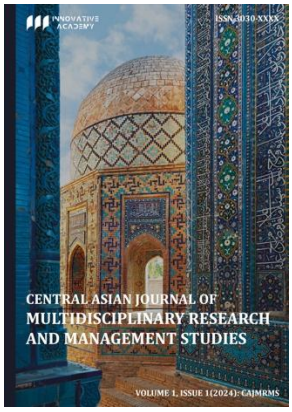

MORPHOLOGICAL CHANGES IN THE SMALL INTESTINE AFTER LOCAL ANESTHESIA IN EXPERIMENTAL MECHANICAL TRAUMA

Tillaev Saidbek Sobir ugli

Bukhara State Medical Institute

https://doi.org/10.5281/zenodo.13365531

ARTICLE INFO

Received: 20th August 2024
Accepted: 22nd August 2024
Published:23rd August 2024

KEYWORDS

local anesthetics, gastrointestinal tract, local anesthetics.

ABSTRACT

This literature review presents the pharmacokinetic properties of local anesthetics responsible for the effectiveness of regional anesthesia methods, and also examines in detail the gastrointestinal effects of local anesthetics, allowing a broader look at the possibilities of their use in intensive care.

Relevance. Today, several modern types of analgesics and drugs have been developed. It is very useful for performing invasive procedures in surgery, dentistry and traumatology. The methods used in anesthesia and the effects of drugs on all organs have been studied by scientists for many years, but the morphological changes of anesthetics in the intestine have not been fully studied.

The effect of local anesthetics on the rate of gastrointestinal paresis resolution as a manifestation of systemic anti-inflammatory action. The pathophysiology of postoperative intestinal paresis is complex. Factors such as surgical stress response, sympathetic hyperactivity, intestinal manipulations, visceral pain stimulate nociceptive afferent and sympathetic efferent nerve fibers. The stress response is accompanied by increased release of endogenous opioids, which inhibit the propulsive activity of the gastrointestinal tract.

The use of opioid analgesics in the postoperative period also prevents the restoration of normal gastrointestinal function due to the effect on opiate receptors of the small intestine. Increased formation of inflammatory mediators during tissue damage sensitizes peripheral nociceptors. Persistent activation of C-fibers contributes to central sensitization with expansion of receptor fields. Morphine and other opioid analgesics suppress the release of acetylcholine from the mesenteric plexus, which increases the tone of intestinal smooth muscles and reduces the propulsive activity of the intestinal tract. Intravenous infusion of MA, in particular lidocaine, seems very promising in light of the recent trends of reducing the length of patients' stay in the clinic, as well as increasing their satisfaction with the quality of treatment in general.

The severity of postoperative paresis depends on: a) the intensity of the inflammatory process, b) increased sympathetic tone, c) the total dose of prescribed opioids. It is believed that the positive effect of MA on this process mainly depends on their systemic anti-inflammatory effect [8], although one cannot ignore the decrease in the doses of opioid analgesics noted in a number of studies [9, 10]. Intravenous administration of lidocaine can

also have a certain effect on sympathetic tone, although limited by its low concentration in plasma.

Harvey K. et al. (2019) believe that systemic administration of MA has both peripheral and central mechanisms of action [11]. At the peripheral level, MA limit the synthesis of inflammatory mediators, at the central level, they modulate neuronal responses at the level of the posterior horns of the spinal cord. MA have a direct stimulating effect on intestinal smooth muscles, which is possibly the result of blockade of inhibitory reflexes originating from the mesenteric plexus. In addition, spinal reflexes, as well as peripheral reflexes conducted through the prevertebral ganglia, have an inhibitory effect on gastrointestinal motility. Intravenous infusion of lidocaine can limit the duration of postoperative intestinal paresis by reducing postoperative irritation of the peritoneum, as well as inhibition of inhibitory gastrointestinal reflexes.

Some authors believe that amide MA, in addition to a powerful anti-inflammatory effect, are also capable of significantly reducing sympathetic activity, which, in particular, is manifested by a decrease in the concentration of catecholamines in the urine for 48 hours after surgery [12, 13]. Some studies have shown that intravenous prolonged administration of lidocaine allows not only to shorten the period of inpatient treatment, but also reduces the intensity of postoperative pain syndrome [9, 14]. The reduction in the length of stay in the hospital is mainly due to faster recovery of gastrointestinal functions.

Three independent studies [8, 9, 14] showed that patients (open and endoscopic colorectal surgery, as well as radical prostatectomy) who underwent intravenous lidocaine infusion were discharged from the clinic 24 hours earlier than the control group, which is associated with faster recovery of gas passage and independent stool. The end of the infusion time varied from 1 to 24 hours after the end of the surgery. In all cases, the plasma concentration of lidocaine did not reach toxic levels.

In the already mentioned study by Harvey K. et al. (2019), patients who underwent elective colon surgery received patient-controlled intravenous analgesia (PCA) with morphine in the postoperative period [11]. In addition, patients in the study group received an intravenous infusion of lidocaine 1 mg/min for 24 hours after surgery. Against the background of lidocaine infusion, a decrease in the average intensity of postoperative pain was noted, in particular, 24 hours after surgery it was 26.1 ± 8.2 on a 100-point VAS, and in the comparison group - 45.4 ± 6.4. The appearance of the first peristaltic noises in the lidocaine group was noted after 88.3±6.8 hours, in patients receiving placebo – after 116±10.1 hours (28 hours later). It is interesting to note that against the background of the introduction of lidocaine, no decrease in the average doses of morphine was noted, compared with the placebo group, i.e., the earlier restoration of gastrointestinal motility in this study cannot be explained by the opioid-sparing effect.

Lidocaine infusion allowed patients to be discharged from the hospital on average one day earlier. Intestinal paresis is a serious enough problem in the acute phase of spinal cord injury. In the study by Baumann A. et al. (2019), it was shown that intravenous lidocaine infusion at a rate of 2–3 mg/min allowed to eliminate intestinal paresis within 10–20 hours in patients resistant to neostigmine therapy [15]. No signs of systemic toxicity of lidocaine were noted in any of the studies. It is known to be dose-dependent and usually manifests itself when the infusion rate is >3 mg/min and the drug concentration in plasma reaches >5 μg/ml [16].

Literature

1. Олимова А. З., Шодиев У. М. Репродуктив Ёшдаги эркакларда бепуштлик сабаблари: Бухоро тумани эпидемиологияси //Scientific progress. – 2021. – Т. 2. – №. 7. – С. 499-502.

2. Zokirovna O. A., Abdurasulovich S. B. Ovarian Diseases in Age of Reproductive Women: Dermoid Cyst //IJTIMOIY FANLARDA INNOVASIYA ONLAYN ILMIY JURNALI. – 2021. – Т. 1. – №. 6. – С. 154-161.
3. Olimova A. Z. ECHINOCOCCOSIS OF LIVER OF THREE MONTHLY WHITE RAT //Scientific progress. – 2022. – Т. 3. – №. 3. – С. 462-466.
4. Олимова А. З. Морфологические и морфометрические особенности печени белых беспородных трех месячных крыс после тяжёлой черепно-мозговой травмы вызванной экспериментальным путём //BARQARORLIK VA YETAKCHI TADQIQOTLAR ONLAYN ILMIY JURNALI. – 2021. – Т. 1. – №. 6. – С. 557-563.
5. Oglu M. Z. M., Zokirovna O. A. МОРФОЛОГИЧЕСКИЕ И МОРФОМЕТРИЧЕСКИЕ ПАРАМЕТРЫ ПЕЧЕНИ БЕЛЫХ БЕСПОРОДНЫХ КРЫС, ПЕРЕНЕСШИХ ЭКСПЕРИМЕНТАЛЬНУЮ ЧЕРЕПНО-МОЗГОВУЮ ТРАВМУ ПОСЛЕ МЕДИКАМЕНТОЗНОЙ КОРРЕКЦИИ //JOURNAL OF BIOMEDICINE AND PRACTICE. – 2023. – Т. 8. – №. 1.
6. Олимова А. З., Турдиев М. Р. БУХОРО ШАҲРИДА МЕЪДА ВА ЎН ИККИ БАРМОҚЛИ ИЧАК ЯРАСИ УЧРАШ ЭПИДЕМИОЛОГИЯСИ //Oriental renaissance: Innovative, educational, natural and social sciences. – 2022. – Т. 2. – №. 4. – С. 642-647.
7. Zokirovna O. A. Modern Concepts of Idiopathic Pulmonary Fibrosis //American Journal of Pediatric Medicine and Health Sciences. – 2023. – Т. 1. – №. 3. – С. 97-101.
8. Zokirovna O. A. Pathology of Precancerous Conditions of the Ovaries //American Journal of Pediatric Medicine and Health Sciences. – 2023. – Т. 1. – №. 3. – С. 93-96.
9. Зокировна, Олимова Азиза и Тешаев Шухрат Джумаевич. «Морфологические аспекты печени белых беспородных крыс после тяжелой черепно-мозговой травмы, вызванной экспериментально в виде дорожно-транспортного происшествия». *Scholastic: Journal of Natural and Medical Education* 2.2 (2023): 59-62.
10. Zokirovna O. A. Comparative characteristics of the morphological parameters of the liver at different periods of traumatic brain injury //Euro-Asia Conferences. – 2021. – С. 139-142.
11. Zokirovna O. A. Macroand microscopic structure of the liver of threemonthly white rats //Academic research in educational sciences. – 2021. – Т. 2. – №. 9. – С. 309-312.
12. Олимова А. З. Частота Встречаемости Миомы Матки У Женщин В Репродуктивном Возрасте //BARQARORLIK VA YETAKCHI TADQIQOTLAR ONLAYN ILMIY JURNALI. – 2021. – Т. 1. – №. 6. – С. 551-556.
13. Zokirovna O. A., Abdurasulovich S. B. Ovarian Diseases in Age of Reproductive Women: Dermoid Cyst //IJTIMOIY FANLARDA INNOVASIYA ONLAYN ILMIY JURNALI. – 2021. – Т. 1. – №. 6. – С. 154-161.
14. Zokirovna O. A. Cytological screening of cervical diseases: pap test research in the bukhara regional diagnostic center for the period 2015-2019. – 2022.
15. Zokirovna O. A., PREVALENCE R. M. M. EPIDEMIOLOGY OF CANCER OF THE ORAL CAVITY AND THROAT IN THE BUKHARA REGION //Web of Scientist: International Scientific Research Journal. – 2022. – Т. 3. – №. 11. – С. 545-550.
16. Olimova A. Z. The frequency of occurrence of my uterus In women of reproductive age //JOURNAL OF ADVANCED RESEARCH AND STABILITY (JARS). – 2021. – Т. 1. – №. 06. – С. 551-556.
17. Olimova Aziza Zokirovna. (2023). MODERN PRINCIPLES OF THE EFFECT OF HEMODIALYSIS THERAPY ON HEART RATE. *International Journal of Integrative and Modern Medicine*, *1*(1), 80–85. Retrieved from http://medicaljournals.eu/index.php/IJIMM/article/view/28
18. Olimova Aziza Zokirovna. (2023). PATHOMORPHOLOGICAL CHARACTERISTICS OF THE EPIDIDYMIS UNDER IRRADIATION. *International Journal of Integrative and Modern Medicine*, *1*(1), 96–100. Retrieved from http://medicaljournals.eu/index.php/IJIMM/article/view/31

19. Olimova Aziza Zokirovna. (2023). THE INCIDENCE OF CANCER OF THE ORAL CAVITY AND PHARYNX IN THE BUKHARA REGION. *International Journal of Integrative and Modern Medicine*, *1*(1), 86–89. Retrieved from http://medicaljournals.eu/index.php/IJIMM/article/view/29
20. Olimova Aziza Zokirovna. (2023). INFLUENCE OF ALCOHOL INTOXICATION ON THE HEART TISSUE OF RATS IN THE EXPERIMENT. *International Journal of Integrative and Modern Medicine*, *1*(1), 90–95. Retrieved from http://medicaljournals.eu/index.php/IJIMM/article/view/30
21. Olimova Aziza Zokirovna. (2023). Modern Aspects of the Etiology of Gastric Ulcer and Its Complications. *American Journal of Pediatric Medicine and Health Sciences (2993-2149)*, *1*(3), 163–166. Retrieved from http://grnjournal.us/index.php/AJPMHS/article/view/208
22. Zokirovna O. A., Jumaevich T. S. Morphological Aspects of the Liver of White Outbred Rats After Severe Traumatic Brain Injury Caused Experimentally in the Form of a Road Accident //Scholastic: Journal of Natural and Medical Education. – 2023. – Т. 2. – №. 2. – С. 59-62.
23. Aziza Zokirovna Olimova GASTRIC ULCER AND ITS COMPLICATIONS // Scientific progress. 2022. №3. URL: https://cyberleninka.ru/article/n/gastric-ulcer-and-its-complications (дата обращения: 28.09.2023).
24. Olimova Aziza Zokirovna. (2022). TECHNIQUE FOR CUTTING BIOPSY AND SURGICAL MATERIAL IN THE PRACTICE OF PATHOLOGICAL ANATOMY AND FORENSIC MEDICINE. *Web of Scientist: International Scientific Research Journal*, *3*(7), 116–120. https://doi.org/10.17605/OSF.IO/PSQ59
25. Zhumayevich N. F., Zokirovna O. A. PATHOMORPHOLOGY OF GASTRIC CANCER //BARQARORLIK VA YETAKCHI TADQIQOTLAR ONLAYN ILMIY JURNALI. – 2022. – С. 330-333.
26. Zokirovna O. A. Epidemiological and Etiological Data of Morphogenesis and Pathomorphology of Congenital Heart Diseases in Children //American Journal of Pediatric Medicine and Health Sciences. – 2023. – Т. 1. – №. 4. – С. 88-91.