

A Randomized Comparative Study of 0.1% Levobupivacaine with Fentanyl Vs 0.1% Ropivacaine with Fentanyl in patients of Labor Analgesia

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Abstract

Background: Labor pain is excruciating and a significant contributor of stress and anxiety. The present study was conducted to assess the efficacy of low concentrations of local anaesthetics (0.1% ropivacaine and 0.1% levobupivacaine) with 2 µg/ml fentanyl as a patient controlled epidural analgesia. **Subjects and Methods:** 30 labouring parturients were divided into 2 groups of 15 each. Group I patients received 0.1% ropivacaine with 2 µg/ml fentanyl and group II patients received 0.1% levobupivacaine with 2 µg/ml fentanyl as epidural solutions via PCEA pump infusions. **Results:** Mode of delivery found to be caesarean seen in 5 in group I and 7 in group II, instrument-assisted vaginal delivery seen 8 in group I and 6 in group II and normal vaginal delivery seen 7 in group I and 7 in group II. The difference was non-significant ($P > 0.05$). Demand boluses per hour was 0.08 in group I and 0.36 in group II, mean total number of manual rescue boluses was 1.02 in group I and 0.61 in group II and first requirement of manual rescue bolus was 3.10 in group I and 2.60 in group II. The difference was significant ($P < 0.05$). **Conclusion:** Both the drugs produced equivalent analgesia for labor at low concentration when used with highly lipid soluble opioid such as fentanyl.

Keywords: Fentanyl, Ropivacaine, Levobupivacaine.

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Introduction

Labor pain is excruciating and a significant contributor of stress and anxiety.^[1] Painful uterine contractions cause maternal hyperventilation and increased catecholamine release resulting in maternal and fetal hypoxemia. Providing labor analgesia takes away the disadvantage and result in better maternal and fetal outcome.^[2] An ideal labor analgesic technique should provide adequate and satisfactory analgesia without any motor blockade or adverse maternal and fetal effects.^[3] Among the variety of labor analgesia techniques, epidural analgesia remains gold standard for providing pain relief during labor. Even though combined spinal epidural analgesia (CSEA) is considered as a safe technique with greater maternal satisfaction, there were no differences in maternal satisfaction, mode of delivery, and ability to ambulate between CSEA and epidural techniques.^[4]

Long acting local anaesthetics like levobupivacaine and ropivacaine have been increasingly used along with adjuvants such as opioids to provide safe, effective and adequate pain relief during labour.^[5] Lee et al,^[6] found no significant differences in the mode of delivery, duration of labour and foetal outcomes in the study comparing low concentration of ropivacaine (0.08%) and levobupivacaine (0.06%) with fentanyl (2 mcg/ml) for labour epidural analgesia. However, the study was besieged with the disadvantages of more frequent top ups in the levobupivacaine group and significantly increased total amount of local anaesthetic consumption in the ropivacaine group. The present study was conducted to assess the efficacy of low concentrations of local anaesthetics (0.1% ropivacaine and 0.1% levobupivacaine) with 2 µg/ml fentanyl as a patient controlled epidural analgesia.

Subjects and Methods

The present study was conducted among 30 labouring parturients. All enrolled patients were informed regarding the study and their written consent was obtained.

Data such as name, age, etc. was recorded. Patients were divided into 2 groups of 15 each. Group I patients received 0.1% ropivacaine with 2 $\mu\text{g/ml}$ fentanyl and group II patients received 0.1% levobupivacaine with 2 $\mu\text{g/ml}$ fentanyl as epidural solutions via PCEA pump infusions. The incidence of instrumental AVD, maternal and foetal vital parameters, maternal VAS scores, degree of motor blockade and total epidural drug consumption was noted. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

Results

[Table 1] shows distribution of patients into group I and II based on agent used.

[Table 2, Figure 1] shows that mode of delivery found to be caesarean seen in 5 in group I and 7 in group II, instrument-assisted vaginal delivery seen 8 in group I and 6 in group II and normal vaginal delivery seen 7 in group I and 7 in group II. The difference was non-significant ($P > 0.05$).

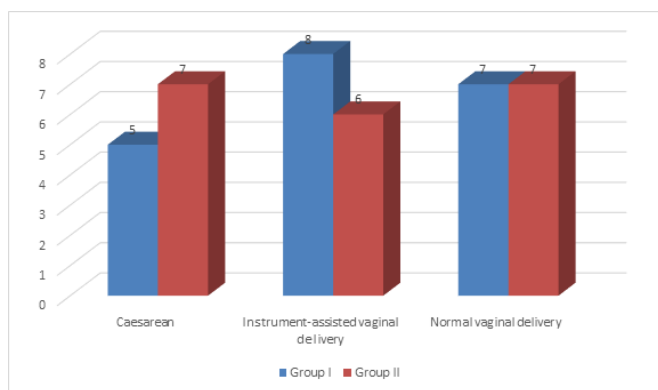


Figure 1: Mode of delivery in all groups

[Table 3] shows that demand boluses per hour was 0.08 in group I and 0.36 in group II, mean total number of manual rescue boluses was 1.02 in group I and 0.61 in group II and first requirement of manual rescue bolus was 3.10 in group I and 2.60 in group II. The difference was significant ($P < 0.05$).

Discussion

Neuraxial techniques have been considered as the gold standard modality for labour analgesia.^[7] In spite of the

superior analgesia and improved safety of epidural labour analgesia, it has been associated with maternal and foetal adverse effects including prolongation of labour, higher incidence of instrumental assisted vaginal delivery (AVD), decreased ambulation mainly due to varying degrees of motor block especially with the use of higher concentrations of local anaesthetics. Epidural bupivacaine provides excellent sensory block and has been used for labor analgesia for many years.^[8] However, concern about its cardiac toxicity and the intensity of motor block has led to the investigation of other agents. Ropivacaine has been associated with reduced incidence of operative vaginal delivery and less motor block when compared to bupivacaine.^[9] Recently, it has been shown that ropivacaine appears equipotent to bupivacaine, less cardiotoxic and neurotoxic and seem to be more suitable agent for pain relief in laboring women.^[10] The present study was conducted to assess the efficacy of low concentrations of local anaesthetics (0.1% ropivacaine and 0.1% levobupivacaine) with 2 $\mu\text{g/ml}$ fentanyl as a patient controlled epidural analgesia.

In present study, mode of delivery found to be caesarean seen in 5 in group I and 7 in group II, instrument-assisted vaginal delivery seen 8 in group I and 6 in group II and normal vaginal delivery seen 7 in group I and 7 in group II. Chuttani et al,^[11] in their prospective study, 60 labouring parturients were randomly allocated into two equal groups to receive either 0.1% ropivacaine with 2 $\mu\text{g/ml}$ fentanyl or 0.1% levobupivacaine with 2 $\mu\text{g/ml}$ fentanyl as epidural solutions. The incidence of instrumental AVD was found to be 43.3% in the levobupivacaine group and 30% in the ropivacaine group. This difference was not statistically significant. Both the groups were comparable in terms of demographic data, maternal VAS scores, total epidural drug consumption and foetal APGAR scores.

We found that demand boluses per hour was 0.08 in group I and 0.36 in group II, mean total number of manual rescue boluses was 1.02 in group I and 0.61 in group II and first requirement of manual rescue bolus was 3.10 in group I and 2.60 in group II. Chethanananda et al,^[12] in their study sixty parturients requesting for labor analgesia were divided into two groups. Group B (n = 30) received racemic bupivacaine (0.0625%) and fentanyl 2 $\mu\text{g/ml}$ of 10 ml and Group R (n = 30) received ropivacaine (0.1%) and fentanyl 2 $\mu\text{g/ml}$. In both groups, the drug was given in 5 ml fractionated doses at 5 min interval. Parturients not experiencing analgesia within 15 min of initial bolus were supplemented with additional 5 ml of the same concentration of the solution. Epidural analgesia was maintained by timed top ups at the end of 90 min with the dosage equal to the initial dose of the drug. Duration of labor analgesia, motor block, visual analog scale, maternal hemodynamic parameters, mode of delivery, and maternal satisfaction was assessed. both

Table 1: Distribution of patients

Groups	Group I	Group II
Agent	0.1% ropivacaine +2 µg/ml fentanyl	0.1% levobupivacaine +2 µg/ml fentanyl

Table 2: Mode of delivery in all groups

Mode	Group I	Group II	P-value
Caesarean	5	7	0.15
Instrument-assisted vaginal delivery	8	6	
Normal vaginal delivery	7	7	

Table 3: Comparison of parameters

Parameters	Group I	Group II	P value
Demand boluses per hour	0.08	0.36	0.01
Mean total number of manual rescue boluses	1.02	0.61	0.02
First requirement of manual rescue bolus	3.10	2.60	0.05

drugs were equally effective clinically. Maternal demographic characteristics were comparable. There were no statistically significant differences in visual analog pain score, highest sensory block, maternal satisfaction, mode of delivery, total dose of LAs during labor and motor block at delivery between the groups.

The limitation of the study is small sample size.

Conclusion

Authors found that both the drugs produced equivalent analgesia for labor at low concentration when used with highly lipid soluble opioid such as fentanyl.

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