

# Evaluation of Acute and Chronic Back Pain After Spinal Anesthesia in Midline and Paramedian Approach: Incidence and Functional Disability

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**Background:** The intensity of low back pain and functional disability in life is a common question of patients before spinal anesthesia. We aimed to compare acute and chronic back pain after spinal anesthesia in midline and paramedian approach.

**Methods:** Two hundred twenty patients elective patients (25-65 year old) candidates for general, and urological surgery under spinal anesthesia, were allocated into the following two groups: Group M (midline) and Group P (paramedian). Spinal anesthesia was performed with hyperbaric bupivacaine 0.5% in the sitting position using a 25G Quincke needle in L3/L4 or L4/L5 level. During the operation, patients were placed in the supine position. The questionnaire assessed back pain and severity of pain with VAS score three days after spinal anesthesia. If the patients complained of back pain then, the effect of back pain on quality of life and the degree of patient's functional disability were assessed by Oswestry Disability Index on,45 and 90 days after surgery.

**Results:** Forty-one patients (18%) had back pain after the operation, 22 patients were in the paramedian (54%) and 19 patients (46%) in the midline method of spinal anesthesia. ( $p=0.6$ ). The mean intensity of back pain was 2.27vs1.45 ( $p=0.5$ ) and the total number of mean functional disability index was less than five in both groups.

**Conclusion:** The incidence of back pain was 18% and was not significantly different between the midline and paramedian methods. The severity of back pain decreased after three days, reaching to less than one on day the 45th and 90th, which does not affect daily patient's functions.

**Keywords:** spinal anesthesia; back pain; midline; paramedian

Spinal anesthesia, one of the most commonly preferred anesthesia technique that is used in usual practice. It can cause complications that may have bad memory in the minds of patients.

Post spinal back pain is one of the complications causing dissatisfaction in patients and leading to refusal of the procedure for future surgeries [1-2].

Although it has been shown that acute back pain related to spinal anesthesia is short termed and self-limiting, a considerable number of patients express hesitation out of concern for the development or worsening of back pain in future that make some problem in quality of life [3].

There are many studies that evaluate risk factors that play a role in occurrence of acute back pain following spinal anesthesia [4-5]. However there are still many questions about the persistence of back pain after spinal anesthesia that affects the quality of life in future. Therefore, we evaluated, in a prospective 3month follow-up study, the incidence of

acute back pain and its impact on quality of life after spinal anesthesia in midline and paramedian approach.

## Methods

After being approved by the Ethical Board Committee of Anesthesiology Department of Tehran University of Medical Sciences (TUMS), this interventional, randomized clinical trial, was conducted on 220 elective patients (25-65-year-old) candidates for general, and urological surgery under spinal anesthesia from January 1 to December 31, 2017. They were interviewed using a structured questionnaire. At the pre-operative visit all patients were informed that they would be given a questionnaire three day after their operation and then for those patients suffering from back pain will be asked by telephone 45 and 90 day thereafter to find the intensity of pain and effect of back pain on quality of their life.

In the anesthetic room, standard monitors, ECG, arterial pressure and oxygen saturation for all patients were applied. Thereafter, an i.v. line was inserted and a crystalloid solution like Ringer or Normal saline was started.

Exclusion criteria were any contraindication to spinal anesthesia, history of canal stenosis, lumbar surgery, addiction, and psychological disorder. Candidate patients were randomly allocated by using a computer-generated

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table into two following groups, midline and paramedian approach.

Spinal anesthesia was performed with hyperbaric bupivacaine 0.5% in the sitting position using a 25G Quincke needle in L3/L4 or L4/L5 level. The dose of bupivacaine injected intrathecally depended on the duration of the surgical procedure. During the operation, patients were placed in the supine position.

Any patient with higher than two times try to spinal anesthesia was excluded from the study.

The questionnaire assessed back pain and severity of pain with VAS score three days after spinal anesthesia. If the patients complained of back pain then, the effect of back pain on quality of life and the degree of patient's functional disability were assessed by Oswestry Disability Index on, 45 and 90 days after surgery [6].

All data are presented as means (SD). Categorical data were analyzed by means of contingency tables and Fisher's exact test. Continuous variables were evaluated by an unpaired t-test.

## Results

220 patients were enrolled in the study. Patients were between the ages of 25 and 64 with an average of  $35.6 \pm 9.6$  years. Of these, 41 patients (18%) had back pain after the operation, 22 patients were in the paramedian (54%) and 19 patients (46%) in the midline method of spinal anesthesia ( $p=0.6$ ) (Table 1).

**Table 1- Incidence of back pain and patient's characteristics between two groups**

Variable	Paramedian	Midline	P value
Age (years)	34.2±9.3	37.2±9.9	0.376
Gender(F/M)	1/21	1/18	0.001
Back pain (%)	22(54%)	19(46%)	0.639
History of back pain	6(28.6%)	3(15.8%)	0.334
History of spinal anesthesia	9(21%)	7(17%)	0.231

The mean intensity of low back pain score in two groups in days 3, 45 and 90 is shown in (Table 2).

**Table 2- The mean of low back pain VAS score in two groups on days 3, 45 and 90**

Variable	Paramedian	Midline	P value
Day 3	2/27	1/47	/5140
Day 45	0/41	0/21	0/32
Day 90	0/45	0/21	0/34

The mean of functional disability Index based on the Oswestry questioner was measured on 45 and 90 postoperative days and is demonstrated in (Table 3).

**Table 3- The mean of functional disability Index**

Variable	Paramedian	Midline	P value		
Postoperative day	45	90	45	90	
Pain intensity	0.4	0.2	0.3	0.1	0.6
Personal care	0.3	0.1	0.2	0.2	0.7

**Table 3- The mean of functional disability Index (Continued)**

Variable	Paramedian	Midline	P value		
Postoperative day	45	90	45	90	
Lifting	0.1	0.2	0.4	0.1	0.4
Walking	0.4	0.5	0.6	0.2	0.8
Sitting	0.6	0.2	0.3	0.1	0.5
Standing	0.4	0.6	0.2	0.3	0.6
Sleeping	0.5	0.3	0.4	0.1	0.4
Sex life	0.4	0.2	0.3	0.6	0.5
Social life	0.5	0.3	0.4	0.1	0.6
Travelling	0.4	0.2	0.3	0.2	0.9
Total score	4	2.8	3.4	2	0.7

## Discussion

In this study, the incidence of low back pain and its severity after spinal anesthesia was evaluated in midline and paramedian approach. It was shown that the incidence of low back pain and its severity on the third days, forty-five and ninety after spinal anesthesia-did not differ significantly between these two methods. The severity of the patient's functional disability index was low on days 45 and 90 after surgery and had no effect on the quality of life of the patients.

Back pain after surgery have several causes such as the condition of the patient during surgery, operative table, the duration of the surgery, the underlying illness of the patient, the trauma caused by the spinal or epidural needle. Its incidence is 46% after surgery and general anesthesia [7].

Low back pain following spinal anesthesia creates a mentality among patients, which in one study was the main cause of the refusal to accept spinal anesthesia in 13.4% of patients [8].

There is a great deal of difference regarding the relationship between the technique of spinal anesthesia and the true incidence of back pain that it reached to 20% in some study [9]. In our study, incidence of low back pain was 18% that wasn't different between two groups.

The kind of local anesthetic spicily lidocaien can also be a major cause of low back pain after spinal anesthesia, that it occurs as Transient neurologic syndrome [10].

In our study, all patients were given bupivacaine, which did not report the risk of low back pain.

The type of needle and its size were studied in several clinical trials. In a study, 274 patients with needles size 23 and 25 had spinal anesthesia. The incidence of back pain was 18%, and there was no significant difference between the two groups [11].

Several studies have been conducted on the frequency of needle insertion. In Shutt et al.'s study, in patients with elective cesarean section with 22 and 25 whitacare needles, it was shown that if the frequency of needles is more than 2 times, then the incidence of low back pain will be high. The severity of their pain decreased after 3 days and was not enough to be followed up [12]. In our study, all patients had one or two attempts to perform spinal anesthesia and

patients were excluded if there were more than two attempts.

In a study by Bayındır et al on Which Approach is Preferred in Spinal Anesthesia: Median or Paramedian? They concluded that, there was no significant difference in complications of spinal anesthesia applied via both technical approaches and discharge in short continuance surgical cases [13].

The mean of the severity of back pain in both groups decreased from the third day and was significantly reduced on the 45 and 90 days after surgery to a degree that was very insignificant.

In the study of Schwabe et al. a small number of patients with low back pain continued after three months, which was a group of patients with pre-operative back pain [14]. But in our study, 9 patients had a history of back pain, which after 3 months decreased to a low level without any disability in daily activities

The Oswestry Disability Index (ODI) is an effective method of measuring disability in patients with back pain with a wide degree of severity and causes [15-16]. We used this questionnaire in this study to evaluate the amount of functional disability which may be left after spinal anesthesia.

The total score of ODI is 50. In our study in both groups, the total score was less than 5, This means that the amount of patient's functional disability is negligible.

## Conclusion

The incidence of low back pain after spinal anesthesia was 18% in our study, and the incidence of it was not significantly different between the midline and paramedian methods, and the severity of back pain decreased after three days, reaching to less than one on day the 45th and 90th, which does not affect the functional ability of patients.

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