



A COMPARISON BETWEEN INTRATHECAL NALBUPHINE VERSUS FENTANYL AS AN ADJUVANT WITH 0.5% HYPERBARIC BUPIVACAINE FOR POSTOPERATIVE ANALGESIA IN PATIENTS UNDERGOING LOWER SEGMENT CESAREAN SECTION

Dr Nisha Kanwar

MD Anaesthesia, Medical Officer, District Hospital, Sirohi

Dr. Nihal Singh
Meena*

M.S. OBS. & GYN., Junior Specialist., District Hospital, Sirohi. *Corresponding Author

ABSTRACT

BACKGROUND- This study aims to compare the postoperative analgesia of intrathecal nalbuphine and fentanyl as adjuvants to bupivacaine in cesarean section.

METHODS- A prospective, randomized, double-blind, and comparative study was conducted on 90 patients of American Society of Anesthesiologists (ASA) physical status I and II. These patients were randomized into three groups with fifty patients in each group. Group A received 2 ml of 0.5% hyperbaric bupivacaine (10 mg) plus 0.4 ml nalbuphine (0.8 mg), Group B received 2 ml of 0.5% hyperbaric bupivacaine (10 mg) plus 0.4 ml fentanyl (20 µg), and Group C received 2 ml of 0.5% hyperbaric bupivacaine (10 mg) plus 0.4 ml of normal saline.

RESULTS- The difference in the time of onset of sensory and motor block was statistically nonsignificant (NS) among the groups ($P > 0.05$). The mean duration of sensory block was 106.32 ± 5.42 min in Group A, 111.39 ± 4.45 min in Group B, and 86.39 ± 2.35 min in Group C. The mean duration of motor block (time required for motor block to return to Bromage's Grade 1 from the time of onset of motor block) was 15.32 ± 3.62 min in Group A, 15.2 ± 2.38 min in Group B, and 124.12 ± 2.36 min in Group C.

CONCLUSION- We concluded that intrathecal nalbuphine prolongs postoperative analgesia maximally and may be used as an alternative to intrathecal fentanyl in cesarean section.

KEYWORDS : Nalbuphine, Bupivacaine, Fentanyl.

INTRODUCTION

Caesarean section (CS or C-section) is a surgical intervention which is carried out to ensure safety of mother and child when vaginal delivery is not possible (emergency CS) or when the doctors consider that the danger to the mother and baby would be greater with a vaginal delivery (planned CS). Proportion of CS to the total births is considered as one of the important indicators of emergency obstetric care.¹

Both fentanyl and nalbuphine are opioid analgesics. Fentanyl is an Opioid agonist and acts on μ -opioid receptors. Nalbuphine is a synthetic Opioid analgesic with agonist-antagonist activity and acts as antagonist at μ -receptors and agonist at k -receptors to provide as an ably potent analgesia. Nalbuphine, when used as adjuvant to hyperbaric bupivacaine, has improved the quality of perioperative analgesia with fewer side effects. Nalbuphine has been used intrathecally by various investigators to enhance the postoperative analgesia and they did not document any reports of neurotoxicity.^{2,5}

MATERIAL AND METHODS

90 patients with ASA physical status Class I or II, posted for cesarean section in our institution were included in this study. This was a prospective randomized double-blind comparative study. Patients with contraindication for spinal anesthesia were excluded from this study.

Inclusion Criteria:

- Age from 20 to 40 years with normal coagulation profile.
- ASA grade I to II

Exclusion Criteria:

- Age ≤ 20 years ≥ 40 years
- ASA grade III and above
- Patient refusal to take part in study
- Any contraindication to spinal anaesthesia
- Coagulation/bleeding abnormalities
- Spine deformities or history of laminectomy
- Allergy to local anaesthetic drug or study drugs

Any specific

Intravenous access was secured with 18G cannula, and all patients were preloaded with 10 ml/kg of Ringer's lactate

solution. The study medication (2.4 ml of the drug solution) was prepared by the anesthesiologist who did not take part in the study. Group I patients received 2 ml of 0.5% hyperbaric bupivacaine plus 0.4 ml nalbuphine (0.8 mg), Group II patients received 2 ml of 0.5% hyperbaric bupivacaine plus 0.4 ml fentanyl (20 µg), and Group III patients received 2 ml of 0.5% hyperbaric bupivacaine plus 0.4 ml of normal saline

RESULTS

Table 1: Demographic Variables

Parameters	Group A	Group B	Group C	P value
Age (years)	23.28 ± 4.12	23.69 ± 4.52	24.02 ± 3.26	>0.05
ASA I/II	24/6	25/5	24/6	>0.05

All groups were comparable.

The difference in the time of onset of sensory and motor block was statistically nonsignificant (NS) among the groups ($P > 0.05$). The mean duration of sensory block was 106.32 ± 5.42 min in Group A, 111.39 ± 4.45 min in Group B, and 86.39 ± 2.35 min in Group C. The mean duration of motor block (time required for motor block to return to Bromage's Grade 1 from the time of onset of motor block) was 15.32 ± 3.62 min in Group A, 15.2 ± 2.38 min in Group B, and 124.12 ± 2.36 min in Group C.

DISCUSSION

We conducted a randomized double-blind study to compare intrathecal nalbuphine and fentanyl as adjuvants to 0.5% hyperbaric bupivacaine with bupivacaine alone in patients undergoing cesarean section.

Nalbuphine exhibits a ceiling effect to analgesia, i.e. increase in dose increases analgesic effect only up to a certain point beyond which there is no further enhancement of analgesia with the increase in dose.⁴ We chose 0.8 mg of nalbuphine to compare with 20 µg of fentanyl as Culebras et al.⁵ and Jyothi et al.⁶ had previously observed that increasing nalbuphine dose from 0.8 to 1.6 mg and 2.4 mg did not increase analgesic efficacy.

We found that onset of sensory block was comparable in the three groups. Gomaa et al. compared intrathecal nalbuphine 0.8 mg and fentanyl 25 µg and found that there was no statistically significant difference in onset of sensory block

between fentanyl (1.64 min) and nalbuphine (1.60 min) group⁷
Similar results were observed by Gupta et al.,⁸ Ahmed et al.,⁹

CONCLUSION

We conclude that intrathecal nalbuphine prolongs postoperative analgesia maximally and may be used as an alternative to intrathecal fentanyl in cesarean section.

REFERENCES

1. Chu CC, Shu SS, Lin SM, Chu NW, Leu YK, Tsai SK, et al. The effect of intrathecal bupivacaine with combined fentanyl in cesarean section. *Acta Anaesthesiol Sin* 1995;33:149-54.
2. Schmauss C, Doherty C, Yaksh TL. The analgetic effects of an intrathecally administered partial opiate agonist, nalbuphine hydrochloride. *Eur J Pharmacol* 1982;86:1-7.
3. Lin ML. The analgesic effect of subarachnoid administration of tetracaine combined with low dose morphine or nalbuphine for spinal anesthesia. *Ma Zui Xue Za Zhi* 1992;30:101-5.
4. Naaz S, Shukla U, Srivastava S, Ozair E, Asghar A. A comparative study of analgesic effect of intrathecal nalbuphine and fentanyl as adjuvant in lower limb orthopaedic surgery. *J Clin Diagn Res* 2017;11:UC25-8
5. Culebras X, Gaggero G, Zatloukal J, Kern C, Marti RA. Advantages of intrathecal nalbuphine, compared with intrathecal morphine, after cesarean delivery: An evaluation of postoperative analgesia and adverse effects. *Anesth Analg* 2000;91:601-5.
6. Jyothi B, Gowda S, Shaikh SI. A comparison of analgesic effect of different doses of intrathecal nalbuphine hydrochloride with bupivacaine and bupivacaine alone for lower abdominal and orthopedic surgeries. *Indian J Pain* 2014;28:18-23.
7. Goma HM, Mohamed NN, Zoheir HA, Ali MS. A comparison between post-operative analgesia after intrathecal nalbuphine with bupivacaine and intrathecal fentanyl with bupivacaine after caesarean section. *Egypt J Anaesth* 2014;30:405-10
8. Gupta K, Rastogi B, Gupta PK, Singh I, Bansal M, Tyagi V. Intrathecal nalbuphine versus intrathecal fentanyl as adjuvant to 0.5% hyperbaric bupivacaine for orthopedic surgery of lower limbs under subarachnoid block: A comparative evaluation. *Indian J Pain* 2016;30:90-5.
9. Ahmed F, Narula H, Khandelwal M, Dutta D. A comparative study of three different doses of nalbuphine as an adjuvant to intrathecal bupivacaine for postoperative analgesia in abdominal hysterectomy. *Indian J Pain* 2016;30:23-8