



Epidural Analgesia in Mothers: Neonatal Outcome- A Retrospective Chart Review

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Abstract

Introduction: Labour pains are described by most women as the most excruciating pain they had experienced ever and commensurate to breaking multiple bones together. But safety of epidural analgesia in terms of neonatal outcome has been a controversial aspect.

Aims and Objectives: To study the neonatal outcomes of maternal epidural analgesia during labour, particularly with respect to respiratory depression and need for resuscitation.

Materials and Methods: 100 consecutive cases of normal delivery with epidural analgesia were enrolled at a single center from June'2016 to December' 2016. Babies born with congenital anomalies, chromosomal disorders were excluded. The cord blood gas, APGAR score, need and extent of resuscitation, NICU admission, Birth asphyxia & neonatal encephalopathy were noted.

Results: 76 women delivered spontaneously vaginally, 9 women required assistance in form of vacuum and 15 women were taken for caesarean section. Only 4 babies required active resuscitation in form of Positive pressure ventilation or Delivery room CPAP. 8 newborns required high flow nasal cannula (HFNC) for <1 hour for respiratory distress. None of the babies had a pH of less than 7. Two babies were admitted in NICU for preterm care and 1 for transient tachypnea of newborn.

Conclusion: There was no evidence of birth-asphyxia or neonatal encephalopathy secondary to maternal epidural analgesia in our study.

Introduction

Epidural analgesia over the years has emerged as a promising and safe intervention to alleviate labour pains to a great extent. American college of Obstetricians and Gynecologists clearly recommends "in the absence of any maternal contraindications, maternal request is a sufficient

medical indication to provide pain relief during labour".

But safety of epidural analgesia in terms of neonatal outcome has been a controversial aspect^{1,2}. Opioid analgesics are known to cross placental barrier and cause early neonatal respiratory depression. So they may contribute to

increase in incidence of perinatal depression and requirement of prolonged resuscitative efforts³.

Most of the earlier studies regarding epidural analgesia for labour have taken into consideration maternal outcomes like hemodynamic changes, length of labour, increased incidence of caesarean section and instrumental deliveries as an indirect marker of neonatal outcome.

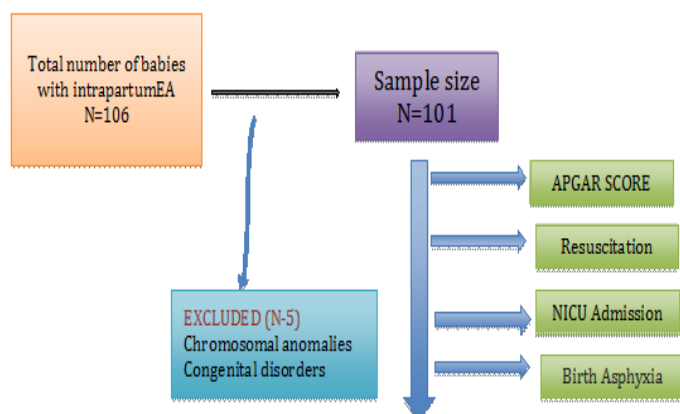
There are not enough evidences to advocate safety of epidural analgesia in immediate newborn period. In this study we retrospectively analyzed whether epidural analgesia as an intervention during labour, has led to an increase in early neonatal morbidities particularly perinatal depression and increased need for resuscitation.

Methods

100 mothers who were given epidural analgesia for normal labour were enrolled into the study. The cord blood gas, APGAR score at 1,5,10 minutes, Neonatal resuscitation if required, Extent of resuscitation required, requirement of NICU admission, Birth asphyxia & development of Encephalopathy in Neonates were noted. Term and preterm babies born to mothers who received epidural analgesia during labour between a period of June 2016 to December 2016 were included. Babies born with congenital anomalies, chromosomal disorders were excluded.

Study design, sample size and place of study

1. Retrospective Study
2. Consecutive deliveries with epidural Analgesia
3. Study period:-7 months(June –Dec 2016)



Methodology

Retrospective analysis of case records of mothers who received epidural anesthesia was done. Epidural anesthesia in our hospital consist of 10 ml of 0.0625% up to 0.125% bupivacaine plus 20 mcg fentanyl followed by continuous infusion depending upon the pain response. Records of Cord blood gas, APGAR score at 1,5,10 minutes, Neonatal resuscitation if required, Extent of resuscitation required, requirement of NICU admission, Birth asphyxia & development of Encephalopathy in Neonates, time from epidural dose to delivery, instrumentation & Caesarean deliveries were collected from the corresponding neonatal & maternal case records. An attempt was done to determine the incidence of perinatal morbidity in correlation to epidural anesthesia.

The study was approved by institutional ethics committee. All patient identifiers were stored in a separate secure USB device, which were accessed by the principal investigator alone. All stored data were destroyed at the end of the study.

Results

Patient characteristics from the data of 100 parturient women was collected retrospectively. 47% women were between age group of 25-29 years, followed by 38% in 30-34 years age group and 13% women in >35 years age group. Only 2 women were <25 years in age (Table1)

12/100 women had gestational diabetes mellitus on diet control and 6/100 had gestational diabetes mellitus on insulin. 18/100 women were hypothyroid on thyroxin and 1 women was hyperthyroid (Table1). One women out of 100 had twin pregnancy. The mean duration of time from the main dose to delivery is 3hours 58min in primigravida and 1hour 40min in multigravida respectively (Table2). 76 women who received epidural analgesia during labour delivered spontaneously vaginally, 9 women required assistance in form of vacuum and 15 women were taken for caesarean section (Table3) for either non progress of labour (6/15) or fetal distress

9/15{fetal bradycardia (6/15) and fetal tachycardia (3/15) (Table4).

Table 1 Patient characteristics with Epidural anesthesia (n=100)

AGE	
>35	13
30-34	38
25-29	47
<25	02
GRAVIDA	
G1	67
> G1	33
Multiple Gestation	1 (Twins)
GDM (on diet)	12
GDM (on insulin)	6
Hypothyroid	18
Hyperthyroid	1

Table 2 Time from main dose to delivery
*mean

Primigravida	3hrs 58 min
Multigravida	1 hr 40 min

Table 3 Mode of delivery

Spontaneous Vaginal	76
Forceps	0
Vacuum	9
Caesarean delivery	15

Table 4 Indication of Caesarean delivery

Non progression of labour	6
Foetal distress	
Tachycardia	3
Bradycardia	6

No baby in our study had clinical or lab evidence of birth asphyxia/neonatal encephalopathy (Table 5). None of the babies had a cord blood gas with a pH of<7 (Table6). Only 4 babies required active resuscitation in form of PPV or delivery room CPAP followed by HFNC (High flow nasal cannula). Total of 8 newborns required HFNC for <1 hours for respiratory distress (Table7)

3/101 babies required NICU admission. 2 newborns were admitted for preterm care and 1 for transient tachypnea of newborn (Table8)

Table 5 APGAR score at 1,5,10 min (n=101)

	1 min	5 min	10 min
<3	0	0	0
3-6	3	0	0
>7	98	101	101

Table 6 Cord Blood Gas (n=101)

PH < 7.0	0
BE < -16	0
PCo2 > 60 mm hg	0

Table 7 Babies requiring Neonatal resuscitation (n=101)

Delivery room CPAP	3
Positive pressure ventilation	1
High Flow Nasal Cannula	8
Intubation	0
Chest Compressions	0
Inj.Adrenaline	0

Table 8 Number of babies requiring NICU admission & their indications

Babies admitted in NICU	3
Preterm Care	2
TTNB	1
Birth asphyxia/Neonatal Encephalopathy	0

Discussion

Painless labour with its ever growing demand by more and more parturient women world over has put it to center stage but the neonatologists and obstetricians globally are concerned about its possible maternal and neonatal outcomes like prolongation of labour, increased incidence of instrumental assistance during deliveries, increased incidence of caesarean section, lower APGAR scores in newborns and increased incidence of respiratory depression/birth asphyxia. It is known that opioid analgesic causes decrease in uterine activity and the bearing down efforts of pregnant women in labour leading to increased instrumentation as concluded by Hasegawa et al⁴ Gizzo et al⁵, and Anim Somuah⁶. While Soncini et al⁷, Bakhamees et al⁸ and Torvaldsen S et al⁹ showed no effect on the mode of delivery. Our study observed that 9% women underwent instrumental deliveries and 15% women had caesarean sections. This further contributes to the theory that epidural analgesia may have some impact on the mode of delivery¹⁰.

Epidural analgesia may lead to neonatal respiratory depression as opioid analgesics readily cross the placental barrier and get deposited in large amounts in fetal peripheral tissues and

neonatal immaturity of the respiratory centre may lead to respiratory depression in lower concentrations. Neonatal respiratory depression related to fentanyl is more proportionate to amount of drug received within four hours of delivery, so we had taken in to account the time duration for which epidural analgesia administered to parturient women. In our study mean duration of epidural analgesia initiation to delivery was 3 hours 58 min & 1hour 40 min in primigravida & multigravida respectively. 3/101 babies had APGAR score <7 at 1 min and required level 2 resuscitation (PPV) and none of the babies had cord blood gas pH <7.

A prospective study by Shreshtha et al¹¹ concluded that there is no significant association of epidural analgesia with birth asphyxia or delayed establishment of breast feeds but did show increased incidence of delayed passage of urine and instrumentation during delivery.

Another prospective study by Sylvanus Kampo et al¹² in Ghana also did not reveal any significant impact on neonatal outcome of epidural analgesia during labour but there was increase in instrumentation during delivery and caesarean sections.

Our study does not show any significant correlation between epidural analgesia and adverse neonatal outcomes in terms of low APGAR scores, birth asphyxia or respiratory depression. Limitations of our study are small sample size and being a non-comparative study it is difficult to say that women not opting for epidural analgesia had same or lower incidence of instrumental or caesarean deliveries and had same or decreased incidence of low APGAR scores or birth asphyxia. Incidence of hypoxic ischemic encephalopathy may be centre specific as it relies on skill of neonatal attendance at resuscitation too. So generalizing results of single centre cannot be justified.

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