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ORIGINAL ARTICLE

Comparison of low concentration ropivacaine with or without fentanyl or clonidine for labour analgesia

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ABSTRACT:
Background: Patient controlled epidural labour analgesia (PCEA) is a method of pain relief during labor, offering control and flexibility for the laboring woman. The present study was conducted to compare low concentration ropivacaine with or without fentanyl or clonidine for labour analgesia. **Materials & Methods:** 45 primegravida in labour were selected. Patient controlled epidural labour analgesia was given to them: Initial bolus of 10ml of ropivacaine 0.125% in Group I; with fentanyl 2 µg/ml in Group II and with clonidine 1µg/kg in Group III. Total analgesic dose of local anaesthetic and feto-maternal adverse effects were also recorded. **Results:** T h e mean age in group I was 23.6 years, in group II was 24.1 years and in group III was 25.8 years. The mean BMI in group I was 24.7 kg/ m2, in group II was 24.3 kg/ m2 and in group III was 23.5 kg/ m2. Cervical dilatation rate 3 was seen in 3 in group I, 2 in group II and 4 in group III, 4 was seen in 12 in group I, 10 in group II and 9 in group III, 5 in 3 in group II and 2 in group III. The difference was non- significant (P> 0.05). In group I, group II and group III, the mean total analgesic dose (ml) was 47.3, 41.2 and 34.8. The number of PCA bolus required was 3.2, 1.5 and 1.2 in group I, II and III respectively. The difference was significant (P< 0.05). **Conclusion:** Without causing any motor blockage, ropivacaine 0.125 percent was successful in reducing labor discomfort. In PCEA for labor, clonidine 1µg/kg outperformed fentanyl 2µg/ml as an adjuvant with no appreciable negative effects on the fetus or mother.
Keywords: clonidine, primigravida, ropivacaine

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INTRODUCTION

Patient controlled epidural labour analgesia (PCEA) is a method of pain relief during labor, offering control and flexibility for the laboring woman. It involves the use of an epidural catheter, which is inserted into the epidural space of the spine.[1] Through this catheter, an anesthetic medication is delivered to reduce pain in the lower body while still allowing the mother to be awake and alert during labor.[2]Since epidural anesthesia relieves labor pain for a longer period of time and promotes a smooth, uneventful birth, it is often considered a blessing for expectant patients. Adding opioids and clonidine to ropivacaine allows for the use of more diluted solutions for greater analgesia, lowers the risk of systemic toxicity, and decreases the incidence of motor block, even if a somewhat higher dose of ropivacaine is needed to provide analgesia.[3]

Clonidine has been used as an adjuvant to epidural local anaesthetics to improve the quality of analgesia after major abdominal surgeries.[4] At low doses, epidural clonidine improves the quality of anaesthesia, reduces the dose requirement of the anaesthetic agents and provides better hemodynamic stability during anaesthesia.[5]PCEA is commonly used in many maternity settings, offering significant relief during labor while allowing women to be involved in the process. It's often preferred by women who want pain relief but wish to avoid the deeper sedation that general anesthesia may cause.[6]The present study was conducted to compare low concentration ropivacaine with or without fentanyl or clonidine for labour analgesia.

MATERIALS & METHODS

The study was carried out on 45 primegravida in labour. All gave their written consent to participate in the study.

Data such as name, age, etc. was recorded. Patient controlled epidural labour analgesia was given to them: Initial bolus of 10ml of ropivacaine 0.125% in Group I; with fentanyl 2 µg/ml in Group II and with clonidine 1µg/kg in Group III. Subsequently each group received ropivacaine 0.125% through patient controlled epidural analgesia (PCEA) as background infusion of 5 ml/hr with lockout interval time of 10min and subsequent bolus of 5ml. Hemodynamic parameters, sensory level, motor block and pain relief were noted. Total analgesic dose of local anaesthetic and feto-maternal adverse effects were also recorded. Results thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Demographic profile

Parameters	Group I	Group II	Group III	P value
Age (in years)	23.6	24.1	25.8	0.84
BMI (kg/ m2)	24.7	24.3	23.5	0.90
Cervical dilatation rate (cm/hr) 3	3	2	4	0.47
4	12	10	9	
5	0	3	2	

Table I shows that mean age in group I was 23.6 years, in group II was 24.1 years and in group III was 25.8 years. The mean BMI in group I was 24.7 kg/ m2, in group II was 24.3 kg/ m2 and in group III was 23.5 kg/ m2. Cervical dilatation rate 3 was seen in 3 in group I, 2 in group II and 4 in group III, 4 was seen in 12 in group I, 10 in group II and 9 in group III, 5 in 3 in group II and 2 in group III. The difference was non- significant (P> 0.05).

Table II Comparison of total analgesic dose and total PCA bolus

Parameters	Group I	Group II	Group III	P value
Total analgesic dose (ml)	47.3	41.2	34.8	0.02
PCA bolus	3.2	1.5	1.2	0.05

Table II, graph I shows that in group I, group II and group III, the mean total analgesic dose (ml) was 47.3, 41.2 and 34.8. The number of PCA bolus required was 3.2, 1.5 and 1.2 in group I, II and III respectively. The difference was significant (P< 0.05).

Graph I Comparison of total analgesic dose and total PCA bolus

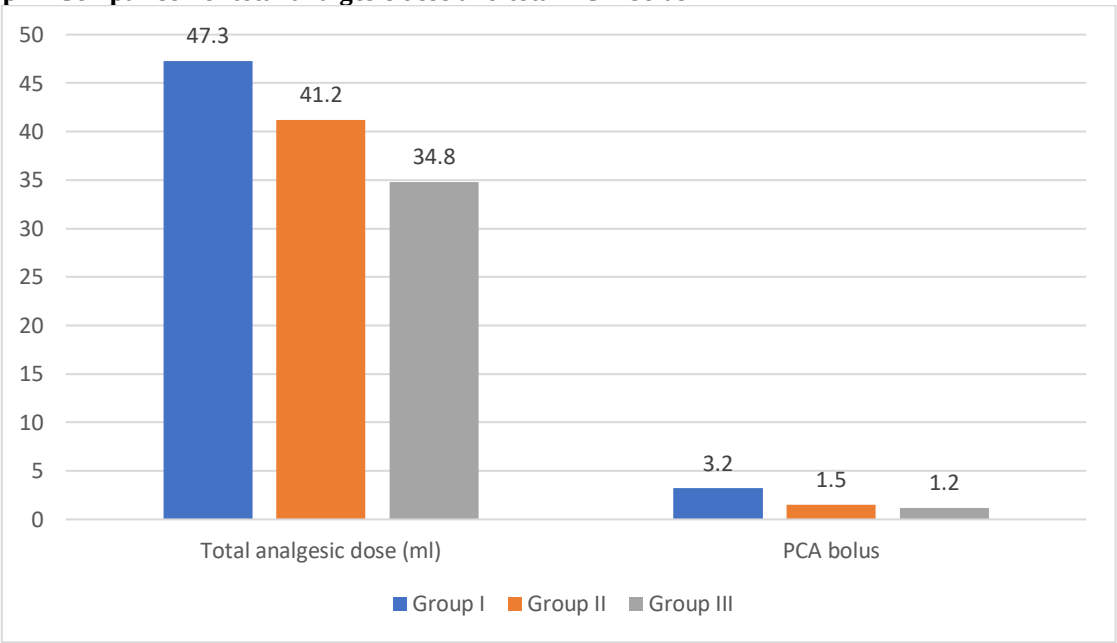

Table III Adverse events

Events	Group I	Group II	Group III	P value
Hypotension	0	1	4	0.05
Shivering	1	3	2	0.91

Table III shows that adverse events were hypotension seen in 1 in group II and 4 in group III. Shivering seen in 1 in group I, 3 in group II and 2 patients in group III. The difference was significant (P< 0.05).

DISCUSSION

Lumbar epidural analgesia is the most effective and commonly used modality for pain relief during labor, with the main goal being a safe fetal outcome with no negative effects on the mother.[7] Out of all the labor analgesia techniques, epidural analgesia meets the fundamental needs of labor analgesia by reducing labor pain without impairing other sensations, such as the urge to push, and permitting regular walking while maintaining pelvic floor muscle tone and the sensation of the baby's head in the vagina, thereby enabling labor to proceed without interference.[8] Epidural bupivacaine has been used widely in the past to relieve labor and delivery pain in patients.[9,10]The present study was conducted to compare low

concentration ropivacaine with or without fentanyl or clonidine for labour analgesia.

We found that mean age in group I was 23.6 years, in group II was 24.1 years and in group III was 25.8 years. The mean BMI in group I was 24.7 kg/ m2, in group II was 24.3 kg/ m2 and in group III was 23.5 kg/ m2. Cervical dilatation rate 3 was seen in 3 in group I, 2 in group II and 4 in group III, 4 was seen in 12 in group I, 10 in group II and 9 in group III, 5 in 3 in group II and 2 in group III. Ahirwar et al[11]compared low concentration ropivacaine with or without fentanyl or clonidine for labour analgesia and its effect on maternal and foetal safety. Ninety primegravida in labour were divided into three groups (n=30) and patient controlled epidural labour analgesia was given to them: Initial bolus of 10ml of ropivacaine 0.125% in Group I; with fentanyl 2 µg/ml in Group II and with clonidine 1µg/kg in Group III. Subsequently each group received ropivacaine 0.125% through patient controlled epidural analgesia (PCEA) as background infusion of 5 ml/hr with lockout interval time of 10min and subsequent bolus of 5ml. At baseline, groups were matched demographically, hemodynamically as well as for intensity of pain. There was a statistically significant decrease in hemodynamic parameters from baseline in all groups with maximum reduction in group III. A significant difference among groups in VAS was observed at zero min and from 120min till 240min intervals and lowest values were in Group III. No significant difference was observed among the groups for mode of delivery and expulsive efforts. Total analgesic dose and PCA bolus requirement was maximum in Group I and minimum in Group III and the difference was statistically significant among groups. Six (20%) patients had shivering in Group II and hypotension was recorded in only 1 (3.3%) patient of Group III.

We found that in group I, group II and group III, the mean total analgesic dose (ml) was 47.3, 41.2 and 34.8. The number of PCA bolus required was 3.2, 1.5 and 1.2 in group I, II and III respectively. Lim et al[12]compared the local anaesthetic consumption by parturients using CI-PCEA with demand only patient controlled epidural analgesia (PCEA) for labour analgesia. They recruited 40 parturients after approval by the ethics committee. Group PCEA (n = 20) received demand only PCEA. Group CI-PCEA (n = 20) received a similar PCEA regimen but the computer integration titrated the background infusion to 5, 10 or 15 ml x h(-1) if the patient required one, two or three demand boluses, respectively, in the previous hour. The time weighted consumption of local anaesthetic was similar in both groups (mean difference 0.7 mg x h(-1), 95% confidence interval [CI: -2.5, 1.1]; p = 0.425). The CI-PCEA group had higher maternal satisfaction scores: mean (SD) 93 (7) vs. 86 (11), p = 0.042. CI-PCEA does not increase the use of local anaesthetic when compared with demand only PCEA but does increase patient satisfaction.

Girard T et al[13] in a double-blind randomised trial bupivacaine and ropivacaine each at 0.125% with 1 microg/ml fentanyl were compared for epidural labour analgesia. This study was performed in two university hospitals.Sixty-three nulliparous women with singleton pregnancies at term were included. There were no differences between bupivacaine and ropivacaine as far as motor blockade, analgesic outcome, mode of delivery and neonatal outcome are concerned. However, the clinical management of epidural analgesia differed significantly between the two institutions involved.

The shortcoming of the study is small sample size.

CONCLUSION

Authors found that without causing any motor blockage, ropivacaine 0.125 percent was successful in reducing labor discomfort. In PCEA for labor, clonidine 1µg/kg outperformed fentanyl 2µg/ml as an adjuvant with no appreciable negative effects on the fetus or mother.

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