A PROSPECTIVE COMPARATIVE STUDY OF COMBINED SPINAL EPIDURAL LABOUR ANALGESIA WITH INTRATHECAL FENTANYL 25 MCG ALONG WITH TWO DOSES OF EPIDURAL BUPIVACAINE WITH EPIDURAL FENTANYL 2 MCG/ML

K. Janaki Babu[1]

[1]*Assistant Professor, Department of Anaesthesiology, Andhra Medical College, Visakhapatnam, Andhra Pradesh.*

ABSTRACT

BACKGROUND

Combined Spinal Epidural Anaesthesia (CSEA) is frequently used for its rapid onset of analgesia and good patient satisfaction. In this group, various types of intrathecal intervention are possible.

The aim of the present study has been designed to evaluate the quality of analgesia when intrathecal fentanyl 25 mcg was given along with epidural 0.0625% bupivacaine 10 cc with fentanyl 2 mcg/mL in one group in companion with another group who has been given intrathecal fentanyl 25 mcg given long with epidural 10 cc bupivacaine 0.1% with fentanyl 2 mcg/mL.

MATERIALS AND METHODS

The parturients who fulfilling selection criteria were randomised and divided into two groups, group A and group B each having 30 patients. Group A were given intrathecal fentanyl 25 mcg with epidural 0.0625 mg bupivacaine 10 mL plus fentanyl 2 mcg/mL. Group B here received intrathecal fentanyl 25 mcg with epidural 0.1% bupivacaine 10 mL plus 2 mcg/mL fentanyl.
A long with routine preparation of normal delivery, parturient baseline HR, RR and BP was recorded.

RESULTS

Parameters total dose of bupivacaine required in group A was 30.46 mg, and in group B, it was 20.62 mg, which was not significant statistically. Total dose of fentanyl was 60.86 mcg in group A and 59.42 mcg in group B, which not significant. Mean of total number of top-up required in group A and group B was 4.02 and 3.96, respectively. Total volume of epidural drugs required was 30.9 mL in group A and 29.46 mL in group B. Height of dermatome reached up to T8 in 18 patients in group A; in 6 patients, it reached up to T9; and in 6 patients, it reached up to T10. Similarly, height of dermatome reached in group B up to T8 in 16 patients, up to T9 in 7 patients and up to T10 in 6 patients.

CONCLUSION

We would like to conclude that both dose of bupivacaine is associated with quality of labour analgesia, but dose requirement for 0.1% bupivacaine was less. Both are associated with no motor blocked and duration of labour was decreased and also not associated with any vital parameter abnormality.

KEYWORDS

Epidural Bupivacaine, Intrathecal Fentanyl, Labour Analgesia.

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BACKGROUND

The experience of labour pain is a complex, subjective and pattern of pain varies between nulliparous and multiparous. Providing effective and safe analgesia during labour was always a challenge and with the development in the field of pain management reflect a shift in obstetric anaesthesia from pain relief to overall quality of anaesthesia.[1]

James Young Simpson first given the concept of "etherisation of labour" and administrated either to a women with deformed pelvis during childbirth, later John Snow administrated chloroform to Queen Victoria during the birth of her 8th child, now we are in the era of neuraxial labour analgesia.[2,3]

Various methods are available for labour analgesia, which includes pharmacological and non-pharmacological, but the neuraxial analgesia is considered as most effective method for labour pain relief with the development in the field of neuraxial analgesia, the techniques have become more refined and various newer and adjuvant drugs are used.

Combined Spinal Epidural Anaesthesia (CSEA) is frequently used for its rapid onset of analgesia and good patient satisfaction. In this group, various types of intrathecal intervention are possible.[4,5]

Present study has been designed to evaluate the quality of analgesia when intrathecal fentanyl 25 mcg was given along with epidural 0.0625% bupivacaine 10 cc with fentanyl

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Corresponding Author:
Dr. K. Janaki Babu,
Assistant Professor, Department of Anaesthesiology,
Andhra Medical College Visakhapatnam, Andhra Pradesh.
E-mail: janakibabu@gmail.com
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2 mcg/mL in one group in companion with another group who has been given intrathecal fentanyl 25 mcg given long with epidural 10 cc bupivacaine 0.1% with fentanyl 2 mcg/mL.

MATERIALS AND METHODS

This is a prospective comparative randomised clinical study conducted in the Department of Anaesthesia, Andhra Medical College, Visakhapatnam, Andhra Pradesh, to evaluate the quality of analgesia when intrathecal fentanyl 25 mcg was given along with epidural 0.0625% bupivacaine 10 mL with fentanyl 2 mcg/mL versus intrathecal fentanyl 25 mcg with epidural 0.1% bupivacaine plus fentanyl 2 ug/mL. Before start of the study, approval was obtained from institutional ethics committee and written informed consent was taken from the entire patient enrolled for this study.

Total 60 patients were included in this study as per exclusion and inclusion criteria.

Inclusion Criteria

- Full-term pregnant.
- Lady with ASA score I and II.
- Inactive labour with.
- Cervical dilatation more than 3 cm.
- But, less than 5 cm.
- Cephalic presentation.

Exclusion Criteria

PIH, history of caesarean section, bad obstetric history, any contraindication for normal delivery, obese elderly age >35 years, spinal deformity and drug allergy.

The parturients who fulfilling selection criteria were randomised and divided into two groups, group A and group B, each having 30 patients. Group A were given intrathecal fentanyl 25 mcg with epidural 0.0625 mg bupivacaine 10 mL plus fentanyl 2 mcg/mL. Group B here received intrathecal fentanyl 25 mcg with epidural 0.1% bupivacaine 10 mL plus 2 mcg/mL fentanyl.

Along with routine preparation of normal delivery, parturient baseline HR, RR and BP was recorded.

Intravenous line was secured with 18G cannula and preloaded with 500 to 1000 mL of Ringer lactate. Drug solution was prepared for infusion. Under all aseptic condition, subarachnoid blocked followed by epidural catheter. Women was placed in left lateral position, local infiltration of 2% lignocaine in the L4-L5 was done, mid lumbar epidural space L3-L4/L5-L6 was identified by using a loss of resistance method with a 18G Tuohy needle and an epidural catheter was secured 3-5 cm in space. For group A, 10 mL 0.0625% of bupivacaine with 2 mcg/mL fentanyl was given and for group B 10 mL of 0.1% bupivacaine with 2 mg/mL fentanyl was given epidurally, 25 mcg of intrathecal fentanyl was given to each patient by Quincke needle in L4-L5 space.

A top-up dose of 10 cc of same concentration of drug was administered as per requirement. After the administration of drugs, patient's vitals (pulse, BP, RR and oxygen saturation) were measured. Maximum level of sensory and motor level achieved and foetal heart rate were monitored at 5, 15, 30, 60, 90, 120 mm and till delivery. Motor block was assessed by modified Bromage score, maximum level of sensory block achieved was assessed by pinprick method. Assessment of sedation was done by 5-point scale 0 = wide awake, 11 = Drowsy, 2 = Dozing, eye shutdown intermittently, 3 = Asleep, 4 = unarousable. Duration of analgesia was calculated as time interval from onset of analgesia to repression of sensory level below T12 or return of painful contraction to VAS more than 3. Foetal heart rate was monitored by cardiotocography. For statistical analysis, unpaired t-test and Chi-square test was used.

RESULTS

Characteristic		Group A (n=30)	Group B (n=30)	P value
Age		26.48	24.80	>0.05
Weight		64.68	62.46	>0.05
Height		158.40	154.60	>0.05
Parity	Multi	16	18	>0.05
	Nulli	14	12	>0.05
Cervical dilatation	>3 cm	16	14	>0.05
	<5 cm	14	16	>0.05
Duration of labor (both first and second staged)		168.68	159.60	>0.05

Table 1. Maternal Demographic Profile

Characteristics		Group A (Mean)	Group B	P value
1. Total dose of bupivacaine		30.46 mg	20.62	<0.05
2. Total dose of fentanyl		60.86 mg	59.42	>0.05
3. Total number of epidural top-up		4.02	3.96	>0.05
4. Total volume of epidural drugS		30.96 mL	29.46 mL	>0.05
Height of dermatome reached	T8	18	16	Not significant
	T9	6	7	Not significant
	T10	6	6	Not significant
Onset of analgesia		126.46 secs.	125.68 secs.	Not significant

Table 2. Anaesthetic Parameters

VAS Score	Group A (Mean)	Group B (Mean)	P value
0-1	26	27	>0.05
1-4	4	3	>0.05
4-7	0	0	
7-10	0	0	

Table 3. Mean Visual Analogue Scale Scores

Time	SBP		DBP		HR		Saturation	
Baseline	Group A	Group B	Group A	Group B	Group A	Group B	Group A%	Group B%
	126.48	122.48	78.62	79.02	90.20	86.1	98.2	98.46
5 mins.	122.64	120.22	76.48	78.24	88.39	86.44	96.44	95.42
15 mins.	120.42	118.22	70.92	76.44	86.44	82.42	98.60	96.2
30 mins.	118.32	116.28	67.24	74.23	84.00	83.43	98.80	96.20
60 mins.	110.32	110.48	66.42	68.42	83.42	82.32	99.20	98.10
90 mins.	114.36	112.65	64.42	66.24	82.43	82.33	99.00	98.20
120 mins.	116.38	114.79	68.42	70.42	80.24	82.42	98.10	98.40
At the end of surgery	122.44	118.87	70.20	73.42	76.28	78.28	98.9	98.9

Table 4. Haemodynamic Parameters in Both the Drugs

Satisfaction	Group A	Group B
1	30	30
2	0	0
3	0	0

Table 5. Patient Satisfaction

As per Table 1, mean age of the point in group A was 26.48 years, and group B, it was 24.80 years, which was not significant statistically. Mean weight was 64.48 kg and 62.46 kg, respectively in group A and group B. Height was 158.40 cm in group A and 154.60 cm in group B. In group A, 16 were multiparous and 14 were nulli in group B. In group A, 14 woman were multiparous and 12 women were nulliparous. In 16 patients of group A, cervical dilatation more than 3 cm, and in group B, it was 14 points. In group A, 14 women has cervical dilatation more less 5 cm, in group B, the number was 16. Total duration of labour including both first and second stage was 168.68 minutes in group A and 159.60 in group B.

Regarding anaesthetic parameters, total dose of bupivacaine required in group A was 30.46 mg, and in group B, it was 20.62 mg, which was not significant statistically. Total dose of fentanyl was 60.86 mcg in group A and 59.42 mcg in group B, which is not significant.

Mean of total number of top-up required in group A and group B was 4.02 and 3.96, respectively. Total volume of epidural drugs required was 30.9 mL in group A and 29.46 mL in group B.

Height of dermatome reached in group A in 18 points, it reached up to T8; in 6 points, it reached up to T9; and in 6 points, it reached up to T10. Similarly, height of dermatome reached in group B up to T8 in 16 points up to T9 and up to T10, 6 points.

From Table 3, it is clear that mean VAS score was 26 points of group A and 27 in group B. Similarly, VAS score 1 to 4 in 4 points of group A and 3 points of group B.

The difference in the haemodynamic parameters was not significant in both the groups.

DISCUSSION

Neuraxial labour analgesia is standard method of pain relief during labour and it does not affect maternal and foetal safety, so it has become popular. Advantage of this technique is its quick onset, lower dose and the ability to prolong the duration of analgesia.[6]

In present study, 60 parturients were selected for labour analgesia divided into two groups, each having 30 parturients. There was no difference between two groups with respect to age, sex and height. Group A were given 25 mcg along with 0.0625 mg 10 cc bupivacaine with 2 ug/mL fentanyl. Group B were given 25ug fentanyl intrathecally with 0.1% bupivacaine 10 cc and 2 ug/mL fentanyl epidurally, quality of analgesia and patient satisfaction at the end of delivery in both the group was compared.

As per various literatures in early phase, opioid may provide pain relief, but after 10 minutes, a low-dose spinal epidural infusion of bupivacaine (0.03-0.0625%) with opioid maybe started, so alternatively epidural component maybe activated. In present study, we have initiated with 25 mcg of fentanyl followed by epidural two dose of bupivacaine with fentanyl 2 mg/mL.

We have found that mean duration of analgesia was 126.46 seconds in group A and 125.68 seconds in group B, which was not significant, which is supported by the work of Lee B B et al.[7] Maximum dermatome level achieved in both the groups are comparable and statistically not significant, which is again similar to the work of Lee BB et al and Parry MG et al.[7,8]

There was no difference between Bromage score that is 0 in both groups and also the haemodynamic parameters.

In total number of top-up was 4.02 in group A and 3.96 in group B that is not significant and also total volume of epidural drug requirement in group A was 30.96 mL and 29.46 mL in group B, so there was no difference between top-up and volume of drug between two groups, which similar to the study of Choi et al and Ben Devid et al.[9,10]

We have found that mean total dose of bupivacaine used in group A was 30.46 mg, and in group B, it was 20.62 mg/dL, which was statistically significant, which is similar to the study of Amit G et al.[11]

Mean duration of labour in both the group was comparable to each other and comparatively shorter than usual, which is supported by various studies.[12,13]

Both the groups have good quality of analgesia and all the cores VAS score was less than 3.

CONCLUSION

We would like to conclude that both dose of bupivacaine is associated with quality of labour analgesia, but dose requirement for 0.1% bupivacaine was less. Both are associated with no motor blocked and duration of labour was

decreased and also not associated with any vital parameter abnormality.

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