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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

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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 B 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 no significant (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, 152± 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 nalbuphineare opioid analgesics. Fentanylis 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 providere as on ably potent analgesia. Nalbuphine, when used as adjuvant to hyperbaricbupivacaine, 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 ≤20years≥40years

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 no significant (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, 152± 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 etal.[5] and Jyothi etal. 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) group[7] Similar results were observed by Gupta etal.,[8] Ahmed etal.,[9]

Conclusion

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

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