Boyarkin K.M., Sabiryanov R.F., Tazhikulov Z.H.**Estimate of central neuraxial blockade efficiency in patients of traumatological profile***NC JSC «Karaganda Medical University»**(Kazakhstan, Karaganda)**doi: 10.18411/lj-03-2021-16**idsp: ljjournal-03-2021-16***Abstract**

The article describes the results of analysis of central neuraxial blockade effectiveness at surgical operations on the lower extremities in patients of traumatological profile with complicated comorbid background. It has been proved that the performed method of anesthesia didn't exert the negative influence on concomitant diseases. The relevance and safety of anesthesia and its role in the development of innovative technologies in anesthesiology are reflected.

Key words: central neuraxial blockade, epidural anesthesia, fractures of the bones of the lower extremities, concomitant diseases, intraoperative efficacy, osteosynthesis, local anesthetic.

Аннотация

В статье приведен анализ эффективности центральной нейроаксиальной блокады при операциях на нижних конечностях у пациентов травматологического профиля с отягощенным коморбидным фоном. Доказано отсутствие негативного влияния проведенной методики обезболивания на сопутствующие заболевания. Отражена актуальность и безопасность данной анестезии и ее роль в развитии инновационных технологий в анестезиологии.

Ключевые слова: центральная нейроаксиальная блокада, эпидуральная анестезия, переломы костей нижних конечностей, сопутствующие заболевания, интраоперационная эффективность, металлоостеосинтез, местный анестетик.

Methods of central neuraxial blockade are widely used in anesthesiology at the modern stages of the development of surgical techniques and innovative technologies. One of these methods is epidural anesthesia (EDA). The mechanism of action of anesthesia is based on the penetration of local anesthetics into the dural couplings of the spinal canal with the subsequent transition to the subarachnoid area, blockade of the passage of nerve impulses with the development of nociceptive and motor blocks.

Fractures of the bones of the lower extremities are one of the urgent problems of traumatology. Such fractures can be isolated or be an integral part of polytrauma [3,5]. The urgency of fracture reposition depends on many factors, in particular, on the patient's age, signs of distal ischemia, the presence of an open fracture and compartment syndrome, and other concomitant traumatic injuries of organs and tissues [1, 2].

EDA fully maintains a high analgesic effect with blockade of the afferent and efferent pathways of nerve impulse [6] conduction in the intraoperative and postoperative periods with minimal impact on hemodynamics and respiration with the development of favorable metabolic and endocrine effects of segmental blockades, no negative effect on the concomitant somatic pathology of the patient with minimization of thromboembolic complications risk [2, 4].

Objective was to analyze the epidural anesthesia effectiveness in urgent operations on the lower extremities in traumatology.

Research methods. Retrospective analysis of medical records of 62 patients (40 men and 22 women) was conducted. The average age of patients was 52.3 ± 3.4 years. It was used the data of inpatients' medical records of the State-owned enterprise "Karaganda Regional Medical Center" and the State-owned enterprise on the right of economic management "Multidisciplinary hospital named after prof. Kh. Zh. Makazhanov" (Karaganda), data of anesthesiologists consultations before the planned surgical intervention, protocols of

anesthetic aids, anesthetic cards, dynamic observation sheets of the wake-up chamber, operations protocols. The statistic data analysis was carried out using the MS Office Excel 2007 software package. Hemodynamic parameters were recorded using the monitors MINDRAY iMEC 8. The volume of surgery in the study groups was: blocking osteosynthesis of the femur (n=14), metal osteosynthesis of the femur (n=20), metal osteosynthesis of the tibia (n=20), arthroscopy of the knee joint followed by meniscectomy (n=8).

The following concomitant diseases were identified in patients before the proposed operation after the mandatory examination by physicians: bronchial asthma of mixed form (n=2), chronic obstructive bronchitis (n=13), diffuse toxic goiter, hypothyroidism (n=5), gastric ulcer (n=3), arterial hypertension (n=31), previous myocardial infarction (n=2), chronic form of normositolic atrial fibrillation (n=3), chronic pyelonephritis (n=3). All somatic diseases were compensated and were in remission at the time of the operation.

The following indicators were taken into account to assess the EDA intraoperative efficacy: subjective pain assessment, motor block assessment on the Bromage scale (Table 1), surgery duration, heart rate (HR), systolic (SBP) and diastolic (DBP) blood pressure levels, blood saturation according to pulse oximetry data.

Table 1.

Evaluation of the motor block at regional blockages (Bromage scale) [5, 6]

Movements in the lower extremity	Characteristics of the motor block	Score
Absolute knee and ankle flexion	No blockage	0
Knee flexion. Inability to lift the straightened leg	Partial blockage	I
Inability to bend the knee at the maintained foot flexion	Almost total blockage	II
Absolute lack of movement in the lower extremity	Total blockage	III

All the patients before EDA underwent premedication 30 minutes before the admission to the operating unit according to standard schemes using M-anticholinergics and benzodiazepine drugs. Before the onset of anesthesia, all the patients underwent infusion preloading with crystal iodine solutions in a volume of 10-15 ml/kg for the purpose of intraoperative maintenance of intravascular fluid volume and prevention of arterial hypotension. EDA was performed at the L3-L4 level in 30 cases and at the L4-L5 level in 32 patients. A local anesthetic (ropivacaine) was used in the amount of 130-150 mg for the main component of anesthesia. Lidocaine 2% was used in an amount of 1 mg/kg of the patient's weight before the introduction of the main local anesthetic in order to conduct a diagnostic test dose.

Research results and discussion. All the patients showed no movement in the lower extremities after the test dose for 5 minutes and the subsequent epidural introduction of the main dose of local anesthetic 20.1±1.2 minutes later, it amounted 3 points on the Bromage scale and indicated the development of complete blockade of the motor block. All the patients subjectively noted the complete absence of pain during the entire intraoperative period [4,9].

There were no significant changes in hemodynamic parameters. At the time of admission to the operating unit, HR was 72.1±1.8 per minute, SBP – 134.8±2.1 mm Hg, DBP – 74.7±0.8 mm Hg. During the surgical treatment, the following figures were noted: HR – 67.2±1.2 per minute, SBP – 140.2±3.8 mm Hg, DBP – 78.2±2.3 mm Hg. Blood saturation before surgery and during intraoperative monitoring did not undergo significant changes in the form of spontaneous breathing of patients and amounted 98-99%. These indicators objectively confirmed the sufficient analgesic effect of EDA and testified to the controllability of hemodynamics [9].

The duration of the surgical intervention was 1.1±0.1 h. The total time of EDA analgesic activity was 4.3±0.1 h, which significantly influenced the stability of the early postoperative period, the comfort of patients and the absence of the need for additional anesthesia at this time.

There were no complications associated with EDA and no deterioration in somatic status. All the patients after observation in the wake-up ward were transferred to the trauma department in 1.3 ± 0.1 hours after the end of the operation.

Conclusion:

1. Epidural anesthesia is one of the most optimal types of anesthetic support at operations on the lower extremities.
2. Epidural anesthesia allows controlling hemodynamic parameters and doesn't worsen the course of concomitant somatic diseases.
3. Prolonged action of epidural anesthesia promotes the stabilization of the early postoperative period and early activation of patients, which contributes to an earlier discharge from the hospital and subsequent rehabilitation with an earlier recovery of the function of the injured limb.

Acknowledgments. The authors express their gratitude to the scientific advisor, assistant of the Department of emergency medical care, anesthesiology and resuscitation of the NC JSC "Karaganda Medical University", anesthesiologist-resuscitator of the highest qualification category Nataliya Nikolayevna Vasiliyeva for regular and effective organization in the execution of the material presented in this work.

1. Aitkenhead A. R., Smith G., Rowbotham D. J. Anesthesiology. – М.: Reed Elsevier, 2010. – 844 p. (Айткенхед А.Р., Смит Г., Роуботам Д.Дж. Анестезиология. – М.: Рид Элсивер, 2010.-844с.)
2. Allman K., Wilson A. Oxford Handbook on Anesthesia. Ed. Ye. A. Evdokimova and A. A. Mirokhin. – М.: BINOM. Knowledge laboratory, 2009. – 764 p. (Оксфордский справочник по анестезии – К. Олман, А. Уилсон; пер. с англ. под ред. Е.А. Евдокимова и А.А. Мирохина. – М.: БИНОМ. Лаборатория знаний, 2009.-764с.)
3. Anesthesiology: National guidelines: short edition /Ed. A. A. Bunyatyan, V. M. Mizikov. – М.: GEOTAR-Media, 2015. – 656 p. (Анестезиология: национальное руководство: краткое издание / ред.: А. А. Бунятян, В. М. Мизиков. – М.: ГЭОТАР-Медиа, 2015. – 656 с. – (Национальные руководства)).
4. Edward Morgan Jr.J., Magid S. Michael, Michael J. Murray. Clinical anesthesiology, 4th edition. – М.: BINOM, 2014. – 1216 p. (Дж. Эдвард Морган-мл., Мэгид С.Михаил, Майкл Дж.Мурри. Клиническая анестезиология, 4-е издание, М.: БИНОМ, 2014,- 1216с.)
5. Gelfand B. R. Anesthesiology and Intensive Care: A Practical Guide. 3rd ed. – М.: Literature, 2013. – 672 p. (Гельфанд Б.Р. Анестезиология и интенсивная терапия: практическое руководство. 3-е изд., исп. и доп. – М.: Литература, 2013-672 с.)
6. Julian Stone, William Fawcett. Visual anesthesiology. Ed. V. A. Svetlakova. Visual anesthesiology. – М.: GEOTAR-Media, 2020. – 120 p. (Джулиан Стоун, Уильям Фоусет. Наглядная анестезиология. Под ред. В.А. Светлакова. Наглядная анестезиология, М.: ГЭОТАР-Медиа, 2020г.- 120с.)
7. Tseng WC, Wu ZF, Liaw WJ, Hwa SY, Hung NK. A patient with postpolio syndrome developed cauda equina syndrome after neuraxial anesthesia: A case report. J Clin Anesth. 2017; 37: 49-51
8. Van Waesberghe J, Stevanovic A, Rossaint R, Coburn M. General vs neuraxial anaesthesia in hip fracture patients: a systematic review and meta-analysis. BMC Anesthesiol. 2017; 17(1): 87
9. Wildsmith, J. Factors that may influence distribution of local anaesthetic solutions in cerebrospinal fluid /J. Wildsmith // Br. J. Anaesth. – 2004. – Vol. 63. – P. 444-449.

Zakharov O.P., Borozdin A.V.

Mixed Anxiety-Depressive Disorder in Patients with Coronavirus Infection. The Authors' Clinical Observation

Voronezh Regional Clinical Psychoneurologic Dispensary (Public Healthcare Establishment of the Voronezh Region "Voronezh Regional Clinical Psychoneurologic Dispensary (Russia, Voronezh)

doi: 10.18411/lj-03-2021-17

idsp: ljjournal-03-2021-17

Аннотация

Клиническая картина коронавирусной инфекцией уже давно и подробно описана в различной литературе, причем прогноз восстановления активности у пациентов с