

## Comparison of the Effect of Epidural Levobupivacaine 0.5 Percentage 20 ML and Ropivacaine 0.75 Percentage, 20 ML in Lower LIMB Surgeries

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### Abstract

**Introduction:** Regional anaesthesia is noted for simplicity, safety and effectiveness. Anaesthesia having least onset time and which can be prolonged with least complications is a challenge to anaesthesiologist. Though spinal anaesthesia provides an efficient block, duration is constant and cannot be prolonged. Epidural anaesthesia is a technique for lower limb, pelvic surgeries where complications are less compared to spinal anaesthesia. There is no limitation for duration of surgery if a catheter is in place, a modality for pain relief. Motor block appears to regress considerably rapidly than sensory block. This makes it specially well suited for epidural administration. **Materials and methods:** The patient was placed in left lateral position with all aseptic precautions epidural space identified at L2-L3 interspace after local infiltration with 2 ml 2% lignocaine. Epidural space is identified using 18 G Touhy needle by loss of resistance technique. Epidural catheter passed into the epidural space through the needle in a cephalad direction until 3cm is in the space. After test dose i.e., 3 ml of 2% lignocaine with adrenaline 1:200000. 4 minutes later 20 ml of drug injected through catheter over 3 minutes. All patients were monitored for cardio respiratory problems, side effects if any and were given supplemental O<sub>2</sub>. The following parameters were observed and recorded. **Results:** On comparison it was found that in Group R there were 4 patients (13%) who had Grade 2 block and 26 patients (87%) who had Grade 3 block. In Group B, 3 patients (10%) had Grade 2 block and 27 patients (90%) had Grade 3 block. The percentage distribution of patients who had Grade 2 and Grade 3 was similar in both the groups. Haemodynamic effects i.e. BP, SPO<sub>2</sub> & PR at various intervals. There is no significant changes in PR, SBP and DBP. **Conclusion:** Epidural anaesthesia using 20 ml of 0.75% Ropivacaine i.e., group R showed lesser duration of motor blockade than 0.5% levobupivacaine 20 ml i.e. group B in lower limb surgeries.

**Keywords:** Regional anaesthesia, Epidural catheter, PR, SBP, DBP.

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### Introduction

Regional anaesthesia is noted for simplicity, safety and effectiveness. Anaesthesia having least onset time and which can be prolonged with least complications is a challenge to anaesthesiologist. Though spinal anaesthesia provides an efficient block, duration is constant and cannot be prolonged[1]. Epidural anaesthesia is a technique for lower limb, pelvic surgeries where complications are less compared to spinal anaesthesia. There is no limitation for duration of surgery if a catheter is in place, a modality for pain relief. Motor block appears to regress considerably rapidly than sensory block. This makes it especially well suited for epidural administration[2].

LevoBupivacaine an aminoamide is a pure "S" enantiomer of Bupivacaine has a same clinical profile, but with a better safety profile that is attributed to its faster protein binding rate. Thus LevoBupivacaine and Ropivacaine that are pure "S" enantiomers of Bupivacaine. Were introduced in clinical practice due to less cardiac and neurotoxic side effects[3]. Ropivacaine an amino amide produces decreased degree of motor block in heavily myelinated motor fibres and faster onset of block in lightly myelinated sensory fibres i.e. greater differential blockade. Its decreased lipid solubility makes less toxic[4]. The onset of motor block occurs earlier in LevoBupivacaine than Ropivacaine as compared with Bupivacaine. The duration of action

of 0.5% LevoBupivacaine is 2-6 hours whereas that of Ropivacaine is 2-5 hours when given epidurally. Hence the aim of our study is to compare the duration of motor blockade of epidurally given LevoBupivacaine with Ropivacaine. Epidural anaesthesia is one technique where complications are less compared to spinal anaesthesia. There is no limitation of duration of surgery if an epidural catheter is in place. It is also a modality for post-operative pain relief[3]. The rapid recovery of motor function helps in early mobilization with decreased incidence of deep vein thrombosis and pulmonary embolism. Epidural Anaesthesia for lower limb surgeries produces early post-operative mobility, shorter hospitalization with successful rehabilitation and improved quantity of life. Neuraxial techniques provide post-op analgesia facilitating early hospital discharge. Early rehabilitation decreases thrombo embolic complications in lower limb surgeries.

### Materials and Methods

This study was conducted in the department of Anaesthesia, Maheswara Medical College from January 2020 to December 2020. 120 patients aged between 18 and 60 years undergoing elective lower limb surgeries were selected at random.

- ASA Grade I and II.
- Weight: 50-70Kgs.
- Exclusive Criteria:
- Patients with H/o HTN, DM, CVA, Neurologic diseases.
- Patients on antihypertensive drugs, cardiac drugs.
- Hepatic and renal diseases.

The study population was randomly divided into 2 groups with 30 patients in each group.

- Study Group R: Received 20 ml of 0.75% Ropivacaine.

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● Study Group B: Received 20 ml of 0.5% Levobupivacaine. Drugs and equipment necessary for resuscitation and general anaesthesia was kept ready. The patient was placed in left lateral position with all aseptic precautions epidural space identified at L2-L3 interspace after local infiltration with 2 ml 2% lignocaine. Epidural space is identified using 18 G Touhy needle by loss of resistance technique. Epidural catheter passed into the epidural space through the needle in a cephalad direction until 3cm is in the space.

After test dose i.e., 3 ml of 2% lignocaine with adrenaline 1:200000. 4 minutes later 20 ml of drug injected through catheter over 3 minutes. All patients were monitored for cardio respiratory problems, side effects if any and were given supplemental O<sub>2</sub>. The following parameters were observed and recorded.

**Results**

**Table 1: Time of onset of Sensory Block (min), Time of onset of motor Block (min), Duration of Motor Block (min), Duration of Sensory Block (min)**

Parameters	0.75% Ropivacaine (Group R)		0.5% Levo-Bupivacaine (Group B)		Mean Difference	P* Value, Sig
	Mean	SD	Mean	SD		
Time of onset of Sensory Block (min)	10.2	1.6	10.8	1.5	0.57	0.30 NS
Time of onset of motor Block (min)	29.5	3.0	28.9	3.4	0.63	0.44 NS
Duration of Motor Block (min)	241.7	22.8	282.3	21.0	40.600	<0.001 HS
Duration of Sensory Block (min)	389.7	16.5	391.1	15.1	1.433	0.72 NS

**Table 2: Degree of motor block**

Degree of motor block	0.75% Ropivacaine (Group R)		0.5% Levo-Bupivacaine (Group B)	
	No	%	No	%
Grade 0	0	0	0	0
Grade 1	0	0	0	0
Grade 2	8	13	6	10
Grade 3	52	87	54	90

On comparison it was found that in Group R there were 4 patients (13%) who had Grade 2 block and 26 patients (87%) who had Grade 3 block. In Group B, 3 patients (10%) had Grade 2 block and 27 patients (90%) had

Grade 3 block. The percentage distribution of patients who had Grade 2 and Grade 3 was similar in both the groups. Haemodynamic effects i.e. BP, SPO<sub>2</sub> & PR at various intervals. There is no significant changes in PR, SBP and DBP.

**Table 3: Side effects**

Side Effects	0.75% Ropivacaine (group R)		0.5% Levo-Bupivacaine (group B)		P Value
	No	%	No	%	
Nausea	2	3	4	7	NS
Vomiting	2	3	2	3	NS

**Discussion**

Over the years, regional blocks are being preferred over general anaesthesia for the fact that they offer excellent pain control, reduced side-effects, and shortened stay in the post anaesthesia care unit.<sup>6</sup> Levobupivacaine, the S(-) isomer of bupivacaine, has emerged as an option that could offer similar intensity and duration of block as bupivacaine can but with a safer toxicity profile owing to its faster protein binding rate, Levobupivacaine has been recently introduced into the Indian market and is being widely used in various health set ups[7]. Despite lower toxicity, its onset time and duration of the neural blockade are not adequate; it might not be useful as a substitute. Data on this issue are scarce, especially from developing countries like India. It is essential to establish an undisputedly better efficacy of ropivacaine vis-a-vis levobupivacaine owing to economic reasons too as ropivacaine is almost five times costlier than levobupivacaine[8]. In the present study, we selected two different dosages of local anesthetics -i.e., 0.5% levobupivacaine for comparison against 0.75% ropivacaine for comparison. The reason for this was a reported slower onset time for ropivacaine as compared to levobupivacaine for the same dose. However, an enhanced dose of ropivacaine (0.75%) has been shown to be comparable to a lower dose of levobupivacaine (0.5%)[9,10]

**Conclusion**

Epidural anaesthesia using 20 ml of 0.75% Ropivacaine i.e., group R showed lesser duration of motor blockade than 0.5% levobupivacaine 20 ml i.e. group B in lower limb surgeries.

**References**

- Forster R. Levobupivacaine. A review of its pharmacology and use as a local anaesthetic. *Drugs*. 2000; 59:551-579.
- Mazoit J, Boico O, Samii K. Myocardial uptake of bupivacaine: II. Pharmacokinetics and pharmacodynamics of bupivacaine

- enantiomers in the isolated perfused rabbit heart. *Anesth Analg*. 1993; 77:469-476.
- Glaser C, Marhofer P, Zimpfer G et al. Levobupivacaine versus racemic bupivacaine for spinal anaesthesia. *Anesth Analg*. 2002; 94:194-198.
- Cox CR, Faccenda KA, Gilhooly C, Bannister J, Scott NB, Morrison LM. Extradural S(-)-bupivacaine: comparison with racemic R-S bupivacaine. *Br J Anaesth*. 1998; 80:289-293.
- Cox CR, Checketts MR, Mackenzie N, Scott NB, Bannister J. Comparison of S(-)-bupivacaine with racemic (RS)-bupivacaine in supraclavicular brachial plexus block. *Br J Anaesth*. 1998; 80:594-598.
- Casati A, Chelly JE, Cerchierini E et al. Clinical properties of levobupivacaine or racemic bupivacaine for sciatic nerve block. *J Clin Anesth*. 2002; 14:111-114.
- Santorsola R, Casati A, Cerchierini E, Moizo E, Fanelli G. Levobupivacaine for peripheral blocks of the lower limb: a clinical comparison with bupivacaine and ropivacaine. *Minerva Anestesiol*. 2001; 67(Suppl 1):33-36.
- Lyons G, Columb M, Wilson RC, Johnson RV. Epidural pain relief in labour: potencies of levobupivacaine and racemic bupivacaine. *Br J Anaesth*. 1998; 81:899-901.
- Polley LS, Columb MO, Naughton NN, Wagner DS, van de Ven CJ. Relative analgesic potencies of ropivacaine and bupivacaine for epidural analgesia in labor: implications for therapeutic indexes. *Anesthesiology*. 1999; 90:944-950.
- Casati A, Santorsola R, Aldegheri G et al. Intraoperative epidural anaesthesia and postoperative analgesia with levobupivacaine for major orthopedic surgery: a double blind, randomized comparison of racemic bupivacaine and ropivacaine. *J Clin Anesth*. 2003; 15:126-131.

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