



COMPARISON OF QUALITY OF SUBARACHNOID BLOCK BETWEEN PREMIXED BUPINORPHINE WITH BUPIVACAINE HEAVY AND WHEN GIVEN CONSECUTIVELY IN INFRA- UMBILICAL SURGERIES

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ABSTRACT

Background: Central neuraxial anaesthesia greatly expands the anaesthesiologist freedom providing the alternative to general anaesthesia, and reduces the incidence of major perioperative complications.

Intrathecal opioids have good synergistic action with local anaesthetics hence are commonly used. However their time of addition to the anaesthetic agent and its implication on overall quality of anaesthesia remains a topic of research.

Methodology and result: In this study total 148 ASA grade 1 & 2 patients underwent infraumbilical surgeries. They were randomly divided in two groups, **Group A** (premixed solution group) given fixed volume of 0.5 % hyperbaric bupivacaine 3ml with 0.5 ml normal saline and 30mcgs buprenorphine. **Group B** given fixed volume of 0.5 % hyperbaric bupivacaine 3ml followed by 0.5 ml normal saline with 30mcgs buprenorphine. The mean time to achieve Bromage 4 score was 45.47 ± 28.89 second in group A while in group B, It was 28.76 ± 4.94 seconds, which is significantly higher ($P > 0.05$). **Conclusion:** Simultaneous mixing of buprenorphine with hyperbaric bupivacaine results in delayed sensory and motor block as compared to subsequent separate administration of drugs.

KEYWORDS : Buprenorphine, neuraxial anaesthesia, bupivacaine, bromage score

INTRODUCTION

With the coming of new class and safer local anaesthetics, regional anaesthesia has emerged as a choice of anaesthesia for infra umbilical surgeries.¹ Central neuraxial anaesthesia greatly expands the anaesthesiologist freedom providing the alternative to general anaesthesia, and reduces the incidence of major perioperative complications including deep vein thrombosis, pulmonary embolism, blood loss, and respiratory complications. Due to their synergistic action with local anaesthetics, intrathecal opioids are most commonly used. Spinal anaesthesia with administration of 0.5% Bupivacaine (H) combined with adjuvant drug has become the choice for infra-umbilical surgeries. Intrathecal adjuvants provide a better quality of blockade and extend the duration of analgesia.² Opioids are widely used for intrathecal administration and benefits of neuraxial narcotics over systemic narcotics are well established.³ Density is the most important determinant of the distribution, duration and degree of the spinal block achieved. Small changes in the anaesthetic density may influence local anaesthetic distribution both experimentally and clinically.⁴ Opioid densities are lower than hyperbaric and in some cases, isobaric local anaesthetic. Mixing of opioids with local anaesthetics will decrease the final density of the mixture.⁵ Mode of administration of these adjuncts with the spinal anaesthesia drug, however are under the domain research and yet to be establish as protocol.

MATERIALS AND METHODS:

The study was conducted on the Patients admitted in Sri Aurobindo institute of medical science and PG Institute, Indore (M.P). Ethical clearance was taken from institutional ethical committee. Total 170 patients who underwent infraumbilical surgery were enrolled and out of that 148 were studied who fulfilled the following inclusion criteria –

1. American Society of Anesthesiologists (ASA) grade 1 & 2
2. Age 18 to 70 years
3. Patients undergoing infra umbilical surgeries.
4. Patients with normal coagulation profile.

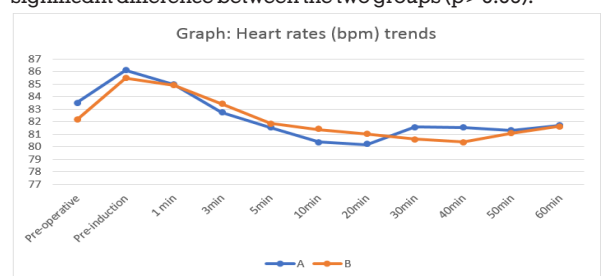
Patients with known allergy to any drug or undergoing any emergency procedures or non-cooperative were excluded from the study.

METHODOLOGY

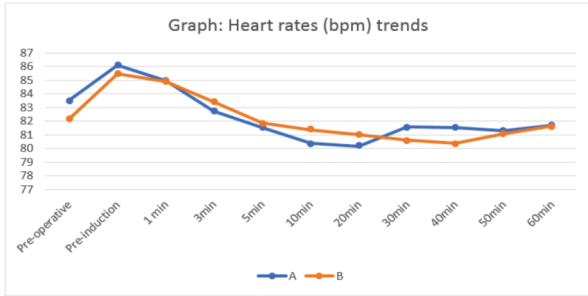
- Informed written consent was obtained. Detailed pre-anaesthetic evaluation was done. Patients were then randomized using the computer generated random numbers technique and divided into two groups – Namely Group A (premixed drugs) and Group B (separate drugs) Patient were preloaded with fluid 10ml/kg.
- Patients fulfilling the required criteria were administered subarachnoid block under all aseptic precautions in sitting position at L3-L4 intervertebral space.
- After identifying the space 2% lignocaine was injected as local anaesthetic.
- Subarachnoid block was performed by inserting 25G spinal needle (Quinke's). After checking free flow of CSF, barbotage is done before administrating the drug.
- In **Group A** - then fixed volume of 0.5% hyperbaric Bupivacaine 3.0 ml + 30 mcg Buprenorphine in a single 5ml syringe + 0.5 ml Normal saline in 2ml syringe
- On the other hand, In **Group B** was administered with fixed volume of 0.5% hyperbaric bupivacaine 3.0 ml in a 5ml syringe followed by 30 mcg buprenorphine + 0.5 ml Normal Saline in a 2ml syringe.
- Patients were then laid down in supine position.
- Monitored with ECG, NIBP, SpO₂ and respirator rate at regular intervals intraoperatively
- Assessment of onset and duration of sensory and motor block, hemodynamic changes and complications were recorded in both groups intraoperatively and post operatively.

RESULT :

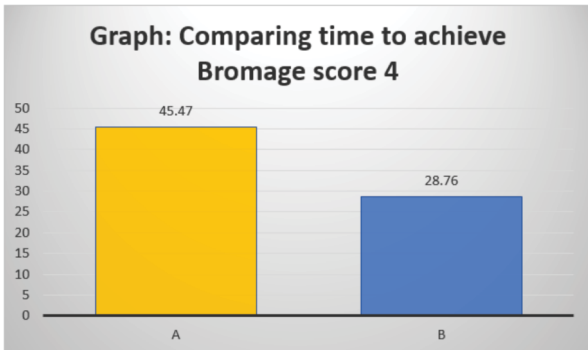
Heart rate on pre-operatively, pre-induction and at 1, 3, 5, 10, 20, 30, 40, 50, and 60 mins did not demonstrate a statistically significant difference between the two groups ($p > 0.05$).



Mean arterial pressure on pre-operatively, pre-induction and at 1, 3, 5, 10, 20, 30, 40, 50, and 60 mins did not demonstrate a statistically significant difference between the two groups ($p > 0.05$).



The mean time to achieve Bromage 4 score was significantly higher in pre-mixed group (Group A) as compared to separate group (Group B), ($p < 0.05$). The mean time to achieve Bromage 4 score was 45.47 ± 28.89 second in group A while in group B, mean time was 28.76 ± 4.94 seconds.



DISCUSSION:

The density of Bupivacaine and patient posture during induction of spinal anaesthesia are believed to be important factors in determining its spread in the CSF.

Hallworth et al.⁶ in their study have shown that in the lateral position, baricity had no effect on the spread of Bupivacaine as compared to the sitting position, where there was a statistically significant trend of increasing block height with decreasing baricity.

Hare et al. have shown that the density of the anaesthetic mixture decreases in a linear fashion as the fractional volume of anaesthetic is reduced by adding a larger proportion of water or opioid⁷. In this study they demonstrated that addition of opioids to hyperbaric anaesthetics changes the density of the mixture in a predictable manner. This could have important clinical implications since a change in anaesthetic density of 0.0027g/ml has been demonstrated to change the sensory block by about two dermatomes.

In Shivashankar et al.⁸ study, it was found that mixing of Buprenorphine with hyperbaric Bupivacaine results in a higher level of sensory block and are associated with higher incidence of hypotension requiring larger doses of vasopressor intraoperatively.

Cesur et al.⁹ studied the effect of sequential administration of hyperbaric and plain Bupivacaine in patients, and showed that patients who received the drugs sequentially had lower incidence of hypotension and reduced vasopressor requirement. Cesur et al injected Bupivacaine of two differing densities (plain and hyperbaric) sequentially and investigated the spread of spinal anaesthesia. They noted that sequential injection of plain and hyperbaric Bupivacaine reduced the incidence of hypotension and vasopressor requirement.

In our study, we found no significant changes in haemodynamic parameters after the drug administration in both study group. We measured the mean arterial pressure, heart rate at pre-induction and at 1, 3, 5, 10, 20, 30, 40, 50, and 60 minutes, post induction but did not demonstrate any statistically significant difference between the two groups ($p > 0.05$).

CONCLUSION:

To conclude, mixing of Buprenorphine with hyperbaric Bupivacaine results in a higher level of sensory and motor block compared to subsequent administration of drugs in subarachnoid spinal anaesthesia of infra umbilical surgeries.

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