Original article:

Comparative Assessment of Hyperbaric Bupivacaine and Hyperbaric Bupivacaine with Fentanyl at a Tertiary Care Teaching Centre

Dr. Mukesh Kumar Prasad

Assistant Professor, Department of Anaesthesia, Government Medical College, Haldwani, Uttarakhand, India.
Corresponding Author: Dr. Mukesh Kumar Prasad, Assistant Professor, Department of Anaesthesia, Government Medical College, Haldwani, Uttarakhand, India.
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Abstract:

Background: Hyperbaric bupivacaine is most commonly used in subarachnoid block but effective calculated dose may be associated with high block and haemodynamic instability. Hyperbaric bupivacaine in 8% glucose is often used the efficacy of spinal anesthesia with bupivacaine alone and bupivacaine with fentanyl.

Materials & Methods: This study was conducted in Department of Anaesthesia, Government Medical College, Haldwani, Uttarakhand, India. It included 40 women of ASA grade I and II posted for lower caesarean section. Patients were divided into 2 groups. Group I (Group B) - This group consisted of 20 women who received 1.5cc of 0.5% of heavy bupivacaine and 0.5cc of normal saline. Group II (Group BF) - This group consisted of 20 women who received 1.5cc of 0.5% of heavy bupivacaine and 0.5cc of fentanyl. 2.0 cc of intrathecal drug was used in both the groups.

Results: Out of 40 patients, 20 were in group I and 20 were in group II. Mean age was 29±4 years and 31±5 in group I and group II respectively.

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, Fentanyl, Spinal Anesthesia.

INTRODUCTION

Various achievements Hyperbaric bupivacaine is most commonly used in subarachnoid block but effective calculated dose may be associated with high block and haemodynamic instability. 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[2] demonstrated its hypobaricity. Adding adjunct (opioid or non opioid) allows reduction in dose of Bupivacaine and provides cardiovascular stability.[1]

For this reason, hyperbaric bupivacaine is favored in obstetric anesthesia.[2] The use of truly isobaric solutions may prove less sensitive to position issues. Hyperbaric solutions may cause hypotension or bradycardia after mobilization, isobaric solutions are favored with respect to their less sensitive to position issues properties.[1-3]

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. 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.[4]

This study was conducted to compare and determine the efficacy of spinal anesthesia with Bupivacaine alone and bupivacaine with fentanyl.

MATERIALS & METHODS

This study was conducted in Department of Anaesthesia, Government Medical College, Haldwani, Uttarakhand, India. It included 40 women of ASA grade I and II posted for lower caesarean section. Patients were divided into 2 groups. **Group I** - This group consisted of 20 women who received 1.5cc of 0.5% of heavy bupivacaine and 0.5cc of normal saline. **Group II**- This group consisted of 20 women who received 1.5cc of 0.5% of heavy bupivacaine and 0.5cc of fentanyl. 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. Pain was evaluated by using VAS scale, where 0 indicates no pain and 10 indicates severe pain. 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 indicates that out of 40 patients, 20 were in group I and 20 were in group II. Table II shows that mean age was 29±4 years and 31±5 in group I and group II respectively. The mean height in group I was 1.21 meters ± 0.04 and in group II was 1.10 meters ± 0.02. The mean weight in group I was 60± 2 Kgs in group I and 61± 3 Kgs in group II.

Table 3 shows significant comparison of sensory and motor blockage among both groups**.** Side effects like hypotension, bradycardia, nausea and itching cases were more in group II as compared to group I. Number of vomiting, backache cases were comparable in both cases.

Table I: Distribution of Patients

Total- 100		
Group	**Group I**	**Group II**
Number	20	20

Table II: Demographic Data of Patients

Parameters	**Group I**	**Group II**
Age (Yrs)	29±4	31±5
Height (M)	1.21 ± 0.04	1.10 ± 0.02
Weight (Kgs)	60± 2	61± 3
No. Of Deliveries	1.11 ± 1.02	1.12 ± 1.06

Table III: Comparison of Sensory and Motor Blockage among Both Groups

	Mean + 2SD		p value
	Group I	**Group II**	
Time to onset of sensory blockade (sec)	7.1±5.40	81±4.41	<0.005
Peak level of sensory analgesia (T)	4.5±1.1	7.1±0.15	
Time to reach peak sensory level (min)	5.1±1.8	3.0±2.3	
Degree of analgesia (grade)	3.0±0.8	3.21±0.4	
Onset of motor blockade(sec)	80±1.2	88±5.2	

DISCUSSION

Administration of Fentanyl intrathecally is an established method for intraoperative 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.[5] Because of the high affinity of fentanyl with nonspecific binding sites on the lipid surface only a small proportion of the administered dose migrates to the cervical region. Jaishri bogra[6] 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 anesthesia with Bupivacaine alone and bupivacaine with fentanyl. This study indicates that out of 40 patients, 20 were in group I and 20 were in group II. Table II shows that mean age was 29±4 years and 31±5 in group I and group II respectively. The mean height in group I was 1.21 meters ± 0.04 and in group II was 1.10 meters ± 0.02. The mean weight in group I was 60± 2 Kgs in group I and 61± 3 Kgs in group II. There is significant comparison of sensory and motor blockage among both groups

Dahlgren G et al[7] concluded that time to reach peak sensory level was earlier with group BF than group Bupivacaine alone. Ben-David[10] et al observed that patients with plain bupivacaine were more likely to require treatment for hypotension than patients with bupivacine - fentanyl. This is because of less dose of bupivacaine used in group BF as compared to group B. Seyedhejazi M[8] 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.

CONCLUSION

The study 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.

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