Original Research Article

A prospective study of comparison of analgesia and foetal outcome in term parturients with and without low dose combined spinal epidural labour analgesia

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Abstract

Background: Ideally pain relief with epidural techniques should be produced with minimum disturbance to the progress of labour or to sympathetic functions, sensory functions (proprioception) and motor functions of the CNS. **Materials and Methods:** This study was undertaken after obtaining approval from the Research and Ethics committee of the hospital. Written informed consent was obtained from all parturients. This study did not interfere with the normal obstetric management technique employed in this hospital. This is a prospective case control study. The study population included 120 pregnant women 60 of who were given labour analgesia-'GROUP T' and 60 of who underwent a delivery without labour analgesia-'GROUP C'. Studied patients were ASA physical status I and II parturients with term singleton gestations and cephalic presentation who requested analgesia. When the patient was in active labor, achieving a cervical dilation of 3-4cm and requested analgesia, a combined spinal-epidural technique was used. Parturients were excluded who were unwilling, any contraindication to regional technique, history of local anesthetic allergy, psychological or neurological diseases. **Results:** There were no differences between the groups with respect to demographic and labor characteristics. Gestational age. Height and weight, Parity, cervical dilatation at which analgesia was instituted, were compared and no significant difference was obtained ($p>0.05$). Though a higher mean systolic and diastolic BP, pulse rate were seen in stage 2 in both groups, the vitals were significantly lower in Group T in both stage 1 and 2 when compared to Group C. **Conclusion:** Low dose' labour analgesia is a safe technique for painless labour with no harmful effects on the mother or baby and it does not significantly affect the obstetric outcome.

Key Words: ASA, Parturients, local anesthetic allergy, systolic and diastolic BP

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INTRODUCTION

Ideally pain relief with epidural techniques should be produced with minimum disturbance to the progress of labour or to sympathetic functions, sensory functions (proprioception) and motor functions of the CNS. Thus it is *important* that the obstetric anaesthetist strikes a balance between patient satisfaction by providing good analgesia and reducing motor block thus making the parturient participate in labour and decreases instrumental deliveries due to prolonged second stage.[1] Labor pain, like other types of acute pain, has negative effects on the respiratory, cardiovascular, neuroendocrine and limbic systems. Several authors have attempted to find a safe method of labor analgesia without side effects on the

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mother and fetus.[2] Combined spinal and epidural blockade is an effective means of providing analgesia during labor. Bupivacaine is widely used to provide efficient epidural analgesia in labor. Dilute solutions of epidural local anesthetic combined with opioids may be used to minimize unwanted motor block. The amount by which fentanyl reduces local anesthetic dose requirement depends on the dose on fentanyl.[3] We aimed to compare the efficacy and side effects in mother and fetus of bupivacaine solutions containing fentanyl for labor analgesia by continuous epidural infusion. Fentanyl was added to bupivacaine as it reduces the local anesthetic requirement.

MATERIALS AND METHODS

This study was undertaken after obtaining approval from the Research and Ethics committee of the hospital. Written informed consent was obtained from all parturients. This study did not interfere with the normal obstetric management technique employed in this hospital. This is a prospective case control study. The study population included 120 pregnant women 60 of who were given labour analgesia-'GROUP T' and 60 of who underwent a delivery without labour analgesia-'GROUP C'. Studied patients were ASA physical status I and II parturients with term singleton gestations and cephalic presentation who requested analgesia.[4] When the patient was in active labor, achieving a cervical dilation of 3-4cm and requested analgesia, a combined spinal-epidural technique was used. Parturients were excluded who were unwilling, any contraindication to regional technique, history of local anesthetic allergy, psychological or neurological diseases. After establishment of good labour pains and cervical dilatation of 3–4cm, the parturients were placed either in left lateral position or in sitting position. The back was painted with povidone iodine and the area draped. The L2-3interspace was identified and the skin over it was infiltrated with 2ml of 2% lignocaine using a 26G hypodermic needle. First spinal analgesia using a 26G Quincke's needle with fentanyl 15mcg diluted to 0.5ml with sterile saline was given and needle withdrawn.[5,6]Next the L3-4 or L2-3 space was identified, a 18G Tuohy epidural needle was inserted. The epidural space was identified by the loss of resistance to saline technique. An epidural catheter was threaded 4-5cm into the epidural space and fixed to the back of the parturient. A 10ml bolus of 0.1% bupivacaine was given followed by an infusion of 0.1% bupivacaine with fentanyl 1mcg/ml at 6-12ml/hr. The woman was given a left lateral tilt of 150subsequently and was catheterized with Foleys catheter. Her vital parameters, progress of labour, efficacy of analgesia and fetal welfare were closely monitored. The group C or control group of the study was those pregnant patients at term who underwent a normal vaginal delivery with intermittent boluses of tramadol to provide pain relief. Mother's vital parameters, PR, BP and SPO2 were recorded throughout the study at regular intervals as per proforma. Maternal hypotension (more than 10% drop from the baseline) was treated by increasing the rate of IV fluids. Duration of I and II stage were noted in both the groups. Degree of pain relief–measured using VAS score during 1stand 2ndstage. Foetal monitoring–auscultation of FHS every15min was carried out to know the type of deceleration if any. APGAR score was assessed at 1, 5 and 10th min. Intervals following delivery in both the groups. Complications like fetal distress, meconium aspiration were noted and resuscitation to new born or shift to NICU was also noted. Patients who received drugs (tramadol) for pain relief was noted. Adverse effects because of procedure and drugs used monitored. Descriptive statistical analysis has been carried out in the present study. Results on continuous measurements are presented on Mean±SD (Min-Max) and results on categorical measurements are presented in Number (%). Significance is assessed at 5 % level of significance. Cases of the samples should be independent Student t test (two tailed, independent) has been used to find the significance of study parameters on continuous scale between two groups Inter group analysis) on metric parameters, Chi-square/Fisher Exact test has been used to find the significance of study parameters on categorical scale between two or more groups.

RESULTS

There were no differences between the groups with respect to demographic and labor characteristics. Gestational age. Height and weight, Parity, cervical dilatation at which analgesia was instituted, were compared and no significant difference was obtained ($p>0.05$). Though a higher mean systolic and diastolic BP, pulse rate were seen in stage 2 in both groups, the vitals were significantly lower in Group T in both stage 1 and 2 when compared to Group C.

Table 1: Comparison of Pain score (VAS) between Two groups in stage 1 and 2 of labour

VAS Score	Group C (n=60)	Group T (n=60)	P Value
I	8.65±0.32	0.63±1.00	<0.001
II	9.75±0.34	1.32±1.54	<0.001

Table 2: Comparison of Duration of labour in 1st and 2nd Stage of labour in min. between Two groups

Duration of labour in minutes	Group C (n=60)	Group T (n=60)	P Value
Stage I	423.16±99.32	468.7±111.32	0.024
Stage II	30.2±15.34	32.65±16.54	0.368

Table 3: Comparison of Apgar score between Two groups

	Apgar score			P Value
	0-3	4-6	7-10	
1 minute				
Group C	-	6(10%)	53(90%)	
Group T	-	6(10%)	53(90%)	NS
5 minute				
Group C	-	0	60(100%)	
Group T	-	1(1.7%)	58(83.2%)	NS
10 minute				
Group C	-	-	60(100%)	
Group T	-	-	60(100%)	NS

Table 4: Comparison of Mode of delivery between Two groups

Mode of Delivery	Group C (N=60)	Group T (N=60)
NVD	41(68.3%)	39(65%)
LSCS	17(28.2%)	17(28.5%)
FORCEPS	0	3(5.0%)
VACCUM	2(3.3%)	1(1.7%)
INFERENCE	Distribution of Mode of delivery is statistically similar between two groups with P=0.515(2X4 Fisher Exact test)	

DISCUSSION

They observed that by reducing the concentration, the quality of analgesia was not affected, and lower concentrations of local anaesthetics minimized or prevented the motor block. Studies by Reynolds revealed that only combination of opioids and local anaesthetics produced successful analgesia on initial and repeat administration and had a significantly quicker onset and longer duration of action. The combination of bupivacaine and an opioid has a synergistic effect on pain relief at lower doses of the either drug. The opioid most commonly used with bupivacaine is fentanyl. Recently alfentanil and sufentanil have been tried for labour analgesia without added advantage. Serutton MJ, Porter JS, Sullivan GO, did a study to know the impact of the introduction of low-dose epidural (bupivacaine 0.1%/fentanyl 2µgm/ml) compared with bupivacaine 0.25% for labour analgesia. The groups were compared for outcome of labour, quality of analgesia and any adverse events related to the epidural analgesia. There was a significant reduction in the low-dose group in the number of women requiring instrumental delivery. Maternal satisfaction regard to pain relief was high in both groups.[7]We found in Group-T pain scores were between 7-10 before giving labour analgesia (CSE) which dropped to mean pain score of 0.67±1.00 in the 1stand 1.33±1.55 in the 2nd stage of labour. They thus had the appreciable pain relief in 2ndstage of labour.[8] There is an expected increase in catecholamines in normal parturients. This increase in the mean pulse rate in the first and second stage of labour was seen in the normal parturients (Group C). After the establishment of the epidural injection in Group-T the mean rise of systolic and diastolic BP and HR in both stage 1 and 2 was not marked. We also observed a more constant heart rate in Group T. This suggests a well-controlled stress response with the use of CSE. Reynolds *et al* also reported the combination of bupivacaine (10-12mg) with fentanyl (80µg) to effectively relieve first stage pain rather than bupivacaine or fentanyl used alone thus shortening the first stage. Unlike in Reynolds study we noted that the duration of the 1ststage of labour was slightly more prolonged in Group T. However the obstetricians felt that labour was more prolonged in 7 parturients in Group C and only 1 parturient in group T. These parturients underwent an LSCS.[9] James reported attenuation of endogenous oxytocin during second stage by epidural block which reduced the uterine contractility. However

lower concentration of local anesthetics helps retention of pelvic floor sensation and is also less likely to affect endogenous oxytocin production and therefore will not unduly prolong labour. In the present study we found appreciably less incidence of prolonged labour (5.9% in Group T and 41.2% in Group C) with the use of "low dose" CSE. Fetal outcome have been assessed in a number of ways. Cohen S E *et al* measured neonatal condition by time to sustained respiration, APGAR scores, neurobehavioural scores and blood gas analysis. They reported no fetal heart rate variability when 2µg/ml of fentanyl was used in the epidural space with bupivacaine, in varying concentrations.[10]

CONCLUSION

Low dose' labour analgesia is a safe technique for painless labour with no harmful effects on the mother or baby and it does not significantly affect the obstetric outcome.

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