

Assessment of Impact of Regional Analgesia on Labor and Neonates in Hilla City

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Abstract

Background: Epidural is the most effective form of pain relief in labor with around 30% of laboring women in the UK and 60% in the USA receiving epidural analgesia. **Objectives:** To assess effect of regional analgesia on labor pain, duration, outcome of delivery and neonates. **Materials and Methods:** Case control study included 400 pregnant woman 200 of them delivered by painless labour and other 200 whose delivered without analgesia who attended to the babylon maternity and pediatric hospital, Al sadiq hospital and private hospitals in al hilla city which included private Teiba, Al Fayhaa hospitals from first of february 2022 to June 2022. **Results:** The duration of first stage of labor was significantly prolonged at control mothers 26% (52) in compare to 10%(20) of mothers with epidural anesthesia had prolonged labor. While second stage shown no significant association with epidural analgesia ($P = 0.96$). Fetal heart rate abnormalities shown no significant association with epidural analgesia ($P = 0.96$). while back pain and headache was significantly higher in mothers with epidural analgesia ($P < 0.001$). **Conclusions:** EA was not associated with a higher instrumental delivery rate and higher rate of c/s, EA not cause significant maternal or neonatal complications in primi- and multiparas. Importantly, EA associated with short first stage of labor and not higher rate effect on duration of second stage of labour.

Keywords: Abor, epidural, nalgesia

INTRODUCTION

The pain of childbirth is arguably the most severe pain most women will endure in their lifetime.^[1] The pains of labor result in a maternal stress response, which is neither beneficial for the fetus nor the mother.^[2] Pain differs from one woman to another. Prior to the 20th century, childbirth predominantly happened in the home, without access to any medical interventions for pain management. This caused a large number of deaths among women and created an urgent need for pain management. With the development of science, it has become possible to reduce the pain resulting from labor and delivery.^[3]

MATERIALS AND METHODS

Study Design, Setting and Time

This is case-control study which is conducted at painless labor room and delivery room of Babylon maternity and pediatric Hospital, Al Sadiq hospital and private hospitals

in al Hilla city which include private Teiba, AL Fayhaa, hospitals From first of February 2022 to June 2022.

Study population

This study included 400 pregnant woman, 200 of them delivered by epidural analgesia and the other 200 of them delivered without epidural analgesia.

Inclusion Criteria

Singleton, term, nine missed period, healthy woman, with no past medical hx of medical disease with spontaneous onset of labour.

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Exclusion Criteria

Patients refuse to participate in the study. All pregnant women with contraindication to regional analgesia (coagulation disorders, anticoagulation therapy, skin or soft tissue infection at the site of the epidural or spinal placement). Pregnant woman with medical disease such as Hypertension, DM or epilepsy.

Pilot study

A pilot study was carried out before starting collection of data for two weeks from 16th January 2022 to 30th January 2022 in painless labor room of Babylon Maternity and Pediatric Hospital to test the question are for any modification required, any other difficulties and to detect the time needed for data collection and to assess whether the research protocol was realistic and workable. The pilot study included 10 newly deliveries woman who were excluded from the study.

Sample size determination: according to the following equation

$$n = \frac{Z^2 (p)(1-p)}{d^2}$$

The prevalence of epidural analgesia is 60% in the USA.^[4]

Study instruments: Data was collected by using a predesigned questionnaire by which the woman were interviewed after giving their verbal consent. Each woman was interviewed for about 10 minutes (woman who refused to participate were excluded).

After took details history (Age, gravida, Para, abortion, past medical Hx, drug Hx and obstetric Hx). Examination of vital signs (Bp, RR, Temperature and pulse rate).

General examination, abdominal and vaginal examination, sonicate to assess FHR and abdominal examination to assess uterine contraction then after 4cm cervical dilation, The epidural catheter is normally inserted at the L2–L3, L3–L4 or L4–L5 interspace.

Monitor duration of active first stage of labour normally (2_6) hrs, become shorter in multi paraous woman, also monitor duration of second stage of labour normally no longer than 2 hrs in nulliparaous and 1 hrs in multiparaous. Measured FHR by intermittent auscultation every 15 minute in first stage of labour and every 5 minutes in second stages of labour normally (110_160) b/m.^[5] Measure of blood pressure consider hypotension if it was 90/60 mmg.^[6]

And ask patient about pain during labour (zero no pain, 1_3 mild pain, 4_6 moderate pain _ 7_10 severe pain).^[7]

Follow up of patient after delivery by mobile phone numbers of them to assess any urinary problems such as (urinary retention, urine incontinence), also asked them

about headache and backache, maternal satisfaction about epidural analgesia.

Limitations of the study

Limited time and duration of the study.

Statistical analysis

Analysis of data was done utilizing SPSS version 25 computer software (statistical package of social science), categorical variables were presented as numbers and percentage P, continuous variables were presented as mean and standard deviation, chi square test was used to show the association between categorical variables, analysis of variance was also used to determine the mean differences between groups, P value of <0.05 was considered as statistically significant.

Ethical approval

The study was conducted in accordance with the ethical principles that have their origin in the Declaration of Helsinki. It was carried out with patients verbal and analytical approval before sample was taken. The study protocol and the subject information and consent form were reviewed and approved by a local ethics committee according to the document number 57 (including the number and the date in (24/4/2022) to get this approval. Study protocol was reviewed and granted permission by the ethical committee of Babylon University, Collage of medicine.

After explaining the objectives of the study to the woman whom deliveries by painless labor, verbal consent were obtained from them prior to interviewing.

Official agreement was obtained from Babylon Health directorate to carry out the study.

RESULTS

A total of 400 mothers were enrolled in this study, 200 mothers with history of epidural analgesia used in last delivery and 200 control mothers who delivered without analgesia.

This study show that: 90.5%(181) of mothers with epidural anesthesia were used oxytocin while 59%(118) of control mothers were used oxytocin and there were a significant association between oxytocin used and epidural anesthesia ($P < 0.001$).

The labor pain was significantly high at control mothers in compare with labor pain for mother with epidural anesthesia ($P < 0.001$), where sever pain was felt by 71.5%(143) of control mothers while only 2%(4) of mother with epidural anesthesia had sever labor pain.

The duration of first stage of labor was significantly prolonged at control mothers 26%(52) in compare

to 10%(20) of mothers with epidural anesthesia had prolonged labor. While second stage shown no significant association with epidural anesthesia ($P = 0.47$). Table 1 shows number of patients in study group. Fetal heart rate abnormalities shown no significant association with epidural analgesia ($P = 0.96$), as in Figure 1.

The studied of mothers early complication shown that: Nausea and vomiting shown no significant association with epidural analgesia used ($P = 0.24, 0.64$ respectively), while back pain and headache was significantly higher

in mothers with epidural analgesia ($P < 0.001$), urinary incontinence and retention shown no significant association with epidural analgesia ($P > 0.05$). hypotension was significantly higher in mothers with epidural analgesia in compare with control mothers ($P < 0.001$) Table 2.

Mother satisfaction about epidural analgesia was 88%(176) of mother had satisfaction score >7 , 9.5%(19) of mothers had satisfaction score between 5–7 and only 2.5%(5) of mothers had satisfaction score <5 about epidural analgesia used during delivery Figure 2.

Table 1: Number of patients in study group

History of recent delivery		Participant		Total	P value
		Control mothers	Mothers with epidural anesthesia		
Oxytocin use	Not used	82(41%)	19(9.5%)	101 (25.3%)	<0.001*
	Used	118(59%)	181(90.5%)	299(74.8%)	
Way of delivery	NVD	175(87.5%)	179(89.5%)	354(88.5%)	0.21*
	Assisted VD	1(0.5%)	4(2%)	5(1.3%)	
	C/S	24(12%)	17(8.5%)	41(10.3%)	
Labor pain	No pain	0	122(61%)	122(30.5%)	<0.001*
	Mild	6(3%)	65(32.5%)	71(17.8%)	
	Moderate	51(25.5%)	9(4.5%)	60(15%)	
	Sever	143(71.5%)	4(2%)	147(36.8%)	
Duration of First stage of labor	Normal	148(74%)	180(90%)	328(82%)	<0.001*
	Prolonged	52(26%)	20(10%)	72(18%)	
Duration of Second stage of labor	Not enter to second stage	11(5.5%)	14(7%)	25(6.3%)	0.47*
	Normal	163(81.5%)	167(83.5%)	330(82.5%)	
	Prolonged	26(13%)	19(9.5%)	45(11.3%)	
Total		200(100%)	200(100%)	400(100%)	

*Chi-square test, significant ≤ 0.05

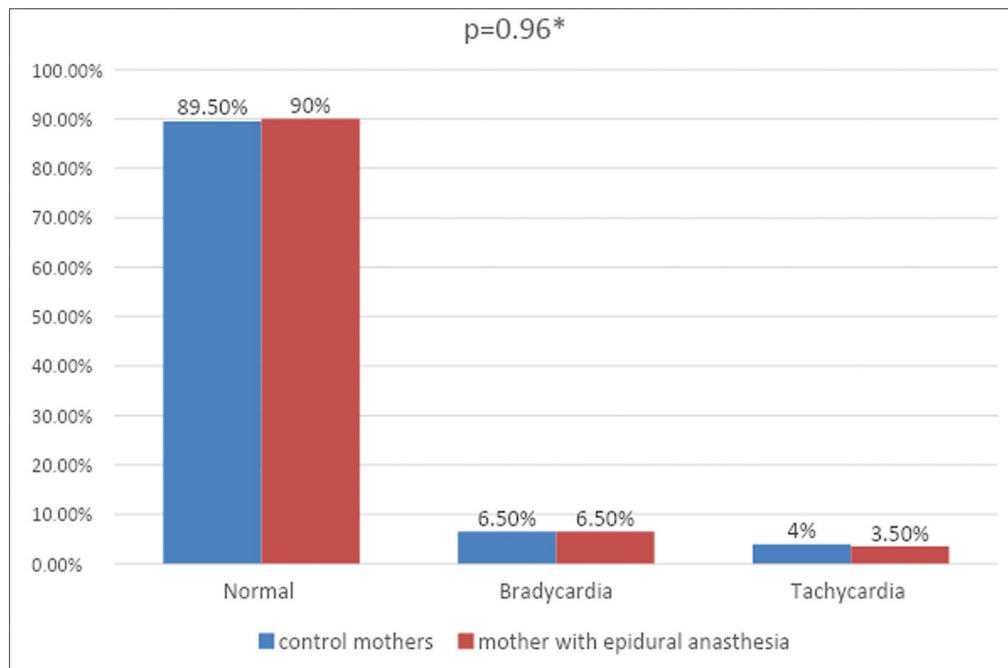
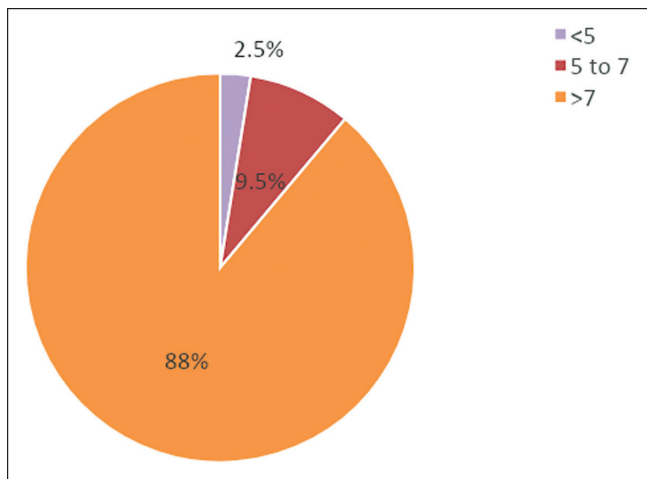


Figure 1: Fetal heart rate abnormalities

Table 2: Difference in mother's early complication

Mother complication		Participant		Total	P value
		Control mothers	Mothers with epidural analgesia		
Nausea	Negative	147(73.5%)	157(78.5%)	304(76%)	0.24*
	positive	53(26.5%)	43(21.5%)	96(24%)	
Vomiting	Negative	175(87.5%)	178(89%)	353(88.3%)	0.64*
	positive	25(12.5%)	22(11%)	47(11.8%)	
Back pain	Negative	103(51.5%)	65(32.5%)	168(42%)	<0.001*
	positive	97(48.5%)	135(67.5)	232(58%)	
Headache	negative	147(73.5%)	71(35.5%)	218(54.5%)	<0.001*
	positive	53(26.5%)	129(64.5%)	182(45.5%)	
Urinary incontinence	negative	176(88%)	186(93%)	362(90.5%)	0.088*
	positive	24(12%)	14(7%)	38(9.5%)	
Urinary retention	Negative	191(95.5%)	187(93.5%)	378(94.5%)	0.38*
	positive	9(4.5%)	13(6.5%)	22(5.5%)	
Hypotension	Negative	122(61%)	81(40.5%)	203(50.7%)	<0.001*
	positive	78(39%)	119(59.5%)	197(49.3%)	
Total		200(100%)	200(100%)	400(100%)	

*Chi-square test, significant ≤ 0.05 **Figure 2: Mother satisfaction about epidural analgesia**

DISCUSSION

In this study, there was statistically significant association between oxytocin use and epidural anesthesia p value <0.001. The studies done in UK^[8] and in Chinese^[9] group with epidural analgesia had higher rate of oxytocin use p value =0.21 as was noted in this study. Higher rate of oxytocin use in epidural analgesia may be many women in latent labour are admitted for painless delivery room for pain control and further observation, these pregnant women increase oxytocin use.

In current study routes of delivery showed no significant association with epidural analgesia p value =0.21, percentage of c/s 12% in control groups versus 8.5% in epidural groups while percentage of assisted vaginal delivery 0.5% in control groups versus 2% in epidural groups and percentage of NVD 87.5% in control groups

while 89.5% in epidural groups, this agreed with studies in China^[10] in India^[11] and in Wolters Kluwer^[12] showed there was no statistically significant difference in routes of delivery between women with or without epidural analgesia.

While disagreed in research in UK^[8] women with epidural group experienced more assisted vaginal birth.

In present study the first stage of labour was statistically shorter in duration in epidural groups compared with control groups p value <0.001. This agreed with research done in India.^[11] Short duration of first stage thought that better analgesia with epidural results decrease inhibitory effect of catecholamine on uterine contractility so faster cervical dilation.

While disagreed in research in Wolters Kluwer^[12] no significant between group in the duration of first stage of labour.

In this study second stage of labour showed no statistically significant association with epidural analgesia $P = 0.47$. This agreed with research done in Wolters Kluwer^[12] there was no significant difference between groups in the duration of the second stage of labour.

In other study in Chinese^[10] women with epidural group experience longer second stage of labour.

Causes of difference in duration, mode of deliveries may be due to presence of confounding factors that lead to prolong second stage of labour and increase rate of AVD and c/s, example of these factors nulliparous (less experience in delivery, visit the hospital earlier in course of labour having higher fetal station, slower dilation of the cervix, delivery of large babies and smaller pelvic outlet).

In this research fetal heart rate showed no significant association with epidural analgesia this agreed with

research in Uk^[8] there were no difference between epidural and control groups for Fetal heart rate abnormalities.

While disagree in research in wolters kluwer^[13] the effect of epidural analgesia showed statistically significantly increase risk of non-reassuring FHR tracing due to high dose or rapid onset of given analgesia, hypotension of mother during labour.

In present study the labour pain score was lower in epidural groups compare with control groups, this result agreed with result in Chinese.^[9]

In present study hypotension was significantly higher in mothers with epidural analgesia compare with control mothers this agree with research in [14] the causes of hypotension in epidural groups may be attribute to multiple factors, route of administration of analgesia, higher speed of given of drugs in analgesia, Abrupt onset of pain relief causes reduction of blood pressure, also higher dose of epidural analgesia cause hypotension.

In present study urinary incontinence shown no significant association with epidural analgesia, this agreed with research done in Chinese^[10] show that urinary incontinence in woman with or without epidural analgesia was not statically significant.

In this research urinary retention showed no statistically significant association with epidural analgesia, this agreed with research done by,^[15] show there's no different between epidural analgesia and control group regarding the urinary retention due to most of gynecologist tries to avoid complication of analgesia, so use of foles catheter before and after deliveries.

While disagreed with research done in [8] woman with epidural analgesia experienced more urinary retention may be change in concentration of epidural solution (higher concentration) use in analgesia.

In current study nausea and vomiting showed no statistically significant with epidural analgesia, this result disagreed with result done by^[14] in patient who received combined spinal epidural technique increase risk of nausea and vomiting because in current study most of participant received epidural analgesia while other study which contrast our result, they use lipophilic opioid in Combined spinal epidural these opioid more likely to cause Nausea and vomiting.

In this research headache was statistically significant higher percentage in epidural groups compare with control groups, this agreed with research done by,^[16] may be attribute to multiple factors, such as previous Hx of migraine, needle size and type, previous Hx of Post dural puncture headache, puncture level.

In current study back pain was significantly higher in epidural group compare with control groups. This result was compatible with several authors worldwide,^[17,18] due to

present of confounding agent such as previous Hx of back ache, duration of labour after insertion of epidural catheter, repeated lumbar puncture and spinal needle radius.

Because of short time of current study loss of follow up of patient regarding long term effect of headache and backache.

In this research pregnant woman whom delivered with epidural analgesia had higher proportion of satisfaction about epidural analgesia, this agreed with research done in UK.^[8]

CONCLUSION

EA was not associated with a higher instrumental delivery rate and higher rate of c/s, EA not cause significant maternal or fetal heart rate complications in primi- and multiparas. Importantly, EA associated with short stage of labor and not higher rate effect on duration of second stage of labour.

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Conflicts of interest

There are no conflicts of interest.

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