

**ORIGINAL RESEARCH****Assessment of Efficacy of Epidural Bupivacaine and Fentanyl for Labour Analgesia****Sangeeth S<sup>1\*</sup>, Putla Enoch Ricky Paul<sup>2</sup>, Saurav Mondal<sup>3</sup>**

<sup>\*1</sup>Senior Resident, Department of Anaesthesia, TMMC & RC, Moradabad, Uttar Pradesh, India.

<sup>2</sup>Senior Resident, Department of Anaesthesia Alluri Sitaramaraju Academy of Medical Sciences (ASRAM), Eluru, Andhra Pradesh, India.

<sup>3</sup>Senior Resident, IQ City Medical College Hospital, Durgapur, West Bengal, India.

**ABSTRACT**

**Background:** To assess efficacy of epidural bupivacaine and fentanyl for labour analgesia.

**Materials and Methods:** One hundred ten pregnant women primigravida and multigravida (ASA grade II) age ranged 18-30 years were recruited for this observational study. All patients were given first loading dose of 10 ml 0.25% plain bupivacaine via epidural catheter followed by continuous epidural infusion of 0.0625% bupivacaine with 2.5 mcg/ml fentanyl @ 12ml/hour. The parturients were assessed for hemodynamics, mode of delivery, VAS and APGAR (neonatal outcome).

**Results:** There were 42 Primigravida and 68 Multigravida. The mean visual analogue score before drug was 5.42 and after drug was 2.18. Mode of delivery was natural in 95, vacuum cup assisted in 14 and caesarean section in 1 case. Patient satisfaction score was excellent in 20 patients, good in 90 and poor in 0. The difference was significant ( $P < 0.05$ ). At 1 minute, APGAR score 7 was seen in 4, score 8 in 45, score 9 in 55 and score 10 in 6 patients. At 5 minutes, score 9 was seen in 25 and score 10 in 85 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.

**Keywords:** bupivacaine, labour analgesia, fentanyl.

**Corresponding Author: Dr. Sangeeth S,** Senior Resident, Department of Anaesthesia, TMMC & RC, Moradabad, Uttar Pradesh, India.

**INTRODUCTION**

Labour is a physiologic process which is associated with most severe pain. 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.<sup>[1]</sup>

Techniques used to alleviate labour pain are transcutaneous electrical nerve stimulation (TENS), water bath, acupuncture, hypnosis, parenteral narcotics, inhalational agents and various neuraxial blocks.<sup>[2]</sup> Adequate pain relief alleviates maternal fear, anxiety, apprehension and prevents increase in catecholamines, cardiac output, peripheral resistance, blood pressure and oxygen consumption. Neuraxial administration of a combination of low dose of local anaesthetic (bupivacaine, levobupivacaine, ropivacaine) with a lipid soluble opioid (fentanyl or sufentanil) is the most widely used technique of labour analgesia.<sup>[3]</sup>

Fentanyl is a potent opioid and addition in low concentration to Bupivacaine increased its efficacy, safety profile and cost effectiveness.<sup>[4]</sup> Bupivacaine is the most commonly used medication administered for epidural analgesia in labour because of its widespread

availability, low cost, relatively safe profile. It has a rapid onset and its duration is long lasting.<sup>[5]</sup> Bupivacaine has also been shown to provide longer lasting analgesia than other local anaesthetics even after sensations return. The addition of opioid to local anaesthetic solution can help treat missed segments, perineal pressure, and maximize efficacy and maternal satisfaction.<sup>[6]</sup> Considering this, we selected present study to assess efficacy of epidural bupivacaine and fentanyl for labour analgesia.

## MATERIALS & METHODS

One hundred ten pregnant women primigravida and multigravida (ASA grade II) age ranged 18-30 years were recruited for this observational study. After obtaining approval from ethical review committee of the institute, we obtained written consent from all enrolled women.

Demographic data of each patient was recorded. All patients were given first loading dose of 10 ml 0.25% plain bupivacaine via epidural catheter followed by continuous epidural infusion of 0.0625% bupivacaine with 2.5 mcg/ml fentanyl @ 12ml/hour. The parturients were assessed for hemodynamics, mode of delivery, VAS and APGAR (neonatal outcome). The results were compiled and subjected for statistical analysis using Mann Whitney U test. P value less than 0.05 was set significant.

## RESULTS

**Table I: Patients distribution according to gravidity**

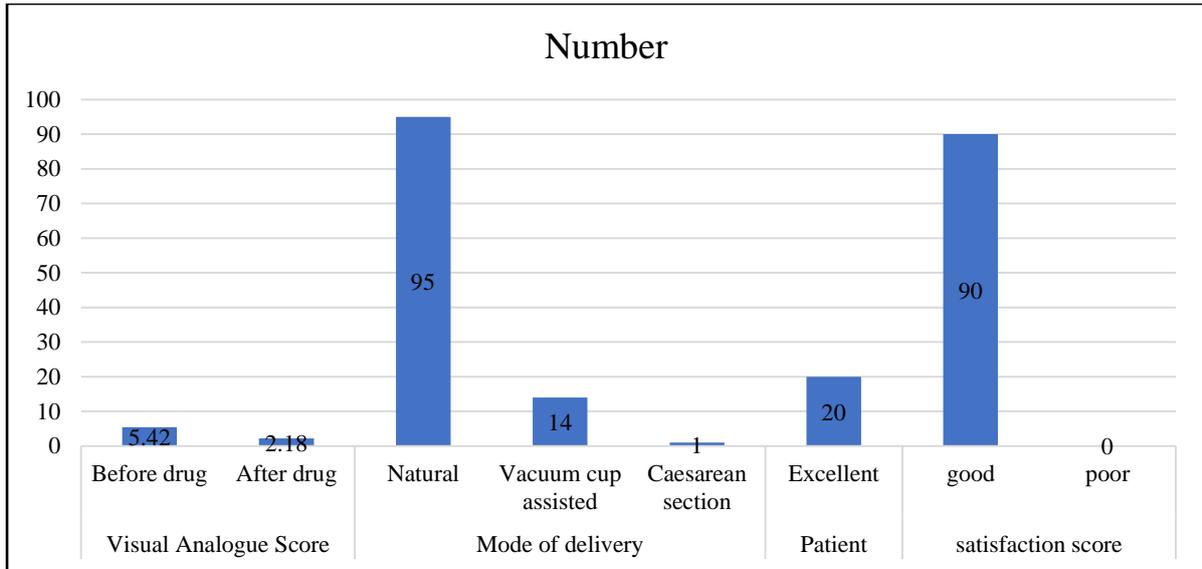
| Type         | Number | P value |
|--------------|--------|---------|
| Primigravida | 42     | 0.01    |
| Multigravida | 68     |         |

There were 42 Primigravida and 68 Multigravida. The difference was significant ( $P < 0.05$ ) (Table I).

**Table II: Comparison of parameters**

| Parameters                 | Variables           | Number | P value |
|----------------------------|---------------------|--------|---------|
| Visual Analogue Score      | Before drug         | 5.42   | 0.02    |
|                            | After drug          | 2.18   |         |
| Mode of delivery           | Natural             | 95     | 0.01    |
|                            | Vacuum cup assisted | 14     |         |
|                            | Caesarean section   | 1      |         |
| Patient satisfaction score | Excellent           | 20     | 0.01    |
|                            | good                | 90     |         |
|                            | poor                | 0      |         |

The mean visual analogue score before drug was 5.42 and after drug was 2.18. Mode of delivery was natural in 95, vacuum cup assisted in 14 and caesarean section in 1 case. Patient satisfaction score was excellent in 20 patients, good in 90 and poor in 0. The difference was significant ( $P < 0.05$ ) (Table II, graph I).

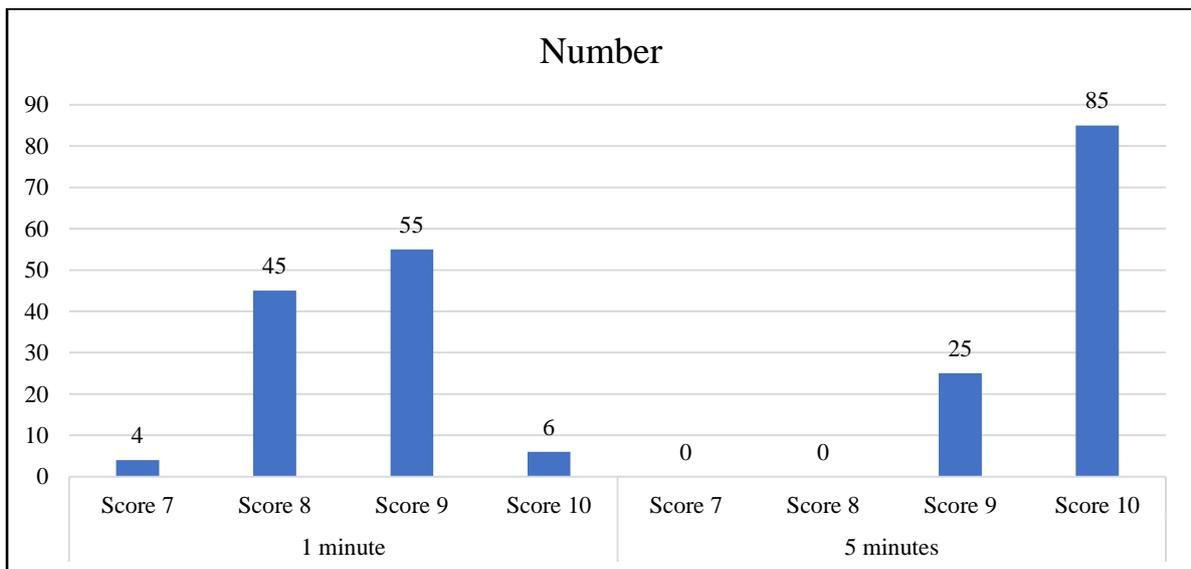


Graph I Comparison of parameters

Table III: Assessment of APGAR score

| Time      | APGAR score | Number | P value |
|-----------|-------------|--------|---------|
| 1 minute  | Score 7     | 4      | 0.02    |
|           | Score 8     | 45     |         |
|           | Score 9     | 55     |         |
|           | Score 10    | 6      |         |
| 5 minutes | Score 7     | 0      | 0.01    |
|           | Score 8     | 0      |         |
|           | Score 9     | 25     |         |
|           | Score 10    | 85     |         |

At 1 minute, APGAR score 7 was seen in 4, score 8 in 45, score 9 in 55 and score 10 in 6 patients. At 5 minutes, score 9 was seen in 25 and score 10 in 85 patients. The difference was significant ( $P < 0.05$ ) (Table III, graph II).



Graph II Assessment of APGAR score

## DISCUSSION

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. Labour analgesia by neuraxial technique, especially by epidural is considered gold standard.<sup>[7]</sup> 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.<sup>[8]</sup> The present study assessed efficacy of epidural bupivacaine and fentanyl for labour analgesia.

We observed that there were 42 Primigravida and 68 Multigravida. Najeeb et al<sup>[9]</sup> evaluated the clinical effectiveness of continuous lumbar epidural for vaginal delivery using 0.0625% bupivacaine with 2.5 mcg/ml of fentanyl. 91 patients admitted for vaginal delivery and who were in active labour were given first loading dose of 10 ml 0.25% plain bupivacaine via epidural catheter followed by continuous epidural infusion of 0.0625% bupivacaine with 2.5 mcg/ml fentanyl @ 12ml/hr. The parturients were assessed for onset and duration of analgesia, hemodynamics, sensory block, mode of delivery, and APGAR (neonatal outcome). Onset of analgesia was significantly faster (10 min). The duration of analgesia was also longer. There were no significant hemodynamic changes. No motor block was seen. 1 min and 5 min APGAR scores were comparable.

The mean visual analogue score before drug was 5.42 and after drug was 2.18. Mode of delivery was natural in 95, vacuum cup assisted in 14 and caesarean section in 1 case. Patient satisfaction score was excellent in 20 patients, good in 90 and poor in 0. Pawar et al<sup>[10]</sup> assessed the efficacy of fentanyl and sufentanil for labour analgesia in comparison with intramuscular tramadol. 90 primigravida parturients who were randomly allocated to three groups of 30 each; Fentanyl group (group BF) received 50 µg of epidural fentanyl with 10 ml of 0.125% bupivacaine, Sufentanil group (group BS) received 10µg epidural sufentanil with 10 ml of 0.125% bupivacaine and Tramadol group (group T), the control group received 100mg intramuscular tramadol with 50 mg repeat dose after 4 hours. Epidural groups were comparable in their visual analogue scale (VAS) score satisfaction score, characteristics of sensory and motor blockade, mode of delivery, side effects, haemodynamic stability and neonatal outcome. Value of VAS did not exceed 3 in the epidural group during the entire study period. Onset of analgesia was early with sufentanil (10.5±2.1 mins, p< 0.01) and total amount of bupivacaine used was also less (44.16 mg, p =0.002). Higher VAS scores (>4), delayed onset and decreased total duration of labour was seen in tramadol group. Epidural and tramadol group were comparable in mode of delivery and neonatal outcome

We observed that at 1 minute, APGAR score 7 was seen in 4, score 8 in 45, score 9 in 55 and score 10 in 6 patients. At 5 minutes, score 9 was seen in 25 and score 10 in 85 patients. Labour analgesia by neuraxial technique, especially by epidural is considered as gold standard.<sup>[11]</sup> The ideal labour analgesia should be easy to administer, should provide predictable and rapid onset of analgesia, should be devoid of motor block and expulsive efforts should be preserved during the second stage of labour.<sup>[12]</sup> Use of low concentration local anaesthetic solution preferably blocks “C” fibres which transmit pain without causing motor block. Epidural lignocaine, chlorprocaine were used in past but bupivacaine still remains the most commonly used local anaesthetic for epidural labour analgesia.<sup>[13]</sup> The use of low concentrations of bupivacaine alone provides suboptimal, short lived analgesia. The addition of lipid soluble opioids, fentanyl 1 to 3 mcg/mL allowed the reduction of local anaesthetic dose with associated decreased motor blockade, preserved analgesia and enhanced maternal satisfaction.<sup>[14]</sup>

## 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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