

Ultrasound-Guided Transversus Abdominis Plane Block versus Land Mark Technique in Lower Abdominal Surgery

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ABSTRACT

OBJECTIVE: To determine the efficacy in terms of pain for Ultrasound-Guided Transversus Abdominis Plane Block versus landmark technique in lower abdominal surgery.

The landmark guided “dual-pop” failure of conflict strategy involves accessing in addition to blocking the T₆ to L₁ nerve branches. A consensus exists that acute postoperative pain is the major cause of prolonged hospital stay and patient dissatisfaction

METHODOLOGY: This Randomized Control trial study was conducted from July to December 2018 at the Department of Anesthesiology, Peoples Medical University & Hospital Nawabshah.

The sample techniques were used randomly through envelopes, and the sample size is 120.

RESULTS: The study findings revealed that distribution of age among L and U groups, regarding gender it was 70% females 66.7% females. Moreover, for ASA status in the L group, 58.3% of the participants stand in 2-4 ASA status whereas in the U group 50% of the participants were in ASA status 1 and 2-4 each. The bilateral block was performed among 85% of the participants in the L group and 96.7% of the participants in the U group. In the surgical procedure in the L group, 15% underwent appendectomy whereas in the U group 28.3% underwent lower c- section. The overall rate of postoperative pain at 60 minutes was observed in a total of 10 women among both groups. Statistically significant results among both groups with a p-value of 0.001.

CONCLUSION: Our study results showed that surgeries performed by using Ultrasound-Guided Transversus Abdominis Plane Block are more effective with required less postoperative analgesia.

KEY WORDS: Efficacy, Ultrasound Guided Transversus Abdominis Plane Block, landmark technique, Lower Abdominal Surgery, Anesthesia, TAP block

INTRODUCTION

Intense postoperative pain is a typical issue experienced in clinical practice. Although the effect of acute postoperative pain control on surgical outcomes remains unclear, an overall agreement exists that intense postoperative pain is the significant reason for delayed clinic stay and patient disappointment¹. The recent concept of “multimodal analgesia” is a better approach that utilizes several agents with the varying mode of action on pain control pathways to reduce postoperative pain with minimum elevation possessions^{1,2}.

Transversus Abdominis Plane Block is an original methodology portrayed in 1993 by Kuppavelumani et al. and later presented in 2001 by Rafi as a land-mark guided strategy to hinder the neural afferents to Anterior Abdominal Wall^{1,3,4}. It has now gone through various changes, which have improved its likely utility for a higher number of surgeries⁴ Transversus abdominis plane block, provincial sedation procedure giving pain-relieving impact to the peritoneum just the same as to the skin as well as muscles of foremost Abdominal Wall⁵. Instead of exceptionally generally safe of producing inconveniences and moderately an extremely high achievement proportion, TAP blocks remain overwhelmingly underutilized⁶.

The landmark guided "double pop" loss of opposition strategy includes getting to and blocking the T₆ to L₁ nerve branches^{7,8}. This procedure has been demonstrated to be a powerful pain-relieving subordinate for lower abdominal surgeries⁸.

According to recent studies, the landmark-guided TAP block has been termed a “blind” technique due to the issues of inaccurate placement of needles and potential for damage to adjacent structures⁹. As previous studies have reported incidences of inaccurate needle and anesthetic placement using the standard landmark-guided technique in adult and pediatric populations^{9,10}.

Likewise, occurrences of liver cut, colonic cut, and intraperitoneal infusion have additionally been accounted for via land-mark guided TAP block^{7,9}. Whereas no investigation has been done to date for the precision of infusion of anesthesia in Transversus Abdominis Plane Block.

Also, **Mc Donnel et al**⁹ reported a greater reduction in morphine consumption. It is in contrast, who reported only a 43% reduction in morphine consumption.

Previous evidence suggests that the ultrasound-guided Transversus Abdominis Plane Block had a long-term effect in addition to a safe with an easy approach that has been increasingly used in abdominal surgeries such as colorectal, bariatric and plastic, Cesarean delivery, hysterectomy, and donor nephrectomy^{1,2,11}.

Etrusca Brogi et al.¹² revealed in 2016; that the patients with Transversus Abdominis Plane Block have reduced pain assessed on VAS at 6, 12, and 24 hours as compared to the placebo group. Likewise, contrasted and fake treatment, Transversus Abdominis Plane Block decreased the utilization of Morphine 24 hours after a medical procedure. This reduction was seen in the group Transversus Abdominis Plane Block after the surgery of appendectomy, Gynaecology, Bariatric, and Urological. Several reviews have reported its effectiveness in reducing the score of pain and utilization of Morphine in 24 hours^{1,11,12}.

METHODOLOGY

A study of Randomized Control Trial was carried out in the Department of Anaesthesiology, Peoples Medical University and Hospital Nawabshah. The Study period was from July to December 2018. The example methods were utilized haphazardly through envelopes, and the sample size is 120. The sample calculation was finished utilizing the past studies^{2,5,7}, and on our research for comparable kinds of studies at different settings.

The sample size was 120 with error and omissions of 5%, and certainty level of 95%, and reaction circulation of 85. The investigation was led after the authorization of the institutional Ethical Review Committee (ERC). After the preoperative appraisal is written approval for research was taken by the patients. After an assortment of information, section and investigation have been checked in SPSS software with the latest version. Frequency and percentages were computed for age, gender, height, weight, ASA status, and surgical procedure performed. Moreover, a Chi-square test was applied to contrast the frequency of Analgesia use among the Ultrasound-Guided and Landmark guided TAP block groups. Outcome variable efficacy was evaluated based on analgesia use among Ultrasound-guided and landmark guided TAP block group.

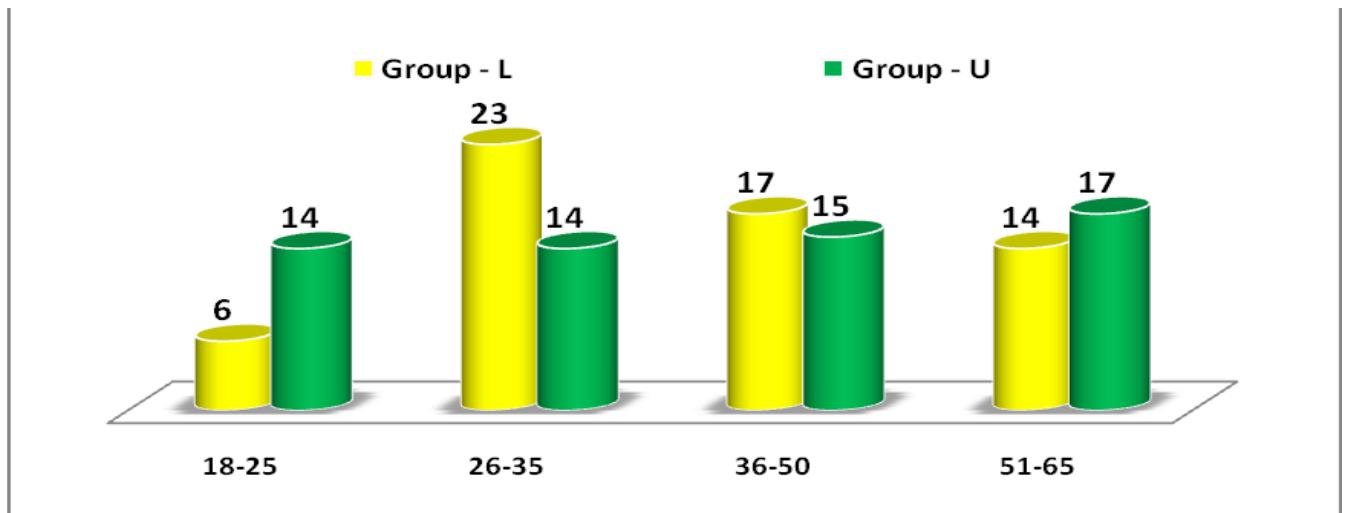
Patients undergoing elective lower abdominal surgeries, American Society of Anesthesiology (ASA) I to IV criteria, Age between 18 to 65 years were included. Patients with the disease at the proposed site of infusion, Patients with draining or coagulation problems, Patients with sensitivity to neighborhood sedatives were excluded

RESULTS

Our study findings revealed that distribution of age among L and U groups study participants were n=23 (38.3%) for 26-35 years of age and n=17 (28.3%) for 51-65 years of age respectively, regarding gender it was n=42 (70%) females in L group and n=40 (66.7%) females in U group, for height in L group n=31 (51.7%) of the participants whereas for U group n=33 (55%) of them fall in 5.1-5.9 inches category. Moreover for weight in L and U group n=40 (66.7%) and n=34 (56.7%) of the participants fall in 45 and above category respectively, regarding ASA status in L group n=35 (58.3%) of the participants stand in 2-4 ASA status whereas in U group n=30 (50%) of the participants were in ASA status 1 and 2-4 each. Moreover for the type of block performed it was reported that bilateral block was performed among n=61 (85%) of the participants in the L group and n=58 (96.7%) of the participants in the U group, regarding the surgical procedure in L group n=9 (15%) underwent appendectomy whereas in U group n=17 (28.3%) underwent lower c- section. The overall rate of postoperative pain at 60 minutes was observed in a total of 10 women among both groups moreover all 10 of them belong to group L whereas none in group U, showing statistically significant results among groups with a p-value of 0.001, this showed the Ultrasound-Guided TAP block is further useful as compared to Land-mark Guided TAP block among lower abdominal surgery patients.

Comparing with the results of other 36 randomized controlled trials (RCTs) contrasting TAP squares and fake treatment. Pain scores at 6, & 12 hrs were examined in^{13,14,39} and study, consequently. Only three studies³⁷⁻³⁹ tended to the correlation among the Transversus Abdominis Plane Block and Epidural sedation, in addition to none, one was seen any huge contrasts among the two strategies. Just a single RCT³⁹ researched 8 hrs pain score and 24 hrs morphine utilization. Past studies⁴⁰⁻⁴⁵ researched the adequacy of TAP block versus nearby sedative penetration at the injury site. Contrasted and local penetration, TAP block essentially decreased the 6 hrs VAS pain score^{40,41,44} by 1.4 (95% CI, - 2.2 to - 0.6; P = 0.001); notwithstanding, this distinction was not huge at 12 hrs^{42,43} and 24 hrs^{41-43,45}. Tranversus Abdominis Plane block essentially decreased the utilization of Morphine in 24 hours.

GRAPH I: DISTRIBUTION OF AGE



GRAPH II: GENDER DISTRIBUTION

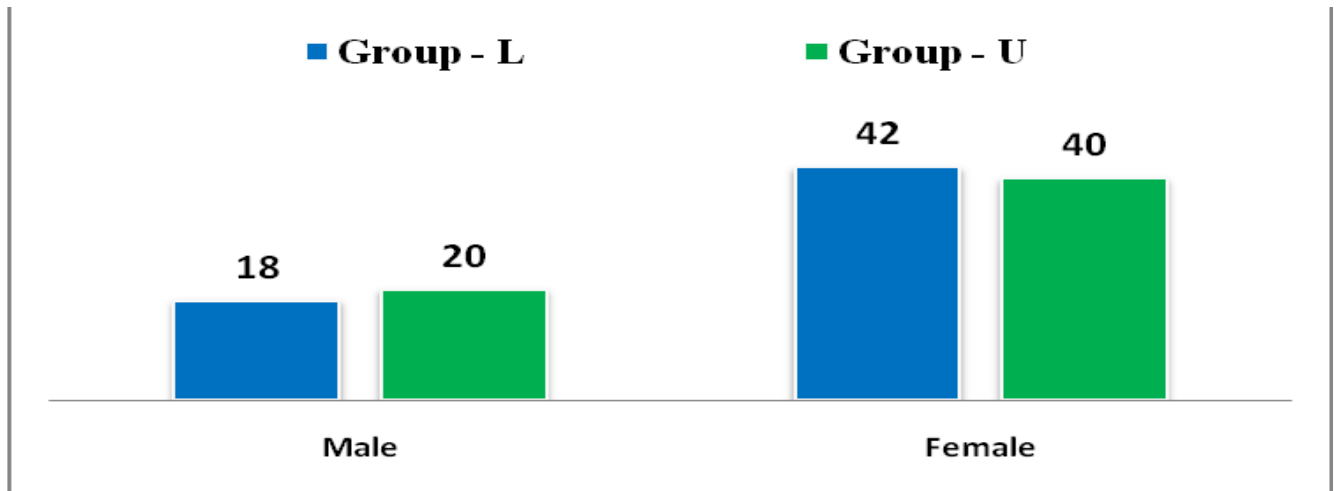


TABLE I: DISTRIBUTION OF SURGICAL PROCEDURE GROUP – L AND GROUP U

Distribution of surgical procedure Group – L			Distribution of surgical procedure Group – U		
Surgical Procedure	Frequency	Percentage (%)	Surgical Procedure	Frequency	Percentage (%)
Lower Segment Caesarean Section	8	13.3	Lower Segment Caesarean Section	17	28.3
Appendectomy	9	15.0	Appendectomy	8	13.3
Prostectomy	6	10.0	Prostectomy	5	8.3
Hysterectomy	6	10.0	Hysterectomy	6	10.0
cholecystectomy	7	11.7	cholecystectomy	8	13.3
Vesical calculus (cystolithotomy)	3	5.0	Vesical calculus (cystolithotomy)	3	5.0
Laprotomy	9	15.0	Laprotomy	5	8.3
Ovarian cyst (Laprotomy)	2	3.3	Ovarian cyst (Laprotomy)	2	3.3
Left inguinal hernia	4	6.7	Left inguinal hernia	2	3.3
Right Inguinal Hernia	6	10.0	Right Inguinal Hernia	1	1.7
Total	60	100.0	Myos Repair	3	5.0
			Total	60	100.0

TABLE II: COMPARISON OF THE FREQUENCY OF POSTOPERATIVE ANALGESIA BETWEEN GROUPS

Time	Group – L	Group – U	p-Value
30 Minute	3	0	0.122
60 Minute	10	0	0.001
120 Minute	16	12	0.259
4 Hours	14	8	0.119
6 Hours	18	24	0.169
12 Hours	5	5	0.628
18 Hours	0	2	0.248

Results are presented as n (%), Chi-Square test applied

DISCUSSION

This study focused on the adequacy of Transversus Abdominis Plane Block for postoperative analgesia pain in a comprehensive group of abdominal surgeries. Contrasted and fake treatment group U, L, when TAP blocks are utilized for postoperative analgesia, the information shows a huge decrease in pain scores at 30min, 60min, 120min, 4 hrs, 6 hrs, 12 hrs, and 18 hrs just as a decrease in opioid utilization. A sum of 120 patients was focused on the study. Patients were haphazardly partitioned into two groups, in Group L 60 patients got landmark-guided transverses abdominis plane and in Group U 60 patients received ultrasound-guided transverses abdominis plane. The overall rate of postoperative analgesia at 60 minutes was observed in 10 women, 10 in group L, and 0 in group U with a significant p-value of 0.001 that is similar to a previous study² in which the level of significance among ultrasound-guided TAP block was < 0.05 . Unlike previous study³⁻⁵ our study results showed ultrasound-guided TAP block more effective.

Similar results were seen in the present study like previous studies revealed that patients with TAP block have reduced pain assessed on VAS at 6, 12, and 24 hours as compared to placebo group U, L. This reduction was seen in the Transversus Abdominis Plane Block group after, appendectomy, gynecological surgeries, bariatric surgery, and urological surgery¹². Similarly, Several reviews have reported TAP effectiveness in reducing the pain scores and 24-hour morphine consumption^{1,11,12}.

Because of our discoveries, the best proposal (for example further developed pain score and diminished opioid utilization) for utilizing TAP block for postoperative analgesia is in gynecological procedures, bariatric medical procedure, appendectomy, and inguinal hernia J nerve block⁴⁶.

Because of our discoveries, the best proposal (i.e., further developed pain score and diminished opioid utilization) for utilizing TAP block for postoperative analgesia is in gynecological methods, bariatric medical procedure, appendectomy, and inguinal hernia fix.

It can likewise be suggested for Cesarean section as a result of a reduction in opioid utilization). There is at this point no substantial suggestion for its capability to diminish pain or opioid utilization in abdominal surgical procedures overall or urological. Regardless of whether TAP block isn't pretty much as successful as ITM or epidural analgesia, TAP block may be utilized to give analgesia when neuraxial strategies or opioids are contraindicated.

CONCLUSION

Our study results showed that surgeries performed by using ultrasound-guided TAP block are more effective than landmark techniques and required less postoperative analgesia.

Ethical permission: Peoples University of Medical & Health Sciences for Women Nawabshsh ERC letter No. PUMHS/ SBA/PVC83. Dated: 06-03-2021.

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DATA SHARING STATEMENT: The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions

AUTHOR CONTRIBUTIONS

Khaskheli MS: Concept, manuscript writing

Tabassum R: Manuscript writing

Awan AH: Data collection

Imtiaz A: Data analysis

Shah S: Data collection

Baloch ZD: Manuscript writing, data collection, data analysis

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