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## Original Research

### Comparative Evaluation Of Intrathecal Hyperbaric Bupivacaine And Hyperbaric Bupivacaine With Fentanyl: A Clinical Study

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#### ABSTRACT

**Background:** Spinal anesthesia has a popular technique for caesarean delivery. This study was conducted to assessment of efficacy of spinal anesthesia with bupivacaine alone and bupivacaine with fentanyl. **Materials & methods:** This study was conducted in department of anaesthesia on 60 women of ASA grade I and II posted for lower caesarean section. Patients were divided into 2 groups. Group I consisted of 30 women who received 1.5cc of 0.5% of heavy bupivacaine and 0.5cc of normal saline. Group II consisted of 50 women who received 1.5cc of 0.5% of heavy bupivacaine and 0.5cc of fenatyl. 2.0 cc of intrathecal drug was used in both the groups. **Results:** Out of 100 patients, 50 were in group I and 50 were in group II. The mean time required to reach peak sensory level was earlier in Group BF than Group B and this was statistically significant ( $P<0.05$ ). Time to onset of sensory blockade, peak level of sensory analgesia, degree of analgesia and onset of motor blockade were comparable in both the groups. **Conclusion:** Author concluded that low dose fentanyl helps in reduction of the dose of bupivacaine for spinal anesthesia, and used as an adjuvant to intrathecal 0.5% hyperbaric bupivacaine.

**Key words:** bupivacaine, Hyperbaric, Intrathecal

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## INTRODUCTION

The choice of anesthesia for caesarean section depends on the reason for the operation, degree of urgency, the desires of the patient and the judgment of anesthesiologists. Spinal anesthesia is simpler to perform and the presence of cerebrospinal fluid provides a more certain end point, and consequently has higher degree of success than epidural anesthesia.<sup>1</sup> Caesarean section is one of the most common operations in the child bearing age of a woman. Spinal anesthesia has a popular technique for caesarean delivery. Spinal anesthesia has a popular technique for caesarean delivery. Hyperbaric bupivacaine in 8% glucose is often used. Plain, or glucose-free, bupivacaine has been frequently referred to as "isobaric" in the literature, even after Blomqvist and Nilsson<sup>2</sup> demonstrated its hypobaricity. More recently, several studies have confirmed that plain bupivacaine is indeed hypobaric in comparison with human CSF.<sup>2</sup> Hyperbaric solutions may cause sudden cardiac arrest after spinal anesthesia because of the extension of the sympathetic

block. The use of truly isobaric solutions may prove less sensitive to position issues. Hyperbaric solutions may cause sudden cardiac arrest after spinal anesthesia because of the extension of the sympathetic block.<sup>3</sup> Fentanyl, a phenylpiperidine derivative, is used as an adjuvant in spinal anaesthesia because of its rapid onset and short duration of action with lesser incidence of respiratory depression. More recently, several studies have confirmed that plain bupivacaine is indeed hypobaric in comparison with human CSF.<sup>4</sup> This study was conducted to compare the efficacy of spinal anesthesia with bupivacaine alone and bupivacaine with fentanyl.

## MATERIALS & METHODS

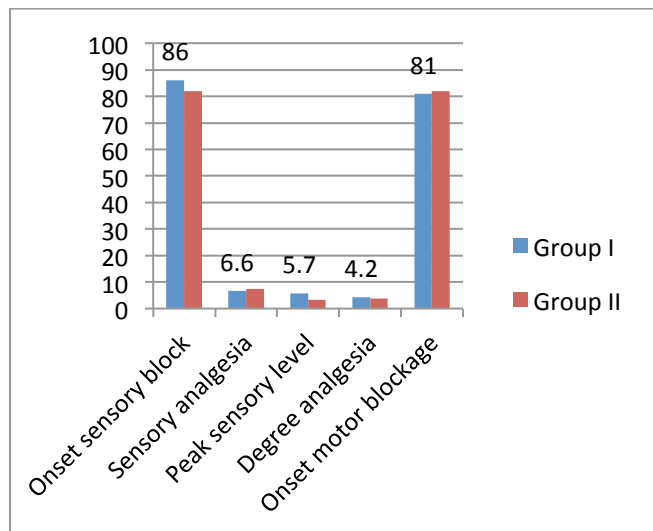
This study was conducted in department of anaesthesia. It included 60 women of ASA grade I and II posted for lower caesarean section. All were informed regarding the study and written consent was obtained. Ethical clearance was taken prior to the study. Patients were divided into 2 groups. Group I consisted of 30

women who received 1.5cc of 0.5% of heavy bupivacaine and 0.5cc of normal saline. Group II consisted of 30 women who received 1.5cc of 0.5% of heavy bupivacaine and 0.5cc of fentyl. 2.0 cc of intrathecal drug was used in both the groups. After injecting anaesthesia, grading of motor block was done as per Bromage Scale. The duration of complete analgesia (time from subarachnoid injection to first reports of pain) (pain score greater than 0) and effective analgesia (time from subarachnoid injection to first dose of rescue analgesic) were recorded.

**RESULTS**

Table I shows that mean age was 32±6 years and 34±2 in group I and group II respectively. The mean height in group I was 1.68 ± 0.02 meters and in group II was 1.74 ± 0.04 meters. The mean weight in group I was 66± 4 kgs in group I and 64± 2 kgs in group II. The gestation time in weeks was 34.40 ± 0.21 in group I and 35.06 ± 0.18 in group II. The surgical time was 42± 1 in group I and 44± 1 in group II. The difference was statistical non significant.

**Graph I Comparison of sensory and motor blockage among both groups**



Graph I shows that time to onset of sensory blockade (sec) in group I was 86±5.41 and in group II was 82±4.41. Peak level of sensory analgesia (T) in group I was 6.6±1.1 and in group II was 7.4±0.15. Peak sensory level was 5.7±4.2 in group I and 3.2±1.8 in group II. Degree of analgesia was 4.2±0.8 and 3.8±0.4 in group I and group II respectively. Onset of motor blockade (sec) was 81±1.2 and 82±5.8 in group I and group II respectively. The difference was comparable in both the groups (p>0.05).

**Table I Demographic data of patients**

Parameters	Group I	Group II	P value
Age (yrs)	32±6	34±2	0.8
Height (m)	1.68 ± 0.02	1.74 ± 0.04	0.6
Weight (kgs)	66± 4	64± 2	1
Gestation time (week)	34.40 ± 0.21	35.06 ± 0.18	0.5
Duration of operation (mins)	42± 1	44± 1	0.7

**DISCUSSION**

Hyperbaric solutions may cause hypotension or bradycardia after mobilization; isobaric solutions are favored with respect to their less sensitive to position issues properties. Although hyperbaric local anesthetic solutions have a remarkable record of safety, their use is not totally without risk. To prevent unilateral or saddle blocks, patients should move from the lateral or sitting position rapidly and after mobilization of the patients, extension or early return of the block may be seen.<sup>5</sup> Clinically, this manifests as an unpredictable median sensory block height with a large inter-individual spread and is occasionally associated with block failure when the spinal block has not spread high enough for surgery. For this reason, hyperbaric bupivacaine is favored in obstetric anaesthesia. The use of truly isobaric solutions may prove less sensitive to position issues.<sup>6</sup> Administration of Fentanyl intrathecally is an established method for intra-operative anaesthesia and to supplement postoperative analgesia. The spread of Fentanyl after administration into cerebrospinal fluid includes movement from the cerebrospinal fluid into the opioid receptors or other non-specific binding sites in the spinal cord and rostral migration via the cerebrospinal fluid to supraspinal sites.<sup>7</sup> Jaishri<sup>8</sup> et al found that mean time of onset of sensory blockade and peak level of analgesia were similar in both the groups and addition of Fentanyl to Bupivacaine did not alter the onset. The present study was conducted to compare and determine the efficacy of spinal anaesthesia with Bupivacaine alone and bupivacaine with fentanyl. In present study, 30 patients were in group I and 30 were in group II. The mean time required to reach peak sensory level was earlier in Group I than Group II. Time to onset of sensory blockade, peak level of sensory analgesia, degree of analgesia and onset of motor blockade were comparable in both the groups. Rajesh et al<sup>9</sup> concluded that time to reach peak sensory level was earlier with group BF than group Bupivacaine alone. David<sup>10</sup> et al observed that patients with plain bupivacaine were more likely to require treatment for hypotension than patients with bupivacaine- fentanyl. This is because of less dose of bupivacaine used in group I as compared to group II. Solomon<sup>11</sup> found that there were significantly less number of patients who experienced nausea and vomiting in group BF, which is explained presumably due to their interaction with opioid receptors of the chemoreceptor trigger zone on the floor of the fourth ventricle. Gulen et al<sup>12</sup> found that the time to reach maximum dermatome for the sensory block, time to regression by two dermatomes and time to regress to T12 dermatome was found to be significantly long in Group BF. It was observed that in Group BF, the evolution of the motor block was faster and lasted longer. Whereas hypotension, bradycardia and nausea were less in Group LF, the need for ephedrine was higher in Group BF.

**CONCLUSION**

It was found that low dose fentanyl helps in reduction of the dose of bupivacaine for spinal anaesthesia, and used as an adjuvant to intrathecal 0.5% hyperbaric bupivacaine.

**REFERENCES**

1. G. Edward Morgan, Maged S. Mikhail, Michael J. Murray. Regional anaesthesia and pain management In: Clinical anaesthesiology, 3<sup>rd</sup> edition. New York: McGraw-Hill. 2002; 291.

2. Samuel, C.H., Gerson, L, Mark, A.R., Shinder and levinson's anaesthesia for obstetrics, 4 Edn. Lippincott Williams and Willkins. 2002.
3. Jakobi P, Weinerz Solt L, Alpert L, Its Kovitz-Eldor-J, Zimmerz. Choice of anaesthesia for parturients Eur J Obst Gynae Report Biol 2000; 93: 432-437.
4. Riley, E.T., Cohen, S.E., Macario, A., Desai, J.B Anaesthesia for pregnant ladies. Anesth Analg 1995; 80:709-712.
5. Techanivate, A., Rodanant, O., Tachawattanawisal, W., Requirement of fentanyl with bupivacaine. J Med Assoc Thai 2005; 88: 1214-1221.
6. Shende, D., Copper, G.M., Bowden, M.I., Bradycardia and asystolic Cardiac Arrest during Spinal Anaesthesia: A Report of Five Cases. Anaesthesia 1988; 53:706-710.
7. Seyedhejazi, M., Madarek, E., Small-Dose Hyperbaric versus Plain Bupivacaine during Spinal Anesthesia for Cesarean Section. Pak J Med Sci. 2007; 23:747-750.
8. Jaishri, Namita Arora, Pratima Srivastava, Anesthesiology. 2005; 5: 1-5.
9. Rajesh G., Hultstrand, C., Jakobsson, J., Norman, M., Cardiac Arrest after Cesarean Section under Subarachnoid Block. Anesth Analg 1997; 85:1288-1293
10. David, B., Miller, G., Gavriel, R., Levobupivacaine and Bupivacaine in Spinal Anesthesia for Transurethral Endoscopic Surgery. Reg Anesth Pain Med. 2000; 25:235-239.
11. Solomon, H. Levin, H. Admoni and Z. Goldik. Intrathecal Fentanyl with Small-Dose Dilute Bupivacaine Better Anaesthesia without Prolonging Recovery. Anesthesia & Analgesia, Vol. 85, No. 3, 1997, pp. 560-565.
12. Gulen, S. Karaman, A. Sargin and V. Firat, "A Randomized Comparison of Different Doses of Intrathecal Levobupivacaine Combined with Fentanyl for Elective Cesarean Section: Prospective, Double-Blinded Study," Journal of Anesthesia 2011; 2: 205-212.

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