International Journal of Applied Research 2015; 1(5): 326-329

ISSN Print: 2394-7500
ISSN Online: 2394-5869
IJAR 2015; 1(5): 326-329
www.allresearchjournal.com
Received: 06-04-2015
Accepted: 23-04-2015

Dr. B Madhukar Goud
Assistant Professor, Department of Anaesthesiology, Maharajah's Institute of Medical Sciences, Nellimarla, Andhra Pradesh, India

Dr. Chekka VGN R Ramanujam
Assistant Professor, Department of General Surgery, Madha Medical College, Kovur, Chennai, Tamil Nadu, India

Correspondence:
Dr. Chekka VGN R Ramanujam
Assistant Professor, Department of General Surgery, Madha Medical College, Kovur, Chennai, Tamil Nadu, India

Evaluation of efficacy of Tranversus abdominis plane block for post-operative analgesia in patients undergoing total abdominal hysterectomy

B Madhukar Goud and Chekka VGN R Ramanujam

Abstract
Background and Objective: Patients having a total abdominal hysterectomy (TAH) must have effective pain management following the procedure. One localized anesthetic treatment that has shown promise in reducing opioid usage and improving pain management is the Transversus Abdominis Plane (TAP) block. In order to determine if TAP block is effective in reducing postoperative pain in patients having TAH, this study set out to do just that.
Material and Methods: This prospective study involved 50 female patients aged 35 to 60 years, slated for elective complete abdominal hysterectomy under spinal anesthesia. This study was conducted at the department of General Surgery, Madha Medical College, Kovur, Chennai, Tamil Nadu, India from April 2014 to March 2015. Patients were randomly assigned to two groups (n=25 each): Group A had a bilateral TAP block with 20 ml of 0.25% bupivacaine postoperatively, while Group B received normal systemic analgesia without a TAP block. Post-operative pain was evaluated with the Visual Analog Scale (VAS) at 1, 2, 4, 6, 12, and 24 hours. The total opioid use within the initial 24 hours and the occurrence of side effects were documented.
Results: At all time intervals, patients in Group A displayed noticeably lower VAS values when contrasted with Group B ($p<0.05$). Group B had mean VAS scores of 4.6±0.7 at 1 hour, while Group A had 2.1±0.4. The overall amount of opioids taken by Group A was much lower (mean 35.2±5.4 mg) than by Group B (mean 72.6±6.2 mg) ($p<0.001$). Patients in the TAP block group were less likely to have vomiting and nausea.
Conclusion: When it comes to post-operative pain relief after a total abdominal hysterectomy, TAP block is a safe and effective option. It improves patient comfort and recovery by drastically lowering pain scores and narcotic usage.

Keywords: Transversus abdominis plane block, post-operative analgesia, total abdominal hysterectomy, regional anesthesia, opioid sparing

1. Introduction
Worldwide, total abdominal hysterectomy (TAH) ranks high among the most popular major gynecological operations. Despite its usefulness in treating both benign and malignant diseases, the procedure's lengthy incision in the abdominal wall and subsequent tissue manipulation cause considerable postoperative pain. Improved healing, earlier mobilization, shorter hospital stays, and higher patient satisfaction are all outcomes of well-managed postoperative pain [1-3].
Opioids have long been the go-to for pain relief after surgery. Nausea, vomiting, drowsiness, respiratory depression, and a slowed recovery time are some of the unpleasant side effects that are commonly linked with opioid-based pain therapy. Given these side effects, it is clear that there is a need for complementary or alternative analgesic methods that can alleviate pain adequately with less reliance on opioids [4, 5].
The use of localized anesthetics in conjunction with other multimodal pain relief approaches has grown in popularity in recent years. When it comes to addressing somatic pain that originates from the anterior abdominal wall, one intervention that has shown promise is the Transversus Abdominis Plane (TAP) block [6, 7]. A local anesthetic is placed between the transversus abdominis and internal oblique muscles, which is where the thoracolumbar nerves (T6 to L1) pass, in order to create the TAP block. Lower abdominal procedures, like hysterectomy, cesarean section, and hernia surgery, benefit greatly from TAP block since these neurons supply the skin, muscles, and parietal peritoneum of the anterior abdominal wall [8, 9].

Multiple studies have shown that TAP block, when administered alongside conventional anesthetic, greatly decreases postoperative pain ratings and narcotic needs. Despite its growing popularity, TAP block has not been well tested in many clinical settings for its effectiveness in reducing systemic analgesic demand and alleviating pain in the first twenty-four hours after a total abdominal hysterectomy performed under spinal anesthesia [10-12].

The purpose of this research is to determine whether transcutaneous electrical nerve stimulation (TAPS) blocks improve postoperative analgesia in patients having total abdominal hysterectomy (TAH). The purpose of this study is to establish whether TAP block should be standard practice for post-operative pain management following a hysterectomy by comparing opioid intake and pain scores between patients who received TAP block and those who received traditional systemic analgesia alone.

Material and methods

This prospective, comparative study was performed at the This study was conducted at the department of General Surgery, Madha Medical College, Kovur, Chennai, Tamil Nadu, India from April 2014 to March 2015. Fifty female patients, aged 35 to 60 years, scheduled for elective total abdominal hysterectomy under spinal anesthesia, were enrolled and randomly assigned to two groups of 25. Group A (TAP Block Group) received bilateral Transversus Abdominis Plane (TAP) block with 20 ml of 0.25% bupivacaine on each side post-surgery. Group B (Control Group) received standard systemic postoperative analgesia without TAP block.

Inclusion Criteria

- Female patients aged 35 to 60 years.
- American Society of Anesthesiologists (ASA) physical status I or II.
- Scheduled for elective total abdominal hysterectomy under spinal anesthesia.
- Patients who provided informed written consent.

Exclusion Criteria

- Known hypersensitivity to local anesthetics.
- History of chronic pain or opioid dependence.
- Coagulopathy or on anticoagulant therapy.
- Infection or skin lesions at the injection site.
- Neurological disorders affecting pain perception.
- Intraoperative complications requiring conversion to general anesthesia.

Statistical analysis: Appropriate software was used to record and statistically evaluate the data. Mean±standard deviation was used to compare continuous variables in the Student's t-test, whereas the Chi-square test was employed for categorical variables. Statistical significance was determined by a p-value less than 0.05.

Results: Group A (TAP Block) and Group B (Control) each comprised 25 participants out of a total of 50 for the study. When looking at demographics and surgical features, the groups were similar. The SPSS software was used for statistical analysis. Statistical significance was determined by a p-value less than 0.05.

Table 1: Demographic Characteristics of Patients in Both Groups

Parameter	Group A (TAP Block)	Group B (Control)	p-value
Age (years)	47.2±6.1	46.8±5.9	0.78
Weight (kg)	61.5±7.4	60.2±6.9	0.52
Duration of surgery (min)	92.6±8.3	94.1±7.6	0.43

Groups A and B were demographically similar, as shown in table 1, since neither group differed significantly from the other with respect to age, weight, or length of operation.

Table 2: Post-operative VAS Pain Scores at Different Time Intervals

Time Post-op	Group A (TAP Block)	Group B (Control)	p-value
1 hour	2.1±0.4	4.6±0.7	<0.001
2 hours	2.4±0.5	5.2±0.8	<0.001
4 hours	2.6±0.6	5.5±0.6	<0.001
6 hours	2.8±0.5	5.1±0.7	<0.001
12 hours	3.1±0.7	4.8±0.8	<0.001
24 hours	2.5±0.6	4.2±0.9	<0.001

Table 2 shows the comparison of the two groups' post-operative pain scores. Group A had superior pain management with TAP block, as seen by consistently lower VAS values across all time periods when compared to Group B.

Table 3: Total Opioid Consumption Over 24 Hours (Tramadol in mg)

Group	Mean±SD	p-value
Group A (TAP Block)	35.2±5.4	<0.001
Group B (Control)	72.6±6.2	

In the first twenty-four hours after surgery, patients in Group A used much less tramadol than those in Group B, demonstrating that TAP block helps to reduce opioid consumption.

Table 4: Number of Patients Requiring Rescue Analgesia

Time Interval	Group A	Group B	p-value
Within 4 hours	2 (8%)	14 (56%)	<0.001
4-12 hours	3 (12%)	8 (32%)	0.04
12-24 hours	2 (8%)	6 (24%)	0.12

The number of patients who needed extra rescue analgesics at various post-operative intervals is displayed in table 4. Patients in Group A were much less likely to need rescue doses in the first several hours after surgery.

Table 5: Incidence of Adverse Effects

Adverse Effect	Group A	Group B	p-value
Nausea	3 (12%)	9 (36%)	0.04
Vomiting	1 (4%)	5 (20%)	0.08
Sedation	0	3 (12%)	0.07

Although not all differences were statistically significant, Group A demonstrated a decreased incidence of opioid-related adverse effects, including nausea, vomiting, and drowsiness. The benefits of lowering systemic opioid use were supported by the statistically significant reduction in nausea (p=0.04).

Discussion

Improving patient outcomes after large abdominal procedures like total abdominal hysterectomy (TAH) depends on effective pain management following the operation. Compared to other regional anesthesia techniques, the Transversus Abdominis Plane (TAP) block greatly improves post-operative analgesia and reduces opioid intake in patients having TAH. This is supported by the results of the present study.

Group A (TAP Block) showed better pain control than Group B (systemic analgesia alone) at all time periods examined post-operatively, as indicated by significantly lower Visual Analog Scale (VAS) scores. These results are in line with earlier research that found that by numbing the thoracolumbar nerves (T6-L1), TAP block successfully blocks the somatic component of abdominal wall pain, which in turn reduces the intensity of post-operative pain reported by the McDonnell *et al.*, 2007; and Petersen *et al.*, 2013 [13, 14].

The study found a statistically significant difference (p<0.001) in the total opioid consumption over 24 hours between the TAP group (35.2±5.4 mg) and the control group (72.6±6.2 mg). Because it reduces the likelihood of opioid-related adverse effects such vomiting, nausea, drowsiness, and constipation—side effects that can lengthen hospital stays and postpone recovery—this opioid-sparing action is clinically relevant. With a statistically significant decrease in nausea (p=0.04), the TAP group had a significantly reduced incidence of vomiting and nausea overall [15].

Further evidence of the block's efficacy in managing acute postoperative pain is the fact that fewer patients in the TAP group needed rescue analgesics, particularly in the first four hours after surgery. According to Baeriswyl *et al.* (2015) [16], the TAP block has a long-lasting analgesic effect that lasts up to 24 hours. This indicates that this approach can be a useful addition to multimodal analgesia regimens. Consistent with these findings, Carney *et al.* (2008) [17] showed that TAP block considerably decreased morphine needs and improved pain levels after abdominal hysterectomy. In a similar vein, Niraj *et al.* (2011) [18] observed that TAP block provided good analgesia during major gynecologic surgeries, leading to a decrease in opioid utilization and an increase in patient satisfaction. The analgesic advantage of TAP block across various lower abdominal procedures was also validated by a comprehensive review and meta-analysis by Abdallah and Chan (2012) [19].

Charlton *et al.* (2010) observed that TAP blocks greatly decreased the need for opioids after surgery and improved recovery from a variety of abdominal procedures, lending further credence to this claim. The fact that TAP block was found to increase analgesia in cesarean section patients when used as part of a multimodal regimen lends credence to the idea that it could be useful for a variety of surgeries involving incisions in the lower abdomen [20].

Keep in mind that the TAP block works best on somatic pain and not so well on visceral discomfort. Accordingly, for complete post-operative pain reduction, it is still necessary to combine TAP block with systemic analgesics. Significantly, no problems such block failure, hematoma, or local anesthetic toxicity were noted in this study, which is a major plus reported by the Hebbard, 2007; and Mukhopadhyay *et al.*, 2010 [21, 22].

The small sample size (n=50) may restrict the study's ability to draw broader conclusions. Additionally, accuracy may have been affected by using a TAP block that is dependent on landmarks instead of ultrasound-guided approaches. The effectiveness and safety of TAP blocks are both enhanced by ultrasound guidance, according to research given by Shibata *et al.*, 2007 [23]. We need further randomized trials with bigger cohorts and ultrasound to learn more about the effects on recovery time, ambulation, and length of hospital stay, and patient satisfaction in the long run.

Conclusion

This study's results show that the TAP block is an easy, safe, and effective way to give patients who have a total abdominal hysterectomy pain relief after the procedure. In comparison to patients who got solely systemic analgesia, those who underwent the TAP block reported much less pain, less opioid usage, and fewer opioid-related adverse effects. In the immediate aftermath of surgery, the block significantly reduced the requirement for rescue analgesics. Patients can experience better pain control after surgery, speedier recovery, and better results overall when the TAP block is used as part of a multimodal analgesic regimen. The TAP block is an effective and safe perioperative pain management tool for abdominal procedures, and it should be included in the protocol even more so in settings with limited resources, as other, more sophisticated pain control methods might not be accessible.

Funding support: Nil
Conflict of interest: None

References

1. Kehlet H, Dahl JB. Anaesthesia, surgery, and challenges in postoperative recovery. Lancet. 2003;362(9399):1921-1928.
2. White PF. The role of non-opioid analgesic techniques in the management of pain after ambulatory surgery. Anesthesia and Analgesia. 2005;101(5 Suppl):S5-S22.
3. Wu CL, Raja SN. Treatment of acute postoperative pain. Lancet. 2011;377(9784):2215-2225.
4. Niraj G, Searle A. Postoperative pain management in patients undergoing gynaecological laparotomies: Role of the TAP block. British Journal of Anaesthesia. 2009;103(5):716-717.
5. Bianconi M, Ferraro L, Ricci R, Zanoli G, Traina GC, Antonelli T, *et al.* Patient-controlled analgesia after hysterectomy: A comparison between fentanyl and tramadol. Anesthesia and Analgesia. 2003;96(3):805-810.
6. McDonnell JG, Laffey JG. Transversus abdominis plane block. Anesthesia and Analgesia. 2007;105(3):883.

7. Rozen WM, Tran TM, Ashton MW, Barrington MJ, Ivanusic JJ, Taylor GI. Refining the course of the thoracolumbar nerves: A new understanding of the innervation of the anterior abdominal wall. Clinical Anatomy. 2008;21(4):325-333.
8. Børglum J, Moriggl B, Jensen K, Lønnqvist PA, Christensen AF, Sauter AR, *et al.* Ultrasound-guided transversus abdominis plane block. British Journal of Anaesthesia. 2013;111(1):40-47.
9. Abrahams MS, Horn JL, Noles LM, Aziz MF. Evidence-based medicine: Ultrasound guidance for truncal blocks. Regional Anesthesia and Pain Medicine. 2010;35(2 Suppl):S36-S42.
10. O'Donnell BD, McDonnell JG, McShane AJ. The transversus abdominis plane (TAP) block in open retropubic prostatectomy. Regional Anesthesia and Pain Medicine. 2006;31(1):91.
11. Carney J, Finnerty O, Rauf J, Bergin D, Laffey JG, McDonnell JG. Studies on the spread of local anesthetic solution in TAP blocks. Anesthesia and Analgesia. 2009;109(2):661-665.
12. El-Dawlatly AA, Turkistani A, Kettner SC, Machata AM, Delvi MB, Thallaj A, *et al.* Ultrasound-guided transversus abdominis plane block: Description of a new technique and comparison with conventional systemic analgesia. Saudi Journal of Anaesthesia. 2009;3(3):130-133.
13. McDonnell JG, O'Donnell BD, Curley G, Heffernan A, Power C, Laffey JG. The analgesic efficacy of transversus abdominis plane block after abdominal surgery: A prospective randomized controlled trial. Anesthesia and Analgesia. 2007;104(1):193-197.
14. Carney J, McDonnell JG, Ochana A, Bhinder R, Laffey JG. The transversus abdominis plane block provides effective postoperative analgesia in patients undergoing total abdominal hysterectomy. Anesthesia and Analgesia. 2008;107(6):2056-2060.
15. Niraj G, Kelkar A, Fox AJ, Yeow C, Wong M, Powell R, *et al.* Evaluation of transversus abdominis plane block in gynecologic surgery: A randomized controlled trial. British Journal of Anaesthesia. 2011;107(5):710-715.
16. Abdallah FW, Chan VW. Transversus abdominis plane block: A systematic review. Regional Anesthesia and Pain Medicine. 2012;37(2):193-209.
17. Baeriswyl M, Kirkham KR, Kern C, Albrecht E. The analgesic efficacy of ultrasound-guided TAP block after abdominal surgery: A meta-analysis. Anaesthesia. 2015;70(11):1186-1194.
18. Charlton S, Cyna AM, Middleton P, Griffiths JD. Perioperative transversus abdominis plane (TAP) blocks for analgesia after abdominal surgery. Cochrane Database of Systematic Reviews. 2010;(12):CD007705.
19. Petersen PL, Mathiesen O, Stjernholm P, Lund J, Jørgensen HL, Dahl JB. The transversus abdominis plane block: A valuable option for postoperative analgesia? A topical review. Acta Anaesthesiologica Scandinavica. 2013;57(5):529-535.
20. Belavy D, Cowlishaw PJ, Howes M, Phillips F. Ultrasound-guided transversus abdominis plane block for analgesia after cesarean delivery. British Journal of Anaesthesia. 2009;103(5):726-730.
21. Hebbard P. Subcostal transversus abdominis plane block under ultrasound guidance. Anesthesia and Analgesia. 2007;104(5):1267-1268.
22. Mukhopadhyay S, Belavy D, Young S, Phillips F. The analgesic efficacy of ultrasound-guided transversus abdominis plane block in women undergoing total abdominal hysterectomy. Anaesthesia and Intensive Care. 2010;38(3):452-456.
23. Shibata Y, Sato Y, Fujiwara Y, Sato T, Asada A. Transversus abdominis plane block: A new approach. Journal of Anesthesia. 2007;21(3):325-326.