



## A STUDY TO COMPARE CLINICAL AND ANAESTHETIC PROPERTIES OF ISOBARIC RACEMIC BUPIVACAINE AND ISOBARIC LEVOBUPIVACAINE DURING SPINAL ANAESTHESIA IN LOWER LIMB SURGERY

### Anaesthesiology

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### ABSTRACT

**Aim :** To compare clinical and anaesthetic features of racemic bupivacaine and levobupivacaine when intrathecally administered in 130 patients undergoing lower limb orthopaedic surgical procedures.

**Materials and Methods:** Its a prospective, double blind study, in which 130 patients were randomly divided into two groups: Group-I receiving isobaric Levobupivacaine 0.5% while Group-II receiving isobaric bupivacaine 0.5% (3 ml) intrathecally at L3 -L4 level through 25 g spinal needle , 65 patients in each group. Sensory and motor blockades were evaluated by the pinprick test and a modified Bromage score, respectively. Vital parameters, postoperative VAS and rescue analgesia were recorded as well.

**Results:** No significant difference was observed in duration of sensory block, onset and duration of motor block ,the mean durations of 2 segment regression, total duration of analgesia, and mean VAS score .Hypotension was significantly observed in group B as compared to group A. There was no significant difference in number of patients experiencing episodes of bradycardia and respiratory distress.

**Conclusions:** Intrathecal isobaric levobupivacaine shows good results with hypotensive patient.

### KEYWORDS

Levobupivacaine , Racemic bupivacaine .

### INTRODUCTION

Racemic bupivacaine has been considered from quite a long time as the elective long-acting local anaesthetic in most of the locoregional procedures, particularly for spinal anaesthesia(1). Recently introduced Levobupivacaine is the pure S(-) enantiomer of racemic bupivacaine. Using Bupivacaine in spinal analgesia may be associated with hypotension, nausea, vomiting and delay recovery of motor and bladder functions also interfering in early ambulation and discharge and because of these concerns, increased interest in use of newer long acting amide local anaesthetic agent levobupivacaine. It is said to produce equivalent spinal analgesia with a faster recovery period than that of Bupivacaine(2). What makes levobupivacaine better is in terms of decreased risk of neurotoxicity and cardiotoxicity as compared to bupivacaine(3,4), Levobupivacaine is a long-lasting local anaesthetic with limited cardiotoxicity and neurotoxicity. It may produce a sensory and motor block that is different from that produced by bupivacaine, the most popular local anaesthetic for parturients undergoing caesarean section (5,6).

### MATERIAL AND METHOD:

After taking approval of the Institutional Ethical Committee and written informed consent of the patient, 130 ASA physical status I-II patients were scheduled for elective lower limb surgery under spinal anaesthesia. Patients who had contraindications to spinal anaesthesia, having poor exercise tolerance, allergy to amide local anaesthetics, and a significant history of drug abuse were excluded. Exclusion criteria also included Lack of consent, History of blood coagulopathies, History of chronic diseases like hypertension, diabetes mellitus, respiratory disease, epilepsy, Spinal deformity or infection at the local site, ASA grade III or above, Patients not willing to participate in the study . Following arrival in the operation theater, I.V. access was established and an infusion of 500 ml 6% hydroxyl ethyl starch solution commenced. Placing patients in the sitting position, With all aseptic precaution, a 20 G introducer needle was inserted at the L3/4 interspace in the midline through which a 25G Whitacre needle was passed. Correct needle placement was identified by free flow of CSF and 15 mg of the study drug injected over 10sec. Using a sealed envelope technique. Patients were randomly allocated to two groups: 65 patients in group A received plain levobupivacaine 15 mg (3 ml isobaric 0.5%), while 65 patients in group B received plain bupivacaine 15 mg (3 ml isobaric 0.5%).

**STATISTICS :** Statistical analysis was performed with the SPSS, version 20 for Windows statistical software package. The Categorical data i.e. type of surgery and the incidence of adverse events (hypotension, bradycardia, respiratory depression, shivering, nausea and pruritis ) were presented as numbers (percent) and were compared among groups using Chi square test.

### RESULTS:

There were no significant differences in the demographic data among the two groups. The mean age of the patients in group A was 33.6 years and in group B 34.3 years. The mean weight of the patients in group A was 63.4 kg and in group B was 62.1 kg. The duration of surgery was different in both groups but statistically not significant ( $p > 0.05$ ).

The onset of sensory Block in both groups is shown in Table 1.

Onset of sensor block	Mean	SD	P Value	significance
Group A	14.1	7.8		
Group B	10.8	5.3	<.001	HS

Sensory onset were significantly higher in Group A as compared to group B but the difference were significant ( $P < 0.001$ ).

The Onset of Motor Block in both groups is shown in Table 2

Onset of motor block	Mean	SD	P Value	significance
Group A	11.5	5.34	0.08	NS
Group B	9.89	5.69		

Onset of motor block was differ in both groups but statistically insignificant ( $p > 0.05$ ).

The onset of motor block was 11.5±5 minutes in group A and 9.8±5 minutes in groups B. Duration of motor block was also found to be similar in both groups. There was no statistically significant difference among groups ( $p > 0.05$ ). The duration of motor block was 220±40 minutes in group A and (215±51 minutes) in group B. Duration of sensory block are similar in both groups in group A( 264±54) minutes and group B (257±37 minutes)  $p > 0.05$ .

The mean durations of 2 segment regression are as follows:

In group A (182±43 minutes) and in group B (185±42minutes) that is Statistically not significant, Total duration of analgesia was as follows:

In group A (264±54 minutes), In group B (257±37 minutes). Statistically not significant difference in duration of post operative analgesia was found when group A was compared with B ( $p>0.05$ ). No significant difference was observed in mean VAS score noted till 90 mins and at first rescue analgesic among the groups.

Significantly higher mean systolic and diastolic blood pressure  $\pm$  SD (mm Hg) was observed in group A as compared to group B. Mean systolic blood pressure  $\pm$  SD (mm Hg) at different time interval in Group B and Group A. Significantly higher mean systolic blood pressure  $\pm$  SD (mm Hg) was observed in group A as compared to group B at most of different time interval except 40 and 50 min after. Significantly higher mean was observed in diastolic pressure  $\pm$  SD (mm Hg) at different time interval in the group A as compared to group B in initial time interval but as the time passes no difference was observed.

#### Distribution of the cases according to haemodynamic changes and the side effects

	GROUP A		GROUP B		P Value	Significance
	NO	%	NO	%		
Hypotension	7	10.7	17	26.15	0.042	S
Bradycardia	6	9.23	4	6.15	0.74	NS
Nausea/vomiting	7	10.7	10	15.38	0.603	NS
Respiratory Distress	2	3.08	0	0	0.4	NS
Shivering	23	35.38	12	18.46	0.048	S

There was no significant difference in number of patients experiencing episodes of bradycardia and respiratory distress. ( $p>0.05$ ) in both the groups. Proportion of the hypotension and nausea/vomiting were more in group B as compared to group A while incidence of bradycardia, and shivering were more in group A.

#### CONCLUSION:

So, we concluded that intrathecal isobaric levobupivacaine 0.5% is a good alternate of isobaric bupivacaine 0.5% intrathecally in lower limb surgery in cases where cardiac stability of the patient is more desirable.

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