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Original Research

Role of intrathecal fentanyl with hyperbaric Bupivacaine on subarachnoid blockade in cesarean section- A clinical study

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ABSTRACT:

Background: This study was conducted to compare the effect of intrathecal Fentanyl with hyperbaric bupivacaine in cesarean section (CS). **Materials & Methods:** This was conducted on 140 patients which were divided into two study groups of 70 each. Group 1 was given 2ml (10 mg) of 0.5% hyperbaric bupivacaine plus 0.5 ml (25 µg) of fentanyl intrathecally and group 2 was given 2ml (10mg) of 0.5% hyperbaric bupivacaine plus 0.5ml NS intrathecally. **Results:** The mean age in group I was 36.52± 3.06 years and in group II was 36.54 ± 3.72 years. Mean height in group I was 164. 2± 5.04 cm and in group II was 158.1± 3.42 cm. Duration of surgery in group I was 120.2± 28 minutes and in group II was 121.6± 24 minutes. Onset of sensory analgesia was 2.24 ± 0.34 minutes in group I and 2.3 ± 0.32 minutes in group II. Mean duration of analgesia was 192.12 ± 21.5 minutes in group I and 204 ± 18.3 minutes in group II. Onset of motor block was 3.42 ± 0.8 minutes in group I and 3.51 ± 0.84 minutes in group II. Time for maximum cephalic spread was 12.42 ± 3.6 minutes in group I and 11.62 ± 3.41 minutes in group II. Time for complete motor block was 6 ± 2.32 minutes in group I and 7.24 ± 2.32 minutes in group II. Time for two segment regression was 86.81 ± 10.7 minutes in group I and 124.12 ± 10.3 minutes in group II. Maximum analgesic block was T5-7 in group I and group II. **Conclusion:** Authors found that addition of fentanyl to 0.5% hyperbaric bupivacaine for sub arachnoid blockage quality of SAB in Cesarean section.

Key words: Bupivacaine, Cesarean, fentanyl.

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INTRODUCTION

Spinal blocks are major regional techniques with a long history of effective use for a variety of surgical procedures and pain relief. It produces sympathetic block, sensory analgesia, and motor block depending on dose, concentration, or volume of local anesthetic.[1] Subarachnoid block is widely used for cesarean section due to the rapid induction, complete analgesia, low failure rate and the prevention of aspiration pneumonia. A larger dose of local anesthetics within a clinical range is required to obliterate the visceral pain caused due to traction on peritoneum and intraparitoneal organs during cesarean deliveries.[2]

In cesarean section (CS), subarachnoid blockade (SAB) is mostly preferred than general anesthesia. SAB is a simple technique, has rapid onset, dense neural blockade and also associated with negligible maternal and fetal risk. As CS requires traction of peritoneum and handling of intraperitoneal organs, which causes intraoperative visceral pain which can be overcome by achieving the higher block upto thoracic level 4 by using higher dose of bupivacaine.[3]

Bupivacaine an amide type of local anesthetic has high potency, slow onset and long duration of action.[4] Although intrathecal bupivacaine alone offers good sensory blockade, a substantial number of patients experiences some pain and discomfort and may require analgesic supplements intraoperatively. Addition of fentanyl not only improves quality of intraoperative analgesia but it also extends to early postoperative period.[5] This study was conducted to compare the effect of intrathecal Fentanyl with hyperbaric bupivacaine in cesarean section (CS).

MATERIALS & METHODS

This study was conducted in the department of Anaesthesia and Gynaecology. It comprised of 140 patients of ASA grade I and II with age ranged 18-38 years scheduled for cesarean section. All patients were informed and their written consent was obtained. Ethical approval from the institutional committee was obtained.

Data such as name, age etc. was recorded. In all detailed history, physical examination and relevant laboratory investigations was done one day before surgery. All patients were randomly divided into two study groups of 70 each. Group 1 was given 2ml (10 mg) of 0.5% hyperbaric bupivacaine plus 0.5 ml (25 µg) of fentanyl intrathecally and group 2 was given 2ml (10mg) of 0.5% hyperbaric bupivacaine plus 0.5ml NS intrathecally. In all patients pulse rate, heart rate, systolic blood pressure, diastolic blood pressure and mean arterial blood pressure were noted and regarded at baseline. The level of sensory block, motor block was assessed in 5, 10 and 15 minutes. The duration of complete analgesia was noted. Postoperative analgesia was assessed at the time of first rescue analgesia by using a visual analogue scale. Results were statistically analyzed.

RESULTS

Table I Demographic profile

Parameter	Group I	Group II	P value
Age (Years)	36.52± 3.06	36.54 ± 3.72	0.91
Height (cm)	164. 2± 5.04	158.1± 3.42	0.72
Duration of surgery (mins)	120.2± 28	121.6± 24	0.81

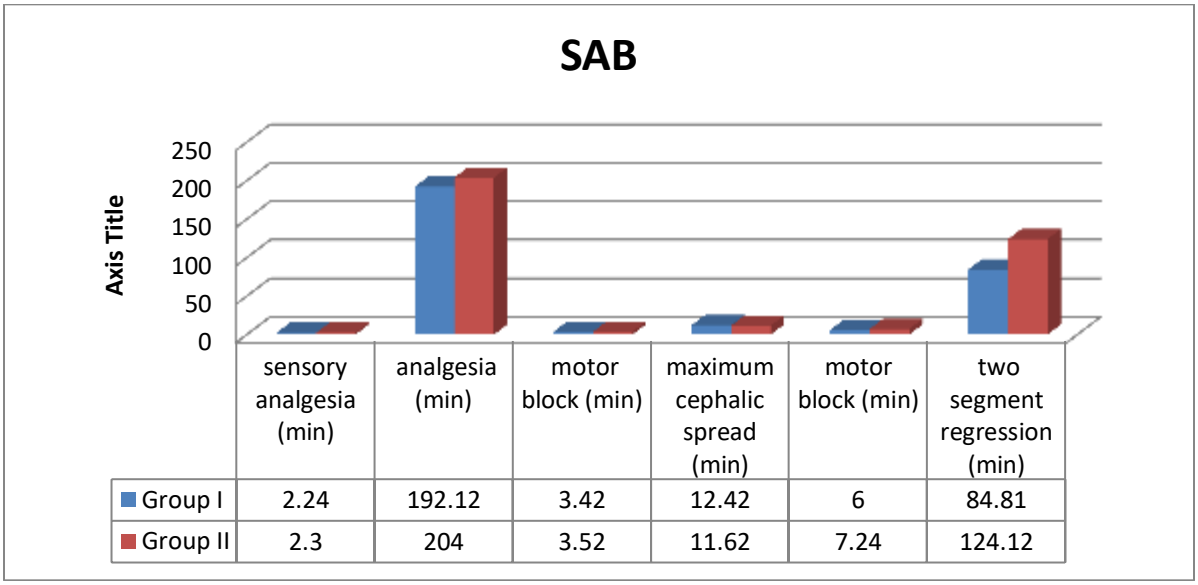
Table I shows that mean age in group I was 36.52± 3.06 years and in group II was 36.54 ± 3.72 years. Mean height in group I was 164. 2± 5.04 cm and in group II was 158.1± 3.42 cm. Duration of surgery in group I was 120.2± 28 minutes and in group II was 121.6± 24 minutes. The difference was non- significant (P>0.05).

Table II Assessment of sub- arachnoid block

Parameters	Group I	Group II	P value
Onset of sensory analgesia (min)	2.24 ± 0.34	2.3 ± 0.32	0.1
Mean duration of analgesia (min)	192.12 ± 21.5	204 ± 18.3	0.02
Onset of motor block (min)	3.42 ± 0.8	3.52 ± 0.82	0.2
Time for maximum cephalic spread (min)	12.42 ± 3.6	11.62 ± 3.41	0.1
Time for complete motor block (min)	6 ± 2.32	7.24 ± 2.32	0.5
Time for two segment regression (min)	84.81 ± 10.7	124.12 ± 10.3	0.01
Maximum analgesic block (segment)	T5-7	T5-7	0.2

Table II shows that onset of sensory analgesia was 2.24 ± 0.34 minutes in group I and 2.3 ± 0.32 minutes in group II. Mean duration of analgesia was 192.12 ± 21.5 minutes in group I and 204 ± 18.3 minutes in group II. Onset of motor block was 3.42 ± 0.8 minutes in group I and 3.51 ± 0.84 minutes in group II. Time for maximum cephalic spread was 12.42 ± 3.6 minutes in group I and 11.62 ± 3.41 minutes in group II. Time for complete motor block was 6 ± 2.32 minutes in group I and 7.24 ± 2.32 minutes in group II. Time for two segment regression was 86.81 ± 10.7 minutes in group I and 124.12 ± 10.3 minutes in group II. Maximum analgesic block was T5-7 in group I and group II. The difference was significant (P< 0.05).

Graph I Assessment of sub- arachnoid block



DISCUSSION

The subarachnoid block (SAB) is popularly known as a spinal block. There can be confusion when the term "spinal anaesthesia" is used as some anaesthetists include subarachnoid block and epidural block under the classification of spinal anaesthesia.[6] Subarachnoid block is most versatile regional block commonly employed for infra-umbilical surgeries. The use of neuroaxial opioids has gained widespread popularity as they potentiate the analgesia produced by local anesthetics.[7]

The use of higher dose of bupivacaine may cause higher incidence of maternal arterial hypotension resulting in maternal and neonatal morbidity.[8] Therefore, several additives like opioids are given intrathecally with local anesthetic mainly to improve the quality and duration of SAB and to minimize the dose of local anesthetic, to reduce the extent and effects of sympathetic blockade.[9] This study was conducted to compare the effect of intrathecal Fentanyl with hyperbaric Bupivacaine on the quality of SAB in cesarean section (CS).

In this study, Group 1 was given 2ml (10 mg) of 0.5% hyperbaric bupivacaine plus 0.5 ml (25 µg) of fentanyl intrathecally and group 2 was given 2ml (10mg) of 0.5% hyperbaric bupivacaine plus 0.5ml NS intrathecally. Acharya et al[10] included sixty patients undergoing cesarean section under subarachnoid block were randomly divided into two groups; Group B received 2 ml (10 mg) hyperbaric 0.5% bupivacaine and 0.25 ml inj Normal Saline intrathecally and BF group received 2 ml (10 mg) 0.5% hyperbaric bupivacaine and 0.25 ml (12.5 µg) injection fentanyl intrathecally. Onset and extent of sensory and motor block, maternal hemodynamics, neonatal APGAR score and occurrence of maternal side effects were compared. Results: The patients' demographic data were comparable. The mean time to peak sensory level in B and BF groups were 7.92 minutes and 9 minutes (p=0.354) respectively. The mean duration of effective analgesia was 49.17 minutes and 64.73 minutes respectively in-group B and group BF (p=0.002). The mean time duration to two segment regression was 76.30 minutes in-group Bupivacaine and 95.17 minutes in-group BF (p=0.001). Eleven patients in-group B (36%) required intraoperative rescue analgesia whereas only six patients (20%) in-group BF required intraoperative rescue analgesia (p=0.15). The incidence of hypotension in group B was 50% and in group BF was 23.33% (p=0.032). Thirteen patients in group B required inj Phenylephrine and only 4 patients required inj phenylephrine in group BF (p value 0.01). Neonatal APGAR score at 1 minute and 5 minutes of birth was similar in two groups.

We found that onset of sensory analgesia was 2.24 ± 0.34 minutes in group I and 2.3 ± 0.32 minutes in group II. Mean duration of analgesia was 192.12 ± 21.5 minutes in group I and 204 ± 18.3 minutes in group II. Onset of motor block was 3.42 ± 0.8 minutes in group I and 3.51 ± 0.84 minutes in group II. Time for maximum cephalic spread was 12.42 ± 3.6 minutes in group I and 11.62 ± 3.41 minutes in group II. This is in accordance to Harbhej S.[11]

We found that time for complete motor block was 6 ± 2.32 minutes in group I and 7.24 ± 2.32 minutes in group II. Time for two segment regression was 86.81 ± 10.7 minutes in group I and 124.12 ± 10.3 minutes in group II. Maximum analgesic block was T5-7 in group I and group II.

Sarvela et al[12] had compared of intrathecal hyperbaric bupivacaine (9 mg) with plain bupivacaine plus Fentanyl (20 μg) on sensory and motor block characteristics. They reported the time to maximum sensory block was prolonged in fentanyl group (19 min).

The shortcoming of the study is small sample size.

CONCLUSION

Authors found that addition of fentanyl to 0.5% hyperbaric bupivacaine for sub arachnoid blockage quality of SAB in Cesarean section.

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