

## OUTCOME OF EPIDURAL ANALGESIA IN PRIMIGRAVIDA

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### **Abstract**

#### **Keywords:**

*Epidural Analgesia, prolonged second stage of labour, instrumental delivery, Apgar score..*

**Aim:** To evaluate the effect of epidural analgesia in primigravida on maternal and fetal outcomes on these parameters - Duration and progress of labor, Mode of delivery (Spontaneous/Instrumental/Operative), Apgar score of newborn, Untoward reaction and intra-partum complications following epidural analgesia.

**Materials and Methods:** This was a prospective study of forty primigravida admitted with latent labor at Al-Ameen Medical College Hospital Bijapur during the period October 2013 to October 2014. On admission to labor room general and System examination along with per abdominal and per vaginum examination was done on admission. Routine investigations were carried out. Epidural analgesia was administered once patient entered active phase of labor. Maternal and fetal outcomes were noted.

**Results:** Majority (88%) women were between 20-25 years of age. 55% of babies had expected fetal weight in range of 2000-2500 gms. Mean duration of active first stage of labor was 361.54 + 52.39 minutes, mean duration of second stage of labor was 71.8 + 14.86 minutes. 38(95%) patients had excellent analgesia. 36(90%) patients had motor blockade. 23(58%) patients had a normal delivery, 15 (37%) had instrumental delivery while only 2(5%) had caesarean section. Maximum number of instrumental deliveries were due to insufficient maternal efforts. 11 (28%) neonates had Apgar score of less than seven at one minute and none with Apgar score of less than seven at five minutes. Maternal complications were few.

**Conclusion:** Epidural analgesia is safe and effective for satisfactory pain relief to parturient women. However, the second stage of labor may be prolonged due to insufficient maternal efforts necessitating instrumental delivery.

### **Introduction**

Labor pain is one of the most severe pains experienced. Relief from the pain of labor and childbirth, can be accomplished by injection of a local anesthetic agent into the epidural or peridural space. A compassionate approach to relieve this stress is important. Epidural analgesia has remained the "Gold Standard" for Obstetric pain management. Neuraxial analgesia has proved to be efficacious in terms of pain relief, stable maternal/ haemodynamics, and is associated with minimal side effects<sup>1</sup>.

The current study was undertaken with a view to evaluate the maternal and fetal outcomes with the use of Epidural analgesia in primigravida with full term singleton pregnancy reporting in early established labour.

### **Materials and Methods**

This is a prospective study of 40 primigravida who were admitted to our institution between October 2013 to October 2014 and who fulfilled the inclusion criteria.

**Inclusion Criteria:** Primigravida with term singleton pregnancy with vertex presentation with spontaneous onset of labor with membranes in labor (Cervical dilatation 3cms, Cervical effacement (25-50%) and Presence of regular painful uterine contractions) with informed consent of mother.

**Exclusion Criteria:** Following patients were excluded from the study - Premature rupture of membranes, Multipara, Multiple gestation, Malpresentation, Cephalopelvic disproportion, Preterm labor, Intrauterine death, Pregnancy induced hypertension, Previous L.S.C.S., Disorders complicating pregnancy, Diabetes Mellitus, Cardiac disease, Post term pregnancy, Fetal compromise before administration of epidural analgesia, Previous back surgeries, Spinal deformities and Bleeding disorders.

**Procedure:** A detailed history was obtained of all patients. General and systemic examinations were performed. Per abdominal and Per vaginal assessment was carried out to check whether patient satisfied inclusion and exclusion criteria. Informed consent for epidural analgesia was obtained from all patients who were included in the study.

**Procedure for epidural analgesia:** With the patient sitting or lying on her side with her knees and hips flexed, a multi lock catheter was inserted into the epidural space via a specially designed 16-18 G Tuohy needle under aseptic conditions. The epidural space was located by incremental or continuous advancement of the needle using a loss of resistance to a syringe filled with saline or air. About 2-4 centimeters of catheter is left in the identified space. Local anaesthetic (10ml of 0.125% bupivacaine) was administered via a filter through this catheter as often as required for the duration of labour. The first dose was given once patient entered the active stage of labor (4cms). After administration of local anaesthetic the level of sensory block was assessed by pin prick technique. The upper level of sensory blockade was maintained at T10 level. Top up doses were repeated at an average of 2 ½ hours or when the level became lower than T10.

The patient was maintained in lateral decubitus position, the top ups being continued till full dilatation. After full dilatation top up was given in sitting position. Perineal infiltration with 5 ml of lignocaine was done before episiotomy.

Continuous monitoring for mother and fetus well being, as well as for the progress of labor was undertaken. 500 ml of Ringer lactate with 5 units of Pitocin was started after ARM and the progress assessed. During second stage a per vaginal examination was done at 10 minute intervals to assess descent and internal rotation of head.

Length of labor, mode of delivery, Neonatal outcome (Apgar score at 1 min. and 5 min) and maternal side effects were all recorded.

## Results And Discussion

Majority of the patients were in the 20-25 years age group (88%) and only 12% were above 25 years. The mean +SD was 21.75% + 1.948. There were 38 registered patients and only two unregistered. (Registered cases were patients who had a minimum 3 ANC checkups before reporting in labor).

22 had expected fetal weight of 2 - 2.5kg whereas 18 babies had an expected weight between 2.5 – 3.25 kg.

### Duration of labor

Mean duration of active first stage of labor was 361.54 +/- 52.39 minutes (39 patients). Mean duration of second stage of labor was 71.84 +/- 14.86 minutes (38 patients). Two patients underwent emergency LSCS one in 1st stage and one in 2nd stage, and hence were excluded.

**Table 1 Showing duration of active first and second stage of labor.**

Duration (Min)	Mean + SD (n)
Mean active first stage	361.54 +/- 52.39 (39)
Mean active second stage	71.84 +/- 14.86 (38)

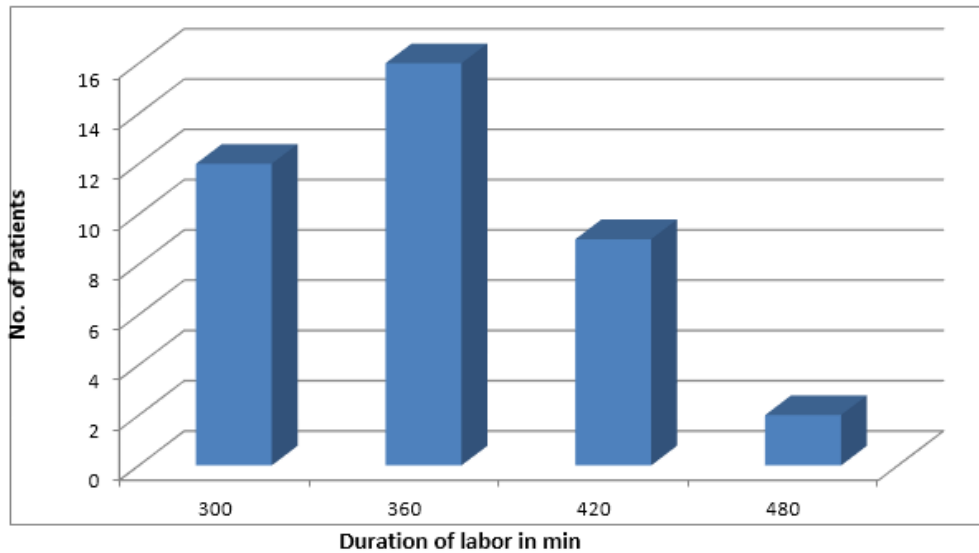


Fig 1 Diagram showing duration of 1<sup>st</sup> stage of labor

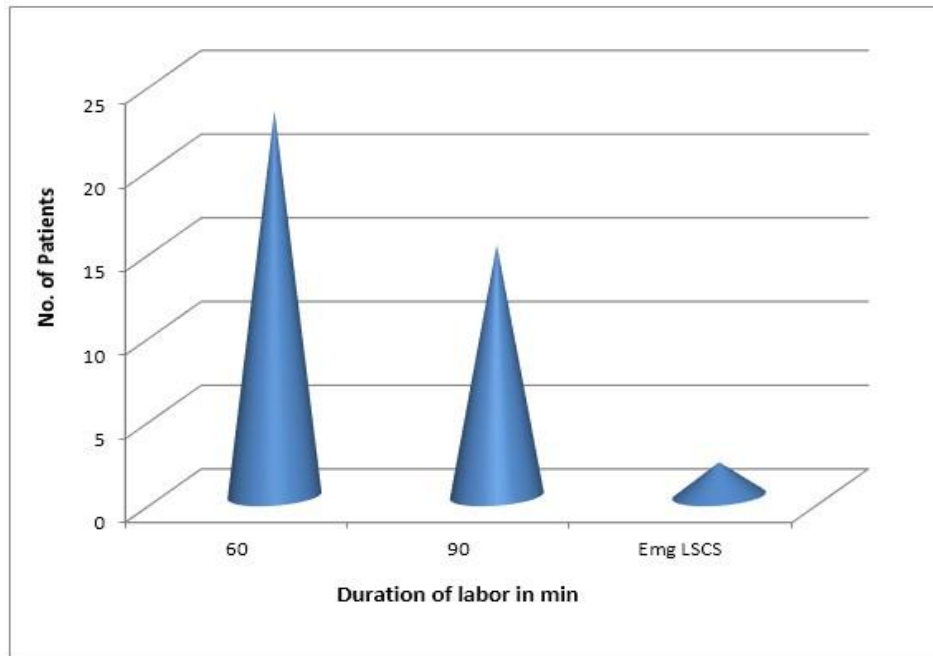
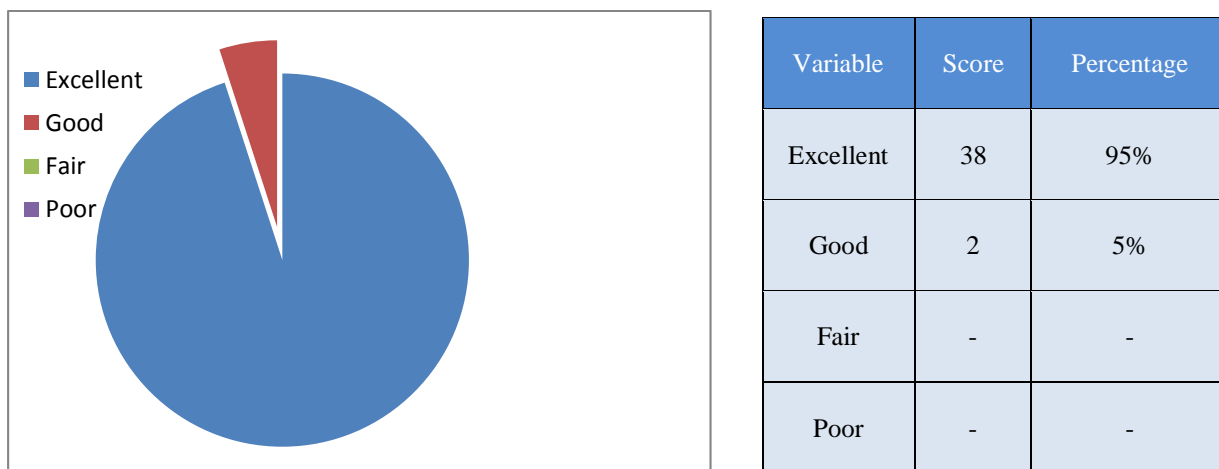


Fig 2 Diagram showing duration of 2<sup>nd</sup> stage of labor

**Visual Analogue Score (VAS):**

Pain relief after top up dose of epidural analgesia as assessed by VAS Score before and after the dose was Excellent in 38 patients and good in 2 patients.



*Fig 3 Visual Analogue Scale showing pain relief*

36 patients (90%) had no motor blockade as assessed using bromage scale while 4 patients (10%) had partial block. 23 patients (58%) had spontaneous vaginal delivery. Instrumental delivery was carried out in 15 (37%) patients while 2 patients required emergency caesarean section due to thick meconium staining and fetal heart rate variability.

#### Mode of delivery

**Table 2 Showing mode of delivery**

Mode of Delivery	Cases	Percentage
Spontaneous Vaginal delivery	23	58%
Cesarean delivery	2	5%
Instrumental Vaginal delivery	15	37%

The indications for instrumental delivery was prolonged 2nd stage 2 patients (5%) fetal distress 2 patients (5%) and insufficient patient efforts in 11 patients (28%). 11 neonates had an Apgar score of <7 at 1 min. There were no neonates who had Apgar score of <7 at 5 minutes.

There were very few maternal side effects.

- A. Direct: Emesis 1 patient and urinary retention 3 patients.
- B. Indirect: Episiotomy wound extension 1 patient.

#### Discussion

Pregnancy and labor are physiological processes which are part of a woman's life. Labor should be remembered with pleasure rather than with dismay at the agony which invariably accompanies it. While a majority of the patients who have undergone successful labor reflect at its outcome with satisfaction, it should be an obstetrician's duty to minimize the severe pain accompanying labor.

Epidural Analgesia has proved it be a blessing in this regard. We have endeavoured to ascertain the advantages of epidural analgesia against the possible disadvantages, if any, to the mother and fetus.

The first parameter for us to ascertain was whether and how much pain relief was obtained in our group of patients: 38 (95%) had excellent Analgesia and 2 (5%) had good Analgesia.

### Duration of labor

**Table 3 Comparing duration of labor of present study with other studies**

Duration	Present Study	C.J. Howell et al	Chestnut et al	Alexander et al
Mean duration of active first stage	361.54 +/- 52.39 min	388.4 +/- 189.8 min	381 +/- 239 min	7.9 +/- 3hr
Mean duration of second stage	71.84 +/- 14.86 min	80.7 +/- 60.4 min	112 +/- 64 min	60 +/- 60 min

This is similar to a study conducted by David H. Chestnut et al <sup>2</sup>, in which maximum patients had excellent 35(76%) analgesia and 9(20%) had good analgesia. Also 68.6% of women were happy and had no pain during labor in a study by El-Hamany and Arul Kumaran. Hence Epidural Analgesia is an effective method for pain relief.

Weighed against these excellent results are factors pertaining to maternal and fetal outcomes. It is generally believed that pain relief during the 2<sup>nd</sup> stage of labor may make the patient complacent and maternal effort for hastening parturition may be decreased. General authors have reported prolonged 2<sup>nd</sup> stage of labor.

In the present study the mean duration of active first stage of labor was 361.54 +/- 52.39 min. Mean duration of 2<sup>nd</sup> stage labor was 71.84 +/- 14.86 min which is similar to a study conducted by C.J. Howell et al <sup>3</sup> in which the mean active first stage of labor was 388.4 + 189.8 min and mean active 2<sup>nd</sup> stage of labor was 80.7 + 60.4 min.

According to study conducted by C.J. Howell et al <sup>3</sup>, epidural analgesia may affect the dynamics of second stage of labor. Length of first stage of labor (mean difference 39 min.), length of second stage of labor was significantly increased (mean difference 19 min.) In the study of Chestnut et al <sup>2</sup>, the mean duration of active first stage was 381 +/- 239 min. Mean duration of second stage 112 +/- 64min. In the study of Alexander et al <sup>4</sup>, mean duration of first stage was 7.9 +/- 3hr. The duration of second stage was 60 +/- 60min.

In a study by David.H.Chestnut et al <sup>2</sup>, Mean (+SD) duration of first stage of labor was 354 +/- 236. Mean + SD duration of second stage of labor was 124 +/- 70 min. With comparison to other studies we can come to the conclusion that there is prolongation of second stage of labor.

It is also believed that epidural analgesia may effect the dynamics of 2<sup>nd</sup> stage of labor. Firstly, due to sensory block the voluntary desire to bare down is decreased.

Secondly, relaxation of pelvic floor muscles delays descent and rotation of the presenting part. Thirdly, weakness of abdominal muscles decreases the expulsive efforts and lastly, abolition of the reflex to bear down, especially in the primigravida, may make coordination of patients own efforts to expel the fetus difficult.

### Mode of delivery

In the present study maximum number of patients had spontaneous vaginal delivery 23 (58%), Instrumental delivery were 15 (37%) and 2 (5%) patients went for cesarean delivery due to thick meconium staining with fetal heart rate variability, this is similar to a study conducted by Desai Pankaj et al <sup>6</sup>, the number of patients who had spontaneous vaginal delivery were 448(61%), Instrumental delivery were 226 (30%) and cesarean delivery were 60 (8%).

In the study of Chestnut et al <sup>2</sup>, the spontaneous vaginal delivery was 59%, instrumental delivery was 27%, cesarean delivery was 15%.

In the study of Thorp et al <sup>7</sup>, spontaneous vaginal delivery was 56.2% Instrumental delivery was 18.7% and cesarean delivery was 25%.

**Table 4 Comparing mode of delivery of present study with other studies**

Mode of delivery	Present Study	Desai Pankaj et al	Chestnut et al	Thorp et al
Spontaneous Vaginal	23 (58%)	448 (61%)	59%	56.2%
Instrumental delivery	15 (37%)	226 (30%)	27%	18.7%
Cesarean delivery	2 (5)	60 (8%)	15%	25%

#### Indications for instrumental deliveries

The indications for instrumental delivery in our study were 2 (5%) due to prolonged second stage of labor, fetal distress for 2(5%) and Insufficient Maternal Efforts 11(28%) patients.

But controversially in a study by David H. Chestnut et al <sup>2</sup> 19 (48%) patients had spontaneous vaginal delivery and 21 (53%) patient had Instrumental delivery. There was an increase in instrumental delivery due to prolonged second stage of labor. However there is no increase in cesarean section rate.

In a study done by Parvez et al, low concentration of local anesthetic reduces the incidence of assisted vaginal delivery.

And finally, prolongation of the second stage beyond previously accepted limits has not been shown to be harmful to the infant so long as close fetal monitoring continues and aortocaval compression is avoided. Opinion is now strongly in favor of allowing the second stage to evolve slowly, towards spontaneous delivery, thereby reducing the need for instrumental delivery which has been shown to be associated with significant immediate and long term morbidity and mortality.

In our series, there were very few maternal complications. Direct – Emesis in one patient and Urinary retention in 3 patients.

Indirect: Wound gaping after episiotomy was seen in one patient.

Regarding fetal outcome epidural analgesia had no untoward effects. 11 newborns had an apgar score of <7 at one minute while none of them had apgar score of <7 at 5 minute.

#### Conclusion

Epidural analgesia provides a versatile method of administering effective and satisfactory pain relief to parturient women

There is no increase in cesarean section and the 2nd stage of labor were prolonged but maximum number of deliveries were spontaneous, significant difference in the rate of instrumental vaginal delivery and the length of 2<sup>nd</sup> stage of labor need to be considered when counselling women.

Most of women do not bear down adequately during 2<sup>nd</sup> stage of labor which can lead to instrumental delivery. There were no intrapartum complications and the Apgar score was good.

It is possible that adjustments in epidural and obstetric care may minimize this effect, requiring a team approach to the management of the 2<sup>nd</sup> stage.

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