

# Comparative study of ilioinguinal - iliohypogastric block versus wound infiltration using 0.5% bupivacaine after elective hernia repair for postoperative pain relief

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## Abstract

**Background:** Pain has been consistently inadequately managed in post herniorrhaphy. Local anaesthetic techniques provide better pain relief and early mobilization after surgery. Main aim of our study is to compare analgesic effect of Ilioinguinal nerve block (IINB) - Iliohypogastric nerve block (IHNB) and wound infiltration using 0.5% bupivacaine in terms of duration of analgesia and requirement of analgesic doses. **Methodology:** A total of 60 patients posted for unilateral elective inguinal hernia repair received subarachnoid block (SAB). Patients were randomly divided into two groups of 30 each, Group 1 - received Ilioinguinal - Iliohypogastric block with 10ml of 0.5% bupivacaine and Group 2 - received local anaesthetic surgical wound infiltration with 0.5% bupivacaine at the end of surgery. Procedures were done by single trained anaesthesiologist. The parameters recorded were intensity of pain measured using visual analogue scale (VAS), requirement of first analgesic dose in postoperative period and complications. **Results:** At 2nd and 4th hours VAS scores in Group 1 were lesser than Group 2, found significant. The time for first analgesic dose requirement in Group 1 (4.83hour) was prolonged when compared to Group 2 (3.88hour) which was statistically significant. There were no major complications associated with the use of both techniques. Only one patient in Group 2 developed itching in the wound area which was easily controlled by antihistaminics. **Conclusion:** IINB-IHNB is safe, simple and better anaesthetic technique in providing postoperative analgesia in uncomplicated unilateral inguinal hernia repair than local infiltration block.

**Key words:** Ilioinguinal-Iliohypogastric nerve block, subarachnoid block, inguinal hernia repair

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## INTRODUCTION

Inguinal herniorrhaphy is one of the most commonly performed surgical procedures under general, regional or

local anaesthesia.<sup>1</sup> Pain is a protective mechanism designed to alert the body to potentially injurious stimuli. The alleviation of pain had been the focus of continuing human effort. However it has been recognized that the management to postoperative pain has been consistently inadequate.<sup>2</sup> Post-operative pain after inguinal herniorrhaphy can be significantly decreased if the surgery is performed with the use of local or spinal anaesthesia.<sup>3</sup> IINB - IHNB has been popularized in recent times because of its simplicity, low cost and lack of potentially detrimental side effects as observed with systemic analgesics. Local anaesthetic techniques provide better pain relief and early mobilization after surgery.<sup>4</sup> The use of IINB-IHNB found to prolong the duration of postoperative analgesia. Surgical wound infiltration has

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also been proposed to delay the time for first systemic analgesic dose in patients undergoing inguinal herniorrhaphy.<sup>5</sup> The present study was formulated to compare and evaluate the usefulness of IINB-IHNB and local surgical wound infiltration with 0.5% bupivacaine for providing pain relief in the postoperative period for patients undergoing elective inguinal herniorrhaphy under spinal anaesthesia.

## MATERIAL AND METHODS

This was a prospective randomised controlled study. The study was conducted in a teaching hospital and approved by the institutional ethical committee. The study population consisted of 60 patients, divided into two groups of 30 each, Group 1 - received Ilioinguinal - Iliohypogastric block and Group 2 - received local anaesthetic infiltration, with 0.5% bupivacaine at the end of surgery. The study population included patients between 20-60 years age belonging to ASA physical status 1 and 2 of either sex, posted for elective inguinal hernia repair. Patients with ASA physical status 4 or more, allergic to local anaesthetic, irreducible or obstructed hernia and contraindications for spinal anaesthesia were excluded from the study. After thorough pre-anaesthetic evaluation, informed written consent was obtained from all patients meeting the inclusion criteria. Patients who gave consent for the study were randomised by using computer generated random table numbers and allotment was done using coded sealed opaque envelopes. The sealed envelope was opened by an anaesthesiologist not involved in the study. The observer, who collected the perioperative data as well as the patient, was masked to the technique of analgesia performed. All the patients were pre-medicated with oral alprazolam 0.5 mg and oral ranitidine 150 mg on the previous night of surgery. Patients was kept nil orally for at least 8 hours. On arrival to the operating room, intravenous line was secured with 18G intravenous cannula in all patients and was preloaded with lactated ringer's solution at 15ml/kg. Patients were connected to all standard monitors such as oxygen-saturation (SPO<sub>2</sub>), ECG, Non-invasive Blood pressure (NIBP) monitors. Baseline values of parameters like heart rate, blood pressure, and SPO<sub>2</sub> were recorded and then every 3-5mins. Under aseptic precaution, all patients underwent lumbar puncture in left lateral position at L3-4 inter laminar space using 26G Quincke's spinal needle and received standard spinal anaesthesia with 3.0 ml of bupivacaine heavy 0.5% to achieve block level up to T8. At the end of procedure patients administered with either IINB – IHNB (blind technique) with 10ml of 0.5% bupivacaine (Group 1) or wound infiltration with 10ml of 0.5% bupivacaine (Group 2). Both the procedures were done by the same trained anaesthesiologist. As there is a lack of ultrasound machine in our set up it was not used.

All the patients of both groups were observed in recovery room for a period of 6hours. Cardiorespiratory parameters such as pulse rate, blood pressure, ECG, SPO<sub>2</sub> were monitored in the Postoperative period. Intraoperative complications like nausea, vomiting, bradycardia and hypotension were treated appropriately. Heart rate of less than 60 considered as bradycardia and treated with atropine 0.2mg intravenous. Blood pressure of less than 20% of baseline considered as hypotension and treated with mephentermine 5mg intravenous bolus along with intravenous fluids. Duration of surgery i.e., from the end of completion of subarachnoid block to closure of surgical site recorded. Severity of pain in postoperative period was assessed using visual analogue scale (0 mm = no pain - 100 mm = worst pain imaginable) every 2nd hour upto 6hours of postoperative period. Requirement of first analgesic dose i.e., time from the end of nerve block or infiltration of the surgical site till patient complaints of VAS more than 30. When VAS was more than 30mm, patients received paracetamol one gram intravenously. Complications like nausea, vomiting, itching or complications to drug were also noted and treated.

## STATISTICAL ANALYSIS

Study results consisting of data were analyzed by student 't' test and Fisher's test. A 'p' value < 0.05 was considered to be statistically significant. All the statistical operations were done through SPSS for Windows Evaluation version 20.

## RESULTS

The demographic data were comparable in both the groups. There was no significant difference between the two groups with regard to duration of surgery, cardiorespiratory parameter in the intraoperative and postoperative period (Table 1). VAS immediately after nerve block or infiltration showed a difference but found insignificant. At 2nd and 4th hours VAS scores in Group 1 lesser than Group 2, which was statistically significant. VAS at 6th hour was 41.176 and 49.623 in Group 1 and 2 respectively, which was insignificant (Table 2). The mean time of first analgesic dose requirement was 4.83hours in Group 1 compared to 3.88hours in Group 2, which was statistically significant (Table 3). Only one patient in Group-2 developed itching in the surgical site (Table 4).

**Table 1:** Demographic profile of patients and duration of surgery

Variable	Group 1(n=30) (Mean±SD)	Group 2 (n= 30) (Mean±SD)
Age (years)	48.4±2.45	50.1±3.04
Height (cm)	155.3±3.05	156.6±2.48
Weight (Kg)	53.7±3.25	55.6±3.65
Duration of surgery (minutes)	95 ±8.12	92 ±10.53

**Table 2:** Mean Visual analogue scale

Time (hours)	Group 1	Group 2	P value
0	0.833	1.257	>0.05
2	10.548	18.667	<0.05
4	24.333	38.169	<0.05
6	41.176	49.623	>0.05

**Table 3:** Mean duration for first analgesic dose

	Group 1	Group 2	p-value
Mean duration (hours)	4.83	3.88	<0.05

**Table 4:** Postoperative complications

Complications	Group 1	Group 2
Itching	0	1

## DISCUSSION

The advantages of local anaesthesia are safety, simplicity, effectiveness and cost effective.<sup>6,7</sup> The alleviation of pain has been the focus of continuing human effort, however it has been recognized for sometime that the management of acute pain especially postoperative pain has been inadequate.<sup>1</sup> Conventional postoperative analgesia involves administration of opioids/NSAIDs injections or oral analgesics. Repeated intramuscular injections are discomfort to patient requiring trained nursing staff and hospitalization, in addition systemic side effects like nausea, vomiting, unwanted sedation or cardiorespiratory depression in case of opioids use. The efficacy of local anaesthetic in reducing postoperative pain after inguinal herniorrhaphy has been investigated using different application modes.<sup>8,9,10</sup> such as Inguinal field block, wound infiltration techniques and wound instillation using local anaesthetics.<sup>11,12,13</sup> However the effect of local anaesthetic infiltration controversial, depending on the surgical and the anaesthetic techniques.<sup>14,15</sup> The present study was conducted to study, the combination of IINB-IHNB block with wound infiltration in relation to quality, intensity and time duration for the first analgesic dose requirement. The demographic profiles were comparable in both the group. Cardiorespiratory monitoring in both groups found to be insignificant statistically. Duration of surgery was also found almost similar duration in both the groups. In the study of Buggedo GN *et al*, pain intensity (measured by VAS) was reduced in study group compared to control group.<sup>9</sup> Similar results were in our study, IINB-IHNB block (Group 1) provided effective pain relief compared to wound infiltration (Group 2) in terms of VAS score, which was less than 30 in Group 1 upto 6hours of post-operative period. VAS score at 2nd and 4th hours found lesser in Group 1 compared to Group 2, which was significant and VAS at 6th hour in both groups shown difference but was found to be not significant. We found mean duration of postoperative analgesia was 4.83 hours in Group 1 and 3.88 hours in

Group 2. So the duration of postoperative analgesia was prolonged in Group 1 when compared to Group 2, thereby reducing need for requirement of systemic dose of analgesic drugs like opioids, NSAIDs. Similar results were found by Abad *et al*, first analgesic dose was delayed i.e., 4-5 hours in their study group.<sup>[16]</sup> Young *et al*, also found similar results in their study.<sup>17</sup> In the present study, there were no major complications associated with the use of both techniques. Only one patient in Group 2 developed itching in the wound area which was easily controlled by antihistaminic.

## CONCLUSION

IINB-IHNB is a safe, simple and effective analgesic technique for post-operative inguinal herniorrhaphy. This needs a multi-center study as pain is a subjective phenomenon.

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