

## Incidence of back pain following spinal anesthesia and its relationship to various factors in 176 patients

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### ABSTRACT

**Objective:** After neuraxial anesthesia, back pain is the most common complaint. The back pain may be related to needle trauma or surgical positioning or transient neurotoxicity of concentrated local anesthetics. The goal of this study was to compare the incidence of back pain following spinal anesthesia with hyperbaric lidocaine 5% and bupivacaine 0.5% and spinal needle insertion spaces.

**Methodology:** In this clinical trial after approving ethics committee and obtaining patients consent, we included 176 adult patients with physical status of I- II ASA from May 2006 to May 2008 undergoing various elective urologic surgeries under spinal anesthesia in Imam Hospital in Tabriz, Iran. Patients were allocated randomly in two equal groups. Group lidocaine, a nesthetized with hyperbaric 5% lidocaine and group bupivacaine. All patients were interviewed 6, 24, 48 hours after surgery for back pain.

**Results:** This study indicated no statistically significance difference in the incidence of back pain following spinal anesthesia considering age and frequency of needle puncture during spinal anesthesia. Incidence of back pain was higher in lidocaine group than bupivacaine group (31.82% vs. 18.18%; respectively;  $P < 0.001$ ). Incidence of back pain was higher in L<sub>3-4</sub> interspace of needle insertion than L4-5 (23.7% vs. 12.8%, respectively;  $P < 0.001$ ). The intensity of back pain was slight and tolerable in 77% of the cases, and the back pain in all the patients lasted not more than 48 hours.

**Conclusion:** This study implies that the area of needle insertion and type of anesthetics have effects on the back pain following spinal anesthesia.

**KEY WORDS:** Bupivacaine, Lidocaine, Back pain, Spinal anesthesia, Spinal needle puncture.

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### INTRODUCTION

Complications resulting from neuraxial block (spinal and epidural anesthesia) are unusual. When they occur, the potential for significant morbidity dose exist. After a neuraxial anesthesia, back pain is the most common complaint. Back pain occurs in 22% to 40% of obstetrical patients.<sup>1,2</sup> Postoperative backache after general anesthesia is reported to occur in as many as 12% of patients.<sup>3</sup> Other studies have not consistently found a significant increase in the incidence of backache when utilizing a regional anes-

thetic in comparison to those undergoing general or local anesthesia.<sup>4</sup> The backache may be related to needle trauma or surgical positioning. Injection of saline or local anesthetic into the interspinous ligaments or the development of a supraspinous hematoma may be the etiology of the backache.<sup>5,6</sup> This discomfort happens following spinal and general anesthesia. Regardless of anesthetic technique, back pain is seen in almost 25% of the patients who have undergone surgical operations through general or spinal anesthesia.<sup>7</sup> The back pain occurring after spinal anesthesia with hyperbaric lidocaine is more severe compared to the one occurring after hyperbaric bupivacaine, and is one of the major problems of the patients who lie down in a supine position.<sup>1</sup> The etiology of back pain following spinal anesthesia with hyperbaric 5% lidocaine has not been known yet.<sup>3</sup> The position of the patient during the surgery has been considered as the most important possible factor and in some cases back anatomic anomalies exist; they must be modified through placing suitable cushions.<sup>1</sup>

It seems that the transient neurotoxicity effect of hyperbaric anesthesia is the first main cause of the transient neural signs following spinal anesthesia. The transient neural signs include the symmetrical pain of the back or buttocks, or the spread of pain to lower extremity after recovery from anesthesia, which are observed with all the local anesthetics following spinal anesthesia, however; these signs are often and generally seen with lidocaine 5%.<sup>2</sup> In one case-control study, it was indicated that the spinal anesthesia was an important factor causing back pain.<sup>8</sup> In a prospective study, it was also reported that the back pain was observed more frequently in the patients who had undergone spinal anesthesia with hyperbaric lidocaine.<sup>9</sup> The goal of this study was to compare the incidence of back pain following spinal anesthesia with hyperbaric lidocaine 5% and bupivacaine 0.5% and spinal needle insertion spaces.

## METHODOLOGY

The present study was carried out on a population of 176 patients aged 17 to 75 years, with of American Society of Anesthesiologists (ASA) physical status classes I, II, from May 2006 to May 2008. Ethical permission for the study was obtained from the Ethics Committee of the Tabriz University of Medical Sciences. The patients were selected randomly and underwent various urologic surgical operations such as prostatectomy, varicocelectomy and hydrocelectomy, in Imam Hospital in Tabriz, Iran. None of the patients suffered from back pain before the operation.

Standard spinal needles sized 25 - gauges Quincke type were used for all patients. Patient were allocated randomly in two equal groups. Patients in lidocaine group, anesthetized with hyperbaric 5% lidocaine 100 mg and in bupivacaine group, hyperbaric 0.5% bupivacaine 15 mg. All the patients underwent anesthesia only by one anesthetist. Written consent to undergo spinal anesthesia was taken from all the patients. The spinal needles were insertion into L<sub>3-4</sub> or L<sub>4-5</sub> spaces in a way that the diagonal surface of the needle was leftward or rightward, and the patient was in sitting or lateral decubitus position. The patients were examined within six and 24 hours and in case of any pain 48 hours after operation, the information required was gathered through an arranged questionnaire and analyzed using SPSS software. Results are expressed as numbers, means  $\pm$ SD and percentage. We used Chi square with Yates correction for categorical variables, Student t test for comparing numerical variable between two groups. P< 0.05 was considered significant.

## RESULTS

Patient's demographic data are shown in (Table-I). There were no significant differences between lidocaine and bupivacaine group. Incidence of back pain in lidocaine group was more than bupivacaine and differences between was significant (Pv=0/036) (Table-I).

Table-I: -Relationship between age, weight, ASA and pain the local anesthetic solution

	<i>bupivacaine 0.5%</i>	<i>lidocaine 5%</i>	<i>Pv</i>
Age (yr)	50.45 $\pm$ 15.4	65.45 $\pm$ 1.15	0.356
Weight	66 $\pm$ 11.24	68 $\pm$ 14.7	0.45
ASA I/II	8.80	13.75	0.24
Back pain	16(18.18%)	28(31.82%)	0.036
No back pain	72(81.82%0)	60(68.18%)	

Values were shown means $\pm$ SD, numbers and percents PV<0.05 was significant

Table-II: The relationship between the insertion points of spinal needle, paresthesia, positioning, operating time and incidence of back pain

	<i>Pain</i>	<i>Pv</i>	<i>No Pain</i>	<i>Total</i>
L3-L4	26(22.8%)	0.001	88	114
L4- L5	8(12.8%)		54	62
Paresthesia	10(24%)	0.46	32(76%)	42
No paresthesia	25(19%)		109(81%)	
Supine position	27(17%)	0.015	134(83%)	158
Lateral position	8(40%)		12(60%)	20
Mean operation time (min)	104		101	

Values are presented as numbers

Eighty-eight patients underwent spinal anesthesia through hyperbaric 0.5% bupivacaine, 16(18.18%) cases of whom suffered from back pain; In addition 88 patients underwent spinal anesthesia through hyperbaric 5% lidocaine, 28(32%) cases of whom suffered from back pain. The statistical difference was significance between two groups ( $P_v < 0.001$ ), (Table-I).

The insertion point of the spinal needle had a significant effect on the incidence of back pain following spinal anesthesia. In patients whom the spinal needle was inserted through the  $L_{3-4}$  spinal space significantly more than  $L_{4-5}$  ( $P_v = 0.023$ ). The results mentioned above, indicate that back pain incidence was higher in the patients who had experienced spinal needle insertion in the  $L_{3-4}$  spinal space (Table-II).

In 109 patients, spinal anesthesia was successfully implemented by inserting the needle only one time, and 21(19.5%) patients of this group suffered from back pain following spinal anesthesia. In 35 patients, the frequency of inserting the spinal needle was two times, 11 patients of whom (31%) suffered from back pain. In addition, in 32 patients the frequency insertion of the spinal needle was more than three times, 10 patients of whom (31%) suffered from back pain (Table-III). The statistical analysis indicated no significance difference between the frequency of needle

insertion and the rate of back pain incidence ( $P_v > 0.05$ ). The relationship between the feeling of paresthesia during induction of spinal anesthesia and incidence of back pain following spinal anesthesia is shown in Table-II, and there were no significant differences ( $p = 0.46$ ). Furthermore, the onset of pain in most patients with back pain (91%) occurred first 6 hours following recovery of spinal anesthesia. The pain also lasted for 48 hours only in eight cases, and not more than 12 hours in 24 cases.

## DISCUSSION

Transient lumbar pain has been reported to occur frequently in patients having surgery using 5% hyperbaric lignocaine for spinal anesthesia. The incidence of transient lumbar pain is highest with this agent in patients having surgery in lithotomic position and in outpatients.<sup>10</sup> In another study that was performed in Tanzania incidence of low back pain was 38/5%.<sup>11</sup>

In our study, the incidence of transient back pain was greater after spinal anesthesia with hyperbaric lidocaine (31.82%) than hyperbaric bupivacaine (18/18%). Muscloligamental relaxation could explain the symptoms as the patient was on his back during spinal anesthesia by lidocaine. It may be speculated that the reason why back pain symptoms were reported more in the lidocaine 5% group could be complete

Table-III: The relationship between the frequency of spinal needle insertion and the incidence of back pain

<i>Frequency of needle insertion</i>	<i>Patients with back pain</i>	<i>Patients without back pain</i>	<i>Total</i>
1	21 (19.5%)	88(80.5%)	109
2	11 (31%)	24(69%)	35
>3	10 (31%)	22(69%)	32

$PV > 0.05$

motor block of muscles with support the spine.<sup>12,13</sup> Potent motor block action of hyperbaric lidocaine may weaken the supportive structures of the spine and cause flattening of the lordotic curve. This could give rise to radiating symptoms in the back, buttocks and legs.

Comparing hyperbaric lidocaine 5% with bupivacaine 0.5% there is a relationship between potent motor block induced by two agents.<sup>12,13</sup> A. Hiller and colleagues reported a 27% incidence of transient back pain after spinal anesthesia in patients operated on the supine position.<sup>13</sup> This observation is supported by our study. In our study low back pain with supine and lateral position was observed in 17% and 40% respectively. The development of back pain after spinal anesthesia in patients with lateral position on the operating table may be due to musculoligamentous tension and more flattening of spine than supine positioning.<sup>10</sup> Middleton and colleagues have reported incidence of back pain probably as result of the supine position on the operating table have in 20% of patients receiving general, spinal or epidural anesthesia for surgery.<sup>14</sup> In our study, the incidence of back pain in supine position was relatively high.

### CONCLUSION

In order to reduce the incidence of back pain occurring after spinal anesthesia, the following points are suggested: It is better to use hyperbaric 0.5% bupivacaine instead of hyperbaric 5% lidocaine in spinal anesthesia, and the L<sub>4-5</sub> spinal space should be used for inserting the spinal needle. Avoid insertion of spinal needle for puncture not more than once as far as possible.

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