

Evaluation of pain relief and satisfaction in women using epidural analgesia in labour

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ABSTRACT

Background: Pain during childbirth is the most severe pain women may experience in their lifetime. Epidural analgesia is an effective form of pain relief during labour.

Methods: This retrospective study was carried out at Omega Hospital, Nagpur in 50 women in labour who demanded epidural analgesia for pain relief. It was carried out to determine extent of pain relief and overall satisfaction in women using epidural analgesia.

Results: In present study, out of 50, 28 (56%) patients delivered by normal vaginal delivery, 14 (28%) patients delivered by cesarean section, 8 (16%) patients had vacuum delivery while in no patient forceps were applied. In first stage, 36 (72%) patients had zero score (no pain), 13 (26%) patients had 1-3 score (mild pain) while 1 (2%) patient had 4-6 score (moderate pain) after epidural analgesia. That means epidural analgesia had very good effect in first stage in terms of pain scoring. In second stage, 13 (26%) patients had zero score (no pain), 31 (62%) had 1-3 score (mild pain) while 6 (12%) had 4-6 score (moderate pain) after epidural analgesia. That means epidural analgesia had good effect in second stage in terms of pain scoring. In terms of satisfaction, 11 (22%) patients said it was excellent, 27 (54%) patients said it was good, 8 (16%) patients said it was average while 4 (8%) said it was poor. Apgar score for all babies at 1 min and 5 min was very good. It was ≥ 7 in all 50 (100%) of newborn babies.

Conclusions: Epidural labor analgesia gives significantly less pain scores and has better maternal satisfaction. It is not associated with increased rate of instrumental vaginal delivery or cesarean delivery. Patients had excellent neonatal outcome.

Keywords: Epidural, Labour analgesia, Pain relief, Satisfaction

INTRODUCTION

Neuraxial analgesia includes spinal, epidural, and combined spinal-epidural analgesia. Epidural analgesia refers to local anesthetics and adjuvant injected into the epidural space. Spinal anesthesia refers to local anesthetic, with or without adjuvant, injected into the

subarachnoid space. Combined spinal-epidural analgesia includes analgesia initiated with an intrathecal injection and then epidural catheter is inserted to provide a route for additional drug in order to maintain analgesia. Here, the spinal component provides rapid analgesia with very little motor block of the lower extremities and then an epidural catheter is placed to ensure that analgesia is available throughout labor.¹ Neuraxial techniques are the

gold standard for intrapartum labour analgesia. Multiple randomized controlled trials have demonstrated lower maternal pain scores and higher maternal satisfaction with neuraxial analgesia. Also, the physiological benefits of neuraxial analgesia for the mother and fetus are well-documented. It improves maternal cardiovascular and pulmonary physiology, and the acid–base status of the fetus.²

Epidural analgesia is achieved by placing a 16- or 18-gauge catheter through a needle inserted into the epidural space. It is an effective form of pain relief during labour. Local anesthetics and/or opioids are administered into the epidural space on either an intermittent and/or continuous basis throughout labour. The drugs act locally on nerve roots which exit the spinal cord and provide segmental analgesia. The epidural catheter may be utilized to administer higher doses of drugs if needed and also for instrumental or cesarean delivery. The catheter may also be left in situ postpartum to manage pain after birth.³

Side effects of epidural analgesia are motor block, nausea, shivering, itching and headache due to accidental dural puncture. Epidural analgesia with low concentration infusions of bupivacaine does not increase the incidence of caesarean section but may increase the incidence of instrumental vaginal delivery and the duration of second stage of labour.³

As per 2002 recommendations of the American College of Obstetricians and Gynecologists Task Force on caesarean section, obstetric practitioners should delay the administration of epidural analgesia in nulliparous women until cervical dilatation reaches 4 cm to 5 cm. Other forms of analgesia be used until that time.⁴

Early initiation is typically defined as with cervical dilatation of less than 4 to 5 cm, and late initiation with cervical dilatation of more than 4 to 5 cm. The American College of Obstetricians and Gynecologists (ACOG) recommended for many years that women delay requesting epidural analgesia, ‘when feasible, until the cervix is dilated to 4–5 cm.’⁵

ACOG has recommended that irrespective of epidural analgesia in second-stage, dystocia, the need for instrumental or surgical intervention should not be mandated solely based on second stage duration, especially if progress of labour is satisfactory.⁶ Several studies suggest that a prolonged second stage of labour does not result in adverse maternal or fetal outcomes if fetal status is reassuring, the mother is well hydrated and has adequate analgesia with progress in fetal head descent.⁷ Epidural analgesia is recommended for healthy pregnant women requesting pain relief during labour, depending on a woman’s preferences.⁸

Epidural analgesia does not increase the risk of caesarean delivery as compared with systemic analgesia. Initiation of epidural analgesia in the latent phase of labour does

not increase the rate of Caesarean delivery or prolong the duration of labour. It can prolong the second stage of labour and increase the rate of instrumental vaginal delivery.⁹ Bupivacaine is superior to lidocaine because of its increased duration of action, reduced incidence of tachyphylaxis, and reduced intensity of lower limb motor block.¹⁰

The well-known visual analogue scale (VAS) and numeric rating scale (NRS) for assessment of pain intensity agree well and are equally sensitive in assessing acute pain after surgery, and they are both superior to a four-point verbal categorical rating scale (VRS). Its correlation is as follows¹¹:

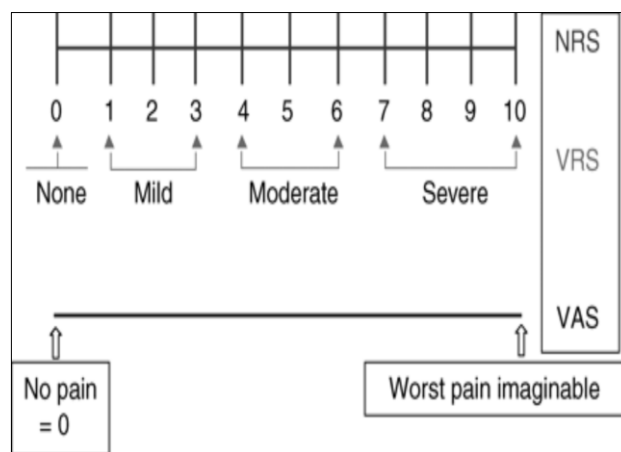


Figure 1: Visual analogue scale (VAS) and numeric rating scale (NRS) for assessment of pain intensity.

The objective of the present study was to evaluate the VAS pain scores and degree of satisfaction in patients receiving epidural analgesia as primary outcome, to evaluate the obstetric and fetal outcomes including risk of caesarean section, instrumental delivery and Apgar score as secondary outcome.

METHODS

This study was carried out at Omega Hospital, Nagpur in 50 women in labour who demanded epidural analgesia for pain relief during April 2017–March 2018. It was a retrospective study carried out in women in labour who had received epidural analgesia for pain relief in labour with no contraindications to spontaneous delivery and in patients with singleton pregnancies of >36 and <41 weeks gestation with cephalic presentation

After routine examination and confirming that patient is fit for anesthesia, epidural analgesia was given.

Inclusion criteria

- Women in labour who demanded epidural analgesia for pain relief with no contraindications to spontaneous delivery.

- Patients with singleton pregnancies of >36 and <41 weeks gestation with cephalic presentation.

Exclusion criteria

- Allergy to opioids, a history of the use of centrally-acting drugs, chronic pain, and psychiatric diseases
- Women younger than 18 year or older than 45 year
- Those who were not willing or could not finish the whole study
- Alcohol- or opioid-dependent patients
- Women with a non-vertex presentation or scheduled induction of labor
- Diagnosed diabetes mellitus and pregnancy-induced hypertension
- Twin gestation and breech presentation.
- Pre-eclampsia, macrosomia, non-reassuring fetal heart rate tracing, abnormal biophysical profile or oxytocin stress test.

After intravenous 500 ml Ringer lactate solution, patients were placed in the flexed lateral position. After raising a midline skin wheal with 1% lidocaine, the epidural space was identified using loss of resistance to air (2 ml) at the L2-L3 or L3-L4 level, and a multiport epidural catheter was advanced 5 cm into the epidural space.

Bupivacaine 0.125% 10 ml with 2micrograms/ml of Fentanyl was used as the initial dose. Top up dose of 5 ml 0.125% Bupivacaine with 2 microgram/ml of Fentanyl was given on demand, not earlier than 30 minutes of the initial dose.

Pain score (VAS), and pulse, mean arterial pressure, respiratory rate were recorded before epidural, 5 min, 15 min and then every 15 min till 1 hour and then every 30 min until the delivery. Sensory block height was assessed by loss of sensation to pin prick.

Onset of analgesia was defined as duration from injection of first initial epidural bolus dose till VAS <3. Duration of analgesia of initial bolus dose was defined as time of administration of study drug until the time of demand of top-up for the first time.

The time taken by the women to request for subsequent top-up dose was recorded. Labor was managed according to obstetric protocols and mode of delivery (normal/instrumental delivery/caesarean delivery) was noted. Injection to delivery interval was defined as the time from administration of first initial epidural dose until the delivery. Fetal heart rate was monitored by a cardiotocograph. Neonatal assessment was done by Apgar score at 1 and 5 min.

Quality of analgesia was assessed as follows-

- Grade 0 - Poor
- Grade 1 - Average

- Grade 2 - Good,
- Grade 3 - Excellent,
- Grade 4-Delivered by cesarean section.

Side-effects including nausea, vomiting, hypotension, hypersensitivity reaction, shivering, fever, drowsiness, pruritus, respiratory depression, retention of urine, and weakness in limbs were noted.

RESULTS

In present study, duration of first stage was 4-6 hours in 24 (48%) of patients, 6-8 hours in 12 (24%) of patients while it was <4 hours in 12 (24%) of patients. 2 patients had duration of first stage of >8 hours (Table 1).

Table 1: Duration of first stage.

Duration of first stage	No. of patients	%
<4 hours	12	24
4-6 hours	24	48
6-8 hours	12	24
>8 hours	2	4

So, in almost half of the patients, first stage was of less duration. In present study, duration of second stage was 30 min-1hour in 29 (58%) of patients, it was <30 min in 19 (38%) patients while it was >1 hour in 2 (4%) patients (Table 2).

Table 2: Duration of second stage and oxytocin requirement.

Duration of second stage	No. of patients	%
<30 min	19	38
30 min-1 hours	29	58
>1 hour	2	4
Oxytocin requirement		
Yes	33	66
No	17	34

33 (66%) patients required oxytocin for augmentation of labour, while 17 (34%) patients did not require augmentation of labour by oxytocin.

Table 3: Mode of delivery.

Mode of delivery	No. of patients	%
Normal Vaginal delivery	28	56
Delivery by Vacuum	8	16
Delivery by forceps	0	0
Cesarean section	14	28

So, in more than half of the patients, second stage was of less duration. But more than half of patients required oxytocin for augmentation of labour. In present study, 28 (56%) patients delivered by normal vaginal delivery, 14 (28%) patients delivered by cesarean section, 8 (16%) patients had vacuum delivery while in no patient forceps

was applied. (Table 3). In present study, in first stage, 36 (72%) patients had zero score (no pain), 13 (26%) patients had 1-3 score (mild pain) while 1 (2%) patient had 4-6 score (moderate pain) after epidural analgesia. That means epidural analgesia had very good effect in first stage in terms of pain scoring.

In present study, in second stage, 13 (26%) patients had zero score (no pain), 31 (62%) patients had 1-3 score (mild pain) while 6 (12%) patient had 4-6 score (moderate pain) after epidural analgesia. That means epidural analgesia had good effect in second stage in terms of pain scoring (Table 4).

Table 4: NRS, VRS and VAS after epidural analgesia.

NRS, VRS and VAS	No. of patients in first stage	%	No. of patients in second stage	%
0 (none)	36	72	13	26
1-3 (Mild)	13	26	31	62
4-6 (Moderate)	01	2	06	12
7-10 (Severe)	00	0	00	0
10 (worst)	00	0	00	0

However, 31 (62%) patients had pain score of 1-3 in second stage. So, most of the patients delivered vaginally. In present study, in terms of satisfaction for the effect of epidural analgesia, 11 (22%) of patients said it was excellent, 27 (54%) of patients said it was good, 8 (16%) of patients said it was average while 4 (8%) said it was poor (Table 5).

Table 5: Patient satisfaction.

Patient satisfaction	No. of patients	%
Excellent	11	22
Good	27	54
Average	08	16
Poor	04	08

So, patient satisfaction was good in most cases. In present study, Apgar score for all babies at 1 min and 5 min was very good. It was ≥ 7 in all 50 (100%) of new-born babies (Table 6).

Table 6: Apgar scores.

Apgar scores	Apgar scores at 1 min	Apgar scores at 5 min
<7	00	00
≥ 7	50	50

So, neonatal outcome was very good in all patients.

DISCUSSION

In present study, duration of first stage was 4-6 hours in 24 (48%) patients, 6-8 hours in 12 (24%) patients while it was <4 hours in 12 (24%) of patients. 2 patients had duration of first stage of >8 hours (Table 1).

Contrary to present study, Anim-Somuah M et al in 2005 Cochrane review reported no difference in the duration of

the first stage of labour among women receiving epidural analgesia as well as those receiving systemic opioid analgesia or no analgesia.¹² In present study, duration of second stage was 30 min-1hour in 29 (58%) patients, it was <30 min in 19 (38%) patients while it was >1 hour in 2 (4%) patients (Table 2).

Contrary to present study, Bogod DG et al found that stage I was significantly longer in the control group (mean 11.1 v. 9.5 h ($P < 0.05$)). Stage II was longer in the infusion group (mean 106 minutes v. 86 minutes), but the difference was not significant ($0.1 > P > 0.05$).¹³

Similar to present study, Fyneyface-Ogan S et al found that the mean duration of the first and second stages of labor were significantly shorter in the epidural group when compared with those in the non-epidural group ($[P < 0.01]$ and $[P < 0.02]$).¹⁴

In present study, 28 (56%) patients delivered by normal vaginal delivery, 14 (28%) patients delivered by cesarean section, 8 (16%) patients had vacuum delivery while in no patient, forceps was applied (Table 3).

Contrary to present study, Yancey MK et al found that even after increased use of epidural analgesia, the Caesarean delivery rate in nulliparous women in spontaneous labour was same. (19.0% vs 19.4%).¹⁵

Similar to present study, Impey L et al found that, the Caesarean delivery rate remained unchanged (4% in 1987, 5% in 1992, and 4% in 1994; not significant) even after increased rate of epidural analgesia.¹⁶

In present study, in first stage, 36 (72%) of patients had zero score (no pain), 13 (26%) of patients had 1-3 score (mild pain), while 1 (2%) patient had 4-6 score (moderate pain) after epidural analgesia. That means epidural analgesia had very good effect in first stage in terms of pain scoring.

In present study, in second stage, 13 (26%) of patients had zero score (no pain), 31 (62%) of patients had 1-3 score (mild pain) while 6 (12%) patient had 4-6 score (moderate pain) after epidural analgesia. That means epidural analgesia had good effect in second stage in terms of pain scoring.

However, satisfaction in terms of pain relief is much more in first stage than in second stage of labour. Similar to present study, Chhetty YK et al found that after epidural analgesia, majority (75%) of parturient achieved VAS <3 significantly earlier in group R2 (0-5 min), then in group R1 (5-15 min) P < 0.001.

After 5 min of epidural bolus injection, VAS score was significantly less in group R2 (1.63±2.89) than in group R1 (5.00±2.89) P <0.001.¹⁷

Similar to present study, Sheiner E et al found that women receiving epidural analgesia experienced significantly less pain during labor as compared to those receiving pethidine (mean VAS scores 5.05 vs. 9.14, respectively; p<0.001).

The pain scores 24 hour after labor were significantly lower in patients who receive epidural analgesia (1.69 vs. 2.13, respectively; p<0.001).¹⁸

In present study, in terms of satisfaction for the effect of epidural analgesia, 11 (22%) of patients said it was excellent, 27 (54%) of patients said it was good, 8 (16%) of patients said it was average while 4 (8%) said it was poor (Table 5).

Similar to present study, Dickinson JE et al found that maternal satisfaction was significantly higher with epidural analgesia than non-epidural analgesia. Overall satisfaction scores for labour and delivery were high for epidural analgesia.¹⁹

In present study, Authors found that Apgar score for all babies at 1 min and 5 min was very good. It was ≥7 in all 50 (100%) of newborn babies (Table 6). Similar to present study, Leighton BL et al found that analgesic method does not affect fetal oxygenation, neonatal pH, or 5-minute Apgar scores.²⁰

CONCLUSION

Epidural labor analgesia gives significantly less pain scores and has better maternal satisfaction. Epidural analgesia is not associated with increased rates of instrumental vaginal delivery or cesarean delivery. Patients receiving epidural analgesia have excellent neonatal outcome.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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