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ORIGINAL ARTICLE

Sufentanil and fentanyl with low-concentration bupivacaine for combined spinal epidural labour analgesia

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ABSTRACT:
Background: Epidural analgesia has been implicated as a cause of dystocia leading to an increase in instrumental deliveries and possibly even caesarean sections. The present study was conducted to assess efficacy of sufentanil and fentanyl with low-concentration bupivacaine for combined spinal epidural labour analgesia. **Materials & Methods:**50 parturients belonging to ASA grade I and IIwith singleton, term pregnancy in spontaneous labourwere divided into two groups of 25. Group I received bupivacaine heavy (2.5 mg) and sufentanil (5 mcg) intrathecally and 10 mL intermittent bolus of sufentanil 0.30 mcg/mL in bupivacaine 0.125% as epidural top-ups. Group II received bupivacaine heavy (2.5 mg) and fentanyl (25 mcg) intrathecally and 10 mL intermittent bolus of fentanyl 2.5 mcg/mL in bupivacaine 0.125% as epidural top-ups. **Results:** The mean age in group I was 24.5 years and in group II was 25.1 years. The mean weight was 58.4 kgs in group I and 59.2 kgs in group II. The mean height was 157.2 cm in group I and 158.9 cm in group II. The difference was significant (P< 0.05). The mode of delivery was full-term normal delivery in 21 and 20 and lower segment caesarean section in 4 and 5 in group I and II respectively. VAS score 0-1 was seen in 22 and 23, score 1-4 in 3 and 2 respectively. Duration of intrathecal analgesia was 108.4minand 76.2min. Time of onset of intrathecal analgesia was 2.45min and 2.58min and mean duration between epidural top-ups was 92.1min and 84.7min in group I and II respectively. **Conclusion:** Combined spinal epidural using sufentanil and fentanyl achieved high patient satisfaction andexcellent labour analgesia.
Key words: spinal epidural, sufentanil, labour analgesia.

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INTRODUCTION

Epidural analgesia has been implicated as a cause of dystocia leading to an increase in instrumental deliveries and possibly even caesarean sections. Motor blockade of the muscles of the pelvic diaphragm by local anesthetics is the suggested mechanism by which epidural analgesia may affect the rate of forceps and caesarean deliveries. Reduction in the concentration of local anesthetics by the addition of potent opioids may decrease the motor blockade and thereby decrease the influence of epidural analgesia on dystocia.[1]

Pain is the single most predominant sentinel of the beginning of labour. Labour pain is excruciating and a significant contributor of stress and anxiety.[2] Painful uterine contractions cause maternal hyperventilation and increased catecholamine concentration resulting in maternal and foetal hypoxaemia. An effective analgesia takes away the disadvantages and results in better maternal and foetal outcome. Hence, the control of pain should form an integral part of labour management at any level.[3]

Combined spinal epidural (CSE) analgesia is increasingly used to provide pain relief during labour. It combines the advantage of rapid onset of spinal analgesia and the flexibility of the epidural catheter.[4] Dose adjustments and frequency of administration of the drug according to parturients' requirement ispossible with the epidural route which can also be extended to provide anaesthesia for caesarean delivery if need arises.[5]The present study was conducted to assess efficacy of sufentanil and fentanyl with low-concentration bupivacaine for combined spinal epidural labour analgesia.

MATERIALS & METHODS

The present study comprised of 50 parturients belonging to ASA grade I and IIwith singleton, term pregnancy in spontaneous labour. All gave their written consent for participation in the study.

Data such as name, age etc. was recorded. All were divided into two groups of 25. Group I received bupivacaine heavy (2.5 mg) and sufentanil (5 mcg) intrathecally and 10 mL intermittent bolus of sufentanil 0.30 mcg/mL in bupivacaine 0.125% as epidural top-ups. Group II received bupivacaine heavy (2.5 mg) and fentanyl (25 mcg) intrathecally and 10 mL intermittent bolus of fentanyl 2.5 mcg/mL in bupivacaine 0.125% as epidural top-ups. Duration of intrathecal and epidural analgesia, mean duration between epidural top-ups and total analgesic requirements were noted. Pain and overall satisfaction scores were assessed with a 10-point visual scale. Mode of delivery was recorded.Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I: Demographic characteristics

Parameters	Group I	Group II	P value
age (years)	24.5	25.1	0.93
weight (kg)	58.4	59.2	0.87
height (cm)	157.2	158.9	0.72

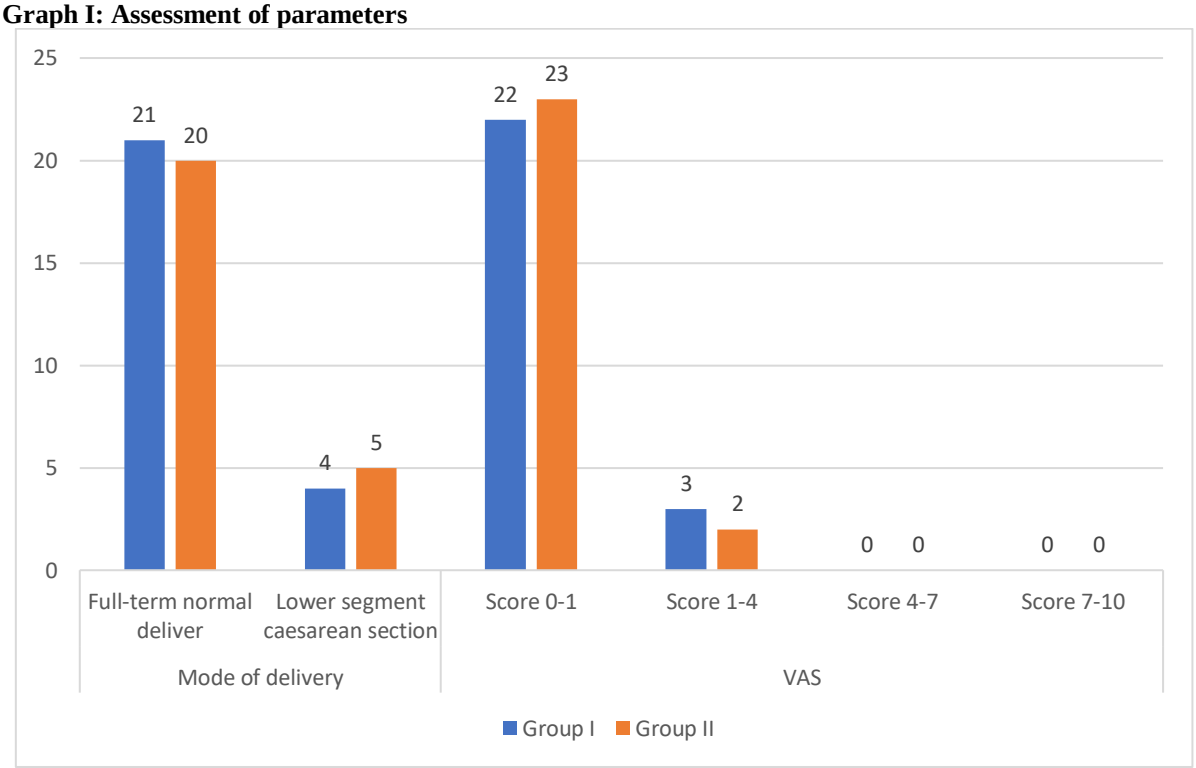
Table I shows that mean age in group I was 24.5 years and in group II was 25.1 years. The mean weight was 58.4 kgs in group I and 59.2 kgs in group II. The mean height was 157.2 cm in group I and 158.9 cm in group II. The difference was significant (P< 0.05).

Table II: Assessment of parameters

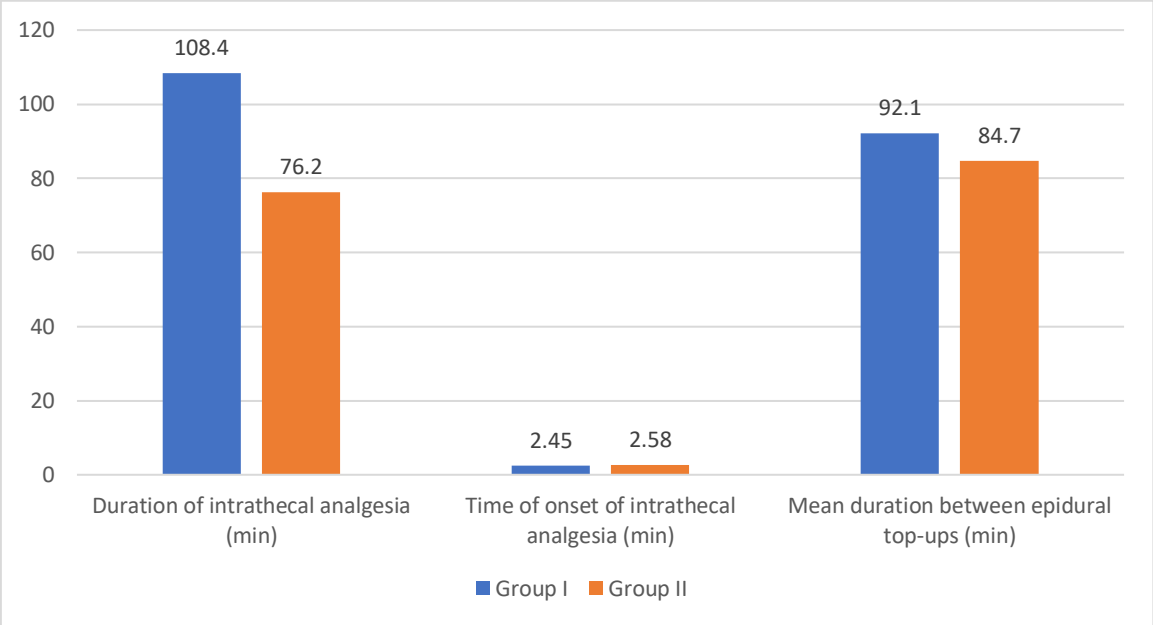
Parameters	Variables	Group I	Group II	P value
Mode of delivery	Full-term normal deliver	21	20	0.17
	Lower segment caesarean section	4	5	
VAS	Score 0-1	22	23	0.85
	1-4	3	2	
	4-7	0	0	
	7-10	0	0	
Duration of intrathecalanalgesia (min)		108.4	76.2	0.01
Time of onset ofintrathecal analgesia (min)		2.45	2.58	0.74
Mean duration betweenepidural top-ups (min)		92.1	84.7	0.02

Table II, graph Ia, b shows that mode of delivery was full-term normal delivery in 21 and 20 and lower segment caesarean section in 4 and 5 in group I and II respectively. VAS score 0-1 was seen in 22 and 23, score 1-4 in 3 and 2 respectively. Duration of intrathecal analgesia was 108.4minand76.2min. Time of onset of intrathecal analgesia was 2.45minand 2.58min and mean duration between epidural top-ups was 92.1minand 84.7minin group I and IIrespectively.

Graph I: Assessment of parameters



Graph II: Assessment of parameters



DISCUSSION

Epidural analgesia has been implicated as a cause of dystocia leading to an increase in instrumental deliveries1 and possibly even caesarean sections.[6] Motor blockade of the muscles of the pelvic diaphragm by local anesthetics is the suggested mechanism by which epidural analgesia may affect the rate of forceps and caesarean deliveries.[7] Reduction in the concentration of local anesthetics by the addition of potent opioids may decrease the motor blockade and thereby decrease the influence of epidural analgesia on dystocia.[8] Numerous studies have used varying doses of opioid added to bupivacaine 0.125% in a bolus dose,whereas others have sought to compare the efficacy of epidural bupivacaine 0.125% with fentanyl and sufentanil.[9,10]The present study was conducted to assess efficacy of sufentanil and fentanyl with low-concentration bupivacaine for combined spinal epidural labour analgesia.

We found that the mean age in group I was 24.5 years and in group II was 25.1 years. The mean weight was 58.4 kgs in group I and 59.2 kgs in group II. The mean height was 157.2 cm in group I and 158.9 cm in group II. Herman et al[11]established the analgesic effective doses as defined as a visual analog pain scale (VAS) of at least 10 for 95% of parturients (ED95) receiving either epidural fentanyl or sufentanil with bupivacaine 0.125% for labor analgesia. 100 female patients, at full-term pregnancy, in active early labor (,5 cm cervical dilation) and requesting obstetric anesthesia services for labor analgesia. Patients were randomized and equally distributed to receive one of ten epidural dosing regimens of bupivacaine 0.125% alone or with either fentanyl 25, 50, 75, or 100 mg or sufentanil 5, 10, 15, 20, or 25 mg in a 10-ml bolus after a 3-ml test dose of bupivacaine 0.25%. Measurements and Main Results: VAS scores were obtained from each parturient using a 10-cm plastic VAS slide rule at times 0, 1, 5, 10, 15, 20, 25, and 30 minutes, and then again when the patient requested additional analgesia. Analgesic duration and demographic and obstetric data also were obtained. Using a log-probit dose–response analysis, analgesic success as defined as a VAS of at least 10 with each opioid dose was plotted and an ED95 value of 8 mg and 50 mg was established for sufentanil and fentanyl, respectively, in bupivacaine 0.125%. No statistical difference was detected for analgesic duration or incidence of side effects between analgesic groups.

We found that the mode of delivery was full-term normal delivery in 21 and 20 and lower segment caesarean section in 4 and 5 in group I and II respectively. VAS score 0-1 was seen in 22 and 23, score 1-4 in 3 and 2 respectively. Duration of intrathecal analgesia was 108.4min and 76.2min. Time of onset of intrathecal analgesia was 2.45min and 2.58min and mean duration between epidural top-ups was 92.1min and 84.7min in group I and II respectively. Akkamahadevi et al[12]compared the efficacy of these two opioids with bupivacaine in terms of the quality of analgesia, side-effects and maternal and foetal outcome. Sixty parturients requesting labour analgesia were divided into two groups randomly. Group S (n=30) received bupivacaine heavy (2.5 mg) and sufentanil (5 mcg) intrathecally and 10 mL intermittent bolus of sufentanil 0.30 mcg/mL in bupivacaine 0.125% as epidural top-ups. Group F (n=30) received bupivacaine heavy (2.5 mg) and fentanyl (25 mcg) intrathecally and 10 mL intermittent bolus of fentanyl 2.5 mcg/mL in bupivacaine 0.125% as epidural top-ups. Maternal demographic characteristics were comparable between the groups. Although CSE provided satisfactory analgesia in both the groups, parturients of group S had a significant prolongation

of analgesia through the intrathecal route compared with parturients of group F. Incidence of caesarean, instrumental delivery did not differ between the groups. No difference in the incidence of motor blockade or cephalad extent of sensory analgesia was observed. Neonatal outcome and incidence of side-effects were similar in both the groups.
The limitation the study is small sample size.

CONCLUSION

Authors found that combined spinal epidural using sufentanil and fentanyl achieved high patient satisfaction andexcellent labour analgesia.

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