

Ambulatory Labour Analgesia and Obstetric Outcomes

Garg Seeru^{1,*}, Pradhan Sameer², Soni Anita³, Karanth Shraddha⁴, Patel Nirali⁵

^{1,3,4,5}Department of Obstetrics and Gynecology, ²Department of Anaesthesia,
Dr LH Hiranandani Hospital, Hillside Avenue, Hiranandani Gardens, Powai, Mumbai. 400076. India.

***Corresponding Author:**

E-mail: drseeru@yahoo.co.in

Abstract

Aims: A prospective study was conducted to evaluate the impact of ambulatory labour analgesia on obstetric outcomes.

Material and methods: The duration of first and second stage of labour, incidence of lower segment cesarean section, mode of delivery, any side effects of the procedure, fetal wellbeing and patient satisfaction was recorded in 228 patients undergoing labour analgesia.

Results: The average cervical dilatation was 2.03 cm/hour for primigravidae and 2.76 cm/hour for second gravidae. The average time for second stage of labour was 68.12 min for primigravidae and 51.24 min for second gravidae. 19.2 % patients underwent LSCS and 9.64 % patients underwent instrumental vaginal delivery. There were minimal side effects. 92.9% patients were satisfied with the epidural technique

Conclusions: The combined spinal epidural is a safe technique with the potential to impact the progress of labour without increasing the risk of cesarean delivery. It does not increase the rate of instrumental vaginal delivery. Majority of patients expressed satisfaction with minimal side effects.

Key words: Labour analgesia, Walking epidurals, Ambulatory labour analgesia, Obstetric outcomes

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Introduction

Regional analgesia in labour has evolved dramatically in the past 20 years. The availability of newer drugs such as ropivacaine, newer adjuvants like fentanyl and technological advances such as “needle in needle” combined spinal epidural (CSE) technique has resulted in the increasing usage of regional analgesia for labour. The use of spinal opioids has resulted in instant pain relief without motor blockade, thus facilitating the ambulatory epidurals. Although the Obstetric Anaesthetist Association, UK¹ guidelines in 2005 have recommended use of CSE for patients in very early or in advance labour, recent Cochrane review by Simmons et al.² have shown that CSE is a safer technique which results in greater maternal satisfaction and faster ambulation. We, therefore, conducted a prospective study in primigravidae and second gravidae to answer 4 important questions;

1. Whether CSE is a safe technique at 4 cm cervical dilatation?
2. Does it affect the progress of labour?
3. Does it increase the rate of instrumental or operative deliveries?
4. Does it increase maternal satisfaction?

Materials and Methods

This prospective study was conducted in a single tertiary care center following the approval of the ethics committee in Indian patients only from March 2012 to June 2014. A written informed consent and the consent for publication were taken from all the patients.

A total of 228 primigravidae or second gravidae were included in this study. All the patients were evaluated before giving labour analgesia. Patients with a past history of bleeding disorders, cerebrovascular diseases, known allergy to local anesthetics, chronic renal or liver diseases, more than 4 cm cervical dilatation at the time of admission, known cephalopelvic disproportion and previous lower segment cesarean section (LSCS) were excluded. Only those patients belonging to American Society of Anaesthesiologist (ASA) physical status class I, II and III were selected irrespective of age.

Once in active labour, all patients were preloaded with 500 ml of ringer lactate solution prior to CSE. We monitored the pulse rate, blood pressure, oxygen saturation, electro cardiogram (ECG) and fetal heart rate intermittently. All patients were given CSE with single space “needle in needle” technique in the sitting position at 4cm cervical dilatation. 15 mcg of Inj fentanyl was given spinally and then started an infusion of 0.1% of Inj ropivacaine along with 2 mcg/ml fentanyl epidurally at a rate of 6 to 14 ml/hour. The patients were given clear fluids orally throughout the labour. They were encouraged to sit in bed and walk for at least one hour during the course of the labour. The labour was augmented by use of oxytocics in all the patients. It was monitored by serial internal examination and feeling for uterine contractions by

obstetric trainees. The duration of first and second stage of labour were noted. The patients were asked to push once rectal pressure was felt. The incidence of LSCS, mode of delivery, the side effects of the procedure and fetal wellbeing were documented. All instrumental deliveries were given an episiotomy. We, at the end of the delivery, asked the patient if they were satisfied with CSE and would like to take the epidural again during the subsequent pregnancy.

Statistical analysis: The data was managed in Microsoft excel spreadsheet. The demographics are described with average, standard deviation, minimum

and maximum observations (range). All the graphs and statistical analysis are done using Minitab 16.

Results

The mean duration of first stage of labour in primigravidae was 176.95 ± 57.33 (84 to 330) min and in second gravidae was 129.98 ± 30.04 (56 to 212) min. (Fig. 1). The speed of cervical dilation was 2.03 cm/hour for primigravidae and 2.76 cm/hour for second gravidae.

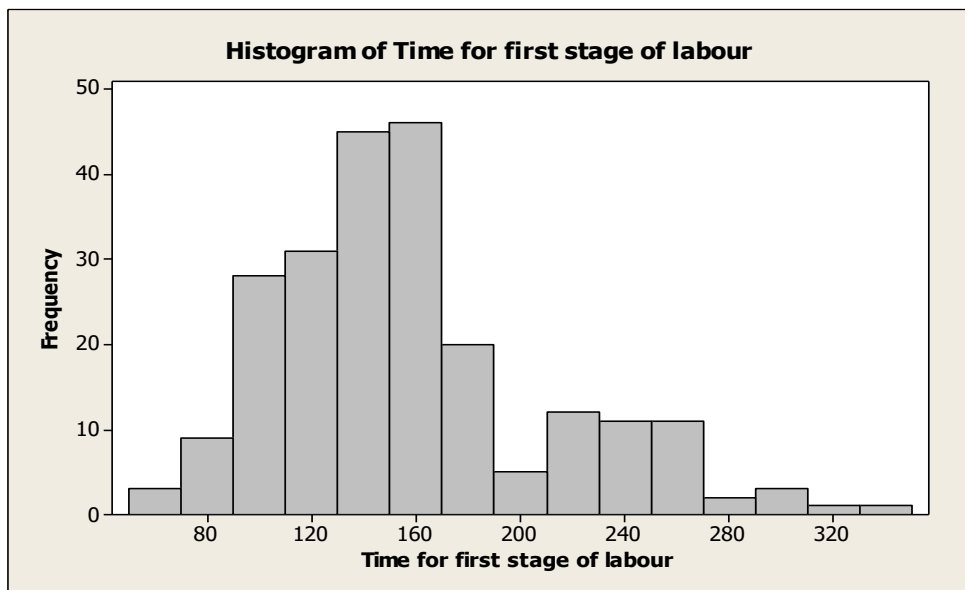


Fig. 1: Duration of first stage of labour

The mean duration of second stage of labour in primigravidae was 68.12 ± 13.7 (15 to 96) min and in second gravidae was 51.24 ± 12.84 (18 to 78) min. (Fig. 2).

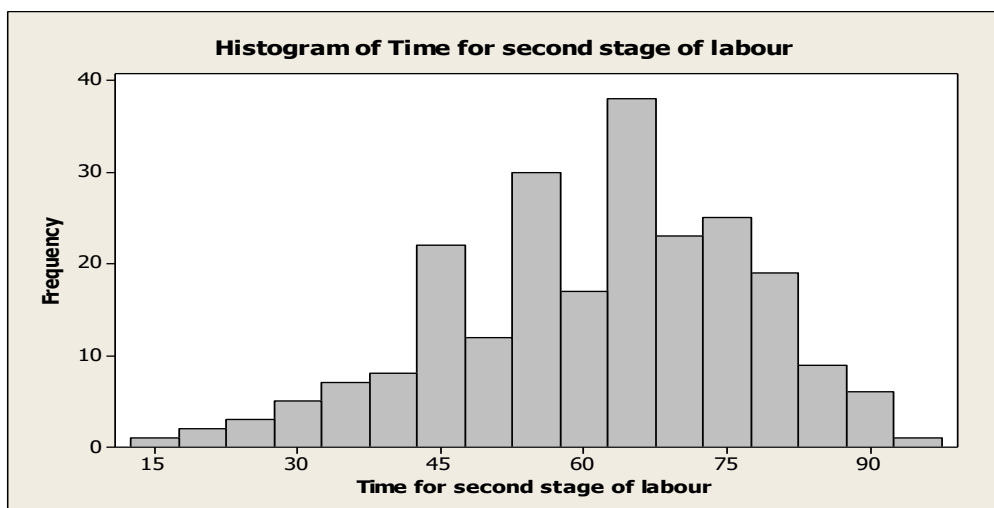


Fig. 2: Duration of second stage of labour:

Out of 228 patients 44 (19.2%) underwent LSCS and 22 (9.64%) patients underwent instrumental vaginal delivery (Fig.3).

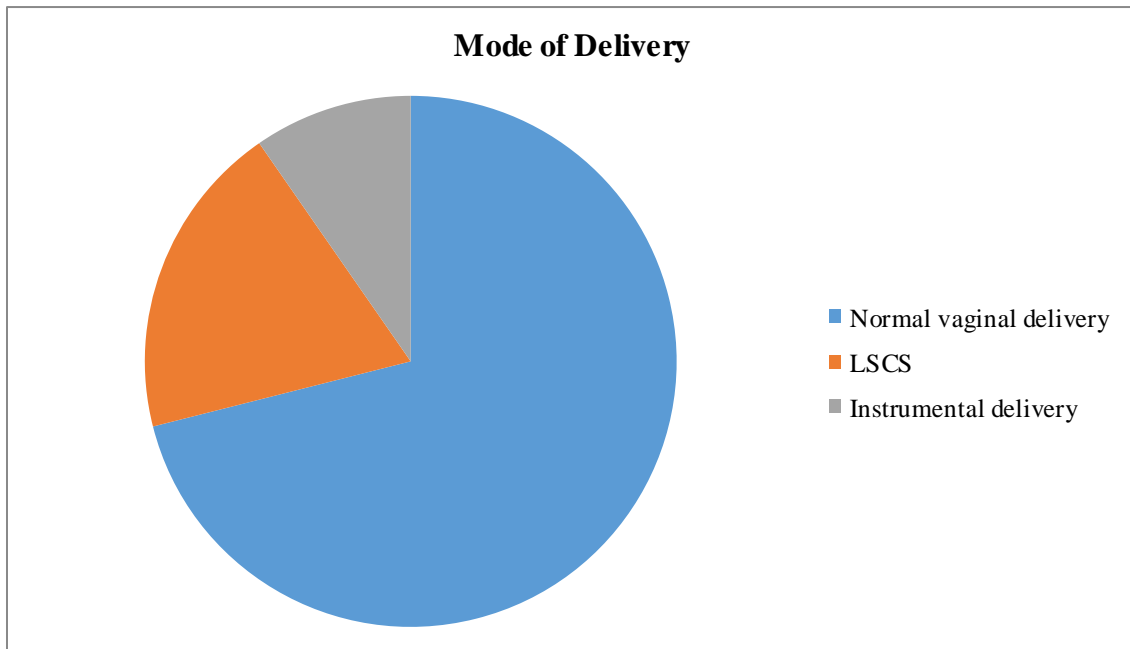


Fig. 3: The mode of delivery

Out of 228 patients 212 (92.98%) were satisfied with CSE (Fig. 4)

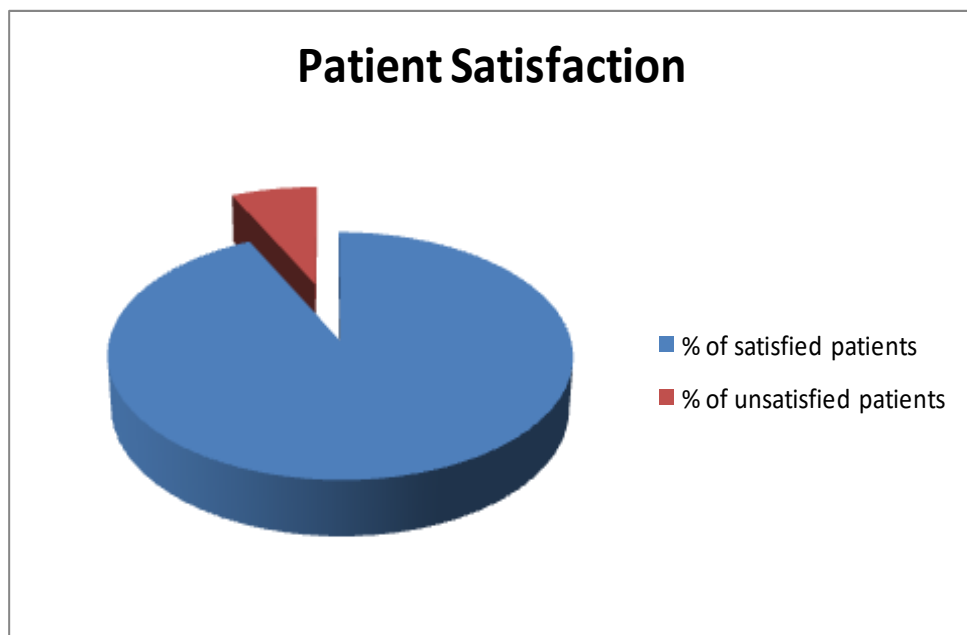


Fig. 4: Patient satisfaction

Discussion

Providing safe and effective labour analgesia has been an ongoing challenge for health care providers the world over. The improved knowledge of physiology and pharmacotherapy of labour pain along with development of obstetric anesthesia as a subspecialty has led to an overall improvement in pain relief in labour. Still there is a continuous on going debate on the impact of labour analgesia on the progress of

labour, mode of delivery, its safety and maternal satisfaction. We undertook this prospective study to evaluate the impact of ambulatory epidurals on the obstetric outcomes and to provide clinicians with a clear understanding of the issues related to this topic.

Effect on the duration of first stage of labour: There has been no randomized controlled trial which has reported duration of first stage of labour as the primary

outcome. In our study, the mean duration of first stage of labour in primigravidae was 176.95 ± 57.33 (84 to 330) min and in second gravidae was 129.98 ± 30.04 (56 to 212) min. The speed of cervical dilation was 2.03cm/hour for primigravidae and 2.76cm/hour for second gravidae. Anim-Somuah M et al.³ in 2005 Cochrane review found no difference between duration of first stage in patients receiving systemic opioids and epidural labour analgesia. However Wong et al.⁴ found that the duration was much shorter with CSE technique. Tsen et al.⁵ found that the rate of cervical dilatation was faster with CSE than with plain epidurals (2.3 vs 1.3 cm/hr) however Simmons et al.² in 2007 Cochrane review found no difference between the two groups. Since internal examinations are not done very frequently, the exact time of full cervical dilatation may be missed in patients with labour analgesia. The dense neuroaxial block can mask complaint of rectal pressure and hence prolong the first stage artificially. The uterine activity decreases due to decrease in production of oxytocin after administration of intravenous fluids. Since preloading is an essential part of CSE, we decided to augment all labours with oxytocin.⁶ Van de Velde et al.⁷ noted that the faster onset of pain relief in CSE results in sudden drop in maternal epinephrine concentration which causes uterine tachysystole. This may result in fetal bradycardia.

Effect on the duration of second stage of labour:

There has been a consensus that the neuroaxial analgesia prolongs the second stage by about 15 min.⁸ In our study, the mean duration of second stage of labour in primigravidae was 68.12 ± 13.7 (15 to 96) min and in second gravidae was 51.24 ± 12.84 (18 to 78) min. American college of Obstetricians and Gynecologists (ACOG) had revised the definition of second stage dystocia depending on the presence or the absence of neuroaxial anaesthesia.⁹ If the mother is well hydrated with adequate fetal head decent then just prolongation of second stage does not result in adverse fetal outcomes.⁶ Fraser WD et al.¹⁰ have found that the late pushing with epidural increases the rate of spontaneous vaginal delivery. The delay in pushing until lower fetal station was reached resulted in less maternal exhaustion.

The effect of epidural on operative delivery rates: In our study the rate of LSCS was 19.2%. Halpern et al.⁸ in a meta analysis found identical risk of LSCS between patients receiving systemic opioids and neuroaxial blockade. Sharma SK et al.¹¹ stated that neuroaxial block does not increase the risk of LSCS per se. In the COMET study,¹² no difference was found in the LSCS rates by increasing the concentrations of local anaesthetics. Wong et al.⁴ found that the timing of initiation of neuroaxial analgesia does not influence the LSCS rates.

The effect of epidural on instrumental delivery rates:

In our study the rate of instrumental delivery was only 9.64%. There are various factors which affect the incidence of instrumental vaginal delivery such as urge to bear down, fetal position and station, epidural induced motor blockade and so on. The dense epidural block can result in less effective maternal expulsive efforts.⁶

There is a tendency amongst obstetricians to perform instrumental deliveries in patients with analgesia rather than no analgesia. Also we have relied on continuous infusions rather than intermittent boluses of local anaesthetics. This also results in dense block.⁶ But at the same time, the late pushing with epidural increases the rate of spontaneous vaginal delivery. The delay in pushing until lower fetal station was reached resulted in less maternal exhaustion.

This may explain the higher normal vaginal delivery rates. In our study the rate of instrumental deliveries with CSE was similar to the rate of instrumental deliveries at our institute without CSE. Collis RE et al.¹³ found no difference in instrumental vaginal delivery rates between CSE and conventional epidural group but the COMET study¹² reported lower rate with CSE. Optimizing maternal comfort and minimizing the rates of instrumental deliveries still remains the challenge for the healthcare providers.

Maternal satisfaction:

According to Hodnett ED et al.¹³ maternal satisfaction during childbirth is a multi dimensional issue of which labour analgesia is just one component. It reflects the overall experience of labour. In our study 92.98% of patients were satisfied with CSE and are likely to opt for it during subsequent pregnancies. It also suggests that patients were satisfied with overall birthing process and in future as the awareness grows more patients will opt for labour analgesia.

Safety issues: 76 (33%) patients had itching and 22 (9%) patients had transient fetal bradycardia following CSE administration which responded to lateral tilt and oxygen therapy. None of the patients required the use of naloxone. 2 (0.8%) patients had retained placenta which was removed manually. 8 (3.5%) patients had atonic post partum hemorrhage which responded to medical line of management. No neonate had APGAR scores of less than 7 at 1 and 5 minutes post delivery.

Conclusion

The CSE is a safe technique. It has the potential to impact the progress of labour. It does not increase the risk of cesarean delivery or the rate of instrumental vaginal delivery. There are minimal side effects. Majority of patients expressed satisfaction with the method of labour analgesia.

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Conflict of interest: None

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