Volume 3, Issue 1, January 2025 ISSN (E): 2938-3765

IN MILITARY PERSONNEL IT WAS CARRIED OUT UNDER UNILATERAL SPINAL-EPIDURAL ANESTHESIA STUDY THE DYNAMICS OF MOTOR AND SENSOR UNIT DURATION IN OPERATION AND POST-OPERATION PERIODS

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Abstract
Unilateral spinal block was first described in 1908 by A. Barker using a hyperbaric solution of local anesthetic. To date, there is no single name for this method in the literature. The names used so far include local spinal anesthesia, partial segmental spinal anesthesia, unilateral spinal anesthesia (USA), monolateral spinal anesthesia, and unilateral spinal anesthesia. The distance between the left and right spinal roots is 10–15 mm [7], which allows the roots to be blocked from only one side. However, to achieve a truly unilateral block, certain conditions must be met, as described below.

Keywords: Unilateral spinal blockade , unilateral spinal anesthesia, heart index i, vegetative index.

Introduction

Unilateral spinal anesthesia allows for the blockade of spinal nerves only on the side of the operated limb, while reducing the negative hemodynamic effects and the dose of local anesthetic. Improving the selectivity, control, and safety of SA is especially important for elderly patients with low functional reserves and pronounced comorbidities. The study of selective spinal anesthesia techniques will allow for a new level of healthcare, based on the safe and targeted achievement of any level of analgesia [17; p. 36].

Unilateral spinal anesthesia is a unique technique for regional anesthesia. It was first described in 1961 [146; 74-85] as “spinal hemianalgesia” in patients undergoing surgery on the extremities. The main goal of unilateral spinal anesthesia is to limit the nerve block to the surgical area and the duration of the operation [99; 605-610, 74; 746-751]. Therefore, it is often recommended for short-term surgical procedures that affect only one side of the body. The advantages of unilateral spinal anesthesia compared with bilateral spinal anesthesia are the lower incidence of hypotension and

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preservation of cardiovascular stability, as well as the provision of a stronger block during surgery and the accelerated recovery of the nerve block [58; 855-886, 60; 1387-1392].

Unilateral spinal anesthesia is becoming an increasingly popular technique for operations that affect only one side of the body, especially in orthopedic surgery of the legs. The most important advantage of the method is the reduction of adverse hemodynamic effects such as hypotension and bradycardia associated with spinal anesthesia. In addition, monolateral spinal block promotes faster recovery and increases patient satisfaction with the procedure [146; 74-85, p. 59; p. 214-219] because it is subjectively well tolerated.

Unilateral spinal anesthesia depends on many factors, including the sensitivity of the local anesthesia, the patient's condition, the rate of injection of the anesthetic solution into the subarachnoid space, and the type of needle used for spinal anesthesia [98; 2-6 p, 56; 355-357-b].

Traditionally, hyperbaric solutions of local anesthetics have been used to perform unilateral spinal anesthesia, the most popular of which is a hyperbaric solution of 0.5% bupivacaine (trademark Marcaine Spinal Heavy). The properties of monolateral block using hyperbaric solutions have been well studied, as confirmed by numerous scientific publications.

However, there are also methods of performing unilateral blockade using isobaric and hypobaric solutions of local anesthetics [86; 17-22-b, 63; 591-596-b], although the blockade technique is fundamentally different from that used with heavy solutions. As a result of studying the information in electronic sources, it can be concluded that there is very little and contradictory information on the use of isobaric solutions in unilateral spinal anesthesia.

Unilateral spinal anesthesia affects sensory, motor, and sympathetic functions on only one side, without the usual side effects seen with bilateral blockade. Cardiovascular stability after unilateral CA is undoubtedly one of the important advantages. Hypotension may develop in up to 30% of patients undergoing bilateral CA, even at moderate doses, compared with 0–6% after unilateral CA [54; 7–82] [94; 342–346].

Research Analysis

The degree of sensory block was assessed using the Pin prick test on a 4-point scale (0 - normal sensitivity; 1 - decreased sensitivity; 2 - hypoesthesia; 3 - complete sensory block). The degree of motor block was determined using the Bromage method on a 4-point scale (0 - normal motor function in the thigh, knee, calf, and fingers; 1 - motor block in the thigh; 2 - motor block in the thigh and knee; 3 - motor block in the thigh, knee, and ankle). The onset of sensory block was considered the time when sensitivity in the thigh and knee was lost, and the end was considered the time when sensitivity in the knee was restored. The beginning of motor block was marked when the patient could not raise the thigh, and the end was marked when the motor function of the thigh muscles was restored.

first anal defecation, time to gait (TOG), time to voiding, and time to hospital discharge (TD) were measured. The patient's ability to stand and walk to a walking device was considered the start of the walking time. Patients were considered to have normal orientation to time and place, stability of vital functions for at least 1 hour, ability to void independently, absence of nausea, vomiting, bleeding, or other surgical complications, and absence or mild pain during movement as the time to hospital discharge. Nausea/vomiting in patients was treated with 8 mg of ondansetron solution

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intravenously. The patient was completely satisfied with the procedure and the quality of anesthesia was rated as "very good" by the patient -; "good" - analgesia was complete, but the condition of the operated leg caused discomfort to the patient and required additional intravenous sedation; "unsatisfactory" - due to incomplete analgesia, additional nerve blockade or analgesia is required; "failure" - cases where general anesthesia (Propofol IV) was required due to inadequate analgesia.

The sensor block i level is 100 on the verbal rating scale The score ranged from % (normal sensation) to "0" (no sensation) . The level of motor block was assessed using the P. Bromage scale , as mentioned above :

I - free movements in the limbs;

II - degree - bending of the knee opportunity in the event of inability to bend the leg in the hip joint ;

III – inability to bend the leg at the hip and knee joints, with the sole of the foot being able to move freely ;

IV - degree - legs complete inactivity .

military personnel of all groups :

sensory and motor blockade is measured from intrathecal injection of local anesthetic to complete sensory and motor blockade .

- Duration of sensory block was defined as the time interval between the onset of complete sensory block (complete lack of response to injection) and the first postoperative pain.

- The duration of motor block was defined as the time interval between complete paralysis (Bromage = IV) and complete recovery (I degree).

In addition, the following indicators were evaluated :

T0 is the time of spinal anesthesia

T1 - the time of appearance of the sensor block ;

T2 - motor block start time ;

T3 - sensor block time peak ;

T4 - the peak of motor block time ;

T5 - sensor block regression time ;

T6 is the time until the first withdrawal dose after the operation .

The following were also found in patients:

- the time before the operation - the time from the patient's admission to the operating room until the start of the operation;

- operation time - the beginning and end of the operation;

- the time the patient stays in the operating room after surgery - the time from the end of the operation until the patient is taken out of the operating room .

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Demographic and clinical characteristics of patients (n = 43).

Indicators	Value
Age , years	53.9 ± 3.0
Gender , male / female , n %	5/38
TVI , kg/mg	23.9 ± 1.4
Operated side , left / right , n %	24/19
Comorbidity index Up to 3 , n % Up to 4 , n %	 19 (47.5) 24 (52.5)
Class according to A S A : II , n %	18 (35)
III , n %	25 (65)

The patients were characterized by a high comorbidity index (100%) and ASA physical status class I (62.5%) and class II (37.5%) .

Sensory and motor units and during the perioperative period in the soldiers of this group of total consumed bupivacaine and fentanyl drugs indicators (n = 43).

Indicators	Value
Sensor block	
The beginning of the block , sec	57.1 ± 6.3
Block peak , min	7.08 ± 0.9
Block start at T h $_{10, min}$	6.34 ± 0.87
Block duration , min	112.5±6.1
Block's regression time	92.7 ± 9.9
Motor unit	
The beginning of the block , sec	6.4 ± 2.1
Block duration , min	129.9 ± 12.8
Block peak , min	7.22 ± 1.9

Analyzing the presented values, it can be noted that in this group, with unilateral spinal-epidural anesthesia performed with low doses (5 mg of bupivacaine) , the onset of blocks and the time to reach the Th10 level of sensory block were slightly longer than in the previous group, where high doses of local anesthetic were used . It is noteworthy that the duration of the sensory block and the regression time were reduced by 14.5% and 19.4%, respectively, compared to the same indicators in the previous group, and We attributed this to a decrease in the bupivacaine dose only , as the intrathecal adjuvant dose (20 μg fentanyl) was the same in both groups. It was the same .

As for the motor block , its duration was sufficient for such an operation and it was regulated by sending bupivacaine into the epidural space without opioids and other adjuvants . Despite the many similarities between spinal and epidural anesthesia, there are also a number of differences in their physiological and pharmacological effects . One of the advantages of UEA over USA is the creation of segmental sensory blockade and control of sensor and motor units [112; 22 -b , 39; 543-553 - b].

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In unilateral spinal epidural anesthesia Sensory blockade of the innervation zones of the femoral and knee joints of the operated leg (Th10 - Th11 and L5 - L4, respectively) was achieved in 100% of cases within 30-35 minutes .

after the start of unilateral anesthesia . Motor block was 3-4 points on the Bromage scale.

one patient (2.3%) of this group , we noted contralateral motor block of the leg (1-2 points) at the beginning of the operation. The development of motor block of the healthy leg in 2 patients in the postoperative period may indicate a central displacement of the epidural catheter tip , and such a decrease in the rate and dose of bupivacaine injection into the epidural space did not lead to the cessation of contralateral motor block of the leg . In the postoperative period, in addition to patient-controlled anesthesia , additional analgesia was provided by injecting bupivacaine into the epidural catheter not passed .

Conclusions

1. In patients with a high (≥ 4) Charles number comorbidity index and high anesthetic risk (ASA II-III), the recommended method of UEA may be the method of choice for total hip arthroplasty .
2. In middle -aged military patients with unilateral SA, along with epidural analgesia, it is important to perform crystalloid- colloid pre -infusion at a dose of 5-7.5 mg of vasopressors (ephedrine and dopamine) and corticosteroids (prednisolone) at a dose of 0.8 - 1.0 mg/kg, calculated on 5 ml/ kg of body weight, at all stages of hemodynamic stability (GEC 130/4) in patients with unilateral SA .
3. In the practice of endoprosthesis of leg joints A differential approach is necessary depending on the choice of the unilateral method of anesthesia, age, comorbidity index .
4. The use of low doses of bupivacaine in unilateral spinal and spinal-epidural anesthesia leads to a relatively slow blockade of (large) large motor neurons .

References

1. Voronova N., Klimova N., Mendzherski A. Anatomy of the central nervous system. Moscow. (in Russian). 2005 .
2. Lakhin R.E. Selective spinal anesthesia for patients, wounds and post-surgery patients. // St. Petersburg, 2015, Avtorof d.m.n. 36 p.
3. Casati A., Fanelli G. Unilateral Spinal Anesthesia: state of the art. // Minevra Anesthesiol; 2001, 67(12): 855-886.
4. Casati A., Moizo E., Marchetti C., Vinciquerra F. A prospective, randomized, double-blind comparison of unilateral spinal anesthesia with hyperbaric bupivacaine, ropivacaine or levobuvicaine for inguinal hernia. // Anasth Analg; 2004, 99 (5):1387-1392.
5. Fanelli G., Borghi B., Casati A., Bertini L., Montebugnoli M., Torri G. Unilateral bupivacaine spinal anesthesia for outpatient knee arthroscopy. Italian study group on unilateral spinal anesthesia. // Can J. Anesth; 2000, 47(8): 746-751.
6. Kuusniemi KS, Pihlajamaki KK, Pitkanen MT A low dose of plain or hyperbaric bupivacaine for unilateral spinal anesthesia. // *Regional Anesthesia and Pain Medicine.* 2000. - vol. 25(6). – pp. 605-610.

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