



LABOR OUTCOME IN EPIDURAL ANALGESIA - A RETROSPECTIVE COHORT STUDY IN A TERTIARY CARE FACILITY IN CENTRAL KERALA.

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ABSTRACT

There are controversial view about adverse effects of Epidural analgesia in labour .This study was conducted to examine the effect of epidural analgesia on selected labour outcomes. In this retrospective cohort study 175 newborns whose mothers received epidural analgesia were compared with 175 newborns whose mothers did not receive epidural analgesia during labour. The data were obtained from the hospital records. The rate of caesarean delivery and instrumental delivery were significantly higher in epidural cases ($p < 0.001$). No difference was observed between the groups with regard to the rate of PROM , duration of active phase of labour, neonatal APGAR score at 5th minute and respiratory distress ($p > 0.05$). Epidural analgesia does not prolong the duration of active phase of labor and incidence of PROM. Neonatal outcome was satisfactory while only the rate of instrumental deliveries was found increased with epidural analgesia.

KEYWORDS: Epidural analgesia, Mode of delivery, PROM, Duration of labour, APGAR score, Respiratory distress.

BACKGROUND

Childbirth has been recognized as the most painful experiences and it is often believed that pain management is the priority concern for labouring woman, and that effective pain relief will provide a positive birth experience for her. Among various modes of pain management, epidural analgesia is considered a very safe and popular mode of analgesia for child birth.^[1] Despite its popularity, epidural analgesia has remained controversial in regards to its safety.^[2] The meta-analyses regarding the safety of epidural analgesia has remained inconclusive.^[3,4] In certain studies Epidural analgesia has been found associated with prolonged labour, respiratory distress and lower APGAR scores in the neonates.^[5,6] At the same time, there are other studies which do not support such association.^[7,8,9] Considering the controversial aspects of epidural analgesia, we intended to study the immediate effects of epidural analgesia in mothers who received epidural analgesia and in their newborns and compare with the newborns born to mothers without epidural analgesia.

MATERIALS AND METHODS

Methods

175 hospital records of women who received epidural analgesia during labour were studied to assess the maternal and neonatal outcome in those cases .The maternal outcome assessed were PROM and type of delivery. The APGAR score at 5 minutes of birth and Respiratory distress were evaluated for fetal outcome. The data obtained were collected from record of women who underwent childbirth in a tertiary care hospital in Kerala in a ten-month period extending from January 2018 to October 2018. Women who had received antenatal steroid for lung maturity of the fetus were excluded from the study. The study was approved by the institutional Ethics Committee of the setting.

Methodology

After obtaining administrative permission from the authorities, the hospital records were reviewed for the maternal exposure to epidural analgesia during labor. Data regarding baseline clinical characteristics and specific maternal and neonatal outcomes were collected using a structured checklist. The data obtained were coded in Microsoft Excel and statistical analyses were performed in R software. p value $0 < 0.05$ was considered statistically significant.

RESULTS

Table 1: Frequency and percentage distribution of subjects based on sociodemographic characteristics. n=350.

Clinical characteristics	Cases (n ₁ =175)		Control (n ₂ =175)	
	Frequency	Percentage	Frequency	Percentage
Age of the mother(years)				
<21	3	1.71	2	01.15
21-25	40	22.86	36	20.69
26-30	104	59.43	75	43.10
31-35	28	16.00	61	35.06
Educational status of mother				
Secondary	18	10.29	21	12.00
Higher secondary	27	15.43	21	12.00
Graduate	123	70.29	120	68.57
Post graduate	7	04.00	13	07.43
Religion				
Hindu	49	28.00	57	32.76
Christian	100	57.14	81	46.55
Muslim	26	14.86	36	20.69

Among 175 cases studied,59.43% were between 26-30 years of age whereas in controls 43.10% were belonging to this age category. Proportion of women with age <21 years and >31 years were comparatively less in cases (1.71% and 16% respectively) but controls had a higher

proportion on women in age group >31 years (35.06%). In both cases and controls majority had graduate level education (70.29 %). Majority were Christians in both cases (57.14%) and controls (46.55%)

Table 2: Mean and SD of period of gestation at labour, birth weight of subjects. n=350

Variables	Cases(n1=175)		Control(n2=175)	
	Mean	SD	Mean	SD
POG in weeks	38.82	1.11	38.47	1.23
Weight of the baby	3.01	0.38	2.97	0.41

The Mean ± SD of period of gestation in weeks at labor was 38.82±1.11 in cases and 38.47±1.23 in controls. The

Mean weight of the baby was 3.01±0.38 in cases and it was found to be 2.97±0.41 in controls.

Table 3: Frequency distribution and percentage of subjects based on clinical characteristics n =135

Clinical characteristics	Cases (n ₁ =175)		Control(n ₂ =175)	
	Frequency	Percentage	Frequency	Percentage
Sex of baby				
Male	86	49.14	85	48.57
Female	89	50.86	90	51.43
Obstetric Care Booking				
Booked	175	100	174	99.43
referred	0	00	1	0.57
Parity				
Primi	156	89.14	78	44.57
Multi	19	10.86	97	55.43
H/o Assisted Conception				
Yes	4	2.29	1	0.57
No	171	97.71	174	99.43
Maternal complications in pregnancy				
PIH	15	2.27	14	08.00
DM	25	14.29	32	18.29
Induced labour				
Yes	132	75.43	79	45.14
No	43	24.57	96	54.86

Duration of epidural analgesia				
<4	82	46.59	-	-
4-8 hours	78	44.32	-	-
>8hours	16	9.09	-	-

50.86% of cases gave birth to female babies and 51.43 had female babies in among controls. All the cases were registered in the same hospital for obstetric care and in controls one subject was referred from outside. Majority of the cases were primi parous (89.14%) and where as in controls only 44.57% belonged to this category. A few had history of assisted conception in both cases (2.29%)

and controls (0.57%). The labour was induced for three forth (75.43%) of women in cases and nearly half of women (45.14%) in controls. The duration of epidural analgesia for cases was less than 4 hours for 46.59 % of subjects and rest of them received epidural for more than 4hours, out of them 9.09 percentage had more than 8hours of analgesia.

Table 4: Frequency distribution and percentage of maternal outcome in terms of mode of delivery, PROM, Duration of Labour. n=135

Clinical characteristics	Cases (n ₁ =175)		Control(n ₂ =175)		P value
	Frequency	Percentage	Frequency	Percentage	
LSCS	37	10.29	19	10.85	<0.001
Vaccum/ Forceps	18	21.14	04	02.29	
Normal delivery	120	68.57	152	86.86	
PROM					
Yes	21	11.93	11	06.29	0.13
No	154	88.07	164	93.71	
Duration of Active phase of 1st stage labor					
<12hours	168	96.00	173	98.86	0.17
>12 hours	07	04.00	02	01.14	

With regard the mode of delivery the cases had higher proportion of caesarean deliveries (10.29%) and instrumental vaginal deliveries (21.14%) as compared to controls (10.85% & 2.29% respectively).The difference observed between the cases and controls in this regard was found statistically significant(p<0.001)

Though there was observable difference in the proportion of PROM and prolonged first stage of labour in cases against controls this was not found statistically significant. In 11.93%of cases PROM was reported where as this clinical condition was found comparatively less (06.29) in controls. The duration of active phase of first stage of labour was more than 12 hours in 4% of cases as compared to controls (1.14%).

Table 5: Frequency distribution and percentage of neonatal outcome in terms of APGAR score at 5 minutes and occurrence of respiratory distress. n =350

Clinical characteristics	Cases (n ₁ =175)		Control (n ₂ =175)		P value
	Frequency	Percentage	Frequency	Percentage	
APGAR score at 5 minute					
<4	0	00.00	0	0	0.123
4-7	5	02.86	0	0	
>7	171	97.14	175	100	
Respiratory distress					
No	163	93.14	166	94.86	0.65
Yes	12	06.86	9	5.14	

Among cases, 2.86% of neonates had 5th minute APGAR score between 4 and 7. 6.86 % of neonates were diagnosed to have respiratory distress. For all women who delivered without epidural analgesia, the newborns demonstrated an APGAR Score >7 at 5th minute of birth and only 5.14 % developed respiratory distress. Statistically significant difference was not observed between cases and controls with regard to these outcomes.

DISCUSSION

In the present study the proportion of instrumental deliveries and LSCS was found high in women who had epidural analgesia as compared to those who did not receive it during labor. This finding is supported by the results of earlier studies,^[10,11] which had shown a modest increase in rates of CS when EA was compared with other methods of analgesia. In contract to this, At Tripler Army Hospital, the rate of instrumental vaginal delivery did not change despite a large increase in the rate of

epidural analgesia.^[12] Similarly, the rate of instrumental vaginal delivery at the National Maternity Hospital in Dublin remained unchanged despite a greater than five-fold increase in epidural rate.^[13] These findings were confirmed in a systematic review of seven impact studies involving more than 28 000 parturient women, which showed no difference in instrumental vaginal delivery rates (mean change, 0.76%; 95% CI -1.2 to 2.8).^[14] Drawing a conclusion from the interpretation of these data is difficult due to the presence of numerous confounding variable including maternal efforts, position and presentation of fetus. The contribution and interaction of these factors to the mode of vaginal delivery are still an area to be well explored.

Though the present study did not reveal significantly increased rate of PROM in women who received epidural analgesia as compared to the nonepidural controls, few evidences are available for association of Epidural analgesia with increased rates of premature rupture of membrane (PROM), a major criteria for neonatal sepsis evaluations in afebrile women.^[15] The relationship between these variables need to be studied further before reaching a conclusion on it.

The duration active phase of labour was found comparable in both epidural group and non epidural group in the present study. Similar finding observed in two meta-analyses,^[16,17] reported no difference in the duration of the first stage of labour among women receiving epidural labour analgesia and those receiving systemic opioid analgesia or no analgesia. However, another meta-analysis of studies conducted at the Parkland Hospital,^[18] demonstrated prolongation of the first stage of labour by approximately 30 min in nulliparous women who received epidural analgesia. The study which was inconsistent with the findings specially focused on the duration of labour in primi and multiparous women. This might have attributed to the difference in the observation. A study further suggests that the maintenance of epidural analgesia throughout labor did not prolong the second stage or increase the forceps delivery rate by comparison with patients in whom top-up injections were withheld during the second stage of labor.^[19]

In our study, the findings are similar to the existing literature, we found no influence on APGAR scores at fifth minute. Meta-analysis of the literature determined that the timing of epidural analgesia does not affect APGAR scores at first and fifth minutes.^[20] Saraiva et al,^[21] also demonstrated that epidural analgesia was not a predictor of low neonate APGAR score at fifth minute postpartum. However isolated findings are seen as in case of a case control study where Kumar et al^[22] found that Late-preterm and term infants exposed to maternal epidural analgesia in labour are more likely to develop respiratory distress in the immediate neonatal period.

LIMITATIONS

This retrospective analysis could only demonstrate associations of variables. In addition this study from a single institution does not provide a cause-effect relationship between findings. However, even with these limitations, we feel that the study provides meaningful information on the association of epidural analgesia on selected maternal and neonatal outcome. This information may help us understand more fully the relationship between labor analgesia, and labor outcomes.

CONCLUSION

Epidural analgesia appears to be very effective in reducing pain during labour, although there appear to be some potentially adverse effects. Further research is needed to investigate adverse effects and the health care providers are responsible to educate their clients based on evidence as it can eliminate the myths and bias around the acceptance and choice for epidural analgesia in labour.

Protection of Human Subjects

As the study was retrospective in nature patients' hospital records were used to collect data. Administrative permission was obtained from hospital authorities. The investigators declare that no human or animal subjects were included in the study. Anonymity of data was ensured using record coding system.

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Conflict of interest

The authors declare no conflict of interest in this study.

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