



COMPARISON OF LVOBUPIVACAINE AND LVOBUPIVACAINE WITH FENTANYL IN LOWER LIMB SURGERIES UNDER SPINAL ANAESTHESIA

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KEYWORDS :

INTRODUCTION

- Spinal Anaesthesia is the most commonly used technique for lower limb surgeries because of its unmatched reliability, cost effectiveness, effective analgesia, muscle relaxation and prolonged postoperative analgesia.
- Levobupivacaine, a pure S(-) enantiomer of bupivacaine is a long acting amide local anesthetic which produces differential neuraxial block, that is, early onset and prolonged duration of sensory block with shorter duration of motor block and lower cardiac toxicity.

To improve the block characteristics of intrathecally administered low dose local anaesthetics, addition of adjuvant is must. Intrathecal opioids enhance sensory block without prolonging motor and sympathetic block. Among them, Fentanyl has rapid onset of action, binds strongly to plasma proteins and potentiates the afferent sensory blockade thus facilitates reduction in the dose of local anesthetics

Aims And Objectives

- The aim of the present study was to evaluate the safety and efficacy of equal doses of levobupivacaine plain (10 mg) and levobupivacaine (10 mg) plus fentanyl 25 g,
- Onset and duration of sensory and motor block,
- Postoperative analgesia,
- Hemodynamic parameters
- Side effects and Complications in spinal anesthesia.

MATERIAL AND METHOD

- Type And Design Of Study-** Prospective Randomized Double Blind Study,
- Study Center-** department of anaesthesiology, saims and pg institute, indore
- Study Duration-** 12 months from time of approval by institutional ethics committee

Inclusion Criteria-

- 100 patients of American Society of Anesthesiologists grades I and II of either sex
- Age group of 20-65 years scheduled for elective lower limb surgeries under spinal block
- Patient who have given informed consent

Exclusion Criteria-

- Patients with unwillingness for the procedure,
- Coagulation or neurological disorders,
- Septicemia,
- Deformity or previous surgery of spine,
- Morbid obesity, pregnancy
- Allergy to the study drug

METHOD

Group L (n = 50) received 2 ml of 0.5% isobaric levobupivacaine (10 mg) plus 0.5 ml normal saline and group LF (n = 50) received 2 ml of 0.5% isobaric levobupivacaine (10 mg) plus 0.5 ml fentanyl (25 g) intrathecally

- Intraoperative vitals were maintained and monitored
- Sensory block was assessed by
 - loss of sensation to pin prick in the midline every 2 min for first 10 min and then at an interval of 5 min till no change in level occurred.
 - Onset of sensory block (when patient does not feel pin prick at T10 level)
 - highest level of sensory block achieved,
 - time to maximum sensory block, regression of sensory block to T10
 - total duration of sensory block (regression to S1 dermatome) was noted.

Motor block was assessed by

Using the modified Bromage scale every 2 min up to 20 min and then at an interval of 10 min till the completion of surgery.

- Modified Bromage scale was taken as:
- 0 – No paralysis: Able to flex hips/knees/ankles,
- 1 – able to move knees, unable to raise extended legs
- 2 – able to flex ankles, unable to flex knees,
- 3 – unable to move any part of limb – complete block.
- Maximum motor block achieved,
- time to maximum motor block and total duration of motor block (motor recovery to Bromage [0] was noted

- In the postoperative period, patients were monitored for
 - Haemodynamic parameters and postoperative pain using VAS score,
 - Rescue analgesia in the form of injection diclofenac 75 mg or if needed injection tramadol hydrochloride intramuscularly was given when VAS >3 in both groups. Time at which patient demanded first dose of rescue analgesia was taken as total duration of analgesia.
 - Number of doses of rescue analgesia required in the postoperative period was also noted.
 - Side effects

Statistical Analysis

The data from the present study was systematically collected, compiled and statistically analyzed using SPSS 25.0. Data was expressed as mean and standard deviation, number and percentages. The patient characteristics (nonparametric data) was analysed using the "Chi-square tests" and the inter group comparison of the parametric data was done using the "unpaired t-test." The P value was finally determined to evaluate the level of significance. P < 0.05 was considered as significant

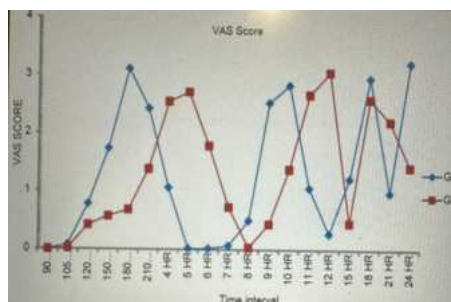
OBSERVATION AND RESULTS

PARAMETER	GROUP L	GROUP LF	P VALUE
ONSET OF SENSORY BLOCK TO T10 IN MINUTES	8.4 +/- 1.3	4.8 +/- 1.4	<0.001
MEDIAN MAXIMUM SENSORY BLOCK	T8	T6	

TIME TO MAXIMUM SENSORY BLOCK IN MINUTES	15.7 +/- 2.43	8.46 +/- 1.7	<0.001
TIME FOR REGRESSION TO T10 DERMATOME IN MINUTES	95.8 +/- 5.32	106.62 +/- 6.17	<0.001
TOTAL DURATION OF SENSORY BLOCK	200.4 +/- 11.22	280.9 +/- 28.2	<0.001
MAXIMUM MOTOR BLOCK	2	2	
TIME FOR MAXIMUM MOTOR BLOCK	12.3 +/- 1.72	8.3 +/- 1.6	<0.001
TOTAL DURATION OF MOTOR BLOCK	152.76 +/- 9.76	187.33 +/- 9.82	<0.001
DURATION OF ANALGESIA	153.66 +/- 9.77	188.32 +/- 8.99	<0.001
TOTAL NUMBER OF DOSES OF RESCUE ANALGESIA	3.44 +/- 0.55	2.8 +/- 0.32	<0.001

Vas Score

Results showed VAS score was >3 at 3 hours in group L while it >3 at 5 hours in group LF indicating better analgesic effect in group LF



Other Observation

- Mean HR, SBP and DBP remained stable and comparable at all intervals.
- Eight patients (10%) in Group LF and three patients (4%) in Group L developed bradycardia, (P = 0.24 not significant). Five (8%) patients in Group L and 6 (12%) patients in Group LF (P = 0.50 not significant) had fall in SBP. Group L: Levobupivacaine, Group LF: Levobupivacaine + fentanyl

DISCUSSION

- Levobupivacaine is a preferred local Anaesthetic due to its longer sensory block, lower cardiac and central nervous system toxicity and shorter motor block.
- Fentanyl, stimulates both 1 and 2 receptors and potentiates the afferent sensory blockade. Studies reported that addition of 25 g fentanyl to LA improves anesthesia quality and prolongs postoperative analgesia without prolonging the time to void.
- The present study showed maximum sensory and motor block was more rapid, the duration of sensory and motor block and postoperative analgesia was more prolonged in levobupivacaine and fentanyl group as compared to plain levobupivacaine group. Maximum sensory level in group L was T8 and in group LF was T6 dermatome but the maximum motor block was Bromage 2 in both groups. Requirement of postoperative analgesics was also less in group LF.
- Heart rate and blood pressure remained stable and comparable in both the groups intraoperatively as well as postoperatively

CONCLUSION

- While both the regimes effectively provided surgical anaesthesia and haemodynamic stability, The study showed that Group LF had an advantage of rapid onset of sensory and motor block and prolonged duration of sensory block and postoperative analgesia, thus decreasing the doses of rescue analgesia in the

postoperative period.

- The downfall was the prolonged motor block that Prevents early ambulation.
- Overall the addition of fentanyl to levobupivacaine provide better block characteristics and analgesic effect without any significant side effects and complication

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