

A STUDY OF POSTOPERATIVE ANALGESIA AND AMBULATION IN PATIENTS OF INGUINAL HERNIA REPAIR BY TAP BLOCK



Surgery

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ABSTRACT

AIM: The aim of the present study is to evaluate the postoperative analgesia and ambulation in patients of inguinal hernia repair by TAP block.

METHODS: This prospective clinical study was conducted to assess the outcomes of the patients undergoing inguinal hernia repair under TAP block. The study included all the patients undergoing inguinal hernia repair in Dr. Sushila Tiwari Government Hospital, Haldwani in the age range of 18-60 years with uncomplicated inguinal hernia and consented to be part of the study. Heart rate and blood pressure were recorded every 30 minutes in post-operative period. Intensity of pain using verbal analogue score upon rest and on movement was assessed at the arrival in the postoperative ward. Nausea and vomiting were assessed on a three-point score.

RESULTS: The study population consisted of 79.3% males and 20.7% females. The mean postoperative pain upon rest and on movement was significantly lower from arrival in the postoperative ward to up to 8 hours with first analgesic dose required at 4-8 hours interval in majority patients (n=74; 80.4%). The requirement of antiemetic was not reported by any patient undergoing inguinal hernia repair by TAP block.

CONCLUSION: TAP block is easy to perform and provides effective analgesia without much complications. TAP block is more promising in providing effective analgesia with reduced demand of rescue analgesic and no anti-emetics along with more patient satisfaction in TAP Block.

KEYWORDS

Inguinal hernia, Pain, Patient Satisfaction score, TAP block

INTRODUCTION

Open inguinal hernia repair is a commonly performed procedure¹ which is associated with substantial postoperative pain.² Inguinal hernia repair usually performed under spinal anaesthesia in adults. The incidence of postoperative pain after inguinal hernia repair varies from 0-37%. Acute postoperative pain reduces the patient quality of life greatly and results in chronic persistent pain.³ A substantial component of the pain experienced by patients after inguinal hernia surgery is derived from the abdominal wall incision.⁴

The abdominal wall consists of three muscle layers, the external oblique, internal oblique and the transversus abdominis and their associated fascial sheaths. The muscular wall is innervated by nerve afferents that course through the transversus abdominis neuro-fascial plane.⁵ A promising approach to the provision of postoperative analgesia after abdominal incisions is to block the sensory nerve supply to the anterior abdominal wall.^{6,7}

Transversus abdominal plane (TAP) block is one of the several modalities used for pain relief in the postoperative period.¹⁰

TAP block has emerged as a safe, reliable and efficient technique to provide post-operative analgesia for a range of abdominal procedures and has been shown to minimise the usage of opioids in the peri-operative period.^{8,9} The aim of the present study evaluates the postoperative analgesia and ambulation in patients of inguinal hernia repair by tap block.

MATERIALS AND METHOD

This prospective study was conducted after clearance from the Institutional Ethics Committee, Government Medical College, Haldwani, Nainital. This study assessed the outcomes of TAP block in patients undergoing Inguinal Hernia repair in terms of intra-operative & postoperative analgesia and ambulation.

Sample Size:

The study included 92 patients undergoing inguinal hernia repair in Dr. Sushila Tiwari Government Hospital, Haldwani.

INCLUSION AND EXCLUSION CRITERIA

INCLUSION CRITERIA :

- Patients with age more than 18 years and less than 60 years and fit

for surgery

- Uncomplicated inguinal hernia
- Patients giving consent to be part of the study
- Patients with co-morbid conditions like diabetes mellitus , systemic hypertension , cardiac disease , COPD

EXCLUSION CRITERIA :

- Complicated Hernia (Incarcerated hernia, Obstructed hernia, Strangulated hernia)
- Patients not giving consent to be part of the study

Study procedure

TAP block was given utilizing transcutaneous approach that required a blind puncture at a point close to the anterior superior iliac spine (ASIS) and a local anaesthetic agent injection into the planes between the external and internal oblique muscles and internal and transverse muscles plane to block the nerve before entering the inguinal region by appreciable loss of resistance (double pop sensation)

After careful aspiration, to ensure no vascular injury has occurred, 20 ml of 0.5% bupivacaine was injected slowly between external oblique and internal oblique (10 ml of 0.5% bupivacaine) and into the fascial plane between the internal oblique and transversus abdominis (10 ml of 0.5% bupivacaine) which contains the nerves from T6 to L1.

Heart rate/blood pressure were recorded every 30 minutes in post-operative period. Intensity of pain using verbal analogue pain score upon rest and on movement was assessed at the arrival in the postoperative ward and at 2 hour, 4 hour, 8 hour, 12 hour, 24 hour using verbal analogue pain score of 0-100 (0-no pain. 100- most severe pain). Nausea and vomiting were assessed on a three-point score. (1-No Nausea, 2-Nausea, 3- Vomiting) Nausea lasting >10 minutes, i.v. Ondansetron 4 mg stat. The patient was offered additional analgesics, if required.

The satisfaction level of the patients was assessed on the basis of postoperative pain , early ambulation and requirement of antiemetic postoperatively and night sleep was assessed on first post-operative day. Any other complications like retention of urine , any complication related to block. Time of discharge from hospital was recorded.

STATISTICAL ANALYSIS

The data was entered into the Microsoft excel and the statistical

analysis was performed by statistical software SPSS version 21.0. The Quantitative (Numerical variables) were present in the form of mean and SD and the Qualitative (Categorical variables) were present in the form of frequency and percentage.

The repeated measures ANOVA test was used for comparing the mean values between different time intervals whereas chi-square test was applied for comparing the frequency. The p-value was considered to be significant when less than 0.05.

RESULTS

Table 1: Demographic profile of study population

		Frequency	Percent
Gender	Male	73	79.3%
	Female	19	20.7%
Operative Diagnosis	Left sided inguinal hernia	36	39.1%
	Right sided inguinal hernia	56	60.9%
Co-morbidities	Diabetes mellitus	12	13.0%
	Systemic Hypertension	9	9.8%
	CAD	1	1.1%
	COPD	5	5.4%

Table 2: Operative duration, Total number of additional analgesia demanded by patient, Length of hospital stay among study population

	Range	Minimum	Maximum	Mean	Std. Deviation
Operative Duration (in min)	60.00	30.00	60.00	42.391	9.33
Total number of additional analgesia demanded by patient	2.00	0.00	2.00	0.20	0.58
Length of Hospital Stay (days)	2.00	1.00	3.00	2.217	0.4878

Table 3: Comparison of Postoperative Pain (at rest) between different time intervals

Postoperative Pain (at Rest)	Mean	Std. Deviation	F-value	p-value	Post-hoc comparisons
At the arrival in Postoperative ward	0.00	0.00	27.389	<0.01*	4, 5 > 1, 2, 3, 6
At 2 hours	1.11	0.31			
At 4 hours	2.18	0.55			
At 8 hours	4.23	0.71			
At 12 hours	4.22	0.68			
At 24 hours	2.00	0.42			

Table 4: Comparison of Postoperative Pain (at movement) between different time intervals

Postoperative Pain (at movement)	Mean	Std. Deviation	F-value	p-value	Post-hoc comparisons
At the arrival in Postoperative ward	1.00	0.00	16.338	<0.01*	4, 5 > 1, 2, 3, 6
At 2 hours	2.11	0.31			
At 4 hours	3.18	0.55			
At 8 hours	5.21	0.64			
At 12 hours	5.21	0.64			
At 24 hours	3.07	0.25			

Table 5: Time of first analgesia demanded by patient among study population

Time of first analgesia demanded by patient		Frequency	Percent
4-8 hours	yes	74	80.4%
	no	18	19.56
8-12 hours	yes	15	16.3%
	no	77	83.69
12-24 hours	yes	3	3.3%
	no	89	96.73
Total		92	100.0%

Table 6: Nausea score, Vomiting score, Requirement of Antiemetic score and Patient Satisfaction score among study population

		Frequency	Percent
Nausea score	Nil	90	97.83%
	One Episode	2	2.17%
Vomiting score	Nil	92	100%
	One Episode	0	0.0%
Headache	Absent	90	97.83%
	Present	2	2.17%
Requirement of Antiemetic score	Nil	92	100%
	One Dose	0	0%
Patient Satisfaction score	Satisfactory	87	94.56%
	Not Satisfactory	5	5.43%

Table 7:

Physical Activity After Surgery		Frequency	Percent
Ambulate around bed Within 24 hours	No	0	0.0%
	Yes	92	100.0%
Return to work and school			
1 day	No	3	3.3%
	Yes	89	96.7%
2 day	No	2	2.17%
	Yes	90	97.83%
3 day	No	0	0.0%
	Yes	92	100%

The study population consisted of 73 (79.3%) males and 19 (20.7%) females. There was Left sided inguinal hernia among 39.1% and Right sided inguinal hernia among 60.9% patients. The Co-morbidities reported were Diabetes mellitus (13.0%), Systemic Hypertension (9.8%), CAD (1.1%) and COPD (5.4%). (Table 1)

The operative duration (in hours) was 42.39±9.33 (30-60). The Total number of additional analgesia demanded by patient was 0.20±0.58 (0-2). The Length of Hospital Stay was 2.217±0.4878 (1-3) days. (Table 2)

The mean postoperative pain at Rest and at movement increased significantly from arrival in Postoperative ward to at 2 hours to at 4 hours to at 8 and 12 hours and then decreased significantly at 24 hours. (Table 3 and table 4)

Time of first analgesia demanded by patient was 4-8 hours among 74 (80.4%) and 8-12 hours among 15 (16.3%) and 12-24 hours among 3 (3.3%), subjects. (Table 5)

Nausea and Headache occurred in 2.17% patients each, vomiting was not reported by any patient, there was no requirement of antiemetic by any patient and Patient Satisfaction score was found to be Satisfactory among 94.56% patients. (Table 6)

Majority of the patients resumed their activity after the surgery with only 3.3% unable to resume their activity at day 1, 2.17% unable to resume their activity at day 2, 100% of patients resume their activity at 3rd day (Table 7)

DISCUSSION

Post-operative pain management is one of the most important aspects of patient management after surgery. Poorly controlled pain after inguinal hernia surgery is associated with a variety of unwanted postoperative consequences, including patient suffering, distress, confusion, Chest and heart problems and prolonged hospital stay. Traditionally, pain relief was provided by medications injected into a vein using a drip such as morphine or paracetamol, administering local anaesthetic into the skin around surgical wound, or by providing epidural pain relief where local anaesthetic and other pain relieving medications are injected through a fine plastic tube into the epidural space of lower back-numbing the nerves that supply abdomen. Following surgery, under local anaesthesia TAP block is a relatively new way of anaesthetising nerves which numb the abdomen to help improve in lower abdominal surgery. The analgesic regimen of the patient after surgery should provide safe, effective analgesia with minimal side effects to the patients. A multimodal analgesic regimen is most likely to achieve these goals. However, optimal components of this regimen continue to evolve. Although single shot neuraxial analgesic technique using long acting opioids or patient controlled epidural opioid administration produce effective analgesia, they are

associated with frequent incidence of side effects, particularly nausea, vomiting and pruritus which reduce overall patient satisfaction.¹⁰ Transverse abdominis plane block is a regional analgesic technique which blocks T6 – L1 nerve branches and has an evolving role in postoperative analgesia for lower abdominal surgeries.

The mean Postoperative Pain (at Rest and at movement) increased significantly from arrival in Postoperative ward to at 2 hours to at 4 hours to at 8 and 12 hours and then decreased significantly at 24 hours..

In our study nausea was reported among 2 patients (2.17%) and vomiting was not reported by any patient and there was no requirement of antiemetic. Patient Satisfaction score was found to be satisfactory among 82 (89.1%) patients. Mean length of hospital stay was 2.217 ± 0.4878 (1-3) days. Majority of the patients were discharged after 24 h following surgery.

Ever since its introduction, the TAP block has been gaining wider acceptance and popularity. Several modifications have been suggested from time to time. Our study demonstrates that pain relief by TAP block is satisfactory at rest and on movement. The analgesia by the TAP block can be further enhanced by addition of adjuvants to the local anaesthetic.

CONCLUSION

In our study, there was no requirement for the use of antiemetic medication and minimal requirement of opioids for pain relief in the postoperative period. Hence, we conclude that TAP block was easy to perform and provided effective analgesia without any complications. TAP block is also useful in patients with comorbid conditions. TAP block is more promising in providing effective analgesia with good patient satisfaction.

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