

## ORIGINAL ARTICLE

# Pain Control in Lower Abdominal Surgeries in Post-Operative Period; Comparison of Transversus Abdominis Plane Block Vs Infiltration of Wound with Bupivacaine

SAIRA NASEEM<sup>1</sup>, TAHIR MAHMOOD CHAUDHARY<sup>2</sup>, ABDUL BARY<sup>3</sup>, TAHIR NAZEER<sup>4</sup>, MUHAMMAD ABDUL AZIZ<sup>5</sup>, RIAZ HUSSAIN<sup>6</sup>, AMNA TAHIR<sup>7</sup>, M. BAQIR ALI KHAN<sup>8</sup>

<sup>1</sup>S.R Anaesthesiology, University of Lahore

<sup>2</sup>Professor of Anaesthesiology, University of Lahore

<sup>3</sup>S.R Anaesthesia Rehbar Medical College, Lahore

<sup>4</sup>Professor of Anaesthesiology, Azra Naheed Medical College, Lahore

<sup>5</sup>Associate Professor Anaesthesiology, Sahara Medical College

<sup>6</sup>Professor of Anaesthesiology Rehbar Medical College, Lahore (EX)

<sup>7</sup>Associate Professor Services Hospital, Lahore

<sup>8</sup>Assistant Professor Continental Medical College, Lahore

Correspondence to: Dr. Tahir Nazeer, E-Mail:- [drtahimazeer@yahoo.com](mailto:drtahimazeer@yahoo.com), Cell: +92 333 4291295

## ABSTRACT

**Introduction:** Post-operative pain is very common problem for both patients and medical professionals. Different medicines and procedures are used to treat it.

**Aim:** To compare the efficacy of transversus abdominis plane block (TAP) with local anaesthetic infiltration in surgical wound regarding post-operative pain management.

**Study Design:** Randomized control trial.

**Material & Methods:** 60 patients (30 in each group) undergoing for lower abdominal surgery were included and divided into two group A and B by using lottery method. In group A bilateral TAP block was applied with 20 ml of 0.25 % bupivacaine on each side. In the triangle of Petit with 16 gage Tuohy's needle. In group B 40 ml of 0.25 % bupivacaine was given in the margins of surgical incision with full aseptic technique at the end of procedures.

**Result:** The mean age of patient was  $36.70 \pm 8.55$  year while mean age in group A was  $36.50 \pm 9.48$  year and in group B it was  $36.90 \pm 7.67$  year. The mean pain in group A was  $2.77 \pm 2.21$  and in group B it was  $6.72 \pm 1.00$ . The mean pain was statistically less in group A as compared to group B and P value was  $\leq 0.05$ .

**Conclusion:** Post-operative pain control was better with TAP block as compare to incisional wound infiltration of local anaesthetic agent.

**Keywords:** TAP Block, Wound infiltration, Surgery, pain.

## INTRODUCTION

The patient satisfaction is very important and it is only possible when patient is pain free and comfortable in post-operative period<sup>1</sup>. Pain is like a nightmare for patients<sup>2</sup>. Severe pain can cause tachycardia, haemodynamic instability and cardiovascular effect.<sup>3-4</sup> Such cardiovascular effect are more pronounced in hypertensive and diabetic patient.<sup>5</sup> Pain is a complex phenomena which required a multi-modal approach to treat it<sup>6</sup>. For post-operative pain management routinely opioids and non-opioids drugs are used<sup>7</sup>. Different combination of other drugs are used like Ketamine, Magnesium Sulphate, Xylocaine & Bupivacaine.<sup>8-9</sup> For post-operative pain management in lower abdominal area one popular technique is transversus abdominis plane block (TAP).<sup>10</sup> In this technique we inject local anaesthetic agent into a plane between transversus abdominis muscle and internal oblique muscle and there is present thoracolumbar nerves<sup>11</sup>. Transversus abdominis plane block is a reliable method and a part of multi modal analgesia management plan<sup>12</sup>. It can be performed with the help of ultrasound machine or land mark technique.<sup>13,14</sup> Different drugs and combination of drugs can be used in TAP block like Ropivacaine, Bupivacaine, Xylocaine, Dexmedetomidine and Magnesium Sulphate.<sup>15,16</sup> Local anaesthetic infiltration in wound along incision line is a classical technique to make patient pain free after surgery<sup>17</sup>. In this technique bupivacaine alone or in combination with other drugs like Xylocaine, Ketamine, clonidine, and dexmedetomidine is used<sup>18,19</sup>. The rationale of this study is to find the best method to treat post-operative pain along with minimal chances of respiratory depression and chances to develop opioids addiction in patients.

## MATERIAL & METHODS

After the approval by research and ethics committee of Sir Ganga Ram Hospital / Fatima Jinnah Medical University Lahore. The study was conducted by anaesthesia department and 60 patients undergoing elective lower abdominal surgery under general

anaesthesia were included. Informed consents were taken during pre-operative assessment visit and demographic information was recorded and were explained about the use of numerical rating scale (NRS) employed in this study. For general anaesthesia all patients were induced with 0.1 mg / kg of inj. nalbuphin, 2.5 mg / kg of propofol and 0.5 mg / kg, atracurium intravenously and intubated with appropriate size endotracheal tube and were mechanically ventilated with 8 ml / kg of tidal volume with respiratory rate of 12 / min. Anaesthesia was maintained with 1.2 % isoflurane, oxygen and 50 % nitrous oxide and standard II monitoring was used. The dose of bupivacaine was calculated by 3mg / kg body weight. The patient in group A received bilateral transversus abdominis plane block by land mark technique and 20 ml of 0.25 % bupivacaine on each side with full aseptic technique at the end of procedure while in group B 40 ml of 0.25 % bupivacaine was given in surgical wound in incision at the end of the procedure. Post-operative pain of both groups was assessed by using numeric rating scale (NRS) for four hours after the procedure and if pain is not controlled then patient was given rescue analgesia with 0.1 mg / kg nalbuphine. Pain score at 4 hour was recorded and all information was recorded on performa. It was a randomized controlled trial and sampling technique was non-probability purposive sampling. The power of test was 80 % with 5 % level of significance. All information was entered and analysed by using SPSS version 21 and t-test was applied and taking P-value  $\leq 0.05$  as significant.

## RESULT

The mean age of all patients was  $36.70 \pm 8.55$  year. Mean age in group A was  $36.50 \pm 9.48$  years and in group B was  $36.90 \pm 7.67$  years. In group A there were 7(23.33 %) male and 23(76.67%) female while in group B there were 5(16.67%) male and 25(83.33%) female cases.

In groups A there were 8(26.67%) obese and 22(73.33%) non obese while in group B there were 7(23.33%) obese and 23(76.67%) were non obese.

The mean pain in group A was 2.77 ± 2.21 and mean pain in group B was 6.72±1. Mean pain is less in group A. Among male cases the mean pain was less in group A (2.86±2.04) than in group B (6.92±0.91). Among obese cases the mean pain was less in group A(3.50±2.39) than in group B (7.29±0.756) and among non-obese cases the pain was less in group A (2.50±2.13) than in group B (6.55±1.01).

Table-1: Mean Comparison of Age (years) in both study groups

Study groups	Age (years)			
	Mean	S.D	Maximum	Minimum
Group A	36.50	9.48	23	54
Group B	36.90	7.67	27	50
Total	36.70	8.55	23	54

Group-A: Bilateral transverses abdominis plane block

Group-B: Wound infiltration

Table-2: Comparison of mean pain score in both study groups

Study groups	Pain Score			
	Mean	S.D	Maximum	Minimum
Group A	2.77	2.21	0	7
Group B	6.72	1.00	5	8
Total	4.71	2.63	0	8

Table-3: Comparison of mean Pain Score in both study groups with respect to Age groups (years)

AGE Group Year	Study Groups	Pain Score			T-Test	P-Value
		Mean	S.D			
18 - 40	Group A	1.90	1.861	-9.845	< 0.001**	
	Group B	6.60	1.046			
41 - 55	Group A	4.50	1.841	-3.713	0.002*	
	Group B	7.00	0.866			

\*\*Highly Significant,

\*Significant

Table-4: Comparison of mean Pain Score in both study groups with respect to Age groups (years)

Gender	Study Groups	Pain Score			T-Test	P-Value
		Mean	S.D			
Male	Group A	2.86	2.04	- 2.69	0.023	
	Group B	5.40	0.55			
Female	Group A	2.74	2.30	- 8.40	< 0.001	
	Group B	6.92	0.91			

Table-5: Comparison of mean Pain Score in both study groups with respect to ASA

ASA status	Study Groups	Pain Score			T-Test	P-Value
		Mean	S.D			
I	Group A	2.32	1.945	- 8.780	< 0.001**	
	Group B	6.62	1.071			
II	Group A	3.55	2.505	- 3.753	0.002*	
	Group B	7.00	0.756			

Table-6: Comparison of mean Pain Score in both study groups with respect to BMI

BMI	Study Groups	Pain Score			T-Test	P-Value
		Mean	S.D			
Obese	Group A	3.50	2.390	- 4.002	0.002*	
	Group B	7.29	0.756			
Non Obese	Group A	2.50	2.133	- 8.040	0.001**	
	Group B	6.55	1.011			

## DISCUSSION

Post-operative pain is a very common problem and all medical professionals face the problem and it is a major cause of patient dissatisfaction.<sup>1</sup>

In the study of Aydogmus MT et al, they found that patients with TAP block had mean pain score of 4 ± 2.96 Standard Deviation and patient with local anaesthetic infiltration had mean pain score 6 ± 2.22 Standard Deviation and according to the results TAP block is superior than local anaesthetic infiltration. His study support the result of my study.

In the study of Wayu B et al, they found that there was less total analgesia consumption in patient with TAP block as compare to local anaesthetic infiltration.<sup>21</sup>

Similarly in the meta analysis of Guo et al they reported that TAP block was associated with less pain score as compare to local anaesthetic infiltration.<sup>22</sup>

Similarly in the meta analysis of randomised controlled trial YuN et al, explain that patient with TAP block has better and prolong post-operative pain control than local anaesthetic infiltration.<sup>23</sup>

Similarly in the study of Sivapurpu V et al, in 2013 they concluded that TAP block is a very effect mean of analgesia with minimal side effects as compared to local anaesthetic infiltration.<sup>24</sup>

But the study of Ortiz et al, has opposite results and they found that local anaesthetic infiltration has better pain control than TAP block in laparoscopic cholecystectomy patients.<sup>25</sup>

## CONCLUSION

It is concluded that TAP block has better and prolong post-operative pain control as compare to local anaesthetic infiltration in surgical wound and has more opioid sparing effect.

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