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Original Research Article

A Study of Fetomaternal Outcome in Labour under Epidural Analgesia: The No Sweat Labour

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Abstract

Introduction: The delivery of an infant into the arms of a conscious and pain free mother is one of the most exciting and rewarding moments in medicine. Modern neuraxial labour analgesia reflects a shift in the obstetric anaesthesia, thinking away from simple focus on pain relief towards a focus on overall quality of analgesia. Epidural blockade has the advantage of being able to provide continuous analgesia for an unpredictable period of time and to convert analgesia to anaesthesia if an operative procedure becomes necessary.

Aims and Objectives: (1) To evaluate the effect of epidural analgesia on the duration of first and second stage of labour; mode of delivery and the need for instrumental delivery or caesarean sections in parturient. (2) To evaluate clinical outcomes of neonates of mothers receiving epidural analgesia in terms of APGAR scores and NICU admissions. (3) To evaluate the effect of epidural analgesia on patient satisfaction and pain relief.

Materials and Methods: The study entitled "A study of fetomaternal outcome in labour under epidural analgesia, the no sweat labour" was a prospective case-control clinical trial, conducted in the Department of Obstetrics & Gynaecology, MKCG Medical College & Hospital, Berhampur from October 2018 to September 2020. Cases were selected in accordance with inclusion and exclusion criteria and included in this study in the labour room. After the cases were selected from labour room, a thorough history taking, general and obstetric examination was done and explained regarding benefits of epidural analgesia. The cases were divided into two groups of 60 patients each. Those who gave their consent for epidural analgesia formed study group whereas equal no of patients was taken as control group. The visual analogue pain scores (VAS) were recorded before the block.

Results: The mean age in study group was 24.27±3.09 years and in control group was a 24.17±3.07 year. The mean no of top up dose of epidural analgesia was 2.42±0.81. Second stage duration in study group was 20-105 min and in control group was 15-75 min. The mean duration was 53.82±20.87 min in study group and 45.72±15.39 min in control group (p value= 0.020). The mean birth weight of the study group was 2.69±0.27 kg and was 2.68±0.33 kg in control group. The mean VAS score at 30 minutes after administration of epidural analgesia was 5.42±1.01 in the study group and 7.93±0.63 in the control group. At the end of 1st stage of labour the mean duration in study group was 1.75±0.84 and in control group was 9.25±0.63. At the end of 2nd stage, the mean duration in study group was 1.60±0.73 and in control group

was 9.53±0.50. The p value of test was 0.000 (<0.05) for vas scores at 30 min, at the end of 1st stage and at the end of 2nd stage (statistically significant).

Conclusion: Epidural analgesia endeavors at making childbirth a pleasurable and painless experience. A significantly reduced VAS score makes it one of the most effective modalities of pain relief.

Keywords: Epidural Analgesia, Instrumental Delivery, Caesarean Sections

Introduction

Pain experienced during labour is one of the most excruciating and severe forms of pain. The delivery of an infant into the arms of a conscious and pain free mother is one of the most exciting and rewarding moments in medicine [1]. The first documented incident of pain relief during labour in USA was for Fanny Longfellow in the year 1847 with ether. The second women to become famous were Emma Darwin, wife of eminent naturalist, Charles Darwin who was administered chloroform during labour [2]. Modern neuraxial labour analgesia reflects a shift in the obstetric anaesthesia, thinking away from simple focus on pain relief towards a focus on overall quality of analgesia [3].

An ideal labour analgesic is the one which in addition to relieving labour pain also attenuates maternal anxiety and fatigue. It should not have any deleterious effect on mother or the foetus, with minimal effects on the progress of labour, and would provide flexibility in changing conditions. The basic requirements are safety, simplicity, and preservation of foetal homeostasis [4].

Central neuraxial analgesia is the most versatile form of labour analgesia and gold standard technique for pain control in obstetrics. Central neuraxial analgesia includes both subarachnoid as well as epidural block. Epidural blockade has the advantage of being able to provide continuous analgesia for an unpredictable period of time and to convert analgesia to anaesthesia if an operative procedure becomes necessary [5]. Epidural analgesia reverses the adverse ventillatory effects of pain and results in an increase in oxygen tension both in mother and foetus which may be beneficial, especially when additional conditions contributing to foetal and maternal hypoxia are also present and should be strongly recommended to all sets of patients who do not have any contraindications to this method of treatment [6-8]. Considering the monumental advantages of epidural analgesia, this study has been taken up in our tertiary care centre to provide pain-free delivery. The aim is to explore the feasibility of instituting this procedure in the infrastructure of our hospital, which gives maximum efficacy with minimal side effects.

Aims and Objectives

- To evaluate the effect of epidural analgesia on the duration of first and second stage of labour; mode of delivery and the need for instrumental delivery or caesarean sections in parturient.
- To evaluate clinical outcomes of neonates of mothers receiving epidural analgesia in terms of APGAR scores and NICU admissions.
- To evaluate the effect of epidural analgesia on patient satisfaction and pain relief.

Materials and Methods

The study entitled "A study of fetomaternal outcome in labour under epidural analgesia" was a prospective case-control clinical trial, conducted in the Department of Obstetrics & Gynaecology, MKCG Medical College & Hospital, Berhampur

from October 2018 to September 2020. Cases were selected in accordance with inclusion and exclusion criteria and included in this study.

Inclusion criteria

- Primigravida of age 19-30 years with full term singleton pregnancy (37-41 weeks) with vertex presentation
- Obstetric high-risk factors ruled out by clinical and ultrasound examination
- Normal foetal heart rate pattern (CTG) at the time of induction
- Women in whom active phase of labour is established as diagnosed by regular uterine contractions and cervical dilatation more than or equal to 4 cms.

Exclusion Criteria

- Elderly primi
- Multiparous females
- Multiple pregnancy
- Post term pregnancy
- Presentation other than vertex
- Meconium-stained liquor or foetal distress
- Cephalopelvic disproportion
- Antepartum haemorrhage, preeclampsia and eclampsia
- History of maternal septicaemia or coagulation disorder
- Any medical disease complicating pregnancy like Cardiac disease, gestational diabetes mellitus
- Contraindication for lumbar epidural anaesthesia like backache, skin infection over proposed site of injection, spinal deformity, systolic blood pressure below 100 mm of Hg
- Known case of sensitivity to the local anaesthetic agent.

After the cases were selected from labour room, a thorough history taking, general and obstetric examination was done and explained regarding benefits of epidural analgesia. Parturients were divided into two groups of 60 patients each. Those who gave their consent for epidural analgesia formed study group whereas equal no of patients was taken as control group. The control group was given conventional forms of pain relief in labour, viz. Inj. tramadol hydrochloride 100mg intramuscularly and repeated on demand. The study group was given lumbar epidural catheter when they entered the active stage of labour with regular uterine contractions and cervical dilatation more than or equal to 4 cm; pain relief was given in the form of 8 ml of 0.125% bupivacaine with fentanyl 10 micro gram in 1 ml normal saline in a bolus dose. Incremental doses of 8 ml of above combination were given on demand as top-up doses.

Frequency of uterine contractions, duration of contractions, cervical dilatation and effacement, and status of membranes was recorded at the time of recruitment. Pulse, BP, SP02 and respiratory rate noted. Foetal heart rate and rhythm noted. BP, PR and SpO2 were monitored and the visual analogue pain scores (VAS, 0-10 cm scale: 0= no pain, 10 = worst pain ever) were recorded before the block. The patients were shown a 10cm long horizontal scale marked from 0-10cm on a blank piece of paper and told to assess her pain. Scores ≤3were considered satisfactory. When the women who were receiving an epidural infusion, complained of pain, a top up dose of anaesthetic solution was given. Total number of top up doses required during the 1st &2nd stage of labour was recorded. Labour was managed according to principles of active management. Oxytocin infusion was added if uterine contractions were less than 3 in 10 min. Lower segment caesarean section (LSCS) and instrumental deliveries were performed for obstetric indication or if CTG abnormalities were found. Uterine contractions and foetal heart rate (FHR) were monitored by an external CTG monitor. The CTG tracings were classified as normal/suspicious/pathological according to RCOG criteria. Foetal condition was also monitored and evidence of foetal distress, on clinical and/or CTG monitoring, was recorded. Quality of analgesia was judged as: Excellent - Complete relief experienced

Satisfactory / good - Pain relief is there but some pain experienced, Inadequate -Slight pain relief experienced but pain experienced during most of time. VAS before epidural analgesia and VAS at 5 min, 10 min, 20 min, 30 min, 45 min, 60 min, and after that half hourly till delivery of baby. Mean VAS is calculated for 1st and 2nd stage of labour. Motor power was assessed using a modified Bromage score at hourly intervals and at each request to get out of bed. The degree of motor block was assessed according to a modified Bromage scale before administration of epidural analgesia and 5, 10, 20, 30 45, 60 min after the first dose of drugs, and every 30 min thereafter until delivery. Bromage score: 0-Free movement of legs and feet, 1-Just able to flex knees; free movement of feet, 2-Unable to flex knees; free movement of feet, 3-Unable to move legs or feet. Duration of 1st and 2nd stage of labour, modes of delivery was recorded. Foetal heart rate was monitored. APGAR scores at 1 minute and 5 minutes and NICU admissions were noted. Number of top up doses, duration of analgesia following labour was noted. Complications related to epidural, like dural puncture and venous puncture were looked for. Complications due to drugs like hypotension defined as a decrease of more than 20% of initial baseline value, pruritus, nausea/vomiting, drowsiness/sedation, rigor, urinary retention and respiratory depression were determined and recorded. Statistical analysis was done by using descriptive and inferential statistics using Chi-square test and Student's unpaired t test; software used in the analysis were SPSS 17.0 version, EPI-INFO 6.0 version and Graph Pad Prism 5.0 version, and $p<0.05$ was considered as level of significance.

Results

In the study group 8 cases (13.33%) were below 20 years of age, 29 cases (48.33%) were between 21-25 years of age and 23 cases (38.33%) were between 26-30 years of age. In the control group 10 cases (16.66%) were below 20 years of age, 25 cases (41.66%) between 21-25 years of age and 25 cases (41.66%) between 26-30 years of age. The mean age in study group was 24.27±3.09 years and in control group was a 24.17±3.07 year. On distribution of weight, 10 cases (16.66%) had 40-50 kg weight, 25 cases (41.66%) had 50-60 kg weight, 18 cases (30%) had 60-70 kg weight, 6 cases (10%) had 70-80 kg weight and 1 case (1.66%) had >80 kg weight in study group. In the control group, 13 cases (21.66%) had 40-50 kg weight, 28 cases (46.66%) had 50-60 kg weight, 12 cases (20%) had 60-70 kg weight, 5 cases (8.33%) had 70-80 kg weight and 2 cases (3.33%) had >80 kg weight. The mean weight in study group is 61.37±9.17 kg and in control group is 58.25±8.75 kg.

At the time of selection, In the study group 6 cases (10%) had 50-60% cervical effacement, 24 cases (40%) had 60-70% effacement, 20 cases (33.33%) had 70-80% effacement,10 cases (16.66%) had >80% effacement. The mean cervical effacement is 72.33±5.48 %. Out of 60 cases, 39 cases (65%) had 4cm cervical dilation, 18 cases (30%) had 5 cm and 3 cases had 6 cm (5%) of cervical dilation. The mean cervical dilatation is 4.40±0.58 cm. In the control group 8 cases (13.33%) had 50-60% cervical effacement, 18 cases (30%) had 60-70% effacement, 22 cases (36.66%) had 70-80% effacement,12 cases (20%) had >80% effacement. The mean cervical effacement is 72.58±6.07 %. Among 60 cases in control group, 34 cases (56.66%) had 4cm cervical dilation, 21 cases (35%) had 5cm and 5 cases had 6cm (8.33%) cervical dilation. The mean cervical dilatation is 4.52±0.65 cm.

In study group, 14 cases (23.33%) were having 1-2 contractions per 10 minutes. 39 (65%) cases were having 2-3 contractions and 7 cases (11.66%) were having 3-4 contractions. The mean contractions were2.88 per 10 minutes. In 22 cases (36.66%) they lasted for <20 seconds and in 38 cases

(63.33%) they lasted for 20-40 seconds. The mean duration of contractions was 32.67 seconds. Among control group, 10 cases (16.66%) were having 1-2 contractions per 10 minutes, 42 (70%) cases were having 2-3 contractions and 8 cases (13.33%) were having 3-4 contractions. The mean contractions were 2.97 per 10 minutes. In 18 cases (30%) they lasted for <20 seconds, in 40 cases (66.66%) they lasted for 20-40 seconds and in 2 cases (3.33%) they lasted for 40-60 seconds. The mean duration of contractions was 34.67 seconds.

On demand of top up doses of epidural analgesia: once in 7 cases (11.66%), twice in 25 cases (41.66%), thrice in 23 cases (38.33%), and 4 times in 5 cases (8.33%). The mean no of top up dose of epidural analgesia was 2.42±0.81. In study group, the duration of 1st stage of labour was < 4 hrs in 4 cases (6.66%), 4-6hrs in 14 cases (23.33%), 6-8hrs in 23 cases (38.33%), 8-10hrs in 11 cases (18.33%), 10-12hrs in 6 cases (10%) and more than 12hrs in 2 cases (3.33%) whereas in control group < 4hrs in 5 cases (8.33%), 4-6hrs in 22 cases (36.66%), 6-8hrs in 20 cases (33.33%), 8-10hrs in 8 cases (13.33%), 10-12hrs in 4 cases (6.66%) and >12hrs in one case (1.66%).

Duration of 1st stage of labour was < 480 minutes without oxytocin in 8 cases (13.33%) of study group and in 10 cases (16.66%) of control group, < 480 minutes with oxytocin in 33 cases (55%) of study group and 37 cases (61.66%) of control group, 480-720 minutes with oxytocin in 17 cases (28.33%) of study group and 12 cases (20%) of control group and >720 minutes in 2 cases (3.33%) of study group and in 1 case (1.66%) of control group. Out of the 57 cases that went into 2nd stage of labour, the study group had duration of less than 30 minutes in 6 cases (10.5%), 30-45 minutes in 15 cases (26.31%), 45-60 minutes in 20 cases (35.08%), 60-75 minutes in 6 cases (10.5%), 75-90 minutes in 5 cases (8.77%) and 90-105 minutes in 5 cases (8.77%). Out of the 57 cases of control group that went into 2nd stage of labour, second stage duration of less than 30 minutes in 12 cases (21.05%), 30-45 minutes in 24 cases (42.11%), 45-60 minutes in 14 cases (24.56%), and 60-75 minutes in 10 cases (17.54%).

Second stage duration in study group was 20-105 min and in control group was 15-75 min. The mean duration was 53.82±20.87 min in study group and 45.72±15.39 min in control group (p value = 0.020) (Table-I).

Table 1: Duration of Second Stage

Second Stage duration (in min)	Study group (n=57)	Percentage	Control group (n=57)	Percentage	Total
<=30	6	10.5%	12	21.05%	18
30-45	15	26.31%	24	42.11%	39
45-60	20	35.08%	14	24.56%	34
60-75	6	10.5%	10	17.54%	16
75-90	5	8.77%	0	-	5
90-105	5	8.77%	0	-	5
Range	20-105 min		15-75 min		
Mean±1 S. D	53.82±20.87 min	t value= 2.360	45.72±15.39 min	p value =0.020	

Maximum vaginal delivery with or without episiotomy occurred in 45 cases (75%), outlet forceps in 6 cases (10%), ventouse extraction in 4 cases (6.66%) and caesarean section in 5 cases (8.33%) of study group whereas maximum vaginal delivery with or without episiotomy in 52 cases (86.67%), outlet forceps in 2 cases (3.33%), ventouse extraction in 2 cases (3.33%) and caesarean section in 4 cases (6.66%) of control group.

In the study group, 10 cases (16.66%) had instrumental delivery with either forceps or ventouse extraction out of which 1 case had fetal bradycardia, 4 cases had prolonged 2nd stage of labour, 5 cases failed to bear down. In the control group 4 cases (6.66%) had instrumental delivery out of which 2 cases had foetal bradycardia, 1 case had prolonged 2nd stage of labour, 1 case failed to bear down. Out of 5 cases (8.33%) in study group underwent caesarean section, 1 case had foetal distress, 2 cases had prolonged 1st stage and 2 cases had prolonged 2nd stage. Out of 4 cases (6.66%) in control group underwent caesarean section, 2 cases had foetal distress, 1 case had prolonged 1st stage and 1 case had prolonged 2nd stage. On evaluation of adverse effects of epidural analgesia in the study group, 4 cases(6.67%) had significant hypotension, 2 cases (3.33%) developed rigor, 4 cases (6.67%) had nausea and vomiting, 5 cases (8.33%) developed post dural puncture headache, 4 cases(6.67%) developed backache, 2 cases(3.33%) had urinary retention, 2 cases(3.33%) had lower limb paresis, 1 case(1.67%) developed pyrexia, 2 cases(3.33%) developed pruritus and 2 cases(3.33%) had sedation as side effect. (Figure-)

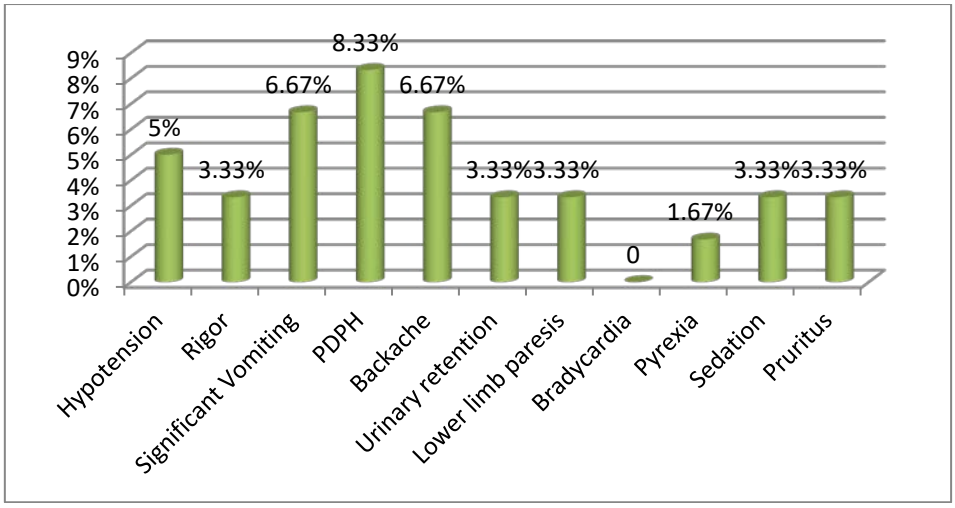

Figure 1: Adverse effect of Epidural Analgesia

Maximum degree of motor blockade was assessed according to Bromage scale. 55 cases (91.66%) had no or grade 0 blockade. 4 cases (6.66%) had grade 1 and 1 case (1.66%) had grade 2 motor blockade.

APGAR score at 1 minute was ≤ 5 in 6 cases (10%) in study group and 4 cases (6.66%) in control group. A score of 6 was seen in 21 cases (35%) of study group and 18 cases (30%) of control group. The score of 7 was seen in 23 cases (38.33%) of study group and 30 cases (50%) of control group. A score of ≥ to 8 was seen in 10 cases (16.66%) of study group and 8 cases (13.33%) of control group. APGAR score at 1 minute was in the range of 5-10 in study group and 5-9 in the control group. The mean score was 7.62±1.02 and 7.7±0.89 in study group and control group respectively (p value= 0.777). APGAR score at 5 min was ≤ to 7 in 5 cases (8.33%) of study group and 3 cases (5%) of control group. A score of 8 was seen in 13 cases (21.66%) of study group and 11 cases (18.33%) of control group. A score of 9 was seen in 19 cases (31.66%) of study group and 18 cases (30%) of control group. A score of 10 was seen in 23 cases (38.33%) of study group and 28 cases (46.66%) of control group. APGAR score at 5 minute was 6-10 in study group and was 7-10 in the control group. The mean score was 9.0±1.02 and was 9.17±0.92 in study group and control group respectively (p value= 0.351).

Out of a total of 60 cases each in the study and control group, neonates 9 cases (15%) in the study group and 5 cases (8.33%) in the control group required NICU admissions. Rest 51 cases (85%) in study

group and 55 cases (91.66%) had healthy neonates who didn't require NICU admission and were given primary care. Out of 9 neonates (15%) in the study group and 5 neonates (8.33%) in control group requiring NICU admissions, transient hypotonia was recorded in 2 cases (3.33%) of the study group. Hypotonia requiring admission for intensive care was seen in 1 case (1.66%) each in both the study and control group. Hyperbilirubinemia was seen in 3 cases (5%) in study group and 2 cases (3.33%) in control group. Prolonged respiratory depression was seen in 3 cases (5%) in study group and 2 cases (3.33%) in control group.(Table-II)

Table 2: Neonatal Complications

Complications	Study group	Percentage	Control group	Percentage	Total
Hypotonia(transient)	2	3.33%	0	-	2
Hypotonia requiring intensive care	1	1.66%	1	1.66%	2
Hyperbilirubinemia	3	5%	2	3.33%	5
Prolonged respiratory depression	3	5%	2	3.33%	5
Total	9	15%	5	8.33%	14

In study group, 20 neonates (33.33%), 35 neonates (58.33%), 4 neonates (6.66%) and one neonate (1.66%) were having birth weight of 2.0-2.4 kg, 2.4-2.9 kg,3.0-3.4kg and 3.5-3.9 kg respectively whereas in control group 26 neonates (43.33%), 26 neonates (43.33%), 5 neonates (8.33%) and 3 neonates (5%) were having birth weight of 2.0-2.4 kg, 2.4-2.9 kg,3.0-3.4kg and 3.5-3.9 kg respectively. The mean birth weight of the study group was 2.69±0.27 kg and was 2.68±0.33 kg in control group. The mean VAS score at 0 minutes or before infusion of epidural analgesia was 7.43±0.81 in the study group and 7.47±0.70 in the control group. The mean VAS score at 30 minutes after administration of epidural analgesia was 5.42±1.01 in the study group and 7.93±0.63 in the control group. At the end of 1st stage of labour, the mean duration in study group was 1.75±0.84 and in control group was 9.25±0.63. At the end of 2nd stage, the mean duration in study group was 1.60±0.73 and in control group was 9.53±0.50. The p value of test was 0.000 (<0.05) for VAS scores at 30 min, at the end of 1st stage and at the end of 2nd stage (statistically significant). In the study group 35 cases (58.33%) had excellent pain relief, 21 cases (35%) had good pain relief and 4 cases (6.66%) had inadequate pain relief. While in the control group, 6 cases (10%) had good pain relief, 40 (66.66%) cases had inadequate pain relief. 14 cases (23.33%) in control group there was failure to give any pain relief. In the study group, analgesia lasted 6-8hrs in most of the cases i.e. 32 cases (53.33%) followed by 4-6hrs in 24 cases (40%), more than 8 hrs in 11 cases (18.33%) and less than 4 hrs in 3 cases (5%) (Table-III)

Table 3: Pain Assessment by VAS

After administration of epidural analgesia	Study group	Control group	t value	p value
at 0 min	7.43±0.81	7.47±0.70	-0.241	0.810
at 30 min	5.42±1.01	7.93±0.63	-16.307	0.000
1st stage of labour	1.75±0.84	9.25±0.63	-55.563	0.000
2nd stage of labour	1.60±0.73	9.53±0.50	-67.595	0.000

Discussion

The details of the results of the current study conducted over 60 cases of each control and study group of epidural analgesia in Department of Obstetrics and Gynecology of MKCG Medical College, Berhampur; Odisha; India were analysed as follows. The mean age of the study group is 24.27 ±3.09 years and the control group is 24.17±3.07 years which was concurrent to that of Wesam *et al* having mean age in epidural group was 26.5 years and control group was 25.5 years [9]. The mean weight of the patients in study group 61.37±9.17 kg and in the control, group was 58.25±8.75 kg. The mean gestational age of the study group was 38.65±1.01 weeks and of the control group was a 38.71±1.09 week. Mean age was 21.90± 3.20 years in control group and 21.96 ± 3.07 years in study group by Varsha Desmukh *et al* (2017) which is similar to current study [10]. The mean cervical effacement was 72.33 ±5.48 % and 72.58 ±6.07% in study and control group respectively. Similarly, the mean cervical dilatation at the time of epidural catheter placement was 4.40±0.58 cm in the study group and 4.52±0.65 cm in the control group which is concurrent to that of Prabhakar *et al* (2014) [11].

The mean frequency of contractions was 2.88 per 10 minutes in the study group and 2.97 in control group. Similarly, the mean duration of contractions was 32.67 seconds in study group and 34.67 seconds in control group. In our study 58.33% cases had intact and 41.66% cases had ruptured membranes in epidural group and 50% cases each had reputed and intact membranes in control group. The mean no of top up dose was 2.42±0.81. This method, of on demand use of analgesia in response to the return of pain in current study (when VAS score is >3) has been described as the method of choice (Bromage1998) [12].

The mean duration of 1st stage of labour in study group was 7.41±2.25 hours (range 3.5-13 hours) and in control group was 6.67±2.16 hours (range 4-12 hours). Though the duration of 1st stage is more in epidural group than control group, this difference was not statistically significant. The results in our study were consistent with Papalkar *et al* [13].

The mean duration of 2nd stage of labour in study group was 53.82±20.87 minutes (range 20-105 minutes) which was longer than in control groups 45.72±15.39 minutes (range 15-75 minutes), and this difference was statistically significant. The duration of 2nd stage was calculated only for 57 cases each in study and control group, 3 patients each in case as well as control group underwent caesarean section due to foetal indications. Dipti Agrawal *et al* showed that duration of 2nd stage was longer in study group (33.13± 12.78) as compared to control group (25.73± 11.73) i.e., epidural analgesia prolongs second stage of labour [14]. The mean duration of third stage was 4.38±0.95 minutes (range 3-7 minutes) in the study group and 4.24±1.02 minutes (range 3-8 minutes) in the control group. This difference was not statistically significant. Similar results were seen by Howell *et al* (2001) [15].

Among study group, 75% cases undergo vaginal delivery whereas among control group 86.67% cases undergo vaginal delivery. Similarly, 16.66% cases of study group and 6.66% cases of control group underwent instrumental delivery. Among the caesarean cases, 8.33% cases belonged to study group and 6.66% cases belonged to control group. No significantly higher rate of instrumental delivery or caesarean section in the epidural group as compared to the control group. Shraddha Agrawal *et al* found the rate of vaginal delivery, instrumental delivery and caesarean section as 82.5%, 7.5% and 10% respectively which is similar to current study [16].

Out of 5 patients who underwent caesarean section in the study group, 2 cases had to prolonged first stage of labour lasting >12 hours, 1 case developed foetal distress and 2 cases developed deep transverse arrest (DTA) in the 2nd stage of labour. Out of 4 cases in the control group underwent

caesarean section, 2 cases had foetal distress, 1 case had prolonged 1st stage >12 hours and 1 case had DTA. This shows that no difference between CS rates associated with epidural analgesia as compared to those without that which is similar to Clark *et al* (1998) [17].

Most cases had no motor block. 4 cases had grade 1 block and only 1 case had grade 2 motor block which is similar to Cohen *et al* having no motor block [18]. Despite providing excellent pain relief in labour, epidural analgesia using LA alone produces motor block in many patients associated with prolonged 2nd stage and increased incidence of instrumental deliveries. Mean APGAR score at 1 minute was 7.62±1.02 in study group and 7.7±0.89 in control group. The mean APGAR score at 5 minutes was 9.0±1.02 in study group and 9.17±0.92 in control group. These differences were not statistically significant, (p= 0.611541) which means epidural analgesia did not adversely affect the neonatal outcome which is concurrent to Anwar *et al* having APGAR score at 5 minutes was >8 in 90% cases [19].

Table 4

	APGAR Score at 1 min (>8)	APGAR Score at 5 min (>8)	Marginal Row Totals
Study group	10 (9) [0.11]	55 (56) [0.02]	65
Control group	8 (9) [0.11]	57 (56) [0.02]	65
Marginal Column Totals	18	112	130 (Grand Total)

The mean birth weight in the study group was 2.69±0.27kg and in control group was 2.68±0.33 kg. The birth weight ranged from 2.3-3.5 kg in study group and 2.3-3.8kg in the control group. The birth weights in both groups were almost similar. In the study group while the pre-epidural score was 7.43±0.81, the score after 30 minutes of epidural analgesia administration was reduced to 5.42±1.01 and was 1.75±0.84 and 1.60±0.73 at the end of 1st stage and 2nd stage of labour, respectively. In the control group, scores at the beginning of the study were 7.47±0.70. After 30 minutes, the score was 7.93±0.63. The 1st and 2nd stage of labour VAS scores were very high, 9.25±0.63 and 9.37±0.50 respectively. The VAS differences between study and control group at 30 minutes and at the end of 1st and 2nd stage were statistically significant. Excellent satisfaction was seen in women in terms of pain relief according to VAS scoring system which were comparable to Desai *et al* and Sharma *et al* [20].

Conclusion

Care during labor should be aimed towards achieving the best possible physical emotional and psychological outcome for the woman and baby. Epidural analgesia endeavors at making childbirth a pleasurable and painless experience. A significantly reduced VAS score makes it one of the most effective modalities of pain relief. This technique of epidural analgesia along with active management of labour may be recommended for routine use in institutions. If properly conducted with meticulous supervision, it would provide the expectant mother with all the satisfaction of a normal childbirth without the agony of labour pain.

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