

Section **Anaesthesiology**

Original Article

Efficacy of Epidural Analgesia and Intravenous Tramadol in Relieving Labour Pain: A Prospective Hospital Based Study

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ABSTRACT

Background: Labour Pain during pregnancy is a painful experience for nearly all women. The aim of this study is to compare the efficacy, safety and adverse effects of epidural analgesia, tramadol in pain relief. **Material and Methods:** A total of 90 cases were studied. They included primi- as well as multigravidae, belonging to ASA grade 1 and 2 between the ages of 20-40 years, 37-41 weeks of pregnancy were selected. They were in established active stage of labor (uterine contraction 3 per 10 minutes, lasting for 30 to 40 seconds, cervical dilation more than 3 cm and up to 5 cm and cervical effacement more than or equal to 60%) with singleton fetus presenting by vertex and agreeable for analgesia. The selected patients were divided into three groups of Group I (control group, n=30), labour was carried out without using any analgesic technique, Group II (epidural Group, n=30) – Inj. bupivacaine 0.25% was given epidurally for analgesia, Group III (Tramadol Group, n=30) – Inj. Tramadol was given intravenously for analgesia. **Result:** From the observations gathered from this study, this can concluded that epidural analgesia provides much better analgesia than non-conventional methods of analgesia during labour. **Conclusion:** Tramadol have also a fair to good role in pain relief in labour, but mainly in first stage of labour when the pain is not severe enough.

Key Words: Epidural Analgesia, Intravenous Tramadol.

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INTRODUCTION

Labour pain is a most painful condition experienced by nearly all women. The pain experienced during labour has various physiological and psychosocial measurements and its strength can vary greatly from one woman to another.^[1] The cause effect relationship in labour pain does not always correspond to a clinical response; what matters is to understand the pain felt by the pregnant woman and to offer pain release.^[2] Pain management during labour is an essential part of good obstetric care. An ideal analgesic in obstetrics should have potent opiate like analgesic efficacy and possess minimal side effects. Physical methods like transcutaneous electric nerve stimulation, subcutaneous sterile water injection to the lower back, provides limited pain relief.^[3] Various anaesthetic techniques had been implemented to relief labour pain. An

epidural anaesthesia technique allows the patient to be fully awake and participating in all aspects of the birthing process. Epidural anaesthesia along with a skilled anaesthetist, a faithful obstetrician and a trained midwife can convert the painful labor into a less stressful event.^[4] Epidural anesthesia is most frequently used method of pain control. It is reliable and preferred method of anaesthesia for 60% hospitalized women in developed countries. Epidural analgesia has an additional advantage of prolonging the labour also, which might in turn leads to assisted vaginal birth. However, there may be situations where either it is not available or it is not feasible.^[5] Parenteral opioids, thus, are still popular for pain

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relief in labour in many countries throughout the world. Tramadol is a synthetic analogue of codeine and is a centrally acting agent.

Studies have shown that tramadol is an effective analgesic without the maternal and neonatal respiratory depression common to other opioids.^[6] Tramadol can be used as labour with minimum cost and less training as compared to the proven epidural analgesia that requires trained staff and equipment and has higher cost. It also avoids the side effects associated with epidural analgesia like fetal heart rate changes, urinary retention, delayed pushing, and a prolonged second stage of labor.^[7] Therefore, this study was conducted to assess the efficacy of Epidural analgesia with Traditional Tramadol.

METHODS

The present study was conducted in the Department of Anaesthesiology, American Institute of Medical Sciences, Udaipur. The cases were selected from the patients attending Antenatal Clinic and Labour room, Department of Obstetrics, of the same tertiary care teaching hospital. A total of 90 cases were studied during the 5 month study period from November 2015 to March, 2016. The cases included were primi- as well as multigravidae, belonging to ASA grade 1 and 2 between the ages of 18-40 years. Ninety pregnant women with 37-41 weeks of pregnancy were selected. They were in established active stage of labor (uterine contraction 3 per 10 minutes, lasting for 30 to 40 seconds, cervical dilation more than 3 cm and up to 5 cm and cervical effacement more than or equal to 60%) with singleton fetus presenting by vertex and agreeable for analgesia. Women with abnormal presentations, cephalo-pelvic disproportion, previous caesarean section and any medical complications were excluded from the study. All the demographic details of the patients were noted. All patients were informed about the methods of analgesia available. They were free to decide the first choice of analgesia and also the rescue analgesia method.

Study Groups

The selected 90 patients were divided into three groups of 30 patients each

Group I (control group)- Consisted labour was carried out without using any analgesic technique.

Group II (Epidural Group) – Inj. bupivacaine 0.25% was given epidurally for analgesia.

Group III (Tramadol Group) – Inj. Tramadol was given intravenously for analgesia.

Group II (Epidural): Technique of Lumbar Epidural Block; before the procedure, pulse, blood pressure, respiration, uterine contractions and dilatation of cervix and fetal heart rate were checked and recorded. Taking all aseptic precautions, skin at puncture site was anaesthetized with local anaesthetic. Epidural space was identified in the L2-3 or L3-4 intervertebral space with the help of Tuohy's needle using the "loss of resistance" technique. Aspiration was done to check for CSF or blood. Then an epidural catheter was inserted through the epidural needle and advanced. Once the point of catheter was beyond the needle, it was advanced to

about 3-5 cm. The catheter was aspirated for blood and CSF. Initial injection of 1 ml of lignocaine (2%) with adrenaline was given as test dose and if in 5 min., there was no evidence of intradural block, e.g., inability to move the feet or any tingling sensations, or sign of possible intravenous injection i.e. tachycardia, it was ascertained that catheter was in epidural space, needle was gently removed and the catheter was fixed in front of the shoulder and the patient was made to lie down on her back. Thereafter, the patient was managed according to the group allocated. After making the patient comfortable in supine position, therapeutic dose of 10 ml of 0.25% inj. Bupivacaine was injected slowly through the epidural catheter. The patient was observed constantly and her blood pressure, pulse and respiration measured and recorded every 1-2 minutes. The patient was made comfortable and reassured. After the analgesia developed, regular monitoring and recording of the various parameters was done. Whenever required top-up with bupivacaine was done.

Group III (Tramadol): after recording the baseline parameters, inj. Tramadol hydrochloride 100 mg diluted in 10 ml of normal saline was given intravenously over 40-60 sec. For maintaining analgesia, continuous infusion of Inj. Tramadol 200 mg in 500 ml of 5% Dextrose was used and drip rate adjusted according to the patients response (10-12 drops/min or 30 ml/hr). Monitoring and recording of the patient's vital parameters, effect on labour and pain and fetal condition was done regularly. Whenever requested for additional analgesia, therapeutic dose of Bupivacaine was given in the usual method as described for group II patients and was monitored carefully.

Data Collection

Record of each case was maintained as follows:- A note was made of the initial choice of analgesia, when first administered in relation to onset of labour and dilatation of the cervix and the initial pain concept.

(A) During Labour with Initial Choice of analgesia in use:

The following parameters were monitored at specific time interval –

Time of onset, degree and duration of pain relief

Blood pressure

Pulse rate

Fetal heart rate

Progress of labour was assessed by monitoring-

- Uterine contractions

- Cervical dilatation

- Descent of head

- Duration of labour

Use of any other form of analgesia

Post-delivery:- 1 hr and 24 hr post-delivery, the woman was asked for her comments regarding the form of analgesia chosen during the labour. She was questioned particularly about pain relief, site of pain relief and any other positive or negative comments she might have about the method she had chosen. She was also asked if she would request the same form of analgesia again.

Criteria to assess pain intensity during labour:

(Gaston et al, 1984)

0 = No pain

1 = Slight pain (not troublesome)

2 = Moderate pain (troublesome but bearable)

3 = Strong pain (very troublesome)

4 = very severe pain (unbearable)

The pain relief was rated as: (Gaston et al.)

0 = No relief (Nil)

1 = Slight relief (Poor)

2 = moderate relief (fair)

3 = Almost complete relief (Good)

4 = Complete relief (excellent)

Data Processing

Statistical Analysis was done using Excel.

RESULTS

Demographic Data: Age-wise distribution of the patient can be seen in Table 1.

Patient Characteristics:

More than 50% patients in both primigravidae and multigravidae groups had complaints of both low back and suprapubic pain in early labour at the time of administration of analgesia and it was not significantly different among the groups. About 70 % patients had severe to almost unbearable pain in the first stage of labour before the analgesia was instituted and was not significantly different among the groups.

Analgesic Effect

On low back pain (in first stage) In group II (epidural), 11 primigravida and 10 multigravida patient experienced excellent relief of low back pain, while 4 primi- and 3 multigravida experienced good relief.

[Table 2] In group I (control), no patient was offered any pain relief method and all of them completed their labour with variable degree of pain as per their threshold.

In group II (epidural), out of 16 primigravidae patients, 11 felt excellent, 4 felt good and 1 felt fair relief of pain. Similarly, out of 14 multigravida, 10 felt excellent, 3 felt good relief of pain during the whole process of labour.

In group III (tramadol), out of 12 primigravida patients, 1 had excellent, 1 felt good and 4 felt only fair relief of labour pain when they opted for tramadol as initial choice of pain relief. But 4 had poor and 2 felt no relief of pain with tramadol. These results clearly show the superiority of lumbar epidural block as an analgesic technique for labour pain. These results reflect the efficacy of the methods applied to block the pain transmission from the site of organ of pain to the brain and hence their effect on the pain relief.

DISCUSSION

Normal labour is characterized by a progressive increase in myometrial contractility with increase in duration and frequency of contractions. Similar findings were observed in group I (control). In group II (epidural), there was slight decrease in mean duration of uterine contractions which was

maximum at 30 minutes (mean decrease of 2.72 seconds in primigravida and 3.12 seconds in multigravida) and also in mean frequency of contractions which was maximum at 30 minutes (mean decrease in frequency of 1.62 contraction/10 minutes in primigravida and 1.75 contractions/10 minutes in multigravida). These findings were consistent with those of Vasicka et al^[8] who also noted that immediately following injection of a therapeutic dose of local anaesthetic, the intensity of uterine contractions almost consistently decreased 10 to 20 mmHg. They concluded that epidural block has no effect on uterine contractions or on course of labour as long as maternal blood pressure is maintained within normal limits. Ruppert also noted similar effects. In-group III (tramadol), there was no significant effect ($p>0.05$) on uterine contractions either in terms of duration of contractions or frequency of contractions. Jain et al^[9] also had similar observations of insignificant effect of tramadol on uterine contractions.

Table 1: Table 1: Distribution of patients according to Age (in years)

Age of Patient (yrs)	Group I (Control)		Group II (Epidural)		Group III (Tramadol)		Total	
	Primi	Multi	Primi	Multi	Primi	Multi	Primi	Multi
20-25	6	1	6	0	5	1	17	2
26-30	5	6	9	5	5	8	19	19
31-35	2	8	1	6	2	6	5	20
36-40	0	2	0	3	0	3	0	8
Total	13	17	16	14	12	18	41	49
	30		30		30		90	

Table 2: Overall Pain Relief during Labour As Described By the Patient Following Initial Choice of Analgesia

Pain Relief	Group I (Control)		Group II (Epidural)		Group III (Tramadol)	
	Primi	Multi	Primi	Multi	Primi	Multi
Excellent			11	10	1	2
Good			4	3	1	2
Fair			1	0	4	5
Poor			0	1	4	5
Nil			0	0	2	4
Total	13	17	16	14	12	18
	30		30		30	

Budsen et al^[7] also observed the effect of epidural analgesia on low back pain and noted that 92% parturients experienced good relief, 6% had moderate relief and 2% had no relief of low back pain in first stage of labour with epidural analgesia. In group III (tramadol) patients, 1 primigravidae and 2 multigravidae experienced excellent relief, 1 primigravida and 2 multigravidae experienced good relief. Budsen et al^[7] also observed the effect of epidural analgesia on low back pain and notes that 92% parturients experienced good relief, 6 % had moderate relief and 2 % had no relief of low back pain in first stage of labour with epidural analgesia.

Need For Additional Analgesia (As Epidural Analgesia) With Analgesia of Initial Choice (In Group III and IV) In group III (tramadol), out of 12 primigravidae, 3 requested for

additional analgesia at 6-8 cm cervical dilatation stage of labour and 9% (56.5%) at 8-10 cm cervical dilatation stage. This suggests that the relief of abdominal pain is of greater importance for the total experience of pain relief during the labour and is better relieved by epidural block.

CONCLUSION

The present study was conducted to evaluate and compare the effects of conventional (Lumbar epidural analgesia technique) and non-conventional (intravenous tramadol) methods for pain relief during labour, on 90 parturients and following conclusions were drawn:

The results of our study do confirm the superiority of epidural analgesia as an analgesic agent. Tramadol had a fair to good role in pain relief in labour, but only in early stage of labour when the pain was not severe enough. Therefore, where the necessary skilled staff are constantly available and the patient consents for invasive procedure, the lumbar epidural analgesia is the technique of choice for pain relief during labour.

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