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Comparative evaluation of continuous epidural infusion of 0.0625% Bupivacaine + 0.0002% Fentanyl and 0.1% Ropivacaine + 0.0002% Fentanyl for labour analgesia

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Aim and Objectives: To compare the total dose of Fentanyl and Bupivacaine with total dose of Ropivacaine and fentanyl in terms of total volume delivered-loading, infusion and top ups. Also, to compare Analgesic efficacy (VAS score) and adverse events if any. **Methods:** 60 ASA physical status I or II parturients in labour who were either primigravidae or gravida 2 were included in a randomized, single blind, prospective study. After a bolus dose of 0.125 % Bupivacaine and 25 mcg Fentanyl, the group BF received a continuous epidural infusion of 0.0625% Bupivacaine and 0.0002% Fentanyl whereas the group RF received a bolus of 0.2% Ropivacaine and 25 mcg Fentanyl followed by an infusion of 0.1% Ropivacaine and 0.0002% Fentanyl. **Results:** The Group BF and Group RF were comparable with respect to their physical parameters. It was seen that the pain relief in the group BF was excellent for 8 out of 30 patients (26.67%) whereas for the group RF it was excellent for 9 of 30 patients (30%). After that till delivery, both the groups had a comparable mean maternal pulse rate (p value >0.05). None of the parturient in study or control group ever had an episode of bradycardia. Throughout the remaining period of analgesia, the mean foetal heart rate was comparable between the two groups. In the present study groups only 2 parturients from group BF and only one parturient from group RF underwent caesarean section due to foetal distress. 6 parturients (20%) from group BF and 5 parturients (16.67%) from group RF developed hypotension. **Conclusion:** Continuous infusion of 0.1% Ropivacaine + 0.0002 % Fentanyl provides equipotent labour analgesia and maternal satisfaction as 0.0625% Bupivacaine + 0.0002% Fentanyl infusion can provide.

Keywords: Bupivacaine, Fentanyl, Ropivacaine, Parturient, Caesarean section, Foetal distress

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Introduction

The pain of childbirth is often rated by women as being most painful experience of their lives. It is estimated that about two third of normal healthy pregnant women, suffer severe intolerable pain during labour and only 2% describe it as little or no discomfort. There are several factors which influence parturition pain and its severity varies widely. It is influenced by parity, primiparous women experience more pain during early labour while multiparous women feel greater pain in the second stage [1,2].

Pharmacological Methods Labour pain represents the most common form of acute severe pain and lack of treatment results in severe psychological and systemic effects. The pain of the early first stage of labor arises from dilation of the lower uterine segment and cervix. Pain from the late first stage and second stage of labor arises from descent of the fetus in the birth canal, resulting in distension and tearing of tissues in the vagina and perineum. An array of regional nerve blocks, systemic analgesic, and nonpharmacologic techniques are currently used for labor analgesia. Nonpharmacologic methods are commonly used, but the effectiveness of these techniques generally lacks rigorous scientific study. Continuous labor support has been shown to decrease the use of pharmacologic analgesia and shorten labor. Intradermal water injections decrease back labor pain [3,4].

01. Inhalational techniques include use of Entonox (Premixed 50:50% O_2 + N_2O), Trichloroethylene (0.35%-0.5%), methoxyflurane (0.35%), Enflurane (0.5%) and Isoflurane (0.2-0.7%).
02. Systemic analgesics used to relieve labour pain include opioids like Pethidine, Morphine, Pentazocine, Butorphenol, Fentanyl, Buprenorphine etc; Sedatives and Anxiolytics like Choral Hydrate, Nitrazepam, Promazine, Diazepam etc.
03. Regional analgesia by various methods.

Non-Pharmacological Methods

01. Psychological methods include Psychoprophylaxis and Read Method.
02. Physical methods include Immersion in water during Active labour, Hypnosis, Acupuncture, TENS (Trans Cutaneous Electrical Nerve Stimulation) etc.

The present study was design to be with the current Era of technical advancement, out of all the techniques, the most popular and widely accepted option of epidural administration of local anesthetic with Opioid was selected i.e. A Comparative study of efficacy of Bupivacaine with Fentanyl and Ropivacaine with Fentanyl for pain relief in labour and delivery.

Materials and Methods

Study setting: The present study was carried out in the Department of Anesthesiology, Critical care and Pain management. Choithram Hospital and Research Centre, Indore. (M.P)

Ethical consideration and permission: Approval was obtained from the Hospital Ethics Committee. Pre-Procedural Clinical Systemic Assessment along with written informed consent was obtained from all parturients.

Study design: The present study was a prospective observational study.

Study duration: The present study was conducted from 01-January-2011 to 30-June-2012.

Objective of the dissertation: To compare the analgesic efficacy and safety of the continuous infusion of 0.0625% Bupivacaine with 0.0002% Fentanyl versus 0.1% Ropivacaine with 0.0002% fentanyl following the bolus dose of 10 ml of 0.125% Bupivacaine with 25 µg fentanyl and 10 ml of 0.2% Ropivacaine with 25 µg fentanyl respectively for epidural analgesia in labour**.**

Inclusion criteria

- Parturient (primipara) of ASA Physical Status I-II, in established labour (at least one painful contraction in 5 minutes) at term giving written, informed consent.
- Gestational Age of 36-40 weeks.
- Single foetus with cephalic presentation.
- Foetus having normal heart rate pattern before induction of epidural analgesia.
- Cervical dilatation of 3 cm.

Exclusion criteria

- Cervical Dilatation less or more than 3 cm
- Weight of Parturient more than 90 kilograms
- Age more than 35 years.
- Previous Administration of Sedatives in last four hours.

- Anatomical deformity of Spine or any local infection

The further drug administration was as follows:

Group BF(30 Parturients)	Group RF(30 Parturients)
Bolus Dose: 10 ml. of 0.125 % Bupivacaine + 25µg Fentanyl.	Bolus Dose: 10 ml. of 0.2 % Ropivacaine + 25µg Fentanyl.
Infusion: 8 ml./hr of 0.0625 % Bupivacaine + 0.0002% Fentanyl (2µg/ml)	Infusion: 8ml./hr of 0.1% Ropivacaine + 0.0002% Fentanyl (2µg/ml)

The infusion was continued till delivery of baby. Following delivery, the epidural catheter was removed and a tincture benzoin seal was given. The tip of the catheter was checked for intactness.

Assessment and monitoring

The following parameters were assessed

01. Maternal Heart Rate and Blood Pressure (Noninvasive blood pressure)
02. Pain Score Using Visual Analogue Scale (VAS)
03. Motor Blockade (Using Bromage Scale)
04. Foetal Heart Rate. (Using Non-Stress Test Machine)
05. Occurrence of Adverse Events like hypotension, pruritis, bradycardia, nausea, emesis and urinary retention.
06. Maternal Satisfaction following Delivery -This was done by asking the parturient to rate the pain relief in both the first and second stages as Excellent/ Good/ Fair/ Poor.
07. Incidence of instrumental delivery and caesarean section

Statistical analysis: Maternal satisfaction was statistically analyzed using Fisher's Exact Test. For other parameters like maternal pulse rate, blood pressure and foetal heart rate Students 't' test and Chi-Square test were applied. The charts and tables are designed from the data obtained from every patient and compiled from the master chart. Data is expressed as Mean ± SD. Statistical analysis was performed using p value. A p value less than 0.05 was considered significant.

Results

The Group BF and Group RF were comparable with respect to their physical parameters (Table 1).

Table-1: Comparison of anthropometric variables and age of parturient between two groups

Variables	Group						Unpaired T-test applied		
	BF			RF					
	No.	Mean	SD	No.	Mean	SD	T-value	p-value	Difference is-
Age (years)	30	26.83	3.13	30	26.87	2.58	-0.450	0.96	Not Significant
Height (cm)	30	153.03	2.41	30	152.97	3.76	0.818	0.94	Not Significant
Weight (kg)	30	59.87	3.86	30	59.37	4.32	0.473	0.64	Not Significant

The two groups were statistically comparable in terms of obstetric parameters like gravida and cervical dilatation since p >0.5 (Table 2), whereas the comparison between the two groups based on the pulse rate at various intervals was summarized in Table 3.

Table-2: comparison of obstetric variables of mothers between the two groups

Variables	Group						Unpaired T-test applied		
	B			R					
	No.	Mean	SD	No.	Mean	SD	T-value	p-value	Difference is-
Gravida	30	1.2	0.407	30	1.17	0.379	0.328	0.74	Not Significant
Cervical dilatation (cm)	30	3.0	-	30	3.0	-	-	-	Not Significant
Baby weight (kg)	30	2.743	0.417	30	2.884	0.444	-1.27	0.21	Not Significant

Table-3: Comparison of pulse at various intervals between the two groups.

Pulse (beats/min)	Group						Unpaired T-test applied		
	BF			RF					
	No.	Mean	SD	No.	Mean	SD	T-value	p-value	Difference is-
0 min	30	96.7	16.1	30	97.1	15.1	-0.992	0.92	Not significant
Bolus	30	94	14.8	30	92.7	13.5	0.346	0.73	Not significant
5 min	30	86.2	14	30	89.83	13.4	-1.02	0.31	Not significant
10 min	30	84	13.9	30	91.3	17.3	-1.79	0.078	Not significant
15 min	30	83.9	13.1	30	89.67	15.9	-1.54	0.13	Not significant

30 min	30	82.5	11.4	30	88.07	11.8	-1.85	0.070	Not significant
60 min	30	81.1	9.47	30	85.1	8.93	-1.71	0.092	Not significant
120 min	18	81.5	9.41	17	84.12	9.71	-0.81	0.42	Not significant
180min	10	77.4	8.54	7	84.86	11.1	-1.57	0.14	Not significant
240 min	6	76	10.1	6	86.2	15.8	-1.33	0.21	Not significant
300 min	4	78.5	9.15	4	85.5	16.2	-0.753	0.48	Not significant
360 min	2	85		2	87				

Table-4: Comparison of mean blood pressure at various intervals between the two groups

Systolic BP at-	Group						Unpaired T-test Applied		
	B+F			R + F					
	No.	Mean	SD	No.	Mean	SD	T-value	p-value	Difference is-
0 min	30	95.7	9.23	30	93.6	8.52	0.916	0.36	Not Significant
Bolus	30	91.9	9.17	30	89.6	9.49	0.968	0.34	Not Significant
5 min	30	89.2	8.51	30	88.9	10.6	0.121	0.90	Not significant
10 min	30	86.8	8.98	30	89.7	10.1	-1.16	0.25	Not Significant
15 min	30	86.2	9.46	30	88.2	9.49	-0.817	0.42	Not Significant
30 min	30	85.1	9.89	30	86.8	9.54	-0.678	0.50	Not Significant
60 min	30	83.3	9.74	30	85.7	9.56	-0.90	0.33	Not Significant
120 min	18	81.7	8.32	17	81.9	9.59	-0.906	0.93	Not significant
180 min	10	81.5	8.40	7	82.4	11.3	-0.195	0.85	Not Significant
240 min	6	78.7	6.15	6	83.3	11.5	-0.876	0.40	Not Significant
300 min	4	79	4.76	4	84.2	15.2	-0.659	0.53	Not Significant
360 min	2	78		2	94				

Table-5: Comparison of foetal heart rate at various intervals between the two groups.

Foetal heart Rate at-	Group						Unpaired T-test applied		
	B+F			R + F					
	No.	Mean	SD	No.	Mean	SD	T-value	p-value	Difference is-
0 min	30	140	11.6	30	138	12.5	0.662	0.51	Not Significant
Bolus	30	141	10.1	30	138	10.1	0.806	0.42	Not Significant
5 min	30	140	9.68	30	138	9.05	0.496	0.62	Not significant
10 min	30	140	8.78	30	137	9.18	1.32	0.19	Not Significant
15 min	30	138	7.81	30	138	9.14	-0.304	0.98	Not Significant
30 min	30	136	9.78	30	138	9.16	-0.859	0.39	Not Significant
60 min	30	136	8.41	30	138	7.96	-0.836	0.41	Not Significant
120 min	18	139	6.94	17	139	7.15	-0.192	0.85	Not Significant
180 min	10	140	6.73	7	137	5.97	0.716	0.49	Not Significant
240 min	6	143	4.34	6	140	6.62	1.03	0.33	Not Significant
300 min	4	144	1.63	4	140	10.2	0.867	0.42	Not Significant
360 min	2	141		2	148				

The comparison of the mean blood pressure between the group at various intervals is depicted in Table 4.

Table-6: Groupwise comparison of maternal satisfaction

Maternal Satisfaction		Group		Total
		B+F	R + F	
Good	No.	22	21	43
	%	73.33	70	71.67
Excellent	No.	8	9	17
	%	26.67	30	28.33
Total	No.	30	30	60
	%	100	100	100

Throughout the remaining period of analgesia the mean foetal heart rate was comparable between the two groups. This absence of a statistically significant difference between the two groups throughout the study indicates the safety of both Bupivacaine with Fentanyl and Ropivacaine with Fentanyl for labour

Analgesia in their respective concentrations as used in this study (Table 5).

Groupwise comparison of maternal satisfaction was represented in Table 6.

Table-7: Comparison of visual analog scale score at various intervals between the two groups

VAS at-	Group						Unpaired T-test applied		
	B+F			R + F					
	No.	Mean	SD	No.	Mean	SD	T-value	p-value	Difference is-
Baseline	30	10	0	30	10	0	-	-	-
Bolus	30	8.93	1.89	30	8.93	1.89	0	1	Not Significant
5 min	30	4.77	2.78	30	4.70	2.72	0.94	0.93	Not Significant
10 min	30	2.73	2.46	30	2.40	2.42	0.53	0.60	Not Significant
15 min	30	1.73	1.82	30	1.43	2.03	0.603	0.55	Not Significant
30 min	30	1.03	1.43	30	0.767	1.36	0.742	0.46	Not Significant
60 min	30	0.767	1.1	30	0.533	0.937	0.882	0.38	Not Significant
120 min	18	0.556	0.856	17	0.176	0.393	1.67	0.10	Not Significant
180 min	10	0.4	0.843	7	0	0	1.24	0.23	Not Significant
240 min	6	0.333	0.516	6	0	0	1.58	0.14	Not Significant
300 min	4	0.250	0.5	4	0	0	1	0.36	Not Significant
360 min	2	0		2	0				

Subsequently at every intervals as per chart, it was seen that p>0.05 and thus the pain relief in both the groups was comparable (Table 7).

Table-8: Mode of delivery in two groups

Delivery		Groups	
		BF	RF
Ventouse	No	3	3
	%	10%	10%
Caesarean section	No.	2	1
	%	6.67%	3.33%
Vaginal	No	25	26
	%	83.33%	86.67%
Total	No	30	30
	%	100%	100%

In the group BF, there were 3 deliveries by ventouse (10%) and there were 3 deliveries by ventouse (10%) in group RF. The ventouse application was due to prolonged second stage. This difference was statistically not significant (Table 8).

Table No.-9: Groupwise comparison of adverse effects

Adverse Effects	Group			Total	P Value
		BF	RF		
Instrumental Delivery	No.	3	3	6	>0.05
	%	10%	10%	10%	
Hypotension	No.	6	5	11	>0.05
	%	20%	16.67%	18.33%	
Motor blockade	No.	0	0	0	-
	%	0%	0%	0%	
Total	No.	9	8	17	>0.05
	%	30%	26.67%	28.33%	

The Group BF and Group RF were comparable with respect to their physical parameters. It was seen that the pain relief in the group BF was excellent for 8 out of 30 patients (26.67%) whereas for the group RF it was excellent for 9 of 30 patients (30%). After that till delivery, both the groups had a comparable mean maternal pulse rate (p value >0.05). None of the parturient in study or control group ever had an episode of bradycardia. Throughout the remaining period of analgesia the mean foetal heart rate was comparable between the two groups. In the present study groups only 2 parturients from group BF and only one parturient from group RF underwent caesarean section due to foetal distress. 6 parturients (20%) from group BF and 5 parturients (16.67%) from group RF developed hypotension (Table 9).

Discussion

Satisfactory relief in pain and bare minimal motor block are necessary for an ideal epidural labour analgesia. Safety of the technique is also important for both the mother and the foetus and should not interfere with the progress or course of labour. The use of low dose local anaesthetic in continuous epidural infusion in parturients via infusion pump has been advocated earlier by investigators. Continuous epidural infusion of dilute solutions of local anaesthetics provides good analgesia during

Labour with minimal fluctuations of the cardiovascular parameters after the initial blockade is established. Because intermittent injection of local anaesthetics into the epidural space carries with it the risk of maternal hypotension and waxing and waning of pain, so continuous epidural infusion may be preferable to minimize the cardiovascular effects of epidural analgesia and to avoid fluctuation in pain relief. Another advantage of the continuous infusion technique is the minimal motor blockade allowing the parturient to change position without assistance and move around with assistance if desired. The present study evaluated the clinical efficacy and maternal and foetal effects of continuous epidural infusion using Bupivacaine-Fentanyl and Ropivacaine- Fentanyl mixture. Drug concentrations and infusion rates were selected and modified with respect to previously published studies, to suit the Indian parturient. James JN et al studied awareness and attitudes towards labour pain and labour pain relief of urban women attending a private antenatal clinic in Chennai, India. Similar study was done by Shidhaye RV et al studied awareness and attitude towards labour analgesia of Indian pregnant women. The aim of this study was to find out the awareness and attitude of pregnant Indian women attending antenatal clinic of our hospital towards labour analgesia. Most of the Indian parturients still suffer from agony of labour pains due to lack of awareness. The awareness level needs to be improved about the availability of the labour analgesia service, as majority of them is keen to listen to the information provided. The involvement of obstetricians is crucial in this education program [5,6]. Othman M et al Non-opioid drugs for pain management in labour. Objective was to summarise the evidence regarding the effects and safety of the use of non-opioid drugs to relieve pain in labour. Opioids appear to be superior to non-opioids in satisfaction with pain relief, while non-opioids appear to be superior to placebo for pain relief and satisfaction with the childbirth experience. There were little data and no evidence of a significant difference for any of the comparisons of non-opioids for safety outcomes. Overall, the findings of this review demonstrated insufficient evidence to support a role for non-opioid drugs on their own to manage pain during labour. In this review they have assessed the evidence on the effectiveness and safety of non-opioid drugs in the management of pain in labour. Non-opioid drugs are used to control mild to moderate pain and include non-steroidal anti-inflammatory drugs, paracetamol, antispasmodics, sedatives and antihistamines. In The past, these drugs were used to help reduce women's anxiety and thus aid pain relief. Currently, they are not commonly used for pain relief in labour. However, they may still however be offered during the early stages of labour in some countries [7]. Van der Vyver M et al did a meta-analysis on patient-controlled epidural analgesia versus continuous infusion for labour analgesia Patient-controlled epidural analgesia (PCEA) is a relatively new method of maintaining labour analgesia. There have been many studies performed that have compared the efficacy of PCEA with continuous epidural infusion (CEI). The purpose of this systematic review is to compare the efficacy and safety of PCEA and CEI. Patients who receive PCEA are less likely to require anaesthetic interventions, require lower doses of local anaesthetic and have less motor block than those who receive CEI. Future research should be directed at determining differences in maternal satisfaction and obstetric outcome [8]. Tveit TO et al did a randomised, controlled trial comparing the analgesic efficacy and side-effects of remifentanil intravenous patient-controlled analgesia (IVPCA) with walking epidural analgesia (EDA) during labour. Visual analogue scale was used for pain assessment. Maternal heart rate, blood pressure, oxygen saturation, respiratory rate, sedation, nausea/vomiting, itching, satisfaction and fetal/neonatal outcome were recorded. Remifentanil IVPCA and epidural provided effective analgesia, with high maternal satisfaction scores and reassuring neonatal outcome. Remifentanil produced more maternal sedation and oxygen desaturation. Close monitoring is, therefore, mandatory [9]. Patkar CS et al did a comparison of continuous infusion and intermittent bolus administration of 0.1% ropivacaine with 0.0002% fentanyl for epidural labor analgesia. Minimal consumption of local anesthetic and opioid for epidural labor analgesia has been advocated for safe obstetric outcome and superior maternal satisfaction. The primary objective of this study was to evaluate and compare the analgesic efficacy of mode of administration of epidural 0.1% ropivacaine with 0.0002% fentanyl via continuous infusion or intermittent boluses during labor. Intermittent bolus administration provides a more efficacious route of drug delivery when compared to continuous infusion by significantly decreasing the total amount of local anesthetic plus opioid without adversely affecting patient safety or maternal satisfaction [10]. Fernández-Guisasola J et al compared the analgesic efficacy and the degree of motor block achieved with epidural infusion of 0.0625% bupivacaine

(Group B) versus 0.1% ropivacaine (Group R), both with 0.0002% fentanyl (2 μg/mL) in laboring patients. A prospective, double-blinded study was performed in 98 ASA physical status I-II parturients who were divided randomly into two groups to receive either bupivacaine or ropivacaine after catheter location had been tested with an initial bolus of lidocaine and fentanyl. The infusion rate was 15 mL/h in every case. They recorded pain intensity, level of sensory block, degree of motor block, hemodynamic variables, secondary effects, mode of delivery, neonatal outcome, and patient satisfaction. There were no statistically significant differences in any of the factors analyzed. Highly effective analgesia was achieved in both groups with a small incidence of motor block. These findings suggest that bupivacaine may be more potent than ropivacaine [11]. The study by Li Y et al compares the effectiveness of bupivacaine and fentanyl (BUPI-FEN) and ropivacaine and fentanyl (ROPI-EFN) in epidural analgesia for labor pain through a meta-analysis of relevant randomized clinical trials. It was concluded that in combination with fentanyl, bupivacaine and ropivacaine exhibit comparable efficacy and safety. However, BUP-FEN analgesia led to a shortened second-stage labor and ROPI-FEN resulted in a significantly lower incidence of motor block [12]. In similar studies, Lee et al compared epidural infusions for labor analgesia, a comparison of 0.2% ropivacaine, 0.1% ropivacaine, and 0.1% ropivacaine with fentanyl. All solutions provided effective analgesia during early labor, with all groups requiring similar numbers of supplementary top-ups. It was concluded that epidural infusion of 0.1% ropivacaine alone at 10 mL/h provided adequate analgesia in the first stage of labor, and that the addition of 2 μg/mL fentanyl to that concentration improved analgesia to a quality similar to 0.2% ropivacaine alone [13]. Wang LZ et al did a study aimed to compare the analgesic efficacy, motor block and side effects of bupivacaine, ropivacaine and levobupivacaine at lower concentrations for patient-controlled epidural labor analgesia. There were no significant differences among groups in the numbers of effective analgesia, pain scores, hourly local anesthetic amount used, sensory and motor blockade, labor duration and mode of delivery, side effects and maternal satisfaction (P>0.05). The relative median potency was bupivacaine/ropivacaine: 0.828 (0.602–1.091), bupivacaine/levobupivacaine: 0.845 (0.617–1.12), ropivacaine/ levobupivacaine: 1.021 (0.774–1.354), Respectively. However, a significantly less number of effective analgesia and higher hourly local anesthetic use were observed in the concentration of 0.05% than those of >0.1 % within each group (P<0.05).Thus they concluded that using patient-controlled epidural analgesia, lower concentrations of bupivacaine, ropivacaine and levobupivacaine with sufentanil produce similar analgesia and motor block and safety for labor analgesia. The analgesic efficacy mainly depends on the concentration rather than the type of anesthetics [14]. Sultan P et al did a metanalysis on the effect of low concentrations versus high concentrations of local anesthetics for labour analgesia on obstetric and anesthetic outcomes. The influence that different concentrations of labour epidural local anesthetic have on assisted vaginal delivery (AVD) and many obstetric outcomes and side effects is uncertain. The purpose of this meta-analysis was to determine whether local anesthetics utilized at low concentrations (LCs) during labour are associated with a decreased incidence of AVD when compared with high concentrations (HCs). When compared with HCs of local anesthetics, the use of LCs for labour epidural analgesia reduces the incidence of AVD. This may be due to a reduction in the amount of local anesthetic used and the subsequent decrease in motor blockade. It is therefore recommended the use of LCs of local anesthetics for epidural analgesia to optimize obstetric outcome [15,16]. Some misconceptions were that epidural increases operative delivery rates. Impey L et al postulated after their study that epidural analgesia need not increase operative delivery rates. This was a retrospective analysis of the first 1000 nulliparous pregnancies in women with a cephalic presentation in spontaneous labor at term in each of 3 different years, over which the epidural rate increased from 10% to 57%. They concluded that Increased use of epidural analgesia had no effect on cesarean delivery rates. Although randomized trials have suggested that it increases instrumental vaginal delivery rates, this might be overcome by active management of labor or judicious use of oxytocin in the second stage [17]. New drugs for epidural analgesia and current drug targets were studied by Congedo Eet al. Regarding to local anesthetics, the most recent literature focuses on the new enantiomers, ropivacaine and levobupivacaine, the efficacy of which is similar to that of bupivacaine with a reduced risk of cardiotoxicity. About opioids, the other class of drugs mainly used, the debate, in the last years, concerned the physicochemical

Properties of morphine and of the more recent lipophilic agents, fentanyl and sufentanil, in order to explain the main differences in efficacy and safety. Other categories of agents have been investigated for epidural administration, such as α2-adrenergic agonists clonidine and dexmedetomidine. They are being used increasingly as adjuvants to local anesthetics and opioids. Ketamine and neostigmine, the more recent studied drugs for epidural use, are still under investigation and are not part of routine clinical practice [18]. New techniques and drugs for epidural labor analgesia was studied by Drysdale et al. Similarly Wong CA et al studied advances in labor analgesia Neuraxial labor analgesia (most commonly epidural or combined spinal-epidural) is the most effective method of pain relief during childbirth, and the only method that provides complete analgesia without maternal or fetal sedation. Current techniques commonly combine a low dose of local anesthetic (bupivacaine or ropivacaine) with a lipid soluble opioid (fentanyl or sufentanil). Neuraxial analgesia does not increase the rate of cesarean delivery compared to systemic opioid analgesia; however, dense neuraxial analgesia may increase the risk of instrumental vaginal delivery [19,20]. Pandya ST et al elaborated recent advances in labour analgesia. Newer advances include introduction of newer techniques like combined spinal epidurals, low-dose epidurals facilitating ambulation, pharmacological advances like introduction of remifentanil for patient-controlled intravenous analgesia, introduction of newer local anaesthetics and adjuvants like ropivacaine, levobupivacaine, sufentanil, clonidine and neostigmine, use of inhalational agents like sevoflourane for patient-controlled inhalational analgesia using special vaporizers, all have revolutionized the practice of pain management in labouring parturients. Technological advances like use of ultrasound to localize epidural space in difficult cases minimizes failed epidurals and introduction of novel drug delivery modalities like patient-controlled epidural analgesia (PCEA) pumps and computer-integrated drug delivery pumps have improved the overall maternal satisfaction rate and have enabled us to customize a suitable analgesic regimen for each parturient. Advances in medical technology like use of ultrasound for localizing epidural space have helped the clinicians to minimize the failure rates, and many novel drug delivery modalities like PCEA and computer integrated PCEA have contributed to the overall maternal satisfaction and safety [21].

Conclusion

Thus, it can be concluded that continuous infusion of 0.1% Ropivacaine + 0.0002% Fentanyl provides equipotent labour analgesia and maternal satisfaction as 0.0625% Bupivacaine + 0.0002% Fentanyl infusion can provide.

What this study adds to the existing knowledge

Nowadays there is an increase in the number of the epidural drugs. Local anesthetics and opioids are still the pharmacological agents more widely used epidurally, nevertheless other drugs from different pharmacological classes are administered as adjuvant to local anesthetics and opioids or are in various early stages of investigation. Addition of Fentanyl provided better haemodynamics with lower pulse rates in later stages of labour. Low concentrations of bupivacaine or ropivacaine with opioids provide excellent analgesia. Motor block can be minimized by using dilute local anaesthetic solutions.

Author's contribution

Dr. Manish Shivani: Concept and Data collection

Dr. Priteema Chanana: Data analysis and discussion.

Dr. Pravesh Kanthed: Guidance and discussion.

Reference

01. Taneja B, Nath K, Dua CK. Clinical audit on the existing attitudes and knowledge of obstetricians regarding labour analgesia. Indian J Anaesth. 2004;48(3)185-188. [Crossref]

02. Reynolds F. The effects of maternal labour analgesia on the fetus. Best Prac Res Clinic Obstet Gynaecol. 2010;24(3)289-302. doi: [Article] [Crossref]

03. Cambic CR, Wong CA. Labour analgesia and obstetric outcomes. Brit J Anaesthes. 2010;105(1)i50-60. doi: [Article] [Crossref]

04. Saravanakumar K, Garstang JS, Hasan K. Intravenous patient-controlled analgesia for labour- a survey of UK practice. Int J Obstet Anesthes. 2007;16(3)221-225. doi: [Article] [Crossref]

05. James JN, Prakash KS, Ponniah M. Awareness and attitudes towards labour pain and labour pain relief of urban women attending a private antenatal clinic in Chennai, India. Indian J Anaesth. 2012;56(2)195-198.
doi: [Article] [Crossref]

06. Shidhaye RV, Galande MV, Bangal VB, Joshi SS, Shidhaye UR. Awareness and attitude towards labour analgesia of Indian pregnant women. An -aesth Pain & Intensive Care. 2012;16(2)131-6.
[Crossref]

07. Othman M, Jones L, Neilson JP. Non-opioid drugs for pain management in labour. Cochrane Data System Rev. 2012(7).
doi: [Article] [Crossref]

08. Van der Vyver M, Halpern S, Joseph G. Patient-controlled epidural analgesia versus continuous infusion for labour analgesia- a meta-analysis. Brit J Anaesthes. 2002;89(3)459-465.
doi: [Article] [Crossref]

09. Tveit TO, Seiler S, Halvorsen A, Rosland JH. Labour analgesia- a randomised, controlled trial comparing intravenous remifentanil and epidural analgesia with ropivacaine and fentanyl. Europe J Anaesthesiol (EJA). 2012;29(3)129-136.
doi: [Article] [Crossref]

10. Patkar CS, Vora K, Patel H, et al. A comparison of continuous infusion a nd intermittent bolus administration of 0.1% rop ivacaine with 0.0002% fentanyl for epidural labo r analgesia. J Anaes Clin Pharma. 2015;31(2) 234-8.
[Article] [Crossref]

11. Fernández-Guisasola J, Serrano ML, Cobo B, Muñoz L, Plaza A, Trigo C, del Valle SG. A comparison of 0,0625% bupivacaine with fentanyl and 0,1% ropivacaine with fentanyl for continuous epidural labor analgesia. Anesthes & Analg. 2001;92(5)1261-1265.
doi: [Article] [Crossref]

12. Li Y, Hu C, Fan Y, Wang H, Xu H. Epidural analgesia with amide local anesthetics, bupivacaine, and ropivacaine in combination with fentanyl for labor pain relief- a meta-analysis. Med Sci Monit. 2015;21;921–928.
doi: [Article] [Crossref]

13. Lee BB, Kee WD, Lau WM, Wong AS. Epidural infusions for labor analgesia- a comparison of 0,2% ropivacaine, 0,1% ropivacaine, and 0,1% ropivacaine with fentanyl. Reg Anesth Pain Med. 2002;27(1)31-36.
doi: [Article] [Crossref]

14. Wang LZ, Chang XY, Xia LI, Hu XX, Tang BL. Comparison of bupivacaine, ropivacaine and levobupivacaine with sufentanil for patient-controlled epidural analgesia during labor- a randomized clinical trial. Chinese Med J. 2010;123(2)178-183.
[Crossref]

15. Sultan P, Murphy C, Halpern S, Carvalho B. The effect of low concentrations versus high concentrations of local anesthetics for labour analgesia on obstetric and anesthetic outcomes- a meta-analysis. Canad J Anesthes. 2013;60(9)840-854.
doi: [Article] [Crossref]

16. Lee BB, Kee WD, Ng FF, Lau TK, Wong EL. Epidural infusions of ropivacaine and bupivacaine for labor analgesia- a randomized, double-blind study of obstetric outcome. Anesthes Analg. 2004;98(4)1145-1152.
doi: [Article] [Crossref]

17. Impey L, MacQuillan K, Robson M. Epidural analgesia need not increase operative delivery rates. Am J Obstet Gynecol. 2000;182(2)358-363.
doi: [Article] [Crossref]

18. Congedo E, Sgreccia M, De Cosmo G. New drugs for epidural analgesia. Curr Drug Targets. 2009;10(8)696-706.
doi: [Article] [Crossref]

19. Drysdale SM, Muir H. New techniques and drugs for epidural labor analgesia. Sem Perinatol. 2002;26(2)99-108.
doi: [Article] [Crossref]

20. Wong CA. Advances in labor analgesia. Int J Womens Health. 2009;1;139-154.
doi: [Article] [Crossref]

21. Pandya ST. Labour analgesia- Recent advances. Indian J Anaesth. 2010;54(5)400-408.
doi: [Article] [Crossref]