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Original Article

Comparative analysis of the effects of combined spinal epidural anesthesia versus psoas compartment and sciatic nerve block for partial hip prosthesis in the geriatric population

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Abstract

Aim: We aimed to compare combined spinal-epidural anesthesia (CSE) and combined psoas compartment & sciatic nerve block (PCSNB) peripheral nerve blocks, in terms of intraoperative and postoperative pain, hemodynamics and side effects in geriatric population who underwent partial hip prosthesis.

Material and Methods: A total of 50 patients who underwent elective partial hip prosthesis and PCSNB or CSE were included. The age range was between 60-99 years and ASA scores were ≤ 3. Twenty-five patients underwent CSE anesthesia with 1 mL plain bupivacaine, while PCSNB and iliac crest blocks were employed in 25 patients. Perioperative anesthetic efficacy, blood pressures, pulse rates, saturation values, need for postoperative analgesia and side effects were compared.

Results: At the end of the operation, the mean arterial pressure was lower in both groups compared to the baseline (initial) values and the decline in the CSE group was statistically significant. Hypotension was detected in 11 patients (44%) in the CSE group and 2 patients (8%) in the PCSNB group. Effective analgesia was provided in all patients in the CSE group, while 5 patients (20%) required additional analgesic medications through the epidural catheter in the follow-up. The first postoperative analgesic hour was remarkably longer in the PCSNB group (4.84 ± 2.54 hours vs. 1.64 ± 0.9 hours).

Conclusion: Our data demonstrated that the combination of the psoas compartment, parasacral, sciatic and iliac crest blocks provides effective analgesia and maintains hemodynamic stability after hip prosthesis operations in elderly patients.

Keywords: Hip prosthesis; combined anesthesia; psoas compartment block; sciatic nerve block; postoperative analgesia

INTRODUCTION

A hip fracture is a break that occurs in the upper part of the femur (thigh bone). Symptoms may include pain around the hip, particularly with movement, and shortening of the leg. Usually the person cannot walk. They most often occur as a result of a fall. Risk factors include osteoporosis, taking many medications, alcohol use, and metastatic cancer (1).

The partial hip prosthesis is an effective procedure performed especially in the geriatric population. It is indicated for fractures and irreversible injuries of the hip and in conditions unresponsive to medical treatment which present with severe and intractable pain of the hip joint accompanied with limitation of motion (2). The comparison of general anesthesia and neuraxial block for hip prosthesis yielded that there was a decline in the frequency of adverse events such as mortality, thromboembolism, need for transfusion with the use of the neuraxial block. These findings were consistent with an improvement in cost-effectivity (3).

The psoas compartment block (lumbar plexus block) is a type of peripheral nerve block which is used in geriatric patients scheduled for hip operations. It has a low rate of side effects and yields a satisfactory method for the surgical team (4).

Aksoy et al. compared the efficacies of continuous spinal anesthesia (CSA) and psoas compartment sciatic nerve block (PCSNB) for hip prosthesis surgery and documented the differences between these 2 techniques (5).

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We aimed to compare the therapeutic efficacies and safety profiles of spinal anesthesia performed with the conventional techniques and PCSNB for partial hip prosthesis operations in the geriatric population.

MATERIAL and METHODS

Study design

This prospective cohort was implemented in the anesthesiology & reanimation and orthopaedics & traumatology departments of a university hospital. The approval of the local institutional review board had been obtained prior to the study (23.10.2017 / 333). The study was performed between April 1st, 2017 and October 1st, 2017 and geriatric patients (age > 60 years) scheduled for elective partial hip prosthesis surgery were recruited. Written informed consent was obtained from all participants.

A total of 50 patients were randomized using a computer program and they were allocated into 2 groups according to the type of anesthesia protocol to be administered. Group 1 (n=25) underwent psoas compartment and sciatic nerve block (PCSNB), whereas Group 2 (n=25) received combined spinoepidural anesthesia. The study group consisted of patients with ASA score < 3.

Baseline descriptives, ASA scores, and comorbidities of our patient population were noted. All patients underwent surgery following a starvation period of 8 hours. Nerve block procedures were carried out in the operation theatre. All patients were monitored using non-invasive and invasive methods for blood pressure, electrocardiogram, and pulse oximetry. After venous cannulation with 18-20 gauge cannula, intravenous isotonic saline was started at a rate of 4-6 ml/kg. Premedication was performed with midazolam 0.03 mg/kg (Demizolam, 5 mg/ml, Dem Pharmaceuticals®, Istanbul, Turkey). Oxygen (100%) was given at a rate of 2 L/minute using a nasal cannula. Perioperatively, heart rates (HR), systolic blood pressures (SBP), diastolic blood pressures (DBP), mean arterial pressures (MAP) and peripheral oxygen saturations (SpO2) were recorded. The onset of blockade procedure was assigned as the end of local antiseptic cleansing and local anesthetic infiltration, whereas the end of blockade procedure was assigned as the end of the injection of local anesthetic solutions.

In the CSE group, the patients were put in lateral decubitus position with the site of operation to be kept at the top. The L4-L5 interspinous space was determined using digital palpation and 18G Tuohy needle (Combifix Standart, Egemen International®, Izmir, Turkey) was passed from this space towards the epidural space. The confirmation of the location of the needle in epidural space was made utilizing the resistance method. Through the same needle, a 27G spinal needle was inserted into the spinal distance and free flow of cerebrospinal fluid (CSF) was observed. 1 mL of bupivacaine (5 mg) (Buvicaine®, % 0.5, Polifarma Pharmaceuticals, Istanbul, Turkey) was injected into the spinal distance and an epidural catheter was placed.

The psoas compartment block was performed using Winnie technique as described in relevant literature [6]. In lateral decubitus position, the site of surgery was maintained at the top and knee and hip joints were kept at flexion. After the cleansing, the operative field was draped. Following the identification of the L4 spinal process, 2 mL of lidocaine (2%) (Jetokain®, 2 mL, Adeka Pharmaceuticals, Istanbul, Turkey) was injected 4 cm lateral to this point. The stimulation needle (Stimuplex® – A needle, 150 mm/20 G, Braun Medical, Melsungen, Germany), which was connected to the nerve stimulator (Stimuplex® – HNS 11, Braun Medical, Melsungen, Germany), was passed until the transverse process of L4. Afterward, the needle was withdrawn and was directed caudally after the transverse process. The current power of the nerve stimulator was initially adjusted as 1.0 mA. The stimulator needle was directed to the posterior part of the psoas muscle and the current was adjusted as 0.5 mA after the contraction of the ipsilateral quadriceps muscle or observation of the patellar motion. If the contraction persisted at 0.5 mA, a local anesthetic solution comprised of a mixture of 20 ml of bupivacaine (0.5%), 10 mL of lidocaine (2%) and 10 mL of isotonic saline was injected at fractionated doses after negative aspiration.

The sciatic nerve blockade was performed as described by Mansour et al [7]. This method is based on posterior superior iliac spine (PSIS) and tuber ischiadicum of the femur. Following the palpation of both reference points, an imaginary line was drawn between these 2 points and the point located on this line which was 6 cm distal to the PSIS was accepted as the point of access for sciatic nerve block [7]. The cutaneous anesthesia was achieved with the injection of 2 mL of lidocaine (2%) and the stimulation needle was directed to the sciatic nerve area. The current was adjusted as 1 mA and it was decreased to 0.5 mA after the confirmation of plantar or dorsal flexion which indicates sciatic nerve stimulation. If the contractions persisted at this current level, a local anesthetic solution consisting of 10 mL of bupivacaine (0.5%), 5 mL of lidocaine (0.2%) and 5 mL of isotonic saline were injected at fractionated doses after negative aspiration.

The iliac crest block was carried out after these 2 blockades. The subcutaneous injection of 10 mL of bupivacaine (0.5%) was performed starting from a point 2-3 cm posterior to the PSIS to the posteromedial of the iliac crest [8].

The effectivity of sensory block was tested with pinprick and ice pack tests 20 minutes after PCSNB. The severity of pain experienced during surgical excision was graded as a 4-score scale as follows: 0: no pain; 1: mild pain; 2: moderate pain; 3: severe pain.

In case of mild pain, patients received fentanyl at a dose 1 g/kg (Talinat®, 0.5 mg / 10 mL, Vem Pharmaceuticals, Tekirdağ, Turkey) and relief of pain with this medication was termed as Score 1. Patients with persistent pain unresponsive to fentanyl were assigned as Score 2 and these cases received propofol (Propofol %2, Fresenius®,

Fresenius Kabi, Graz, Austria) at a rate of 20 g/kg/minute after a loading dose of 30 mg in addition to fentanyl. Patients with severe pain that could not be relieved with fentanyl and propofol were termed as Score 3 and block was accepted as unsuccessful in these cases. They underwent general anesthesia or laryngeal mask and they were excluded from the following measurements.

In CSE group, the sensory block was evaluated with pinprick and ice pack cold tests. The sufficiency of the block was decided if the block reached the level of T10. If the block failed to reach the level of T10 and there was pain during surgery, 5 mL of plain bupivacaine (0.5%, 25 mg) was administered through the epidural catheter.

The heart rates, systolic, diastolic and mean arterial pressures and oxygen saturations were noted every 5 minutes. The regional block procedure time was recorded.

Bradycardia was defined as a heart rate of less than 50/minute and in such a case, atropin (0.01 mg/kg) (Atropin Sulphate®, 0.5 mg/ml, Galen Pharmaceuticals, Istanbul, Turkey) was administered via the intravenous route. If mean arterial pressure was below 60 mmHg or a decrease more than 30% of its basal level (the average of 3 consecutive preoperative measurements) was accepted as hypotension. In such a circumstance, norepinephrine (Cardenor®, 4 mg / 4ml, Defarma Pharmaceuticals, Istanbul, Turkey) was applied at abolus dose of 0.1 g/kg and an infusion was started at a rate of 0.05 g/kg/minute. The dose was titrated according to the course of the blood pressure and the amount of norepinephrine was noted.

Desaturation was defined as the decrease in oxygen saturation below 90%. If there was oxygen desaturation, the patient was instructed to breathe deeply and was supported with face mask ventilation if necessary.

Postoperatively, patients were transferred to the recovery room and monitorization was maintained using electrocardiogram, and measurements of blood pressure and arterial oxygen saturation. Patients with Aldrete score ≥8 were transferred to the inpatient department or intensive care unit.

Postoperative pain scores were assessed using a Numeric Rating Scale (NRS-11) as shown in Figure 6 (0: no pain, 10: excruciating pain). The period at which NRS was ≥4, was assigned as the first analgesic time. In this circumstance, tramadol was given intravenously at a dose of 100 mg (Contramal®, 100 mg, Abdi İbrahim, Istanbul, Turkey) in the PCSNB group. On the other hand, 3 mg morphine was administered epidurally (Morphine hydrochloride®, 0.01 g/ml, Osel Pharmaceuticals, Istanbul, Turkey) in the CSE group.

In addition to postoperative pain, patients were closely monitored for hemodynamic changes, desaturation, headache, nausea and vomiting, neurological and other complications during 24 hours.

RESULTS

The baseline descriptives in patients receiving CSE and PCSNB are presented in Table 1.

Table 1. Baseline descriptives in our series

Variable		Group		p-value
		CSE (n=25)	PCSNB (n=25)	
Age (years)		159 (56.9)	101 (36.0)	17 (6.0)
Body weight (kg)		177 (44.8)	197 (49.9)	13 (3.3)
Sex	M	12	10	0.316
	F	13	15	
ASA (I/II/III)	I	0 (%0)	0(%0)	
	II	4 (%16)	2 (%8)	0.389
	III	21 (%84)	23 (%92)	
Operative duration (minutes)		75.60 ± 14.239	68.20 ± 13.985	0.091

(Abbreviations: M: male; F: female; ASA: American Society of Anesthesiologists; CSE: combined spinal epidural anesthesia; PCSNB: psoas compartment sciatic nerve blockade)

Both groups displayed similar features in terms of demographic and operative variables.

The durations of blockade procedures in PCSNB and CSE groups were 5.3 ± 1.5 minutes and 2.2 ± 0.7 minutes, respectively. The duration of the PCSNB procedure was significantly longer than CSE (p=0.001). In the CSE group, no patients reported incision site pain and a complete sensory block involving T10 area was successfully achieved. In 5 cases (20%), an additional dose of bupivacaine (5 mL, 0.5%, 25 mg) was given through the epidural catheter.

In PCSNB group, 3 patients (12%) reported pain at the incision site or discomfort and fentanyl was given at a dose of 1 g/kg to achieve anesthesia (Score 1). A total of 7 patients (28%) reported pain despite the administration of fentanyl (Score 2) and propofol infusion was introduced to these patients. All patients receiving propofol infusion had a total dose of less than 50 g/kg during the operation and none of the patients were termed as Score 3.

The systolic arterial pressures in 2 groups along various time intervals are shown in Table 2.

Table 2. A comparative overview of systolic arterial pressures (mmHg) in two groups			
Variable	Group		p-value
	CSE (n=25)	PCSNB (n=25)	
Entrance to OT	143.6 ± 24.56	146.20 ± 22.54	0.069
0 minute	120.8 ± 20.20	128.36 ± 16.77	0.064
5 minutes	104.48 ± 30.13	125.96 ± 18.85	0.004*
10 minutes	99.92 ± 27.68	128.92 ± 28.84	0.001*
15 minutes	104.56 ± 25.25	123.44 ± 33.84	0.030*
20 minutes	108.08 ± 20.47	129.32 ± 26.05	0.002*
25 minutes	109.04 ± 17.83	132.36 ± 26.51	0.001*
30 minutes	110.32 ± 25.61	126.48 ± 23.26	0.020*
35 minutes	110.52 ± 21.99	126.72 ± 27.71	0.030*
40 minutes	109.92 ± 18.93	125.48 ± 24.87	0.020*
45 minutes	117.36 ± 20.10	129.04 ± 27.86	0.105
50 minutes	121.60 ± 21.84	128.65 ± .85	0.433
55 minutes	118.84 ± 17.87	128.68 ± 27.94	0.216
60 minutes	119.67 ± 15.76	129.90 ± 29.31	0.265
Exit from OT	119.36 ± 16.73	130.88 ± 20.13	0.227

(Abbreviations: OT: operation theatre; CSE: combined spinal epidural anesthesia; PCSNB: psoas compartment sciatic nerve blockade; *: statistically significant)

Even though the basal levels were similar between 2 groups, the CSE group had a significantly higher systolic arterial pressure at the time of exit from the operation theatre. Notably, the systolic arterial blood pressures in the first 40 minutes were lower in the CSE group (Table 3).

Table 3. Demonstrates the course of diastolic blood pressures in 2 groups under investigation.			
Variable	Group		p-value
	CSE (n=25)	PCSNB (n=25)	
Entrance to OT	80.28 ± 14.06	80.24 ± 17.12	0.990
0 minute	65.76 ± 13.66	70.76 ± 11.70	0.170
5 minutes	59.00 ± 15.78	70.36 ± 11.31	0.004*
10 minutes	56.28 ± 12.58	69.44 ± 17.42	0.004*
15 minutes	59.88 ± 14.19	72.04 ± 16.49	0.007*
20 minutes	59.60 ± 11.51	69.88 ± 13.99	0.007*
25 minutes	60.00 ± 10.79	71.96 ± 13.81	0.001*
30 minutes	60.72 ± 13.09	68.28 ± 15.23	0.060
35 minutes	59.68 ± 10.78	69.84 ± 16.13	0.021*
40 minutes	63.12 ± 16.92	69.88 ± 14.10	0.060
45 minutes	64.68 ± 10.45	68.44 ± 12.64	0.308
50 minutes	65.76 ± 9.64	71.39 ± 13.98	0.148
55 minutes	64.96 ± 10.16	69.68 ± 13.98	0.132
60 minutes	65.04 ± 9.22	72.50 ± 11.32	0.013*
Exit from OT	66.52 ± 8.407	74.88 ± 11.33	0.005*

(Abbreviations: OT: operation theatre; CSE: combined spinal epidural anesthesia; PCSNB: psoas compartment sciatic nerve blockade; *: statistically significant)

In the CSE group, diastolic blood pressure was notably lower at the time of exit from the operation theatre. Similarly, the CSE group displayed lower diastolic blood pressures at the first 25 minutes, as well as 35th and 60th minutes. Hypotension was detected in 11 patients in the CSE group (44%) and in 2 patients in the PCSNB group (8%). Norepinephrine was started in these patients and the amounts of norepinephrine given in CSE and PCSNB groups were 1163 and 712 grams, respectively. The mean arterial pressures are shown in Table 4.

Table 4. A comparative overview of mean arterial pressures (mmHg) in two groups

Variable	Group		p-value
	CSE (n=25)	PCSNB (n=25)	
Entrance to OT	101.40 ± 16.10	102.2 ± 17.94	0.8
0 minute	84.36 ± 16.32	89.68 ± 12.29	0.200
5 minutes	74.30 ± 18.60	88.79 ± 14.19	0.003*
10 minutes	70.27 ± 17.59	91.48 ± 21.02	0.001*
15 minutes	74.71 ± 17.40	86.84 ± 19.72	0.025*
20 minutes	75.77 ± 13.26	89.68 ± 16.62	0.002*
25 minutes	77.43 ± 11.19	92.10 ± 17.08	0.001*
30 minutes	76.22 ± 14.71	87.68 ± 17.08	0.014*
35 minutes	78.48 ± 17.89	88.75 ± 19.60	0.040*
40 minutes	76.98 ± 13.06	88.42 ± 16.94	0.016*
45 minutes	82.03 ± 12.64	88.64 ± 16.39	0.118
50 minutes	84.00 ± 12.18	83.24 ± 30.14	0.415
55 minutes	82.92 ± 11.96	80.00 ± 34.67	0.497
60 minutes	83.25 ± 9.66	77.14 ± 37.98	0.302
Exit from OT	85.14 ± 10.09	90.46 ± 111.08	0.452

(Abbreviations: OT: operation theatre; CSE: combined spinal epidural anesthesia; PCSNB: psoas compartment sciatic nerve blockade; *: statistically significant)

The baseline values were similar in both groups; however, there was a remarkable decline in mean arterial pressures in both groups at the time of exit from the operation theatre compared to the initial values of every group ($p<0.001$ for CSE group, and $p=0.003$ for PCSNB group). The decline in the CSE group was more remarkable than that of PCSNB group between 5 to 40 minutes. The pulse rates during the procedures are shown in Table 5.

Table 5. A comparative overview of pulse rates in two groups

Variable	Group		p-value
	CSE (n=25)	PCSNB (n=25)	
Entrance to OT	90.08 ± 17.11	84.76 ± 15.79	0.259
0 minute	88.36 ± 14.12	80.96 ± 13.82	0.060
5 minutes	86.60 ± 13.74	79.76 ± 13.18	0.070
10 minutes	86.36 ± 15.55	81.32 ± 13.61	0.240
15 minutes	83.00 ± 15.86	80.32 ± 13.60	0.500
20 minutes	81.72 ± 15.94	79.88 ± 13.99	0.650
25 minutes	81.56 ± 16.01	79.76 ± 13.03	0.920
30 minutes	80.88 ± 16.05	80.80 ± 12.88	0.940
35 minutes	81.96 ± 17.28	80.56 ± 12.45	0.744
40 minutes	83.12 ± 18.17	80.24 ± 11.17	0.503
45 minutes	84.60 ± 16.36	81.72 ± 12.81	0.492
50 minutes	84.04 ± 17.24	80.78 ± 14.08	0.479
55 minutes	79.60 ± 14.97	78.90 ± 11.74	0.862
60 minutes	80.92 ± 17.54	79.76 ± 13.33	0.807
Exit from OT	81.84 ± 12.73	83.08 ± 12.64	0.731

(Abbreviations: OT: operation theatre; CSE: combined spinal epidural anesthesia; PCSNB: psoas compartment sciatic nerve blockade; *: statistically significant)

No remarkable differences were detected between groups in terms of pulse rates at any of the intervals under investigation. Bradycardia was noted in 3 patients in the CSE group (12%9 and 2 patients in the PCSNB group (8%). Atropin sulphate was administered intravenously at a dose of 0.01 mg/kg.

In both groups, no significant desaturations were noted. In the PCSNB group, mild desaturation which did not influence the clinical picture was detected in 4 patients (16%). In 3 of these cases (12%), desaturation resolved after recovery and in 1 patient (4%) short duration of ventilation improved the oxygen saturation.

As for Aldrete scores, the duration of stay in the postoperative recovery room before transfer to the inpatient department or intensive care unit were 15 ± 6.12 minutes for the PCSNB group and 19.8 ± 11.03 in the CSE group. The postoperative need for intensive care unit in the PCSNB group was 4 (16%), while it was 7 (28%9 in the CSE group. There were no differences between 2 groups in terms of neither the duration of recovery (p=0.063) nor the need for intensive care unit (p=0.306).

The first need for postoperative analgesia was 4.84 ± 2.54 hours in the PCSNB group, and it was 1.64 ± 0.90 hours in the CSE group. The PCSNB group had a remarkably longer duration for the first postoperative need of analgesia compared to that of the CSE group (p<0.001) (Figure 1).

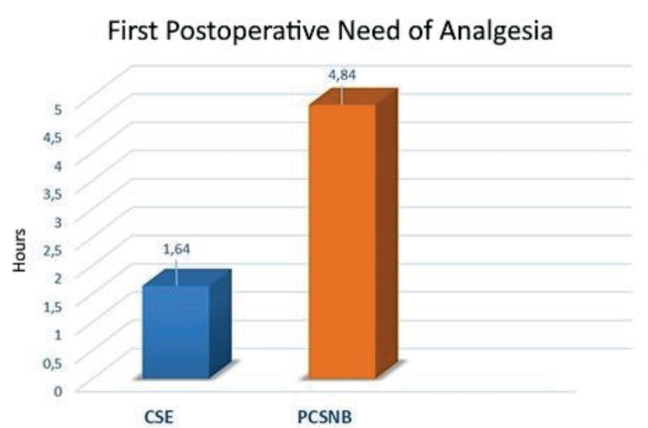

Figure 1. The time of first postoperative analgesic administration in combined spinal epidural anesthesia (CSE) and psoas compartment sciatic nerve blockade (PCSNB) groups.

In both the CSE and the PCSNB groups, intraoperative nausea and vomiting were detected in 3 patients (12%). In the CSE group, 2 patients (8%) had postoperative nausea and vomiting. Back pain was noted in 1 patient in the CSE group (4%). No neurological or procedure-related complications were encountered during the postoperative follow-up period in both groups.

DISCUSSION

Our aim was to comparatively investigate the efficacies of psoas compartment and sciatic nerve blocks and combined spinal epidural anesthesia for partial hip prosthesis surgery in the geriatric population. We assessed the quality of anesthesia, hemodynamic stability, amount of inotropic agent consumption, side effect profile and investigated the pros and cons of both methods in this particular patient population. Attributed to the prolonged human life expectancy, surgical procedures performed in the geriatric population became more popular recently. Since the cardiac and pulmonary reserves of these patients are lower, they are under more substantial risks associated with general anesthesia and surgical stress.

Hip prosthesis operations are more frequently performed in the elderly population and due to the increased amount of blood loss; intraoperative and postoperative deterioration of hemodynamics constitutes a considerable risk in these patients [9]. Recent publications advocate the use of regional anesthesia for hip surgery [10-12].

Neuraxial anesthesic techniques such as spinal and epidural anesthesia offer important advantages such as preservation of cognitive functions, diminish the amount of bleeding, decrease the risk of thromboembolism and provide effective postoperative analgesia. On the other hand, disadvantages such as hypotension, bradycardia, urinary retention and delay of the mobilization due to block on the contralateral extremity [13-15]. Moreover, patients with hip fractures may not be able to flex their legs due to pain and disorders such as spinal calcification and degenerative diseases may hinder the administration of neuraxial blocks [16]. Therefore, efforts are spent to develop the alternative regional anesthesia techniques which avoid these aforementioned disadvantages.

The peripheral nerve blocks such as the psoas compartment or triple femoral blocks are used in conjunction with general anesthesia for intraoperative and peroperative analgesia [17]. Some publications support that the concomitant use of psoas compartment block together with general anesthesia diminished the use of the anesthetic agents, reduces the amount of blood loss, and decreases the risk of thromboembolism and improve the quality of postoperative analgesia [13,18-20].

Owing to the wide surgical field and innervation of the posteromedial part of the hip joint capsule by the sciatic nerve, the psoas compartment block can be used in conjunction with sciatic nerve block [21]. The combination of psoas compartment block and sciatic nerve block provides a sufficient level of anesthesia for hip surgery [22-24]. However, these methods have still not gained enough popularity for their use alone or under mild sedation. This fact may be linked with confounding factors such as the need for multiple injections, late onset of anesthesia and utility of high volume local anesthetics [14].

The PCSNB is a relatively safe and practical method for high-risk patients who cannot tolerate hemodynamic instability. The long-term and satisfactory levels of analgesia, unilateral motor block, and limited sympathetic blockade are the main advantages of peripheral nerve blocks [25-27]. Moreover, it diminishes side effects associated with opioid use, allows early mobilization of patients and decreases the duration fo stay in the postoperative intensive care unit [15]. Similar to our data, relevant publications support that PCSNB provides a sufficient level of analgesia without any need for further analgesia in patients scheduled for hip surgery [15,28,29].

We noted that the administration of PCSNB technique and onset of anesthesia necessitated longer periods than that of CSE. These findings were similar to the previous reports in the literatüre. However, its advantages and the extent of surgical intervention must be taken into account while considering these disadvantages.

Every spinal anesthetic technique has its outcomes and risks and each method should be evaluated within its own indications, advantages and disadvantages. Factors such as the composition of the medications used and the position of the patient may directly influence the distribution of the spinal anesthesia. Moreover, single shot technique and continuous spinal anesthesia with or without combined epidural anesthesia lead to significant differences in terms of optimal doze use. These variable saffect the width of distribution and rates of sympathetic denervation and hypotension. Anyway, peripheral nerve blocks are supposed to provide limited hemodynamic outcomes compared to those of central blockades.

Effective postoperative analgesia allows early postoperative mobilization and contributes to the improvement of surgical outcomes and decreases the rate of morbidity linked with immobilization. Better postoperative analgesia can be achieved with catheterized spinal and epidural analgesia or with the addition of opioid agents to spinal agents. However, we would like to emphasize that peripheral nerve blocks can constitute effective alternatives in selected cases rather than being the supreme anesthetic method in terms of all aspects.

The main limitations of this study involve observational design, relatively small sample size, lack of detailed evaluation of sensory block and data confined to the experience of a single centre. Moreover, assessment of the quality of anesthesia was based on the response to surgical stimuli after the initial evaluation.

CONCLUSION

In conclusion, results of the present study imply that the combination of psoas compartment, parasacral sciatic and iliac crest blockades constitute a safe and effective alternative method that preserves hemodynamic stability in hip prosthesis operations in the geriatric population.

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