

ORIGINAL RESEARCH

Transverse Abdominis Block versus Ilioinguinal Nerve Block in Adult Inguinal Hernia Surgeries: An Analytical Comparison of Analgesic Efficacy and Adverse Effects

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Received: 13/04/2024

Accepted: 20/05/2024

ABSTRACT

Introduction: Surgery for inguinal hernia is often linked with substantial postoperative pain and discomfort and is a frequently performed surgical intervention. The use of local anesthetic infiltration has been found to enhance the management of postoperative pain, decrease discomfort, minimize nausea and vomiting, reduce respiratory issues, and lower the need for opioid medications. This research aimed to compare the effectiveness, duration, and adverse effects of transversus abdominis block versus ilioinguinal nerve block in the context of postoperative analgesia for inguinal hernia surgery. **Methods:** This observational study involved patients aged between 20 and 50 years who were randomly divided into two groups of 30 individuals each: Group T received a Transverse Abdominis Block, while Group I received an Ilioinguinal Nerve Block. The study protocol included preoperative assessments, standard diagnostic evaluations, and administration of anesthesia according to the assigned group. Continuous monitoring of vital signs, pain levels, and postoperative complications was carried out. Statistical analysis was performed using MS Excel and SPSS version 22, utilizing appropriate statistical tests and graphical representation of data, with a significance threshold set at $p < 0.05$. **Results:** No significant differences were observed in age, sex distribution, weight, visual analog scale (VAS) scores, adverse effects, or mean time to rescue analgesia between the two groups. Both techniques were deemed safe and effective for managing postoperative pain. The quality and duration of pain relief achieved with the transverse abdominis plane block were comparable to those with the ilioinguinal nerve block. Furthermore, the occurrence and severity of side effects associated with both nerve blocks were minimal. **Conclusion:** The study findings suggest that both methods are equally safe and effective in alleviating postoperative pain. Both transverse abdominis plane block and ilioinguinal nerve block are viable options for improving postoperative analgesia outcomes in patients undergoing inguinal hernia surgeries.

Keywords: Postoperative Pain, Analgesia, Transversus Abdominis, Ilioinguinal Nerve, Inguinal Hernia

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INTRODUCTION

Inguinal hernia surgery is associated with significant postoperative pain and distress and is a commonly performed procedure. This surgery consumes a substantial portion of healthcare resources, with an estimated 15-20 million patients undergoing it

globally each year. Studies indicate that around 37% of patients experience postoperative pain following inguinal hernia surgery. Previous research has shown that regional anesthesia is used in 5–15% of cases, central neuraxial blockade in 10–20% of cases, and

general anesthesia in approximately 60–70% of cases for hernia surgeries [1–3].

The utilization of local anesthetic drugs for blocks or infiltration has shown benefits such as delaying the time to breakthrough analgesia, shortening intra-hospital recovery, reducing morbidity, and lowering overall costs. Local anesthetic infiltration improves postoperative pain management, lessens discomfort, reduces nausea, vomiting, respiratory depression, and lowers the demand for opioids [1].

Peripheral nerve blocks like TransversusAbdominis Plane (TAP) block and Ilioinguinal (IIN) nerve blocks are mentioned in the literature as effective methods to alleviate pain from abdominal wall incisions [1,2]. TAP block is particularly useful as part of a multimodal approach for postoperative analgesia after abdominal surgeries including inguinal hernia repair. This block involves injecting local anesthetic into the plane between the abdominal muscles, specifically the transversusabdominis and internal oblique muscles. IIN blocks are commonly used for surgeries below the umbilicus, including inguinal hernia repair, and they target the ilioinguinal and iliohypogastric nerves [4,5]. Recent trends show increasing popularity of TAP and IIN blocks to reduce postoperative pain after inguinal hernia surgery [5]. While TAP block is a compartment block affecting the transversusabdominis and internal oblique muscles, IIN block targets the ilioinguinal nerve directly. However, both blocks influence the ilioinguinal and iliohypogastric nerves, presenting a similarity between them [5]. This study aimed to compare the efficacy, duration, and adverse effects of transversusabdominis block with ilioinguinal nerve block in managing postoperative analgesia for inguinal hernia surgery.

MATERIAL AND METHODS

The research was structured as an observational inquiry carried out at a tertiary care public hospital over a span of 18 months. After obtaining approval from the Institutional Ethics Committee, patients were thoroughly briefed on the study protocols, and written informed consent was acquired from each participant. Patients aged between 20 and 50 years were randomly allocated to two cohorts of 30 individuals each: Group T, subjected to a Transverse Abdominis Block, and Group I, subjected to an Ilioinguinal Nerve Block. Inclusion criteria comprised patients slated for elective primary open inguinal hernia surgeries, categorized as ASA grades I and II, and expressing willingness to partake. Exclusion criteria were applied to patients with specific medical conditions, aged over 50 years, unable to comprehend the Visual Analog Scale (VAS), and possessing known allergies to the medications used in the study.

The comprehensive procedure encompassed preoperative assessments, standard investigations, and administration of anesthesia as per the assigned group. Group T: Underwent Transverse Abdominis Block with 20 ml of 0.25% ropivacaine.

Group I: Underwent Ilioinguinal Nerve Block with 10 ml of 0.25% ropivacaine and local infiltration of 10 ml of 0.25% ropivacaine along the incision line. Patients observed a 6-hour fasting period prior to surgery.

Patients were closely monitored for vital signs, pain levels, and postoperative adverse effects. Statistical analysis was conducted using MS Excel and SPSS version 22, employing appropriate statistical tests and graphical depiction of data. A significance threshold of $p < 0.05$ was deemed statistically meaningful.

RESULTS

Table 1: Baseline demographic and clinical variables of study participants

Variable	IIN	TAP	p Value
Age in Years; Mean \pm SD	38.77 \pm 8.69	38.47 \pm 9.82	0.901
Male; n (%)	30 (100)	1 (3.33)	0.313
Female; n (%)	0 (0)	29 (96.67)	
Weight in KG; Mean \pm SD	74.47 \pm 4.38	73.57 \pm 5.04	0.463
ASA I; n (%)	0 (0)	0 (0)	-
ASA II; n (%)	30 (100)	30 (100)	

Table 2: Mean VAS comparison between two groups at different intervals of time

Group	IIN (Mean)	IIN (SD)	TAP (Mean)	TAP (SD)	p value
After premedication	1	0	1	0	1.00
After spinal anesthesia	1	0	1	0	1.00
At the time of surgery	1	0	1	0	1.00
At the end of surgery	1	0	1	0	1.00
At the time of block	1	0	1	0	1.00
10 Mins	1	0	1	0	1.00
30 Mins	1	0	1	0	1.00
1 hour	1	0	1	0	1.00
2 hours	2	0	1	0	1.00
4 hours	3	0	2	0	1.00
6 hours	4	0	3	0	1.00

8 hours	4	0	3.93	0.37	0.32
12 hours	4	0	4	0	1.00
16 hours	4	0	4	0	1.00
18 hours	4.23	0.43	4.23	0.5	1.00
24 hours	4.57	0.5	4.5	0.51	0.61

Table 3: Adverse Effects Distribution between two groups at different intervals of time

Interval of Time	Adverse Effect	IIN (n)	IIN (%)	TAP (n)	TAP (%)
After premedication	No	30	100	30	100
After spinal anesthesia	No	30	100	30	100
At the time of surgery	No	30	100	30	100
At the end of surgery	No	30	100	30	100
At the time of block	No	30	100	30	100
10 Mins	No	30	100	30	100
30 Mins	No	30	100	30	100
1 hour	No	30	100	30	100
2 hours	No	30	100	30	100
4 hours	No	30	100	30	100
6 hours	No	30	100	30	100
8 hours	No	30	100	30	100
12 hours	No	30	100	30	100
16 hours	No	30	100	30	100
18 hours	No	30	100	30	100
24 hours	No	30	100	30	100

Table 4: Time of Rescue analgesia between two groups

Group	n	Mean	SD	p Value
IIN	19	21.78	2.973	0.748
TAP	19	21.47	3.043	

DISCUSSION

The benefits of effective postoperative analgesia are multifaceted, encompassing reductions in the postoperative stress response and morbidity, improvements in patient satisfaction, and better overall outcomes [6]. Ilioinguinal nerve block is known to provide effective postoperative analgesia following inguinal hernia surgery. On the other hand, the transversus abdominis plane (TAP) block is an alternative, easily performed, and effective peripheral abdominal field block that targets the ilioinguinal, hypogastric, and lower intercostal (T7–T11) nerves [6].

In our present study, the mean time for rescue analgesia in the Ilioinguinal Nerve Block group was 21.78 ± 2.973 hours, while in the Transverse Abdominis Nerve block group, it was 21.47 ± 3.043 hours [41]. The criterion for postoperative rescue analgesia in our study was a VAS score greater than 4. Interestingly, we observed no significant difference in the mean time for rescue analgesia between these two groups, consistent with a study conducted by OnurOkur et al. in 2017 [7].

In another study by Sujata et al. [1], both ilioinguinal nerve block and TAP block provided significant postoperative analgesia. However, ultrasound-guided TAP block offered better postoperative pain control after inguinal hernia repair, which contrasts with our findings. AnatoliStav et al. [8], in their 2016 study,

concluded that while both TAP block and ilioinguinal nerve block were effective for postoperative analgesia, the latter provided better pain relief following open inguinal herniorrhaphy.

Our study also aimed to measure postoperative VAS scores [9]. We found mean VAS scores of 4.57 and 4.50 for ilioinguinal nerve block and TAP block, respectively, after 24 hours. This difference was statistically insignificant. Similarly, Kirti Kamal et al. [6] observed comparable VAS scores between groups immediately postoperatively and up to 90 minutes after surgery, although at 24 hours, ilioinguinal nerve block showed better postoperative analgesia.

Veering [10], in their 2016 study on TAP block for laparoscopic inguinal hernia repair, reported significantly lower VAS scores in the TAP group at specific time points, consistent with our findings. However, DakhaleGN et al. [11] observed a shorter duration of postoperative analgesia with TAP block compared to our study's findings.

In summary, our study highlights the importance of evaluating various analgesic techniques comprehensively to tailor effective postoperative pain management strategies.

CONCLUSION

The present study investigated the efficacy of transverse abdominis plane block and ilioinguinal nerve block in providing postoperative analgesia

following inguinal hernia surgeries. The study findings suggest that both methods are safe and effective in alleviating postoperative pain. Moreover, the quality and duration of analgesia achieved with transverse abdominis plane block were comparable to those with ilioinguinal nerve block. Additionally, the incidence and severity of side effects associated with both nerve blocks were minimal, indicating their suitability for postoperative pain management. These conclusions underscore the potential of both transverse abdominis plane block and ilioinguinal nerve block as viable options for improving postoperative analgesia outcomes in patients undergoing inguinal hernia surgeries.

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