

## A Comparative study of ilioinguinal/iliohypogastric nerve block and transverses abdominis plane block for postoperative analgesia in patients for open inguinal hernia repair.

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### Abstract:

**Background:** For postoperative pain relief in patients undergoing open inguinal hernia repair both TAP block and combined ilioinguinal-iliohypogastric blocks are used under ultrasound guidance.

**Materials and Methods:** In this prospective randomised controlled study, 60 patients of ASA physical status I and II belonging to age group of 18-60years undergoing elective open inguinal hernia repair surgery under sub-arachnoid block were randomly allocated into 2 groups o30patients each, Group A (Transversesabdominisplane block) and Group B (Ilioinguinal-iliohypogastricnerve block). Group A received 20ml of 0.25%Bupivacaine for transversesabdominis planeblock and group B received 20ml of 0.25% Bupivacaine for ilioinguinal-iliohypogastric nerve block.Both groups of patients were monitored for postoperative pain for the next 24 hours.Postoperative rescue analgesia was with intravenous tramadol for the first 4 hrs and later with injection diclofenac intramuscularly.Total analgesic consumption in the first 24 hours postoperative period was the primary objective,,secondary objectives were intraoperative hemodynamics,number of attempts,time required for performing the block and postoperative pain scores were evaluated.

**Results:** There was no difference in age, BMI,and duration of surgery between two groups. Postoperative analgesia was better with ilioinguinal-iliohypogastric block when compared to transverse abdominis plane block and rescue analgesia was lesser with groupB when compared to groupA. The postoperative analgesia was significantly prolonged with ilioinguinal-iliohypogastric group ( $p<0.05$ ) when compared to transverse abdominis group.

**Conclusion:** Ilioinguinal-iliohypogastric nerveblock provide better postoperative analgesia when compared to TAP block for open inguinal hernia repair.

**Key Word:** Ilioinguinal-iliohypogastric ,transverse abdominis plane ,bupivacaine, postoperative analgesia..

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### I. Introduction

Inguinal hernia repair are the most common surgical procedure performed which causes moderate to severe postoperative pain.The main goal in the postoperative pain management is decreasing the amount and dosage of medications to decrease their sideeffects and improve the analgesia and make the postoperative period comfortable.Various pharmacological modalities are available such as topical or intravenous,intramuscular,epidural analgesia...Regional nerve blocks offer a great degree of postoperative pain relief thus facilitating early ambulation and discharge.ultrasound guided ilioinguinal-iliohypogastric nerve blocks provide adequate analgesia without any adverse effects.The TAP blockwas extensively used to provide postoperative analgesia following major abdominal surgeries.The present study was conducted to compare the efficacy of TAP block and ilioinguinal and iliohypogastricblock for postoperative analgesia in adult patients undergoing hernia surgeries.

### II. Material And Methods

This prospective comparative study was carried out on patients of Department of Anaesthesiology at Coimbatore medical college hospital,Coimbatore,Tamilnadu from february 2020 to September 2020. A total of 60 adult subjects (both male and females) between 18-60 yrs of ASAgrade I and II scheduled for elective inguinal hernia repair were included in this study.

**Study Design:** Prospective randomized control study.

**Study Location:** This was a tertiary care teaching hospital based study done in the Department of Anaesthesiology, at Coimbatore Medical college Hospital, Coimbatore, Tamilnadu.

**Study Duration:** febraury 2020 to September 2020..

**Sample size:** 60 patients.

**Sample size calculation:** The sample size was estimated on the basis of a single proportion design. The target population from which we randomly selected our sample was considered 5000.

**Subjects & selection method:** The study population was drawn from consecutive patients who presented to Coimbatore Medical College Hospital with inguinal hernia for surgical management. Patients were divided into two groups (each group had 30 patients) who were posted for elective inguinal hernia repair.

**Group A(N=30)** –Transversesabdominis plane block with 20ml of 0.25% bupivacaine.

**Group B (N=30 patients)** –Ilioinguinal-iliohypogastric nerve block with 20 ml of 0.25% bupivacaine

**Inclusion criteria:**

1. 18-60yrs age with ASA grade I and II .
2. Patients posted for elective unilateral inguinal hernia repair.

**Exclusion criteria:**

1. Pregnant women;
2. Patients with genetic disorders
3. Patients with coagulation disorder,hepatic/renal disease,obese with BMI above 35kg/m2.
4. Patient refusal,infection at the site of block.
5. Patients with previous history of angina, severe vascular disease, or other life threatening disease.
6. Patients taking concurrent corticosteroids, /or hormone replacement therapy.
7. Patients with a history of drug or alcohol abuse.

**Procedure methodology :**

After written informed consent was obtained, patients were shifted to operating room and intravenous access was secured.They were connected tothe multipara monitor and baseline vitals recorded.(pulse rate, NIBP,ECG,SPO2).All the patients surgery was done under subarachnoid block with 0.5% hyperbaric bupivacaine 3ml at L3-L4 space,and the surgery duration was not more than one hour.The block was performed at the end of the surgical procedure under ultrasound guidance using high frequency linear probe[sonosite Mturbo].For ilioinguinal-iliohypogastric nerve block probe was kept obliquely in the line joining the anterosuperior iliac spine and the umblicus ,immediately superior to the anterosuperioriliac spine.After identifying the nerves in the plane between internal oblique and transvers abdominis needle tip was targeted to the nerves and 20ml of 0.25% bupivacaine injected after aspiration .For TAP block the linear probe was kept on the lateral abdominal wall cephalad to iliac crest and caudal to the costal margin.The needle tip was placed in the plane between the internal oblique and transverse abdominis muscle using inplane technique and 20ml of 0.25% bupivacaine was administered.The patients were monitored for vitals for 30minutes in the Operating room and were also familirised with the use of VAS score (0-10cm)for the assessment of postoperative pain.Score 0 means no pain and 10 means worst pain.Then patients were shifted to the postoperative ward and monitored for 24hrs. Initially every 30minutes upto 2hours,then every 2hours till 10hours then 8thhrly.Severe pain within 4hrs was treated with intravenous tramadol or intramuscular diclofenac injection.

**Statistical analysis**

Data was analyzed using SPSS version 20 .For continuos variables paired or unpaired students t-test was done and for categorical data,chi-square test used.VAS pain score was analysed using Mann-Whitney U test.A probability of  $P < 0.05$  was considered statistically significant.

**III. Result**

The study population included 60 patients who were randomized into 2 groups.Average age was  $36.65 \pm 8.2$  years old.Mean body weight was  $63.45 \pm 5.46$  and height was  $1.62m \pm 0.05$ .There was no difference in age,BMI ,height and duration of surgery between the two groups. ( $p > 0.05$ )

**Table 1: Demographic profile**

VARIABLE	MEAN±SD		P VALUE
	GROUP A TAPBLOCK	GROUP B IIHNERVE BLOCK	
MEAN AGE (YRS)	36.6523+/-9.02	36.1+/-7.08	0.718
MEAN HEIGHT(CM)	160.23+/-2.02	160.56+/-0.8	0.519
MEAN WEIGHT(KG)	60.07+/-5.6	59.45+/-4.3	0.122
MEAN BMI(KG/M <sup>2</sup> )	24.02+/-1.4	24.5+/-2.2	0.452

**Table 2-showing VAS scores at different time intervals in the postoperative period.**

VAS at rest	0min	30min	60min	90min	2hr	4hr	6hr	8hr	10hr	18hr	24hr
Group A	0.62±0.46	0.68±0.48	0.82±0.46	0.90±0.6	1.60±0.6	1.82±0.48	2.25±0.48	3.34±0.45	3.44±0.68	3.76±0.68	3.87±0.80
Group B	0.58±0.36	0.62±0.4	0.70±0.42	0.74±0.50	0.80±0.58	0.84±0.68	1.27±0.68	2.07±0.7	2.84±0.76	3.62±0.84	3.74±0.86
Pvalue	0.72	0.61	0.335	0.25	<0.001	<0.001	<0.001	<0.001	0.003	0.494	0.554

The mean VAS score at rest was lower in Group B than Group A at all time period. The difference was statistically significant from 2 hours till 8 hours postoperatively after that was not significant at other points of times. So the analgesic satisfaction was greater in ilioinguinal-iliohypogastric block that is Group B than TAP block. The number of patients who required injection tramadol in Group A was 4 and Group B was 3 which was statistically not significant.

**Table 3-Rescue Analgesia**

Duration of Rescue Analgesia	MEAN+/-SD		P VALUE
	GROUP A TAPBLOCK	GROUP B IIHNERVE BLOCK	
Mean duration of rescue analgesic requirement in min	313.2±100	402±112.4	0.005

The average time for rescue analgesia was 313±100 min in Group A and 402±112.4 in Group B. Using independent t test, this difference was statistically significant. Patient satisfaction for postoperative pain relief was better with Group B than Group A.

#### IV. Discussion

For all type of surgeries postoperative pain relief is very important to improve the quality of patients care. Even though hernia surgeries are done widely and more commonly in all institutions, postoperative pain relief was not well taken care as like that of major abdominal surgeries. Regional nerve block techniques offer a good pain relief and help in early ambulation and patient discharge.

In our study we compared the efficacy of postop analgesia between TAP block and Ilioinguinal and iliohypogastric nerve block in patients undergoing open hernia surgery,

Petersen et al[1], who studied the postoperative effect of TAP block and ilioinguinal block in 90 patients undergoing hernia repair. The TAP block was evaluated versus placebo and versus ilioinguinal block and wound infiltration. They found no significant difference between two groups.

Aveline et al[2] studied postop analgesia requirement for 273 patients either with ultrasound guided TAP block or Blind Ilioinguinal block with levobupivacaine 0.5% before surgery. They found rescue analgesia was less with TAP block than Ilioinguinal nerve block which is contradicting with our study, But they didn't use ultrasound guidance for ilioinguinal that may be a cause for failure to achieve adequate analgesia in their study

Kamal et al[10] in his study encountered IIN/IHN block is superior to ultrasound guided TAP block which supports our study.

Demerci et al[3] in his study compared ultrasound guided IIN/IHN block with anatomical land mark technique and concluded that ultrasound technique was superior.

Ding y white et al[4] in his study concluded that use of IIN\_IHN block with bupivacaine 0.25% as an adjuvant decreases pain in the PACU.

Bærentzen F[5], Maschmann C, Jensen K, Belhage B, Hensler M, Børglum J, et al. in their study compared postoperative analgesia with ilioinguinal/iliohypogastric nerve block with bupivacaine and placebo normal saline and found good analgesia with bupivacaine group. so in our study we found that post operative analgesia was better with IIN/IHN block than TAP block and none of our patients had any complications during the study.

In our study we didn't encounter any complications whereas Peterson et al had paralysis of thigh musculature in 3 of his patients.

## V. Conclusion

From our study we observed that ultrasound guided ilioinguinal-iliohypogastric nerve block provides better postoperative analgesia when compared with ultrasound guided TAP block in patients posted for elective inguinal hernia surgeries.

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