DOI: 10.7860/JCDR/2014/8039.4111

Original Article

Obstetrics and Gynaecology Section

The Impact of Labour Epidural Analgesia on the Childbirth Expectation and Experience at a Tertiary Care Center in Southern India

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ABSTRACT

Background: Labour epidural analgesia is increasingly used as a means of pain relief for women during labour and delivery. The significant pain during labour and delivery can be terrifying for mothers-to-be and the prospect of relief from pain can help reduce fear of childbirth to an extent. However, it is not necessary that reduced fear of childbirth may lead to an increased satisfaction with the childbirth experience.

Aim: To determine the influence of labour epidural analgesia (LEA) on the experience of childbirth in pregnant women at a tertiary care center in southern India

Materials and Methods: A pre-post interventional non-randomized study design at a tertiary care perinatal institute that used the Wijma Delivery Expectation and Experience questionnaires to determine baseline expectations of labour and childbirth and the actual experience in pregnant women. Labour analgesia was provided on maternal request or demand. Total and domain scores were compared between the two groups using non-parametric tests and a generalized linear repeated measures model after adjusting for factors that were found significant in the bivariate model.

Results: The study included 235 pregnant women who opted for LEA and 219 pregnant women who opted against LEA. Overall, 37 (15.74%) of woman with LEA and 30 (13.70%) of women without LEA had a worse than expected experience of childbirth. Significant pain relief ($p<0.001$) was provided with LEA, however, the post-delivery scores did not differ significantly between the two groups ($F=0.90$, $p=0.34$) in a generalized linear repeated measures model.

Conclusion: Maternal satisfaction with the process of childbirth is a complex dynamic that is not limited to the significant relief from pain provided by LEA.

Keywords: Maternal satisfaction, Labour epidural analgesia, Pain relief, Childbirth, Delivery

INTRODUCTION

Maternal satisfaction with childbirth is a complex measure that is influenced by several factors including antenatal and intra-natal complications and care, the condition of the baby, and the environment of care from the family as well as the hospital [1-5]. The expectation of the mother pertaining to the childbirth experience is an important consideration with unmet expectations often leading to a state of lower satisfaction [1-5]. The anticipation of pain during labour and childbirth may even lead to severe emotional states including anxiety, stress and fear that may impact the overall experience of childbirth.

Modern obstetrics uses several methods to provide pregnant women with relief from pain during labour and childbirth. Labour epidural analgesia (LEA) is an increasingly recognized and accepted for pain relief and several studies have shown an appreciable reduction in pain with the use of LEA [6]. Although the procedure may lead to adverse events like assisted vaginal deliveries and prolonged second stage of labour, recent studies have shown that LEA does not increase the rates of caesarean section [7-10].

A pre and post interventional non randomized study was designed to measure two aspects of childbirth. Firstly, to measure the childbirth expectation-experience gap in a population of pregnant women delivering their children at a tertiary care center and secondly, to determine the impact of LEA and pain relief on the childbirth expectation-experience.

MATERIALS AND METHODS

This prospective study was conducted over a 12 month period from December 2010 to November 2011 based on a study protocol that was approved by the Ethics Committee - Institutional Review Board of the study institute. Written informed consent was obtained from each pregnant woman who agreed to participate in the study. At the study institute, pregnant women are routinely provided counselling for labour analgesia at booking for antenatal care as well as the onset of labour. An appropriate participatory strategy for analgesia is chosen based on maternal request after the counselling session. The study population was broadly categorized into two groups- a group that opted for LEA and a group that did not opt for LEA. A randomized study design was not considered as it was deemed unethical to withhold LEA from women who wished to have pain relief.

Pregnant women who presented at the antenatal clinics of the study institute with a singleton pregnancy of at least 34 weeks of gestation, with either spontaneous or induced labor, with or without medical co-morbidities were considered eligible for recruitment and enrollment to the study. Pregnant women with multiple pregnancies, women admitted for planned elective cesarean sections including cesarean sections on maternal demand, emergency cesarean sections, women for whom LEA could not be initiated due to known hypersensitivity or allergy to the drugs, or other contraindications, failed epidurals or wet taps, women who were deemed to resist the tap during the procedure and women who did not provide informed consent for the study were excluded.

Labour epidural analgesia was initiated when the cervix was 2 to 3 cm dilated and the woman was determined to have true labour pains. A combination of intermittent boluses and patient controlled epidural analgesia infusions (PCEA) was used to provide the LEA. Intermittent boluses were provided with low dose mixtures of

Characteristic	Labour Epidural Analgesia (n=235)	Non-Labour Epidural Analgesia (n=219)	Wilcoxon ranksum test p-value
Mean (SD) Age in years	26.97 (3.43)	26.49 (4.91)	p=0.12
Mean (SD) Years of Education of woman	5.03 (0.96)	4.72 (0.99)	p =0.0003
Mean (SD) Years of Marriage	3.22 (2.96)	4.56 (3.78)	p <0.001
Nulliparous	176 (74.89%)	99 (45.21%)	p <0.001
Hypertensive disorders in pregnancy	17 (7.23%)	14 (6.39%)	p=0.72
Gestational Diabetes	39 (16.60%)	28 (12.79%)	p=0.25
Hypothyroidism	26 (11.06%)	19 (8.68%)	p=0.39
Bad obstetric history	4 (1.70%)	5 (2.28%)	p=0.66
Fetal growth restriction	2 (0.75%)	6 (2.74%)	p=0.13
Assisted Vaginal Delivery	49 (20.85%)	8 (3.65%)	p<0.001
Cesarean section	43 (18.38%)	39 (17.81%)	p=0.89
Episiotomy	125 (55.07%)	58 (27.36%)	<0.001

[Table/Fig-1]: Characteristics of the study population stratified by Labour Epidural Analgesia

Characteristic	Experience was Better than or as expected (n=387)	Experience worse than expected (n=67)	Wilcoxon ranksum test p-value
Mean (SD) Age in years	26.72 (3.66)	26.87 (4.11)	p=0.93
Mean (SD) Years of Education of woman	4.90 (0.98)	4.79 (1.03)	p =0.31
Nulliparous	235 (60.72%)	40 (59.70%)	p =0.87
Hypertensive disorders in pregnancy	24 (6.20%)	7 (10.45%)	p=0.20
Gestational Diabetes	53 (13.70%)	14 (20.90%)	p=0.13
Hypothyroidism	36 (9.30%)	9 (13.43%)	p=0.30
Assisted Vaginal Delivery	46 (11.89%)	11 (16.42%)	p=0.30
Cesarean section	69 (17.89%)	13 (19.40%)	p=0.76
Episiotomy	150(40.21%)	33 (50.00%)	p=0.18
Female Baby	184 (47.79%)	27 (40.30%)	p=0.26
Small for gestational age baby	34 (8.79%)	3 (4.48%)	p=0.23
Large for gestational age baby	23 (5.94%)	8 (11.94%)	p=0.08
Neonatal morbidity	154 (39.79%)	28 (41.79%)	p=0.76

[Table/Fig-2]: Characteristics of the study population stratified by experience of childbirth

Bupivacaine (0.1%) with Fentanyl (2mic / cc), 15 - 20ml every 90 minutes and pro re nata (PRN) or on demand basis keeping in mind the safe total dose the woman has received during the preceding hours as per the institute protocol. In the PCEA mode, a background infusion (Low dose mixture as stated above) 4ml/hour and patient controlled boluses 5ml in 3 minute with a lock out interval of 20 minutes was given. Based on the request and choice of the woman, IV Fentanyl or IM pethidine was used for pain relief in those who did not want LEA. A standard Visual Analogue Pain Score (VAPS) was used to assess pain on a scale of 0-10, assessed once after delivery and masked to the mode of delivery.

The WIJMA Delivery Expectation and Experience (W-DEQ) questionnaire was used to measure maternal expectations of delivery and their perceptions of the actual experience. Appropriate permissions to use the questionnaire was sought and obtained from

Domain	Group	Mean Pre-test score	Mean Post-test score	Wilcoxon sign rank test p- Value
How labour and delivery turned out	Lea	5.18	4.99	0.18
	Non Lea	5.36	4.99	0.03
General Feelings	Lea	40.51	40.34	0.66
	Non Lea	40.22	40.49	0.42
Feelings during Labour	Lea	15.42	15.30	0.43
	Non Lea	14.91	15.19	0.53
Intensity of Labour	Lea	7.6	7.04	0.03
	Non Lea	7.06	7.27	0.19
Feelings during moment of Childbirth	Lea	9.92	10.84	<0.001
	Non Lea	9.52	10.89	<0.001
Fantasies of Injury to Child	Lea	5.14	5.60	0.001
	Non Lea	5.58	5.37	0.15
Total Score	Lea	83.77	84.12	0.78
	Non Lea	82.65	84.21	0.03

[Table/Fig-3]: Domain scores with the WDEQ questionnaire stratified by Labour Epidural Analgesia

the copyright holders prior to the study. The W-DEQ questionnaire has been widely used in several studies worldwide and has a good reliability (>0.9) [11]. The questionnaire had two versions of thirty three questions each, version A that measures the expectations of delivery and version B that measures the experience of delivery. The questionnaire covered several domains; an overall and general domain, intensity of childbirth, fears and fantasies of childbirth and feelings during labour and childbirth. Responses were scored using a six point Likert scale from 0 to 5. The scores were presented as a visual sliding scale with the outermost scores (0 and 5) corresponding to the opposite extremes of the item (example- extremely frightful, not at all frightful) and intermediate scores marked as per the perception of the woman as to how close or far they are from the extremes. The W-DEQ-version A was administered on admission after the woman had made her choice pertaining to labour analgesia. The W-DEQ-version B was administered within 24 hours of childbirth and prior to discharge of the pregnant woman.

The sample size for the study was estimated, based on a primary outcome of maternal experience and satisfaction, as a minimum of 220 persons in each group (LEA and non LEA) based on an equal allocation between the two groups, a two sided alpha of 0.05 and power of 80% and an anticipated 20% drop out rate (including possible cross overs to LEA) and a 15% difference in the two groups for the outcome of satisfaction. The sample size was estimated using Analysis of Resources for Trials (version 1.0.4, MRC clinical trials unit, London) available as add on for STATA statistical software.

Data was entered into a MS Excel data workbook and exported into SPSS version 16.0 (SPSS Inc) for the data analysis. The score for each woman was determined based on a simple summation of all the responses after standardizing the direction of the responses of all items (example- all scores of 5 indicate worse outcomes and all scores of 0 indicate good outcomes) as per the questionnaire protocol. The distribution of scores was assessed using the Shapiro Wilk test for normality. Non-parametric Wilcoxon ranksum test was used for the bivariate analysis as the distribution of pre-intervention scores was not normally distributed (Shapiro Wilk test p=0.003). The total scores and domain scores were compared between the two groups using a Wilcoxon paired signed rank test. A generalized linear repeated measures model was used to compare the scores of the two groups after adjusting for factors that were found significant in the bivariate analysis and differences in the baseline characteristics of the two groups. A p value < 0.05 was considered as statistically significant.

RESULTS

Four hundred and fifty four pregnant women who met the eligibility criteria were recruited for the study. Three women who did not complete the pre-delivery questionnaire and one woman who did not complete the post-delivery questionnaire were excluded from further analysis. The study population thus included 235 pregnant women who opted for LEA and 219 pregnant women who did not opt for LEA. Women who opted for LEA were married for a shorter duration, had more years of education, and were more likely to be nulliparous [Table/Fig-1]. Co-existing morbidity did not differ significantly between the groups. Assisted vaginal deliveries and episiotomies were more likely in the group that opted for LEA [Table/Fig-1].

A worse than expected experience was reported by 67 (14.76%) pregnant women including 37 (15.74%) of women with LEA and 30 (13.70%) of women without LEA. A worse than expected experience was not significantly associated with medical co-morbidity, LEA, type of delivery, or neonatal morbidity [Table/Fig-2].The mean pain score, measured with the visual analogue scale,in those who opted for LEA was 3.86 (2.34) and 6.96 (2.9) in those who did not opt for LEA ($p<0.001$). This was consistent with the result using the WDEQ; the relevant item in the WDEQ showed that the experience of pain was significantly worse than expected without LEA ($p=0.0005$). There were no cervical tears or birth injuries in this series.

Pregnant women who did not opt for LEA had a significantly worse than expected experience compared to those who opted for LEA [Table/Fig-3]. Women who opted for LEA had a better experience during the intense moments of labour; however, both groups had an experience that was significantly worse than expected during the moment of childbirth [Table/Fig-3]. However, the post-delivery scores did not differ significantly between the two groups ($F=0.90$, $p=0.34$) in a generalized linear repeated measures ANOVA model that adjusted for age, years of education of the woman, years of marriage, gravida, co-existing maternal morbidity, gestational age at delivery, mode of onset of labour and mode of delivery, episiotomy and neonatal outcomes.

DISCUSSION

To the best of our knowledge, this is the first study from India to assess the obstetric experience from the perspective of the pregnant woman and considering the expectations of the pregnant woman pertaining to child birth and the influence of LEA.The collection of baseline expectations prior to childbirth and the comparison of the actual experience with the baseline expectation is a major strength of the study. A recent study from India reported on the woman's perspective and needs during childbirth and concluded that quality improvement programs for reproductive care should include non-clinical aspects of care including respectful treatment, privacy and emotional support [12]. However, this study was based on in depth interviews and focus group discussions conducted within 42 days after delivery and did not include a comparison of baseline expectations and actual experience.

Consistent with previous studies, the result of the study shows that labour epidural analgesia is associated with significant pain relief [7,8]. The differential uptake of LEA in nulliparous and multiparous women is probably related to the expectation of pain and recall of pain for women with prior pregnancies. Relief from pain, which is often the most fearful aspect of childbirth, helped improve maternal satisfaction for only 60% of pregnant women. The finding that the post-delivery scores (that looked at the actual experience) did not significantly differ between the two groups in an adjusted model suggests that pain relief, although important, is only one aspect of the obstetric experience. Previous studies report that painful experiences result in lowered satisfaction[4,13-16] but that the experience of high levels of pain does not necessarily bring about a dissatisfied mother [2,17]. In a longitudinal study assessing the quality of women's birth experience, Doering et al., [2] reported that pain does reduce the quality of the birth experience, but even so, remaining in control is more important to a pleasurable experience. In a systematic review Hodnett [18] concluded that pain and pain relief do not play a major role in childbirth satisfaction, unless expectations regarding either are unmet. Maternal satisfaction with the process of childbirth has to consider the entire obstetric experience starting from an understanding and a reasonable discussion on the expectations of childbirth for each pregnant woman that allow for possible differences in culture.

Labour Epidural Analgesia was associated with significant increase in assisted vaginal deliveries and episiotomy in this study, which could affect maternal satisfaction.A meta-analysis of several studies concluded that instrumental delivery may be increased up to two times in women with LEA but is dependent on inter-physician and inter-institute variations in obstetric practice [19]. However, the increased incidence of assisted deliveries or episiotomy did not translate to a worse than expected experience in this population.

The lack of association of several medical factors (medical co-morbidities in the mother, type of delivery, neonatal outcomes and LEA indicate the possible influence of non-medical factors on maternal satisfaction with the childbirth experience. The lack of detailed information on factors like planned pregnancy, whether the woman desired the pregnancy, any gender preference, support from the family, expectations from hospital services is a limitation that prevents us from offering any conclusions on the possible role of non-medical factors on maternal satisfaction. The importance of ascertaining non-medical factors is highlighted when we consider that 14.76% women in this study population reported an experience that was worse than their expectations and was not significantly associated with medical factors.

In conclusion, maternal satisfaction with childbirth is a complex dynamic that includes, but is not limited to, the relief from pain. The overall experience of childbirth for each woman depends on meeting the pre-delivery or antenatal expectations of childbirth. Even with the provision of a significant pain relief through LEA, the obstetric and anesthetic teams and the pregnant woman will have to work together to understand and address the expectations of childbirth for each pregnant woman in a pragmatic manner. A systematic assessment of maternal satisfaction may help obstetric units to identify potential trouble spots.

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FINANCIAL OR OTHER COMPETING INTERESTS: None.

Date of Submission: **Oct 31, 2013**
Date of Peer Review: **Nov 26, 2013**
Date of Acceptance: **Jan 09, 2014**
Date of Publishing: **Mar 15, 2014**