



COMPARATIVE STUDY OF BLOCK CHARACTERISTICS OF SUBARACHNOID HYPERBARIC BUPIVACAINE WITH FENTANYL VERSUS HYPERBARIC BUPIVACAINE ALONE IN INFRAUMBILICAL SURGERIES

Anaesthesiology

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ABSTRACT

Introduction: Adjuvants like fentanyl, clonidine, dexmedetomidine etc are in use with Bupivacaine in subarachnoid block to reduce the dose and side effects of Bupivacaine with prolongation of duration of block. However, literature has divided opinion regarding efficacy and side effects of these intrathecal adjuvants. So, search of a better adjuvant goes on. **Aim:** The aim of study was to evaluate the efficacy of Fentanyl as adjuvant with intrathecal Bupivacaine for infraumbilical surgeries. **Materials and Methods:** The study was a double blinded randomised controlled one in which 80 patients posted for infraumbilical surgeries were divided into two groups of forty each. Group F – received intrathecal hyperbaric Bupivacaine (2.5 ml) +25 µg Fentanyl (0.5 ml). Group B - received intrathecal hyperbaric Bupivacaine (2.5 ml) + 0.5 ml normal saline. Sensory and motor block characteristics, time of first dose of post-operative rescue analgesia and side effects were recorded and analysed. **Result:** We observed early onset of sensory block with prolonged duration of sensory and motor block in group F in comparison with group B. Time for first dose of rescue analgesia was delayed in group F compared to group B which was statistically significant ($P<0.001$). **Conclusion:** We recommend the use of Fentanyl 25 µg as adjuvant to Bupivacaine heavy for better block characters in infraumbilical surgeries.

KEYWORDS

Bupivacaine, Fentanyl, Intrathecal

INTRODUCTION

Spinal anesthesia is preferred method for infraumbilical surgeries as it is easy to perform, rapid in onset, decreased intraoperative blood loss, reduced incidence of deep venous thrombosis, self controlled airway and less polypharmacy [1]. However, it produces a fixed duration of anesthesia with hemodynamic side effects [2]. A number of adjuvants like clonidine, dexmedetomidine, neostigmine, opioids etc [3,4,5] have been tried but all have some side effects. Fentanyl is most commonly used opioid as adjuvant in regional anesthesia. It is highly potent drug due to its high lipophilicity. It is preferred in spinal anesthesia because of its rapid onset, minimal cephalic spread with prolonging duration of blocks produced by Bupivacaine [6,7]. In this study fentanyl has been evaluated as adjuvant to hyperbaric Bupivacaine in terms of block characteristics in patients undergoing infraumbilical surgeries.

MATERIALS AND METHODS

This study was performed in the Department of Anesthesiology & ICU in Jawaharlal Nehru Medical College & Hospital, Bhagalpur after obtaining informed consent from all patients. Eighty (80) ASA Gd-I & -II patients scheduled for infraumbilical surgeries were selected for this study. The study population was randomly divided into two groups, Gp B (saline group) & Gp F (Fentanyl group), forty ($n=40$) in each.

Pre-anesthetic Preparation:

NPO protocol was followed, 18 G i.v cannula inserted and fluid (Ringer lactate) supplemented to fulfil the loss. Vitals were recorded at PAC, before intrathecal injection and every 5 minutes thereafter till the completion of surgery. Drugs used were Bupivacaine (0.5%) heavy 2.5 ml (12.5mg) with normal saline (0.5 ml) in Gp (B) and with Fentanyl 0.5 ml (25 µg) in Gp(F). Under all aseptic precautions in sitting position, lumbar puncture was performed in L3 –L4 subarachnoid space and free flow of CSF observed. The intended drug combination was injected intrathecally.

Immediately after the injection of the drug, the patient was turned supine and administered oxygen at the rate of 4 lts/min via nasal prong. Sensory and motor block characteristics along with postoperative analgesic duration were monitored. Side effects / complications if any, were noted and dealt accordingly. The data obtained were statistically analysed, inferred, discussed, summarised and concluded.

OBSERVATIONS

Observations are tabled as below:- **Table-1**

Table-1 Comparison of block characteristics between group B and group F

	Group B	Group F	P Value
Mean time taken for onset of sensory block (in mins)	2.9±0.810	1.55±0.503	$P<0.001$
Mean time taken for onset of motor block (in mins)	4±0.784	1.65±0.483	$P<0.001$
Mean time taken for regression of sensory block by two segments (in mins)	78.92±9.44	135.9±13.57	$P<0.001$
Mean time taken for wearing off of motor block (in mins)	165.12±25.88	279±24.68	$P<0.001$
Time of first dose of post operative rescue analgesia (in mins)	193.75±23.28	337.25±28.86	$P<0.001$

DISCUSSION

Fentanyl is the most frequently used intrathecal lipophilic opioid used as analgesic agent. Fentanyl produces intense, prolonged analgesic action without gross autonomic changes. Fentanyl exhibits close structural similarities to local anesthetics and has demonstrable anesthetic effect on sensory C primary afferent nerve fibres, which may facilitate analgesic effects. The lesser time taken in onset of sensory and motor block in Fentanyl group (f) in our study concurs with the studies done by Khezri et al [8] and Bajwa et al [9]. Mean time taken for regression of sensory block by two segment and time for wearing off of motor block was more in fentanyl group (f) of our study which was in accordance to studies done by Khezri et al [8], Bazwa et al [9], Benhamou D et al [10] etc. Time of first dose of post operative rescue analgesia was found to be greater in fentanyl group (f) as compared to bupivacaine group (b) which concurs with the studies done by Khezri et al [8], Routry et al [11].

Summary

We compared intrathecal Bupivacaine+ Fentanyl (25 µg) with Bupivacaine + normal saline in equal volume of 3 ml in 40 ($n=40$) cases each. We found that the addition of Fentanyl to Bupivacaine significantly fastens sensory and motor block onset, prolongs duration of sensory and motor block and increases duration of request for 1st postoperative rescue analgesia.

CONCLUSION

From the present study, we recommend use of Fentanyl (25 µg) with intrathecal Bupivacaine as its addition produces better block characteristics.

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