

## To Compare the Efficacy of Epidural Analgesia, Tramadol and TENS in Pain Relief During Labour: An Institutional Based Study

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### ABSTRACT

**Background:** Labor pain is among the most severe pain experienced by women. Pain management during labour is an essential part of good obstetric care. The present study was conducted to compare the efficacy of epidural analgesia, tramadol and TENS in pain relief during labour.

**Materials and Methods:** The present study was conducted to compare the efficacy of epidural analgesia, tramadol and TENS in pain relief during labour among 150 patients. Complete history was taken. All patients were informed about the methods of analgesia available. The selected 150 patients were divided into three groups of 50 parturients. Group I (Epidural Group) – Inj. bupivacaine 0.25% was given epidurally for analgesia. Group II (Tramadol Group) – Inj. Tramadol was given intravenously for analgesia. Group III (TENS group) – TENS electrodes were applied as the initial choice of pain relief. The woman was asked for her comments regarding the form of analgesia chosen during the labour. She was questioned particularly about pain relief. Chi – square test, Student 't' test, Paired t-test was used for comparing the data.

**Results:** In the present study a total a total of 150 primi- as well as multigravida patients were included. The patients were divided into three groups depending upon the analgesia used. Group I was epidural analgesia, group II was tramadol and group III was TENS. In group I Primigravida patients was 27 and multigravida patients was 23. In group II Primigravida patients was 34 and multigravida patients was 26. In group III Primigravida patients was 27 and multigravida patients was 23. In this study maximum Primigravida and multigravida patients were of age group 25-30 yrs. In group I (epidural), out of 27 primigravidae patients, 46% felt excellent, 6% felt good and 2% felt fair relief of pain and out of 23 multigravida, 42% felt

excellent, 2% felt good and 0% felt poor relief of pain during the whole process of labour. In group II (tramadol), out of 34 primigravida patients, 4 % had good, 14% had fair and 10% had poor, 12% had nil relief of labour pain when they opted for tramadol as initial choice of pain relief. Out of 26 multigravidae, 4% had excellent, 6% had good relief and 20% felt fair relief of labour pain with tramadol, while 16% felt poor and 14% had no relief of labour pain. In group III (TENS), out of 27 primigravidae, 18% felt good relief, 20% felt fair relief and 4% had nil relief of labour pain when they opted for TENS as initial method of pain relief. Out of 23 multigravidae, 10 % had good relief and 22% felt fair relief of labour pain with TENS, while 6% felt poor and 8% had no relief of labour pain.

**Conclusion:** This study concluded that epidural analgesia provides much better analgesia than tramadol and TENS in pain relief during labour.

**Keywords:** Epidural Analgesia, Tramadol, TENS, Labour.

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### INTRODUCTION

Pain during childbirth is one of the most excruciating pain experienced by women in their lives.<sup>1</sup> Fear of childbirth has been associated with a longer first and second stage of labour and dissatisfaction with the childbirth experience.<sup>2</sup> The level of pain experienced and the effectiveness of pain relief may influence a woman's satisfaction with labour and the birth and may have immediate and long-term emotional and psychological effects.<sup>3</sup>

The type of pain relief used in labour may impact on breastfeeding and mother-infant interaction.<sup>4</sup> The most important consideration in pregnancy is that there are two individuals receiving treatment – mother and baby. Anesthetic requirements in the peripartum period include long periods of constant pain relief and increased depth of analgesia might be needed as labour progressed and pain increases.<sup>5</sup>

Psychological methods of pain relief in labor are time consuming, relief unpredictable, inconsistent, and incomplete. Physical methods like transcutaneous electric nerve stimulation, subcutaneous sterile water injection to the lower back, provides limited pain relief.<sup>6</sup>

The ideal obstetric analgesic used should be cheap, easy to administer, produce good and reliable relief from pain but not impair consciousness and cooperation. It should have minimal maternal and neonatal adverse. A variety of labour analgesia options are available, including psychoprophylaxis, transcutaneous electrical nerve stimulation (TENS), systemic medication, inhalational techniques, and neuraxial blocks. In addition, other regional techniques such as caudal or para-cervical block are used infrequently.<sup>7</sup>The present study was conducted to compare the efficacy of epidural analgesia, tramadol and TENS in pain relief during labour.

## MATERIALS AND METHODS

The present study was conducted to compare the efficacy of epidural analgesia, tramadol and TENS in pain relief during labour among 150 patients. Before the commencement of the study ethical approval was taken from the Ethical Committee of the institute and informed consent was obtained from the patient. The cases were selected from the patients attending Antenatal Clinic and Labour room. The patients primi- as well as multigravidae, belonging to ASA grade 1 and 2 between the ages of 18-35 years, pregnant women with 37-41 weeks of pregnancy were selected for the study. They were in established active stage of labor with singleton fetus presenting by vertex and agreeable for analgesia. Women with abnormal presentations, cephalopelvic disproportion, previous caesarean section, antepartum hemorrhage, any medical complications or any electrical device fitted to patient were excluded from the study. Complete history was taken. All patients were informed about the methods of analgesia available. The selected 150 patients were divided into three groups of 50 parturients. Group I (Epidural Group) – Inj. bupivacaine 0.25% was given epidurally for analgesia. Group II (Tramadol Group) – Inj. Tramadol was given intravenously for analgesia. Group III (TENS group) – TENS electrodes were applied as the initial choice of pain relief.

**Group I (Epidural):** Preloading with 500 ml of Ringer Lactate solution was done in every patient. Patients were asked to lie in left lateral position. Taking all aseptic pre-cautions, 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. 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. 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. If analgesia was present, but not sufficiently extensive, reinjection was carried out 20 minutes after the first injection. Whenever required top-up with bupivacaine was done. Top-up doses – as soon as patient started to perceive the pain, 10 ml of 0.125% bupivacaine was given through the epidural catheter.

**Group II (Tramadol):** 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 patient's response (10-12 drops/min or 30 ml/hr).

**Group III (TENS):** for those choosing TENS, two pairs of carbon rubber electrodes were placed on either side of the spine the electrodes were sited (1) dorsally from T10-L1 and (2) from S2 to S4 approximately 5 cm from the midline. These were attached to a dual channel TENS capable of generating current of maximum 60 mA and a maximum frequency of 100 Hz. This was set initially with a pulse repetition rate of 5-6 (80-100 pulses per second). Following instructions, the woman was allowed to adjust the amplitude settings commencing with a 5-10 mA on each channel, increasing gradually as contractions gained momentum to higher amplitudes and density. Whenever requested for additional analgesia, therapeutic dose of bupivacaine was given in the usual method as described for group II patients.

All the patients were given injection oxytocin 20 units in 500 ml IV drip immediately after delivery of anterior shoulder of the baby, if not contraindicated. The woman was asked for her comments regarding the form of analgesia chosen during the labour. She was questioned particularly about pain relief.

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)

Chi – square test was used to test the significance of 2 proportions each having more than 1 group. Student 't' test was used to test the significance of difference between mean of one sample with an externally determined mean.

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

Age of patients(yrs)	Group I		Group II		Group III		Total	
	Primi	Multi	Primi	Multi	Primi	Multi	Primi	Multi
18-25	7	2	7	0	14	8	28	10
25-30	15	11	8	11	10	13	33	35
31-35	5	10	19	15	3	2	27	27
<b>Total</b>	50		50		50		50	

**Table 2: Overall Pain Relief during labour as described by the patient following initial choice of analgesia**

Pain Relief	Group I		Group II		Group III	
	Primi	Multi	Primi	Multi	Primi	Multi
<b>Excellent</b>	23(46%)	21(42%)	0(0%)	2(4%)	0(0%)	0(0%)
<b>Good</b>	3(6%)	1(2%)	2(4%)	3(6%)	9(18%)	5(10%)
<b>Fair</b>	1(2%)	0(0%)	7(14%)	10(20%)	10(20%)	11(22%)
<b>Poor</b>	0(0%)	1(2%)	5(10%)	8(16%)	6(12%)	3(6%)
<b>Nil</b>	0(0%)	0(0%)	6(12%)	7(14%)	2(4%)	4(8%)
<b>Total</b>	50		50		50	

## RESULTS

In the present study a total a total of 150 primi- as well as multigravida patients were included. The patients were divided into three groups depending upon the analgesia used. Group I was epidural analgesia, group II was tramadol and group III were TENS. In group I Primigravida patients was 27 and multigravida patients was 23. In group II Primigravida patients was 34 and multigravida patients was 26. In group III Primigravida patients was 27 and multigravida patients was 23. In this study maximum Primigravida and multigravida patients were of age group 25-30 yrs. In group I (epidural), out of 27 primigravidae patients, 46% felt excellent, 6% felt good and 2% felt fair relief of pain and out of 23 multigravida, 42% felt excellent, 2% felt good and 0% felt poor relief of pain during the whole process of labour. In group II (tramadol), out of 34 primigravida patients, 4 % had good, 14% had fair and 10% had poor, 12% had nil relief of labour pain when they opted for tramadol as initial choice of pain relief. Out of 26 multigravidae, 4% had excellent, 6% had good relief and 20% felt fair relief of labour pain with tramadol, while 16% felt poor and 14% had no relief of labour pain. In group III (TENS), out of 27 primigravidae, 18% felt good relief, 20% felt fair relief and 4% had nil relief of labour pain when they opted for TENS as initial method of pain relief. Out of 23 multigravidae, 10 % had good relief and 22% felt fair relief of labour pain with TENS, while 6% felt poor and 8% had no relief of labour pain.

## DISCUSSION

Epidural analgesia effectively relieves labour pain and is now chosen by many parturient women. In addition to their analgesic benefits, the physiological benefits of epidural analgesia for the mother and fetus are well documented.<sup>8-11</sup>

Tramadol is a weak opioid which inhibits nor-adrenergic and serotonergic transmission, having analogous analgesic efficacy to other opioids like meperidine but is without much maternal sedation and neonatal respiratory depression. It can be used by various routes such as oral, intramuscular, intravenous and epidural with minimal side effects. It is a potent analgesic which can be given to the labouring patients. Parenteral tramadol is being a less invasive alternative. It can be given by obstetricians themselves.<sup>7</sup>

In the present study a total a total of 150 primi- as well as multigravida patients were included. The patients were divided into three groups depending upon the analgesia used. Group I was epidural analgesia, group II was tramadol and group III were TENS. In group I Primigravida patients was 27 and multigravida

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Jain S et al studied the analgesic efficacy of intramuscular opioids versus epidural analgesia in labour and concluded that the analgesic efficacy and maternal satisfaction is better with epidural analgesia than with opioids.<sup>12</sup>

Thakur R et al compared the effect of transcutaneous electrical nerve stimulation (TENS) with 100 mg IM tramadol for pain relief in labour and concluded that pain relief in labour with TENS is as good as that with tramadol. TENS has hardly any side effects.<sup>13</sup>

Singh AK et al concluded that epidural analgesia provides much better analgesia than non-conventional methods of analgesia during labour.<sup>14</sup>

Loughnan et al conducted a randomized comparison of epidural (0.25% bupivacaine) versus I/M 100 mg pethidine for analgesia in labour where 83% patients in the epidural group had excellent pain relief during the first stage in contrast to only 56% patients in the parenteral pethidine group.<sup>15</sup>

## CONCLUSION

This study concluded that epidural analgesia provides much better analgesia than tramadol and TENS in pain relief during labour.

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