

Indicators and effectiveness of sensory and motor blocking unilateral spinal anesthesia combined with unilateral epidural analgesia.

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Annotation

The relevance of this issue is due to the intensive development and introduction of the latest technologies in modern surgical interventions, including joint replacement, and a significant expansion of indications for surgical treatment. We have already pointed out that in the vast majority of patients of these operations, elderly and senile people with various comorbidities and, in some cases, severely disabled, burdened with severe pain for many months and years, which leads to whole complexes of somatic reactions. and deviations in the clinical status of patients. All this greatly complicates the choice of the method of anesthesia and postoperative analgesia. After all, postoperative pain is the result of surgery, but its treatment is not just a humane requirement, but a key aspect of postoperative therapy.

Endoprosthetics of the joints of the lower limb is also a very traumatic intervention and, in some cases, is accompanied by significant blood loss. In the postoperative period, venous thrombosis and PE are the most dangerous [152; pp.101-106, 151; pp. 1018-1025, 72; pp.455-461].

In connection with the above, anesthesia should correspond to the nature of this intervention: completely block nociceptive impulses, maximally reduce perioperative blood loss and the need for donor blood components, the likelihood of developing thrombotic complications in the postoperative period, and the severity of postoperative pain syndrome [18; pp.210-212]. All these requirements are met to the maximum extent by the methods of central segmental blockades [92; pp. 810-814, 188; pp.193-199].

Key words.

Combined unilateral spinal - epidural anesthesia, epidural space.

Aim of the study

The aim of the study in this group was to study perioperative hemodynamic changes and complications, the efficacy and safety of unilateral SA combined with unilateral epidural anesthesia and analgesia in elderly and senile patients with total cement arthroplasty of the joints of the lower extremities.

Material and research methods

43 patients operated on under conditions of combined unilateral spinal-epidural anesthesia were studied. Inclusion criteria were: age at least 75 years old with ASA-II-III physical status, Charlson comorbidity index over 5.

All patients in this group underwent cement arthroplasty of the joints of the lower extremities (38 - THA, 5 - TKA) under conditions of combined unilateral SA and unilateral EA. Patients of this group, we carried out a two-level blockade. Initially, an intrathecal puncture was performed and a low dose of 0.5% hyperbaric bupivacaine (5 mg) with 20 µg fentanyl was administered with the patient in the lateral position (operated leg from below). Then, in the same position, patients underwent catheterization of the epidural space at the level of L2 - L3.

The adequacy of anesthesia was assessed intraoperatively, and the postoperative period analgesia, its effectiveness was assessed after 6, 24, 48 hours according to VAS at rest and during flexion in the operated joints, while walking.

A feature of patients in this group, as well as the previous one, was the age of patients, in which senile age prevailed with a high comorbidity index of 5 and above and physical status according to ASA - II (62.5%) and III class (37.5%).

Inclusion criteria were: age at least 75 years, physical status according to ASA-II-III, Charlson comorbidity index of 5 or more.

Demographic characteristics

The table below shows the demographics of patients in this group operated under conditions of unilateral combined spinal-epidural anesthesia.

Table 3.21
Demographic and clinical characteristics of patients in this group (n = 43).

Indicators	Value
Age, years	78,2 ± 3,0
Gender, m/f, n %	17/26
BMI, kg/mg	23,9 ± 1,4
Operation side, r/l, n %	24/19
Comorbidity index	
Up to 3, n%	19 (47,5)
Up to 4 or more, n%	24 (52,5)
ASA class: II, n %	18 (35)
III, n %	25 (65)

A feature of patients in this group was elderly and senile age with a high comorbidity index (100%) and physical status ASA II (62.5%) and class III (37.5%).

Results and Discussions.

Indicators of sensory and motor blocks

Index	Value
Sensory block	
Block start, sec	57,1 ± 6,3
Block peak, min	7,08 ± 0,9
Time to reach the block up to Th 10, min	6,34 ± 0,87
Block duration, min	112,5±6,1
Block regression time, minutes	92,7 ± 9,9
Motor block	
Block start, min	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 indicated that in this group with unilateral spinal-epidural anesthesia with small doses (5 mg of bupivacaine), the timing of the onset of blocks and the time to reach the sensory block to the level of Th10 are slightly prolonged, relative to those with high doses of local anesthetic (in the previous group). Attention is drawn to the decrease in the duration of the sensory block and the regression time, relative to the same indicators in the previous group by 14.5% and 19.4%, respectively, which we associated exclusively with a decrease in the dose of bupivacaine, since the dosage of intrathecal adjuvant administration in both groups was the same (20 mcg fentanyl).

As for the motor block, its duration was sufficient for such an operation, and it was regulated by the introduction of bupivacaine into the epidural space without opioids and other adjuvants. Despite many similarities between spinal and epidural anesthesia, their physiological and pharmacological effects differ. One of the advantages of EA over SA is the creation of segmental sensory blockade and control of sensory and motor blocks [155; p.22, 62; With. 543-553].

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

In all patients of this group, by 30–35 minutes after the start of the unilateral anesthesia procedure, a motor block of the pathological limb developed, towards which the epidural catheter was oriented. Moreover, motor blockade was 3 - 4 points on the Bromage scale.

By the beginning of the operation in one patient in this group (2.3%), we registered motor blockade (1-2 points) of the contralateral limb. The development of motor blockade of the healthy leg in 2 patients in the postoperative period could be evidence of displacement of the tip of the epidural catheter in the central direction; this was also evidenced by the fact that a decrease in the dose and rate of administration of bupivacaine into the epidural space did not lead to the termination of the motor block of the contralateral limb. In the postoperative period, in addition to CPA, no additional anesthesia was performed by introducing bupivacaine into the epidural catheter.

Unilateral sensory and motor blockade, which ensures their rapid recovery and a stable hemodynamic state during the operation, can be achieved at low doses of hyperbaric bupivacaine (7.5 mg) with the obligatory addition of an adjuvant (20 µg fentanyl), slowly injected towards the operated limb, followed by the patient is on the side for 20 minutes. This method of unilateral SA, combined with epidural analgesia, provides stable hemodynamics, especially in elderly and senile patients.

Practical recommendations.

1. Unilateral spinal-epidural anesthesia with low doses of intrathecal administration of bupivacaine 0.5% - 5 mg with 20 µg of fentanyl is an effective and safe, opioid-sparing analgesia for total lower limb joint replacement in elderly patients with high anesthetic risk.

2. Two-level CSEA implies a simpler technique, while allowing to achieve the proper effect of intraoperative anesthesia, timely resolution of the motor block, as well as all the positive effects of prolonged epidural analgesia in the postoperative period.

3. The use of variants of balanced anesthesia based on regional blockades (USA, UEA, unilateral spinal-epidural anesthesia with reduced concentrations of local anesthetics) is justified for anesthetic management of lower limb joint replacement in geriatric patients with high comorbidity and physical status III-IV ASA class. Fentanyl with bupivacaine administered intrathecally in unilateral SA, potentiating bupivacaine leads to an increase in the duration of sensory and motor blocks and prolonged pain relief.

Conclusions

1. The vast majority of patients undergoing total joint replacement of the lower limb are of elderly and senile age with a high Charlson comorbidity index (3 and above), and ASA class II-IV, and severe pain syndrome.

2. The addition of fentanyl to bupivacaine when administered intrathecally has a synergistic effect, potentiating and prolonging the development and duration of sensory blockade, with virtually no effect on the duration of motor block.

3. Unilateral spinal-epidural anesthesia is characterized by hemodynamic stability, adequate protection against operational stress, a small number of complications and side effects, and an opioid-sparing effect. It should find a niche for its use in elderly and senile people with a high comorbidity index and physical. status (II - III) ASA.

4. The method of unilateral and spinal and epidural anesthesia proposed by us with small doses of intrathecally administered local anesthetic (5 mg of 0.5% hyperbaric solution of bupivacaine with 20 µg of fentanyl) and additional introduction of low doses of bupivacaine 2.5 mg into the epidural space makes it possible to achieve proper sensory-motor block necessary for the production of endoprosthesis replacement of the joints of the lower extremities.

5. Unilateral insertion of an epidural catheter makes it possible to achieve a predominantly unilateral distribution of the local anesthetic in the epidural space with the development of selective sensory and motor blockade.

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