Original Research Paper

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A study on effects of Epidural labour analgesia on fetal outcome

Gynaecology

KEYWORDS: Epidural Analgesia, APGAR Score, Umbilical artery pH.

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ABSTRACT

Objective- The purpose of this prospective, randomized observational study is to determine the effects of epidural labour analgesia with regard to fetal outcome in terms of APGAR Score, Umbilical artery pH and NICU Admissions. Method- Study included 60 full term parturient women at term pregnancy in active labour who were further allocated in two groups, one received Epidural analgesia & other without any analgesia (Control Group) and effect on fetal outcome were observed. Result Effect on fetus in terms of APGAR Score, Umbilical artery pH and NICU Admissions were comparable in both the groups.

Introduction

"The delivery of the infant into the arms of a conscious and pain free mother is one of the most exciting and rewarding moments in medicine". **- Moir DD**

The modern era of childbirth analgesia began in 1847 when Dr J Y Simpson administered ether to a woman in childbirth, and later in the same year, chloroform. Queen Victoria was given chloroform by John Snow (1853) for the birth of her eighth child Prince Leopold and this did much to popularize the use of pain relief in labour.

Pain is a noxious and unpleasant stimulus which produces fear and anxiety. Pathophysiological responses occur in the body during pain. In the respiratory system there is hyperventilation during contraction, increasing the work of breathing and oxygen consumption2. Unrelieved stress in labour produces increased plasma cortisol and catecholamines concentrations which reduces utero-placental blood flow3 by 35-70% compounding the effects of hyperventilation on the oxygen supply to the fetus.

The pain-induced hyperventilation and hypocapnia7, reduces uteroplacental blood flow by up to 25%. The respiratory alkalosis further impairs feoto-maternal gas exchange by shifting the oxygen haemoglobin dissociation curve to the left and fetal PaO2 may fall up to 23%.

Labour pain and stress are associated with progressive fetal metabolic acidosis. It's been analyzed that with epidural analgesia, a better APGAR score and lower incidence of fetal acidosis compared to no analgesia.

Advances in the field of labour analgesia have tread a long journey from the days of ether and chloroform in 1847 to the present day practice of comprehensive program of labour pain management using evidence-based medicine. Safe fetal outcome without any adverse maternal effect is the chief goal of pain relief during labour and lumbar epidural analgesia is the most efficient and widely employed modality for this.

The purpose of this prospective, randomized observational study is to determine the effects of epidural labour analgesia with regard to fetal outcome.

Materials and Methods

The present study was carried out prospectively in obs and gynae department of MLB Medical College Jhansi. Study included 60 full term parturient women in term pregnancy in active labour who were further allocated in two groups, one received Epidural labour analgesia & other without any analgesia (Control Group) and effect on fetal outcome was observed. Sample size: Group I (Epidural analgesia) n=30

Group II (Non Epidural analgesia) n=30

Inclusion criteria: Women who give written informed consent, Healthy women at term gestation in active phase of labour, Singleton pregnancy with vertex presentation, Women in active phase of labour with cervical dilatation 4 cm in Primigravida and more than 3-4 cm in Multigravida, Age 18-35 years, Hb% ≥ 9gm/dl

Exclusion criteria: Patient refusal, Pregnancy with other co-morbid conditions, Medical disorders complicating pregnancy like diabetes, hypertensive disorders of pregnancy etc., Untreated coagulopathy or patient on any anticoagulant therapy, Neurologic or neuromuscular diseases, Thrombocytopenia, Infection at the injection site, Refractory hypotension, Allergy to local anesthetics

Study methodology: The study was conducted after Institutional Ethical Committee approval and informed written consent on 60 full term parturient women of ASA status I and II who fits in inclusion criteria. Each participant in active labour with cervical dilation 3–5cm was randomized into two groups, in which group I receives epidural analgesia and group II no analgesia. Both the groups will be preloaded with 500ml of ringer lactate solution and monitoring with NIBP, and Pulse oximetery will be done. Baseline pain was assessed by Verbal Rating Scale (VRS; 0 = no pain, 10 = worst pain imaginable).Then Epidural block using initial epidural injection of 15 ml of ropivacaine 0.1% with fentanyl 2g/ml was given by qualified anesthesiologists in L 2-4 interspace. The catheter taped in place in all group 1 patients and monitored throughout labour. Following delivery APGAR score of newborn at 1st and 5th min, umbilical artery pH and NICU admissions were compared.

Statistical analysis: Study included both qualitative and quantitative results. statistical analytical methods was done using students unpaired two tailed t test , p value calculated and inference were obtained.

Observations &Results

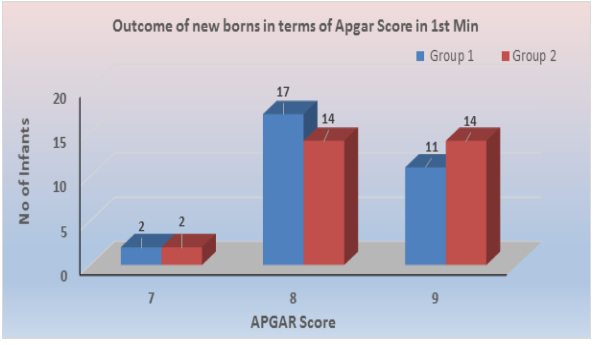

Fig 1- Outcome of newborn in terms of APGAR score in 1st Min

1st min: The t-value of 1st min is -0.63612. The p-value is .527199. The result is not significant as p value is not less than 0.05.

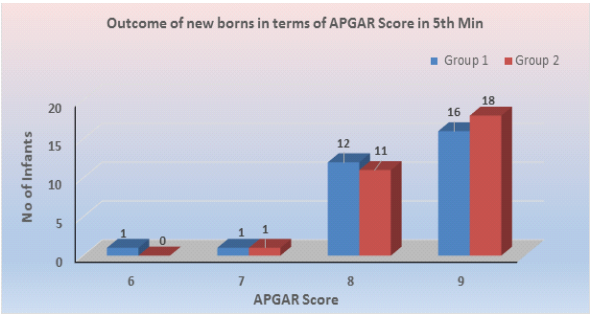

Fig 2- Outcome of newborn in terms of APGAR score in 5th Min

5th Min: The t-value is -0.79078. The p-value is .432293. The result is not significant as p value is not less than 0.05.

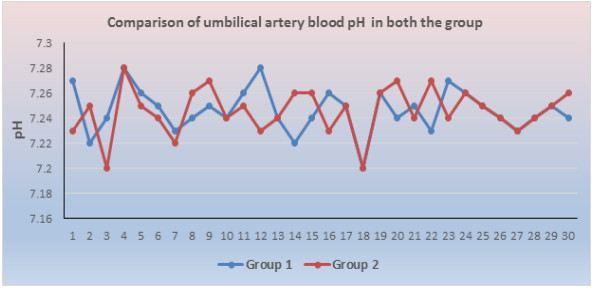

Fig 3- Comparison of umbilical artery blood pH in both the group

Umbilical artery pH of the new born baby was comparable in both the group. The p-value is 0.687. The result is not significant as p value is not less than 0.05.

Discussion

F.Reynolds concluded in their study that epidural analgesia is more consistently beneficial in terms of better APGAR score neonatal acid-base status.

A retrospective review of FHR tracing from 199 labouring parturients, there was no statistically significant difference in incidence of FHR abnormalities when an intrathecal technique using fentanyl was compared with a conventional epidural technique for labour analgesia, low incidence (6% - 12%) of FHR. Changes was found in both groups none of FHR changes identified resulted in need for cesarean delivery, no difference between groups in ultimate mode of delivery.

Porter et al detected no difference in APGAR scores, umbilical artery prior neonatal respiration between low dose combinations and plain bupivacaine infusion.

Craig M. et al studied incidence of fetal heart rate changes after intrathecal fentanyl labour analgesia either 25 g fentanyl alone or with combination of 2.5 mg Bupivacaine, low incidence of (6-12%) of FHR changes was found none of FHR changes identified resulted in need for caesarean deliveries.

Fernando et al conducted a study of 40 nulliparous women receiving low dose CSE. In their study they measured maternal and umbilical plasma concentrations to fentanyl and bupivacaine at delivery. Their neonatal outcome measurements consisted of 1 and 5 min APGAR scores. Umbilical blood gases and neurologic and adaptive capacity scores at 2 and 24 hours post-delivery. They concluded that the concentration of bupivacaine and fentanyl achieved during use of routine CSE for labour were not detrimental to the fetus which is similar to our study.

There was no difference in APGAR scores, umbilical artery blood pH, NICU Admissions between the epidural and non-epidural group in our study.

Conclusions

Epidural analgesia is the most reliable mean of effective analgesia and gives complete freedom from pain of labour. Epidural analgesia during labour using Bupivacaine 0.0625% with Fentanyl is associated with increase in duration of labour but did not reach statistical significance. The relative increase in length of labour does not appear to affect the fetus adversely.

No variations were observed in APGAR scores, Umbilical artery blood PH and NICU admissions.

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