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Experience of using epidural labour analgesia in developing countries: effects to feotus and mother

Abstract

Background: Epidural analgesia is regarded one of the one techniques used to relieve pains associated with labor among women used and recommended by many among the 21st century modern obstetric practitioners. The technique has advantages and disadvantages but also there is myth surrounding the practice such as its impact towards the mother and the baby.

Objectives: The major objective of this study was to investigate and assess the effect(s) of epidural analgesia in regard to labor progress, baby, mother and the mode of delivery. The study further aimed at finding out complications associated with the technique in regard to neonate and the effect of the practice in regard to APGAR score.

Methods: This study was conducted in a period of one year from April 2016 to February 2018 at Square Hospital Limited, Panthapath, Dhaka Bangladesh. 50 women were given epidural analgesia as a technique to relieve pains during labour, and other 50 women were put in group serving as a control.

Key areas of interest during the study were; the duration of active first and second stage(s), The APGAR score, the mode of delivery, reaction after giving epidural analgesia, and Mother's satisfaction rate.

Results: There was no huge difference in the two groups in regard to deliveries as a result of operation; control group stood at 8%, while study group was at 6%. There was also comparable need of oxytocin. The study also observed no life threatening side effect with very good rating of satisfaction in regard to relieving pains. The study credits Epidural analgesia is for high rate normal delivery and a small percentage of lower segment caesarean option.

Keywords: Labour duration, epidural analgesia, Neonatal outcome

Volume 13 Issue 1 - 2021

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Received: January 22, 2021 | **Published:** January 29, 2021

Introduction

Studies indicate that labour pains experienced during labour periods are perhaps the most severe a human being to experience. This agony of pain can get worse especially at the advance time of labour. Some scholars argue that nervousness and anxiety can as well make the situation worse making pains almost unbearable. Therefore, it can be argued that delivering a baby without experiencing such pains is every mother's wish. Indeed, in his scholarly work titled "*On the administration of chloroform during parturition*", Snow J, M.D observes that; "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]. Other than anxiety it causes labour pains effects according to Boudou M. et. Al., 2007 scholarly work "*Association between the intensity of child birth pain and the intensity of postpartum blues"*, labour pains have other effects such as affecting the flow of uterine blood, the expectant mother losing her consciousness and hypercarbia[2].

Previous studies such as Bandyopadhyay, et al's.,"*Labour Epidural analgesia: Past, present and future.*[3]*"* contend that labour pains if continuous, other than the side effects on the mother, it can leave severe side effects on the foetus because uncontrolled labour pains can in the end cause change in metabolic as well as flow of catecholamine levels of the mother.

Indeed, studies indicate that women in labour their most concern and fear is labour pains, adding that the pain experienced by women during labour differs. However, depending on how labour pains maybe managed, this has effect both short and long including psychological impacts[4] and according to Walker's 1997 article – "*Do labour medications affect breastfeeding*[5]*"* depending on the type used, the method can as well cause impact when it comes to breastfeeding as well as affect the the relation or interaction of mother and the new born baby.

Despite the known known effects related with epidural labour analgesia, American College of Obstetricians and Gynaecologists (ACOG) contends[6] that if it's at the request of the woman in labour, it is enough for to go for labour pains relief. It is important to note that there are various methods that can be used in relieving pains in labours well as several strategies that can help one to cope with pains. They include for example breathing exercises and also medical techniques like epidural analgesia. What is important is that no matter

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the method opted, the method opted for while trying to ameliorate the maternal discomfort as a result of labour pains should be safe for the mother and the foetus.

With intention of studying and understanding both chronic and acute pains in women, International Association for the study of pain in 2007 indicated that labour pain can help and found it can be used as a model in studying and treating of acute pain. Sengar and Ohary (2009) in their scholarly work "*Observation on effects of lumbar epidural analgesia for painless labour*"[7] contends that continued studies of pharmacotherapy and physiology have inevitably improved understanding, debate and research in training of obstetric of labour pain easing.

Using epidural analgesia first surfaced in early 1946 and since then it's now more common especially in developed countries for example in the United Kingdom, estimations indicate that 20%[8] use it while 58%[9] of women in the United States of America use it.

In their published work: "*Epidural ropivacaine versus bupivacaine for labour: a meta-analysis"*[10], scholars Halpern SH and Walsh V (2003) observes that, epidural analgesia can help in reversing what could be severe ventilatory effects of pain which is can result into increasing oxygen which is much needed for mother and the foetus which is necessary in case of maternal and foetal hypoxia[11].

Despite the fact that epidural analgesia can result into effective pain relief during labour, it's been reported that sometimes it can contribute to inadequate analgesia which may be caused by factors like different spread of anaesthetic. Indeed, there have been some reported maternal complications as a result of the practice; including reduced blood pressure, sudden hypotension which all can cause a clinically significant low utero-placental blood flow and hence disturb the foetus by causing inadequate reserves. Also, there have been some side effects[12] like itches, developing fever, drowsiness and also cases like where some women develop urinary retention (Eberle, 1996).

Therefore, basing on the above, epidural analgesia as a method of relieving pain during labour is best to be recommended if the expecting mother(s) has no contraindications[13]. However, this method has several merits.

Aims and objectives

1. Investigate side effects and complications of the procedure.
2. Compare foetal result(s) between both groups in terms of APGAR score, NICU admissions.
3. To study and compare the duration and course of the first and second stage of labour, investigate the need for caesarean section in parturients with or without epidural analgesia.

Materials, methods used during study

This study was conducted at Square hospital Limited, in the department of Obstetrics and Gynaecology starting from April 2016 to April 2017. The study involved 50 patients deemed to be at a low risk primgravida and in labour who went through physical examination. During this process, patients were classified with those who came as physical status ASA 1 were subjected to epidural analgesia purposely to serve as a case in this study.

The Inclusion criteria

The study considered Primi gravida with full-term singleton pregnancy[14] with vertex presentation.

In the table below (Table 1), the study considered demographic profiles[15] for patients in the two groups of which both are comparable. As indicated in the table, 21.90 is the average number of age control, 21.96 on the other hand represented study group. 22.35 represented average BMI is for patients in control group, and 21.98 was considered for study group. Average gestational age for patients placed in control group is 38.46 and 38.44 represents study group. The current number of study is 60.0% of the patients are placed under study group, 54% of patients which is placed in control group came on basis of emergency admission, and 40% and 46% are in study group and control group respectively all were are patients where were booked.

Table 1 Demographic data the two groups indicating age, BMI, gestational age & registration status

	Group control	Study group
Mean age	21.90± 3.20	21.96 ± 3.07
Mean BMI	22.35	21.98
Age- Mean gestational	38.46	38.44
Registration status	54	60

Table 2. In the table below, shows the period or duration of first and second of labour.

As indicated in the table below (Table 2), operative delivery rates placed in control group stood at 8%and 6% for study group – making it less significant. Average duration in first stage of labour for control group was at 6.77% while the number stood at 7.24 for study group (also making it less significant).

At second stage, the average duration of labour for patients in control group was 45 minutes, and 41.12 minutes in study group. As indicated in the table, need for oxytocin as well as side effects of drugs administered for the groups were very comparable. Indeed, in group of control, of the 5 patients there, 3 recorded deed transverse arrestwhile 2 patients recorded inadequate bearing efforts. Lastly, the average duration in second stage of labour is 45 and 41.12 minutes for control group and study group respectively.

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[14]Considered pregnancy of 37 – 41 weeks.

[15]This included age, BMI, Status of registration, as well as gestation age.

Table 3 During this study, as a result of deep transverse arrest, three patients who were in placed in control group were subjected to LSCS. As a result of pronged labour, in both control and study group, one patient was subjected to LSCS. In study group, there were also other identifiable indicators of LSCS in patient, an example of such indicator was foetal distress.

Table 4.Though not showing sign of serious effect like threatening the patient's life, the most observed or registered side effects in the current study include the feeling of rigor, body itches/pruritis as well as hypotension as indicated in the table (4) bellow;

Table 5. start here As indicated in the table below (table 5), when you compare study group and control group, there is really a significant VAS score indicating a easiness and pin relief which is as a result of going for epidural anaesthesia.

Table 2 In the table below, shows the period or duration of first and second of labour

First stage of labour labour	**control group**	**study group**	**x2-value**	**p value**
1<8 hrs[1] with no oxytocin	11 representing 22%	9 (18%)	0.69	0.87NS, p >0.05
<8 hrs with no oxytocin	30 representing 30%	29 (58%)		
2Btn[2] 8-12 hrs without oxytocin	8 (16%)	11 (22%)		
>12 hrs	1 (2%) 1 (2%)			
Total	50(100%)	50(100%)		
Second stage labour Labour	**control group**	**study group**	**x2value**	**P value**
<1 Hr	45 (90%)	49 (98%)	2.83	0.09NS, p>0.05
>1 Hr	5 (10%)	1 (2%)		
Total	50 (100%)	50(100%)		

Table 3 How patients were distributed considering their mode of delivery

Delivery mode	**control group**	**study group**	**x2-value**	**p value**
Vaginal	44 (88%)	42 (84%)	1.47	0.47 NS, p > 0.05
LSCS	4 (8%)	3 (6%)		
Instrumental	2 (4%)	5 (10%)		
Total	50 (100%)	50 (100%)		

Table 4 List of Identified effects of epidural analgesia

Signs and symptoms	**number of patients**	**Percentage rate**
Vomiting	4	8.00%
Backaches complaints	3	6.00%
Rigor	2	4.00%
Itching/Pruritis	2	4.00%
Hypotension	1	2.00%

Table 5 Showing Arrangement of the patients in regard to VAS technique score in the two groups as observed at different labour stage

VAS score	**Control group**	**study group**	**t value**	**p value**
0 minute	7.80 ± 0.88	7.94 ± 0.91	0.78	0.43, NS
30 minutes after drug drug	7.92 ± 0.92	2.68 ± 0.86	29.26	0.0001, s
Second stage of labour	8.62 ± 1.06	1.94 ± 0.61	38.28	0.0001,s

Table 6. As indicated in the table below; neonates in the two groups - that is control group and study group, APGAR score is at > in duration of 8 minutes. Also important to note is there is that in both groups – that is study and control groups, there is no increase when we consider the rate of NICU admissions.

1. As a result of ultrasound and clinical examination(s), obstetric high-risk was ruled out.
2. Registered a very normal foetal heart rate pattern at the beginning/ before induction time.
3. Registered a very normal foetal heart rate pattern at the beginning/ before induction time.
4. The women placed in active labour stage has been confirmed and established as diagnosed result of a result of constant urine contractions and also cervical dilatation is registered at more more than 4 cent meters.

Exclusion criteria

1. Any kind of infection especially at local site of catheter placement
2. Need to study Allergy to study drug.

Citation: Mohammad N, Xueping H, Hasan T, et al. Experience of using epidural labour analgesia in developing countries: effects to feotus and mother. *J Anesth Crit Care Open Access.* 2020;13(1):5–10. DOI: 10.15406/jaccoa.2021.13.00462

3. Anatomical deformity of spine.
4. Maternal septicaemia.
5. Medical disorder which can/may complicate pregnancy.
6. Any case(s) of Cephalopelvic disproportion.

Table 6 Arrangement of patients in regard to neonatal outcome in the two groups

APGAR score 5 minutes	**control group**	**study group**	**x2-value**	**p value**
>8	39 (78%)	40(80%)	0.21	0.89NS, p > 0.05
5 – 8	8 (16%)	8 (16%)		
<5	3 (6%)	2 (4%)		
Total	50 (100%)	50 (100%)		
NICU Admissions	control group	study group	x2-value	p value
Yes	7 (14%)	7 (14%)	0	1.00NS,p >0.05
No	43 (86%)	43 (86%)		
Total	50 (100%)	50 (100%)		

First time expectant mothers/primigravida who in fulfilment inclusion criteria came for antenatal services in labour room and antenatal clinic were given epidural analgesia as an option. For controls, the study considered 50 parturients not subjected to analgesia while 50 parturients willingly opted for epidural analgesia. In the study, we ensured a clinical report was done including a clear and complete relevant history of patient. After precisely and in simple terms explaining to the parturient and her attendants both merits and demerits of analgesia and its process, the parturient and her attendants or relatives were requested to write a consent note showing willingness for epidural analgesia. Also done was lignocaine sensitivity, regular investigations along BT/CT and lastly, the epidural catheter was inserted into parturient(s). Blood pressure, SpO2, heart rate and FHR were all recorded.

Procedure of Epidural analgesia. Before epidural catheter was inserted, intravenous ranitidine was given to the parturient. Using a partograph, BP, effacement, maternal pulse, uterine contractions were all recorded. Ringer lacte solution of 10ml formed the preloading part and, a 16G epidural needle was positioned in space of L2-L4. After this dose test, a 1.5% inj lidocaine was administered or injected and this followed close observation and monitoring for in case there was pulse rise. Numbness as well as nondevelopment of cases like tingling worked as evidence for for proper insertion of epidural catheter. At 0 minute, a solution of bupivacaine/ropivacaine 0.125% and fentanyal 10ml and 2mcg respectively were given administered on patients.

The monitoring of patient after epidural catheter was inserted. During monitoring process, the Patient(s) was(were) moved to labour room where cases like blood pressure and pulse were closely monitored in interval of every after 30 minutes while cervical dilatation was closely monitored on interval of two hours. Partograph was used to record and monitor the progress of labour, while CTG helped in monitoring heart rate. Relatives and or a nurse remained in company of the patient supporting her. Either on the request of the patient or after a confirmation of regression of sensory level[16]up to when the patient delivered, top up doses were given in interval of 60 to 90 minutes. VAS scale was used to grade the level of pain in patient. The duration of first stage was reached at by calculating and adding the time interval between when a patient entered active stage of labour, epidural catheter inserted, and then entire dilation of cervix done. The duration of second stage of labour was reached after calculating full dilation of cervix till the expulsion of the foetus or baby from birth canal.

[16]after two segments.

This study considered normal duration in a woman who is pregnant for the very first time/ primigravida to be eight to 12 hours' while the study considered a prolonged 1st stage as; the duration which is 12 and more hours. The study further considered 2nd stage of labour as; calculated starting from or between the full dilatation of the cervix and removal of foetus from the birth canal. The study further recorded normal duration in primigravida where there was no use of epidural analgesia as one hour while two hours where epidural was used. Principles of active management aided the management of labour, where by in incidences where uterine contractions were measured to be less than 3 in ten minutes, oxytocin infusion was added. Where CTG abnormalities were discovered or found, instrumental deliveries were preferred and consequently performed while Lower segment caesarean section or (LSCS) was performed to aid obstetric induction. There was some epidural analgesia related effects such as nausea, vomiting, hypertension and pruritis. During the study, patients who complained of vomiting and cases of nausea were treated with ondansetron and intravenous ranitidine.

The indication of Oxytocin during active labour (>4cm).

a. In incidence where uterine contraction is measured to be less than 3 in 10 minutes where by it has t last for 20 to 40 s.
b. The study observed that, save having observed good uterine contraction, no dilation was observed for two hours.

During this study, we used inferential and descriptive statistics to do statistical analysis which we based on Chi-square test and students as well as student's unpaired T test. The study further employed a software known as SPSS 17.0 version, GrapPad Prism 5.0 version and EPI-IINFO 6.0 version. Also considered is p\0.05 which was observed as level of significance.

The discussion

There are several techniques which including regional and non-regional that can be followed and used to to determine labour analgesia. However, it is important to note that epidural analgesia remains the most effective one analgesia when it comes to labour pain managing.

Notable demographic characteristics included; body mass index, registration status, age, and gestation age. Both results reached in this study - that is control and study group are and were indeed comparable.

During this study, there was not any case registering failure of procedure, not even a case of complaint's such as inadequate block.

Like other published studies such as in Papalkar et al.,'s article[17], during our study, there was no any significant difference observed in duration of the first stage of labour in the two groups – that is the study and control group respectively. Relatedly, another published study published in *Journal of Clinical and Diagnostic Research entitled; "*The Effect of Epidural Analgesia on Labour, Mode of Delivery and Neonatal Outcome in Nullipara of India, 2011-2014"[18] authors Dipit et al., in their study they observed that there was a short duration of first phase in epidural study group. This scarily can be explained by factors such as having used ropivacaine which may explain the reported reduction inhibitory effect of catecholamines on uterine and even contractility thereby causing rapid cervical dilatation as the study suggested. This concurs with other published[19] studies (Thorp,et al,. 1986).

Other scholars such as Hinch et al, in their 2014 scholarly work "*Epidural analgesia during labour: a retrospective cohort study on its effects on labour, delivery and neonatal outcome*"[20] observed that the average duration of the first stage in their study was prolonged, an explanation for this maybe that as a result of high usage of local anaesthetic dose may contribute to such findings. In our study we further observed that during second state duration of labour in both study and control groups was largely comparable and there was no prolonged duration at second stage of labour. Appropriate usage of analgesic dosage and adequate hydration of patients can be advanced as the reasons for this scenario. When together taken into consideration, results for this study can be compared with other scholars' findings such as Papalker et al (2013) findings. Non the less, other published studies for example Dipti et al,. (2014) observes that in second stage of labour, it was reported to have been prolonged in the group where the patients were given epidural. This may be attributed to reasons such as weak pelvic floor muscle and motor blockade which can result into lowering effective maternal pushing and hence involuntary bearing down flex. In our study, both operative and instrumental deliveries did not record increase. This concurs with other studies and are comparable with findings of published studies such as in Papalker et al,.(2014) Dipti et al,. (2014) and in Hincz et al,. (2014) where these studies in patients who were given epidural anaesthesia in labour, the studies recorded no increase in instrumental delivery rates. Nonetheless, other studies such; Anwar et al (2015) in their scholarly work entitled; "Effect of epidural analgesia on labor and its outcomes" and Hincz et al, (2014) recorded increased forceps deliveries inpatients that were given epidural analgesia. The observation as recorded above maybe attributed to factors such as the existence of high concentrations of local anaesthetic which could have been used in past yet it had intermittent boluses thereby causing motor blockade which can reduce on maternal mobility which further decreases maternal efforts especially in second stage of labour.

During this study, seven lower segments caesareans were conducted in total, of these three were performed on a study group while four in control group. These cases were as a result of prolonged second stage of labour. Three patients in control group were subjected to lower segments caesareans while only one of our patients in study group also underwent lower segments caesareans as a result of prolonged second phase of labour. In both groups, (control and study), one patient was subjected to lower segments caesareans because of prolonged first stage of labour while in study group, one patient was subjected to the process (lower segments caesareans) after a foetal distress was diagnosed. When we compare with other published studies such as Anwar et al,. (2015), largely, lower segments caesareans in their study groups were carried out as a result of foetal distress which their study observed to have been done due to meconium stained liquor and deceleration or cardiotocogrsphy. In our study, we carried out seven lower segments caesareans of which two were done after administering top-up dose of epidural while the remaining five lower segment caesarean were performed under the general anaesthesia. Throughout this study, we did not register any of our patient with abnormal cardiotocragraph after epidural anaesthesia was done.

Our study's most reported and observed side effects are nausea, vomiting, rigor, itches/pruritis and hypotension.Other published studies such as; Palpalkar et al,. (2013), Labor et al.,[21] (2008) Smouh et al,.[22] (2005) observed in their studies that hypotension, nausea, vomiting, and rigor were some of reported side effects during their studies. Other side effects observed during this study among our patients were minimal and not very life threatening and often were managed by symptomatic treatment. This scenario can be attributed to more does administered to our patients.

Our study observed and recorded good results as far as effectiveness of epidural analgesia is concerned considering the rate of satisfaction among our patients (women) as far as pain relief is concerned in labor. This conclusion is derived from the meaurements of VAS scoring system which we used in the study. Our results concurs with other published results such as; Smouh et al,. (2005) and Desai et al,. where both studies credit epidural analgesia for saving women labor pains.

Another notable finding during this study is that there was a low rate level of acceptance when it comes to epidural analgesia. Many women would rather go through labor pain while giving birth than going for this technique. This can be attributed to factors such as background of women – especially their social economic status. Majority of them were from rural areas and had phobia for epidural analgesia. Others see the technique as too expensive to manage hence opting for the traditional method no matter how painful it maybe. There is generally need for mass sensitization since majority of them seem not to know anything about the technique or all they know are myths surrounding it.

The number of neonates according to our study was generally high standing at APGAR score >8 min, this was the case in our both groups (control and study group). Further to this, there was no significant increment in number of NICU admissions in our two study groups. Our results concurs with other scholars findings and can be compared with studies such as Anwar et al,. Dipti et al, (2014); Papalk et al,

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(2013); and Smoouh et al (2005). Nonetheless, Hincz et al, (2014); in their study entitled "*Epidural analgesia during labor: a retrospective cohort study on its effects on labour, delivery and neonatal outcome*" reported a lower APGAR score at 1 min (<7) for babies whose mothers delivered after receiving epidural analgesia.

Conclusion

Considering the fears associated with labor pains, epidural analgesia provides a best option for patients (women) to get pain relief during labor. The technique has been proven to be very effective with less life threatening side effects on the mother and the baby/foetus. This study proves that with the technique, no prolongation in first and second stage of labor was observed. The study further did not record increase for instrumental delivery, neither was there observation of threatening complication to mother(s). The study concludes that it's a matter of time, the relief epidural analgesia provides women in labor will make it a best option for many in the nearest future.

Citation: Mohammad N, Xueping H, Hasan T, et al. Experience of using epidural labour analgesia in developing countries: effects to feotus and mother. *J Anesth Crit Care Open Access.* 2020;13(1):5–10. DOI: 10.15406/jaccoa.2021.13.00462