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Original Research

Efficacy of epidural bupivacaine and fentanyl for labour analgesia

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ABSTRACT:
Background: Epidural analgesia has been extensively used to provide pain relief in labor.The present study was conducted to evaluate efficacy of epidural bupivacaine and fentanyl for labour analgesia. **Materials & Methods:**74 pregnant women primigravida and multigravida of ASAgrade IIwere given first loading dose of 10ml 0.25% plain bupivacaine via epidural catheter followed by continuous epidural infusion of 0.0625% bupivacaine with 2.5 mcg/ml fentanyl @ 12ml/hour. Hemodynamics, mode of delivery, VAS and APGAR score were assessed. **Results:** There were 40 Primigravida and 34 Multigravida. Mode of delivery was vaginal in 54, vacuum cup assisted in 18 and caesarean section in 2 cases. The mean visual analogue score before drug was 5.48 and after drug was 2.14. Patientsatisfaction score was excellent in 32 patients, good in 42 and poor in 0. The difference was significant (P< 0.05). At 1 minute, APGAR score 7 was seen in 6, score 8 in 20, score 9 in 40 and score 10 in 8 patients. At 5 minutes, score 9 was seen in 14 and score 10 in 60 patients. The difference was significant (P< 0.05). **Conclusion:** Epidural labour analgesia with low dose bupivacaine (0.0625%) with fentanyl (2.5 mcg/ml), given through continuous infusion technique provides good pain relief to the parturient.
Key words: bupivacaine,Epidural labour analgesia, fentanyl

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INTRODUCTION

Labour is a physiologic process which is associated with most severe pain.[1] American College of Obstetricians and Gynaecologists (ACOG) suggested, if not contraindicated, a parturient should receive labour analgesia and under no circumstances labour pain should be left untreated.[2]Techniques used to alleviate labour pain are transcutaneous electrical nerve stimulation (TENS), water bath, acupuncture, hypnosis, parenteral narcotics, inhalational agents and various neuraxial blocks.[3,4]

Epidural analgesia has been extensively used to provide pain relief in labor. Epidural bupivacaine is still the most widely used local anesthetic in obstetric analgesia.[5] However, it's potential for motor blockade and central nervous system and cardiac toxicity by accidental intravenous injection of high dose is clinically undesirable, especially for obstetric patients. In addition, to minimize unwanted motor block, a trend toward the use of lower concentrations of local anesthetics combined with opioids has been used in many clinical trials with good results.[6]

Goal of labour analgesia should be to ensure painless labour without significant adverse effects. Pharmacological and non-pharmacological methods have been employed for labour analgesia.[7] Labour analgesia by neuraxial technique, especially by epidural is considered gold standard.[8] Epidural analgesia offers the most reliable pain relief with the least amount of side effects for the longest period of time in labour when compared to all other forms of pharmacological methods.[9]The present study was conducted to evaluate efficacy of epidural bupivacaine and fentanyl for labour analgesia.

MATERIALS & METHODS

The present study comprised of 74 pregnant women primigravida and multigravida of ASAgrade II were selected. All gave their written consent for the participation in the study.

Data such as name, age etc. was recorded. All patients were given first loading dose of 10ml 0.25% plain bupivacaine via epidural catheter followed by continuous epidural infusion of 0.0625% bupivacaine with 2.5 mcg/ml fentanyl @ 12ml/hour. Hemodynamics, mode of delivery, VAS and APGARscore were assessed. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

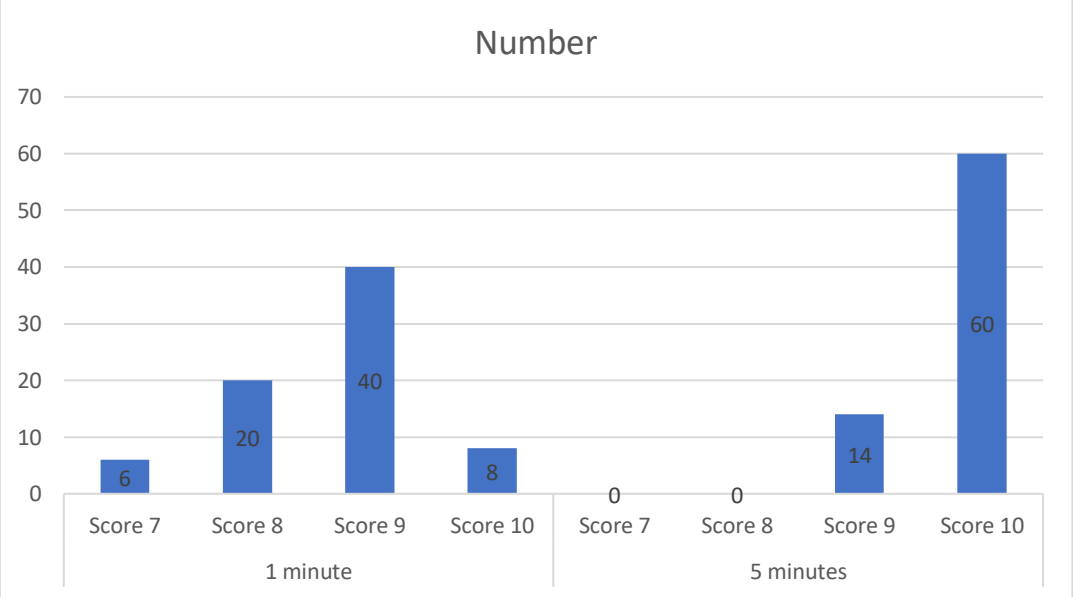
RESULTS

Table I: Patients characteristics

Parameters	Variables	Number	P value
Gravida	Primigravida	40	0.85
	Multigravida	34	
Modeof delivery	Vaginal	54	0.01
	Vacuum cupassisted	18	
	Caesarean section	2	
Visual Analogue Score	Before drug	5.48	0.04
	After drug	2.14	
Patient satisfaction score	Excellent	32	0.05
	good	42	
	poor	0	

Table I shows that there were 40Primigravida and 34Multigravida.Mode of delivery was vaginal in 54, vacuum cup assisted in 18 and caesarean section in 2 cases.The mean visual analogue score before drugwas 5.48 and after drug was 2.14.Patientsatisfaction score was excellent in 32 patients, good in 42 and poor in 0. The difference was significant (P< 0.05).

Graph I: Assessment of APGAR score



Graph I shows that at 1 minute, APGAR score 7 was seen in 6, score 8in 20, score 9 in 40 and score 10 in 8 patients. At 5 minutes, score 9 was seen in 14 and score 10in 60 patients. The difference was significant (P< 0.05).

DISCUSSION

Epidural administration of amide local anesthetics in combination with opioids is widely used for pain relief in labor because of the dose minimizing and side effects reducing benefits.[10,11]Bupivacaine is the most widely used long-acting amide local anesthetic. It is a racemic mixture of 2 stereoisomers.[12] Ropivacaine, a levorotatory propyl homologue of bupivacaine, because of its structural features and physicochemical properties, is found to be less toxic to nervous system and heart in comparison with bupivacaine, although, it possesses relatively lower potency.[13] Fentanyl, a low molecular weight, high potency, and lipid soluble synthetic opioid, is a suitable analgesic drug which is in use for labor since many decades.[14,15]The present study was conducted to evaluate efficacy of epidural bupivacaine and fentanyl for labour analgesia.

We found that there were 40 Primigravida and 34 Multigravida. Mode of delivery was vaginal in 54, vacuum cup assisted in 18 and caesarean section in 2 cases. The mean visual analogue score before drug

was 5.48 and after drug was 2.14. Patientsatisfaction score was excellent in 32 patients, goodin 42 and poorin 0. Lim et al[16]examined the analgesic efficacy of demand-only PCEA and PCEA with background infusion. They recruited 300 nulliparous parturients. Analgesia was initiated with intrathecal ropivacaine 2 mg and fentanyl 15 microg and maintained with epidural ropivacaine 0.1% with fentanyl 2 microg/mL.Parturients were randomized to one of three groups. Group 0: demand-only PCEA, bolus of 5 mL, lockout interval of 15 min. Group 5: background infusion of 5 mL/h, bolus of 5 mL, lockout interval of 12 min. Group 10: background infusion of 10 mL/h, bolus of 5 mL, lockout interval of 10 min. The maximum dose of all groups was 20 mL/h. The primary outcome was incidence of breakthrough pain. Secondary outcomes included intrapartum pain scores, neuraxial blockade characteristics, side effects, the total and hourly volume of ropivacaine, neonatal outcomes, and obstetric outcomes.The incidence of breakthrough pain and the maximum visual analog scale (0-100 mm scale) pain scores were higher in Group 0 versus Groups 5 and 10 (43% vs 17% and 11%, $P < 0.001$ and 37 +/- 28 vs 22 +/- 26 and 16 +/- 25 [mean +/- SD], $P < 0.001$), respectively. Group 10 had a longer duration of effective analgesia compared with Group 0 (mean 895 min, 95% CI 823-966 vs 565 min, 95% CI 454-677, $P < 0.001$) and increased ropivacaine consumption, and was associated with a longer duration of the second stage of labor.

We observed that at 1 minute, APGAR score 7 was seen in 6, score 8 in 20, score 9 in 40 and score 10 in 8 patients. At 5 minutes, score 9 was seen in 14 and score 10 in 60 patients. Selim et al[17]compared the effect of bupivacaine-dexmedetomidine (BD) or bupivacaine – fentanyl (BF) on uterine artery pulsatitly index (UtA-PI) and umbilical artery pulsatitly index (UA-PI) during uterine contractions and relaxations.130 healthy full term parturients divided into 3 groups [23 cases as control, 44 cases as (BD) epidural group and 43 cases as (BF) epidural group]. Over the study duration of 120 minutes; UtA-PI and UA-PI were measured at baseline, 30, 60, 120 minutes during uterine contractions and relaxations. Maternal hemodynamic, visual analogue scale (VAS), sedation score, side effects of epidural analgesia including nausea, vomiting, pruritis and respiratory depression were assessed.VAS significantly decreased after epidural compared with control group. BD group showed significant improvement in onset and duration of analgesia and sedation scores with lower incidence of nausea and pruritis compared with BF group. The BF and BD groups were associated with significant maternal hypotension and bradycadia that increase the UtA-PI during uterine contractions and relaxations compared with control group. UA-PI was increased with uterine contractions compared with during uterine relaxations in the three studied groups yet the effect of epidural and uterine contractions does significantly affect newbornsapgar scores or umbilical cord pH. Bupivacaine-dexmedetomidine epidural analgesia showed better maternal satisfaction for labor pains control compared with bupivacaine – fentanyl without deleterious effect on utroplacental circulation and newborns outcome.

The limitation the study is small sample size.

CONCLUSION

Authors found that epidural labour analgesia with low dose bupivacaine (0.0625%) with fentanyl (2.5 mcg/ml), given through continuous infusion technique provides good pain relief to the parturient.

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