

## A Comparative Study of 100 Cases for Lignocaine and Bupivacaine as Spinal Anaesthetic Agent in Lscs in Combind Military Hospital in Mymensingh

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### Abstract

### Original Research Article

One hundred ASA grade 1 and 2 female patients in combined military hospital in Mymensingh, aged from 18 to 40 years scheduled for caesarean section willing to accept regional anaesthesia were studied in two groups. Group A received 2ml of injection lignocaine hydrochloride 5% in 7.5% dextrose and Group B received 3ml of injection bupivacaine hydrochloride 0.5% in L3-L4 subarachnoid space. Statistically there was difference ( $p < 0.001$ ) in onset of complete analgesia and its duration in these two drugs but clinically lignocaine produces better motor blockade than bupivacaine. Hypotension was observed with bupivacaine ( $p < 0.001$ ) whereas nausea and vomiting was prevalent with lignocaine. Lignocaine is found suitable for operation of shorter duration, whereas bupivacaine is suitable for operation lasting up to two and half hours, both the drugs were found safe, caused no significant complication.

**Keyword:** Lignocaine, bupivacaine, hypotension, bradycardia.

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## INTRODUCTION

Spinal anaesthesia, the temporary interruption of nerve transmission following injection of a local anesthetic solution into the subarachnoid space, is a versatile and frequently employed method of regional anaesthesia in surgical and obstetrical as well as in management of certain pain problems. This regional anesthetic technique offers significant advantage over general anaesthesia, the pharmacology of the local anesthetic agent as well as the physiologic changes that accompany these anaesthetics, can anticipate any untoward side effects and enables to counter them efficiently. We have carried out this comparative study between lignocaine and bupivacaine as spinal anesthetic agents to find out the safety, reliability and acceptability of lignocaine hydrochloride.

## MATERIALS AND METHODS

One hundred patients of ASA grade 1 and 2 aged from 18 to 40 years, scheduled for lower uterine caesarean section were studied. Patients with neurological disorders, spinal deformities, hypovolemia and coagulopathy were excluded from study. Patients were divided into two groups. Group A consisted of 50 patients, each patient received 2 ml of lignocaine

hydrochloride 5% in 7.5% dextrose and group B consisted of 50 patients and each patient received 3ml of injection bupivacaine hydrochloride 0.05% in 8% dextrose. Intravenous preloading of fluid was done before operation. During operation no analgesic or sedatives were given. Intravenous fluid given at the rate of 10 ml/kg/hour in addition to fluid loss. Monitoring of pulse and blood pressure were done at predetermined regular interval and also when desired. The patient was positioned in lying lateral and under aseptic condition drug was injected into the subarachnoid space between L<sub>3</sub>-L<sub>4</sub> using 22 to 25-gauge spinal needle. Onset and height of analgesia were determined by every minute pin prick method. The intensity of sensory and motor block were recorded as follows

A. Sensory block (Bromage grading) [1].

1. Excellent – full sensory blockade was achieved.
2. Good – full sensory blockade was adequate but sedation with diazepam and intravenous opiates were required to supplement the block.
3. Fair – block was not sufficient for operation and supplementation of volatile anesthetic agents were required.

B. Motor block (Bromage scale) [2].

1. Complete - unable to move legs or feet.

2. Almost complete – under to flex knee but still flexion of feet is possible.
3. Partial – just able to flex knee out still full flexion of feet possible.
4. 'O' block – full flexion of knee and feet possible.

## RESULT

Hypotension was considered significant when systolic blood pressure drooped by 30% of the

preanaesthetic level and was treated with rapid intravenous infusion. Vasopressor were kept in reserve for more severe cases. Significant bradycardia was considered when pulse rate was less than 60/min and was treated with injection prochlorperazine 12.5 mg intramuscularly. Results were compiled and student's 't' test was used for statistical analysis. The  $p < 0.05$  was taken as level of statistical significance.

**Table 1: Age distribution**

Age(years)	Lignocaine(n-50)		Bupivacaine(n-50)	
	Number	Percentage	Number	Percentage
21-25	20	40	18	36
26-30	12	24	13	26
31-35	10	20	11	22
36-40	08	16	08	16

**Table-2: Time of onset of complete analgesia (in minutes)**

Time of onset in min	02	03	04	05	06	07	08	09	10	12	13	14	15	Mean± SD	Result
Lignocaine (n-50)	07	20	14	04	03	-	02	-	-	-	-	-	-	3.68±1.36	P<0.001
Bupivacaine (n-50)	-	05	08	13	05	05	02	03	06	01	-	01	01	6.42±2.85	

**Table-3: Duration of analgesia (in minutes)**

Duration in min	00-30	31-40	61-70	71-80	81-90	91-100	101-110	111-120	Mean± SD	Result
Lignocaine (n-50)	02	00	03	00	19	02	19	05	108.48±34.12	P<0.001
Bupivacaine (n-50)	00	00	01	10	10	03	25	02	145.5±43.47	

**Table-4: Degree of sensory block**

Grading	Lignocaine (n-50)		Bupivacaine (n-50)	
	Number	Percentage	Number	Percentage
Excellent	43	86	47	94
Good	04	08	01	02
Fair	02	04	00	00
Poor	01	02	02	04

**Table-5: Degree of motor block**

Grading	Lignocaine (n-50)		Bupivacaine (n-50)	
	Number	Percentage	Number	Percentage
Complete	45	90	44	88
Almost complete	03	06	03	06
Partial	02	04	03	06
No block	00	00	00	00

**Table-6: Systolic blood pressure changes**

Fall of BP (mm of Hg)	00-10	11-20	21-30	31-40	41-50	51-60	61-70	Mean± SD	Result
Lignocaine (n-50)	09	15	14	10	00	02	00	22.01±12.35	P>0.05
Bupivacaine (n-50)	07	10	10	12	04	04	03	29.43±17.12	

**Table-7: Diastolic blood pressure changes**

Fall of BP (mm of Hg)	00-10	11-20	21-30	31-40	41-50	51-60	61-70	Mean± SD	Result
Lignocaine (n-50)	24	12	11	03	00	00	00	13.86±9.91	P>0.005
Bupivacaine (n-50)	15	11	13	09	01	01	00	19.95±12.83	

**Table-8: Heart range changes**

Fall of heart rate (Beat/min)	00-10	11-20	21-30	31-40	Mean± SD	Result
Lignocaine (n-50)	21	23	04	02	12.69±7.98	P>0.05
Bupivacaine (n-50)	19	19	10	02	14.31±8.83	

**Table-9: Perioperative and postoperative complications**

Lignocaine (n-50)	Bupivacaine (n-50)	
	Number	Percentage
Complications	Number	Percentage
Nausea	06	12
Vomiting	04	08
Restlessness	00	00
Unconsciousness	00	00
Retention of urine	00	00
Headache	00	00
Backache	00	00
Neurological sequel	00	00
Shivering	02	04
Respiratory arrest	00	00

Table 1 shows age distribution. Out of one hundred patient age ranged from 20 to 40 year in Group A about 40% of patients were between 21 to 25 years age, 24% of patients were 26-30 years age, 20% between 31-35 years and 16% between 36-40 years. In Group B about 36% of patients were between 21-25 years, 26% of patients were 26-30 years, 22% between 31-35 years and 16% between 36-40 years. Table 2 shows time onset of complete analgesia by both drugs. Lignocaine took 2 to 8 minutes, the mean value 3.8±1.36 minutes and bupivacaine required 5 to 13 minutes, the mean value being 6.42±2.85 minutes. The difference is statistically significant ( $p<0.001$ ) lignocaine being of rapid onset than bupivacaine. Table 3 shows duration of analgesia. It is observed that the mean time of lignocaine is 108.48±43.47 minutes and of bupivacaine is 145.5±43.47 minutes. Difference is statistically significant ( $p<0.001$ ). Table 4 shows degree of sensory block. "Excellent" result obtained with lignocaine in 86% of patients and with bupivacaine 94% of patients. Table 5 shows degree of motor block. Complete block obtained with lignocaine in 90% and with bupivacaine it is 88%. The difference is insignificant. Table 6 shows changes of systolic blood pressure. the mean fall of blood pressure with lignocaine is 22.01±12.35 mm Hg and with bupivacaine is 29.43±17.12 mm Hg ( $p>0.05$ ). Fall of blood pressure more than 30 mm Hg is more common with bupivacaine. Changes of diastolic blood

pressure is shown in Table 7. Table 8 shows effect of drug on heart rate. The mean fall of heart rate was 14.31±8.83 beat/min with lignocaine ( $p>0.05$ ) Table 9 shows per-operative and immediate post-operative complications. Nausea and vomiting is common with lignocaine then bupivacaine. Shivering occurred in 04% of patient with lignocaine and 10% patient with bupivacaine.

## DISCUSSION

One hundred patients were studied to compare the action of lignocaine hydrochloride with bupivacaine hydrochloride in spinal anesthesia. We have found that there is significant difference in the time onset of analgesia between these two drugs. This is not in conformation of findings by Singh NP *et al.* who could not detect any significant deference in this regard [3]. In the mean duration of analgesia the findings are comparable with those of Moor *et al.*, Covino *et al.*, Chowdhury M A *et al.* and Sachdeva *et al.* [4-6]. This shows that bupivacaine gives analgesia for about two hours whereas lignocaine gives analgesia for about 1hour. About 86% of patient with lignocaine and 94% patient with bupivacaine showed satisfactory sensory blockage. These findings are in corroboration with those of Maître and Pramanik [7]. It can be inferred that bupivacaine produces better sensory block then lignocaine. Complete motor block obtained with

lignocaine in 90% of patients and with bupivacaine in 88% of patients which is comparable to Shah *et al.* [8]. Fall in excess of 30% of original blood pressure was more common with bupivacaine than lignocaine. Arterial hypotension after spinal anaesthesia is common. It is caused at least in part by a decrease in total peripheral resistance as a result of sympathetic denervation. Fall of heart rate occurs with both the drugs but the difference is statistically insignificant. Incidence of bradycardia occurred only in 02 cases. Smith and Barton in their study mentioned almost all patients had nausea and vomiting along with hypotension and bradycardia [9]. In this study 6 patient had nausea and 4 patient vomited with lignocaine whereas 03 patient had nausea and 2 patient vomited with bupivacaine they responded well with reassurance and injection prochlorperazine. 12.5 mg intramuscularly. During operation 2 patients with lignocaine and 05 patients with bupivacaine developed shivering due to fall of body temperature because of cutaneous vasodilatation. Headache is the major complication of spinal block. In this study majority of spinal punctures were with 25-gauge spinal needles and a few cases with 22 gauge needle. None of the cases developed post dural puncture headaches (PDPH). Shutt L E *et al.* in their study found that the use of 22 and 25 gauge needle is associated with a low incidence of PDPH [10].

## COCNCLUSION

In this study we can conclude that lignocaine is found suitable for operation of shorter duration, whereas bupivacaine is suitable for operation lasting up to two and half hours, both the drugs were found safe, caused no significant complication.

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