

COMPARISON OF THE EFFECT OF EPIDURAL LEVOBUPIVACAINE 0.5% 20ML AND ROPIVACAINE 0.75%, 20ML IN LOWER LIMB SURGERIESH. L. Baby Rani¹, K. Pavani Kalyanam²**HOW TO CITE THIS ARTICLE:**

H. L. Baby Rani, K. Pavani Kalyanam. "Comparison of the Effect of Epidural Levobupivacaine 0.5% 20ml and Ropivacaine 0.75%, 20ml in Lower Limb Surgeries". Journal of Evolution of Medical and Dental Sciences 2015; Vol. 4, Issue 84, October 19; Page: 14669-14674, DOI: 10.14260/jemds/2015/2085

ABSTRACT: Ropivacaine an enantiomerically pure ('S' enantiomer) amino anaesthetic producing decreased degree of (motor) block in heavily myelinated motor fibres and faster onset of block in lightly myelinated (sensory) fibre i.e., greater differential effect. Its decreased lipid solubility makes it less CNS & CVS toxic, with CVS: CNS ratio is 2:0.⁽¹⁾ Levobupivacaine is less cardiotoxic than Bupivacaine. Background, Aims and objectives ever since the history of Anaesthesia Bupivacaine takes longer time for regression of motor blockade. This makes Ropivacaine potentially well suited for administration through epidural route. Hence this study is undertaken to compare the effectiveness of epidural ropivacaine and epidural LevoBupivacaine. Single optical preparation of Ropivacaine.⁽²⁾ and LevoBupivacaine improve the safety profile for long lasting regional anaesthesia. Both Ropivacaine and LevoBupivacaine are approximately equipotent to racemic Bupivacaine for epidural anaesthesia.^{(3),(4)} Both drugs have 30-40% less systemic toxicity than Bupivacaine.⁽³⁾ Reduced cardio toxicity potential is because of reduced affinity for brain and myocardial tissue from their single isomer preparation.⁽³⁾ Continuous epidural Ropivacaine is used for relief of post-operative pain. Inadvertent I.V. injection of levobupivacaine is less prone to cardiac effects or seizures.⁽⁶⁾

KEYWORDS: Group – R: Ropivacaine, Group B: Bupivacaine, SBP: Systolic Blood Pressure, DBP: Diastolic Blood Pressure.

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.⁽⁵⁾ 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.

CONTEXT: Epidural block is well known for its definitivity. Orthopaedic surgeries are associated with perioperative pain which is potent trigger for stress response and a leading cause to various adverse events.⁽⁶⁾

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.⁽⁷⁾ Thus LevoBupivacaine and Ropivacaine that are pure "S" enantiomers of Bupivacaine.^{(8),(1)} Were introduced in clinical practice due to less cardiac and neurotoxic side effects.⁽⁷⁾

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Ropivacaine an amino amide.^{(9),(1)} 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.⁽¹⁰⁾

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 2-5hours when given epidurally.⁽⁸⁾

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.

The rapid recovery of motor function helps in early mobilization with decreased incidence of deep vein thrombosis and pulmonary embolism.⁽¹¹⁾

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.⁽¹¹⁾ Early rehabilitation decreases thrombo embolic complications in lower limb surgeries.

AIM: Comparison of 20ml of 0.75% Ropivacaine and 20ml of 0.5% Levobupivacaine given epidurally in terms of efficacy and duration of action in lower limb surgeries.⁽¹²⁾

OBJECTIVES: To compare the following in 2 groups.

1. Onset of Sensory block.
2. Onset on Motor block.
3. Duration of Motor block.
4. Duration of Sensory block.
5. Degree of motor block (Using modified Bromage scale.)
6. Haemodynamic effects i.e. BP, SPO₂ & PR at various intervals.
7. Any side effects.

MATERIAL AND METHODS: After institutional committee approval and written informed consent, 60 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 20ml of 0.75% Ropivacaine.
- Study Group B: Received 20ml of 0.5% Levobupivacaine.

Drugs and equipment necessary for resuscitation and general anaesthesia was kept ready.

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The patient was placed in left lateral position with all aseptic precautions epidural space identified at L2-L3 interspace after local infiltration with 2ml 2% lignocaine. Epidura space is identified using 18 G Touhy needle by loss of resistance technique.⁽¹³⁾ 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., 3ml of 2% lignocaine with adrenaline 1:200000. 4 minutes later 20ml of drug injected through catheter over 3 minutes. All patients were monitored for cardio respiratory problems, side effects if any and were given supplemental O₂. The following parameters were observed and recorded.

RESULTS:

Parameter	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

1. The time for sensory block:

Group R: 10.2 Minutes.

Group B: 10.8 Minutes.

The difference is only few seconds.

2. The mean time for onset of motor block:

Group R: 29.5 Minutes + 3 min.

Group B: 28.9 Minutes + 3.4 min.

Not statistically significant.

3. Duration of motor block in:

Group R: 241 Minutes.

Group B: 282 Minutes.

P value <0.001.

Group R significantly lower than group B.

4. Duration of sensory block in Group R is lower by few minutes. Not statistically significant.

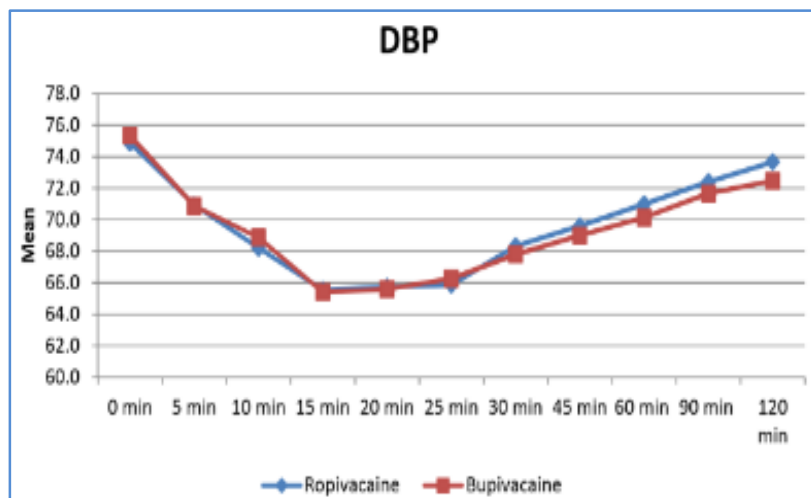
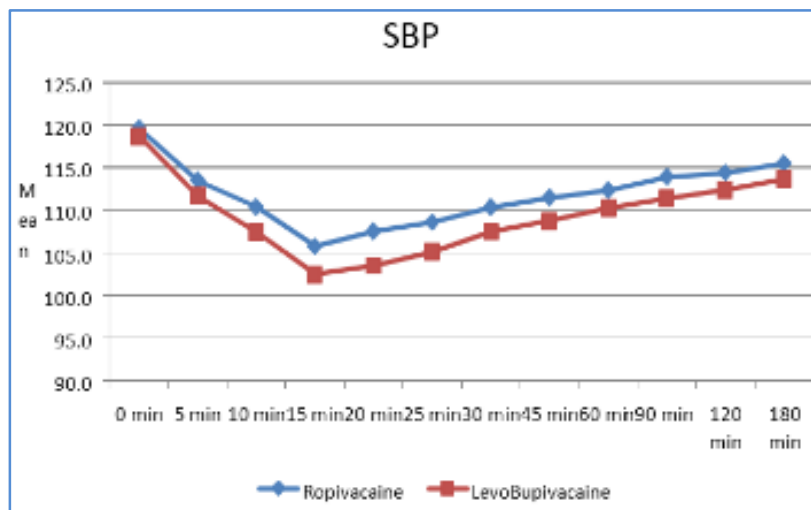
5. Degree of motor block.

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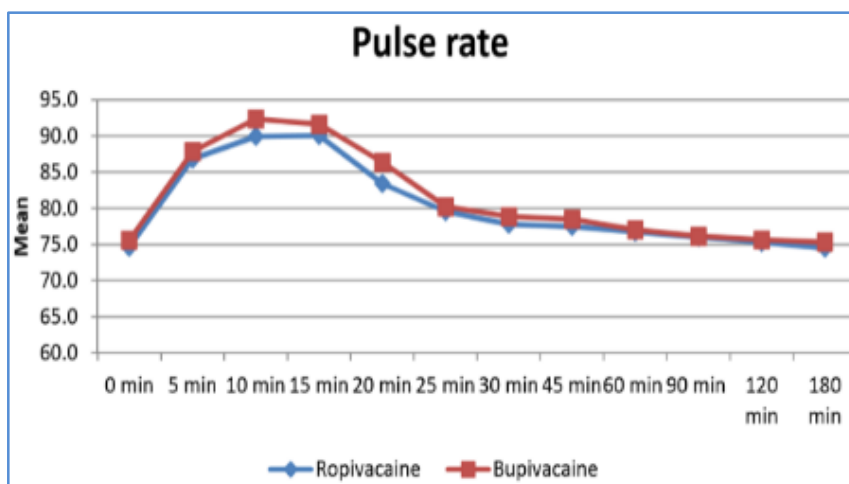
Degree of Motor Block	0.75% Ropivacaine (Group R)		0.5% Levo-Bupivacaine (Group B)	
	No.	%	No.	%
Grade 0	0	0	0	0
Grade 1	0	0	0	0
Grade 2	4	13	3	10
Grade 3	26	87	27	90

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.

6. Haemodynamic effects i.e. BP, SPO₂ & PR at various intervals. There is no significant changes in PR, SBP and DBP.



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7. Side Effect:

SIDE EFFECTS	0.75% ROPIVACAINE Group R		0.5% LevoBupivacaine Group B		P Value
	No	%	No	%	
Nausea	1	3	2	7	NS
Vomiting	1	3	1	3	NS

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

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