kowark A. Efficacy of perioperative dexmedetomidine on postoperative delirium: systematic review and meta-analysis with trial sequential analysis of randomised controlled trials. British Journal of Anaesthesia . 2018;121(2):384–397. doi: 10.1016/j.bja.2018.04.046.
7. Chen, P., Chen, F., Lei, J., and Zhou, B. Efficacy and safety of dexmedetomidine combined with tramadol for patient-controlled intravenous analgesia in Chinese surgical patients: A systematic review and meta-analysis. Med. Baltim. 2020; 99 (3), e18825.
8. Shin HJ, Koo BW, Bang SU, Kim JH, Hwang JW, Do SH, Na HS: Intraoperative dexmedetomidine

sedation reduces the postoperative agitated behavior in elderly patients undergoing orthopedic surgery compared to the propofol sedation. Minerva Anestesiol 2017; 83:1042–50

9. Djaiani G, Silverton N, Fedorko L, Carroll J, Styra R, Rao V, Katznelson R: Dexmedetomidine versus propofol sedation reduces delirium after cardiac surgery: A randomized controlled trial. Anesthesiology 2016; 124:362–8
10. Park JW, Kim EK, Lee HT, Park S, Do SH: The effects of propofol or dexmedetomidine sedation on postoperative recovery in elderly patients receiving lower limb surgery under spinal anesthesia: A retrospective propensity score-matched analysis. J Clin Med 2021; 10:135