

# Ultrasound Guided Transverse Abdominis Plane Block for Post Operative Analgesia for Unilateral Hernioplasty

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**Abstract:** Background: Transversusabdominis plane (TAP) block with local anaesthetics produces effective pain relief following lower abdominal surgeries. Although opioids have been found to have effects through peripheral receptors, reports on their effect as additive to local anaesthetics for TAP block are lacking. Objective: To assess the analgesic effect of peripherally administered morphine with bupivacaine for ipsilateral ultrasound guided TAP block in patients undergoing unilateral hernioplasty under spinal anesthesia. Methodology and Results: After ethical committee clearance and written informed consent, Forty patients ASA I & II undergoing unilateral hernioplasty were randomized to undergo ipsilateral ultrasound guided TAP block with 20 ml of 0.5% bupivacaine plus 2 ml of NS (Group TB) or with 20ml of 0.5% bupivacaine plus 2 mg (2 ml) of morphine (Group TBM). The visual analog scale was compared at the time intervals 1,2,3,4,5,6,8,12,24 hrs during rest as well as movement. Inj. Tramadol 100 mg IV was used as rescue analgesic when postoperative numerical rating scale was 4 or more. The mean duration of analgesia in Group BM was longer ( $446 \pm 38.92$  min than in Group B ( $281.00 \pm 42.17$  min) which is statistically significant  $p < 0.001$  The mean postoperative 24 h tramadol requirement was also less in Group BM ( $69.23 \pm 25.31$ mg) than in Group B ( $100.00 \pm 38.34$  mg) with a p value  $< 0.001$ . Conclusion: Morphine added to bupivacaine effectively prolongs the analgesic duration of TAP block in unilateral hernioplasty.

## 1. Introduction

Patients undergoing hernioplasty suffer significant postoperative pain and require effective analgesia. Transversus Abdominis Plane (TAP) block is one of the approaches to provide effective postoperative analgesia in patients undergoing surgical procedures involving anterior abdominal wall. Ultrasound guided TAP block has been described with promises of better localization and deposition of the local anaesthetic with improved accuracy. Although opioids have been found to have effects through peripheral receptors also, reports on their effect as an additive to local anaesthetic for TAP block are lacking. To assess the effectiveness of adding Morphine to Bupivacaine on the quality and duration of USG guided TAP block for postoperative analgesia in adult patients undergoing hernioplasty.

## 2. Methodology

It was Prospective randomised double blinded study. Age 30 -70 years, ASA I & II were included. Patient refusal, ASA grade III & IV, Known allergy to study drug, Local infection, Patient with coagulopathies, Patient with diabetic, renal, liver diseases, Patients with known or suspected pregnancy, morbid obesity were excluded.

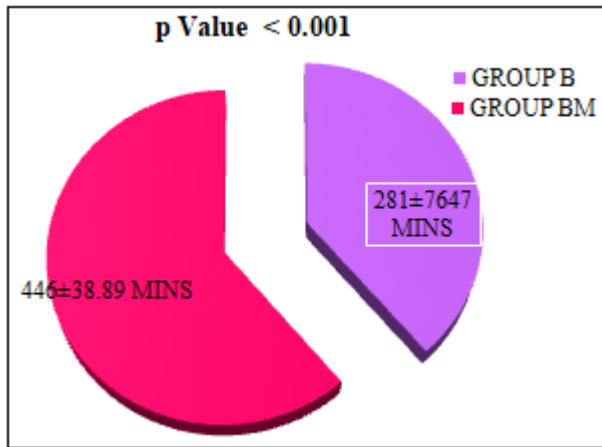
After institutional review board approval, and written informed consent 40 patients undergoing unilateral hernioplasty were selected. Subjects were randomly assigned to either group B or group BM using envelope technique. Group B received 20 ml of 0.5 % Bupivacaine +2

ml of normal saline {total 22 ml} and Group BM received 20 ml of 0.5 % Bupivacaine +Morphine 2mg { total 22ml}. The block was performed by an anaesthesiologist and post op assessment of the patients for visual analogue score and supplemental analgesic requirement was done by different anaesthesiologist. All patients undergoing unilateral hernioplasty were given SAB under aseptic conditions in the right lateral position using 25-gauge Quincke spinal needle at L3-L4 interspace and 15 mg of 0.5% hyperbaric bupivacaine was injected after confirming free flow of CSF. After completion of the surgical procedure, the unilateral USG guided TAP block was performed with the drugs as per the random allocation sequence. After spinal regression below L2 in the opposite side, cold sensation was checked at L1 dermatome in the side of block. If the patient was not able to perceive cold sensation at L1, the block was graded as success. The visual analog scale was compared at the time intervals 1, 2, 3, 4, 5, 6, 8, 12, 24 hrs during rest as well as movement. Inj. TRAMADOL 100mg was given intramuscularly when visual analog score  $\geq 4$  and the time was noted as time of first analgesic dose. Duration of analgesia was the time interval between the performance of block and the time of first analgesic dose.

Volume 8 Issue 3, March 2019

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### 3. Results

The baseline patient characteristics were comparable between the groups. The intensity of pain both at rest and during movement were statically significant at all the observation time points among the groups. The mean duration of analgesia in Group BM was longer ( $446 \pm 38.92$  min) than in Group B ( $281.00 \pm 42.17$  min) which is statistically significant  $p < 0.001$ . The mean postoperative 24 h tramadol requirement was also less in Group BM ( $69.23 \pm 25.31$  mg) than in Group B ( $100.00 \pm 38.34$  mg) with a p value  $< 0.001$ . Four patients in group B developed mild to moderate nausea, while one patient in group BM had mild symptom of nausea. None of the patients had respiratory depression, pruritis.

### 4. Discussion

The present study has shown that Morphine added to Bupivacaine for ipsilateral TAP block significantly prolongs the duration of analgesia following hernioplasty with reduced 24 h postoperative analgesic requirement. Patient receiving Morphine as additive to Bupivacaine for TAP block had more than three and a half hours duration longer analgesia compared to the patients receiving only Bupivacaine for TAP block. This finding is further supported by reduction in tramadol requirement in patient receiving Bupivacaine and Morphine for TAP block. Precise mechanism of prolonged analgesic effect of local anaesthetics in TAP block is not clear but it is assumed that TAP is a poorly vascularised space and the drug clearance is delayed.

To improve the efficacy of postoperative analgesia, opioids are injected close to the nerve trunks and nerve endings. Nielsen and colleagues in a review article concluded that the analgesic effects of peripherally applied opioids may depend on the presence of postoperative inflammation. The occurrence of nausea and vomiting and requirement of ondansetron as rescue antiemetic was clinically more with the patients who received TAP block with Bupivacaine only.

El Sherif et al. compared the effect of with or without addition of morphine to bupivacaine in ultrasound guided transversus abdominis plane block for postoperative analgesia following lower abdominal cancer surgery and found significantly prolonged duration ( $10.40 \pm 4.96$  Vs

$6.97 \pm 3.26$  h) of analgesia with TAP block with bupivacaine plus morphine. Systemic opioids are regarded effective in managing postoperative pain but are not free of unwanted effects like respiratory distress, nausea-vomiting, pruritis and urinary retention. So, elderly patients, obese patients with history of obstructive sleep apnea may benefit more with TAP blocks as it provides opioids sparing effects.

### 5. Conclusion

Morphine as an adjunct to Bupivacaine in ipsilateral ultrasound guided Transversus Abdominis Plane block as a component of multimodal analgesia provides effective postoperative analgesia with reduced opioid analgesic requirement with minimal side effects in patients undergoing hernioplasty.

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