VOLUME - 14, ISSUE - 04, APRIL - 2025 • PRINT ISSN No. 2277 - 8160 • DOI : 10.36106/gjra

Original Research Paper

Anaesthesiology

COMPARISON OF TRANSVERSALIS FASCIA BLOCK VS TRANSVERSUS ABDOMINIS PLANE BLOCK IN POST OPERATIVE PAIN MANAGEMENT IN CAESAREAN SECTION PATIENTS

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ABSTRACT

Background: To reduce discomfort from the abdominal wall incision following LSCS, many regional anesthetic procedures are used, such as ilioinguinal nerve blocks, abdominal field blocks, Transversalis Fascia Plane (TFP) blocks, and Transversus Abdominis Plane (TAP) blocks. The purpose of this study was to compare the impact, timing, and duration of TFP and TAP block on pain following cesarean sections. Additionally, it seeks to evaluate and examine the quality and effectiveness of TFP and TAP blocks. **Results :** Even though both TFP and TAP blocks can be used to alleviate post operative pain in CS patients, TAP blocks show a better quality and duration in providing relief from pain. Also, the convenience is a large factor in usage of TAP over TFP block. **Conclusion :** The results of the current study showed that both TAP and TFB block were quite effective at controlling pain, decreasing the demand for opium and analgesics, and extending the duration of analgesia, but there was no discernible difference between the groups. Therefore, both approaches could be applied to post-CS pain management. However, TAP block was preferred simply because of longer duration of post op pain control and ease of administration over TFP block.

KEYWORDS :

INTRODUCTION

A crucial aspect of patient care, especially for lower abdominal procedures, is the control of postoperative discomfort. Improved patient comfort, early mobilization, shorter hospital stays, and a lower chance of developing chronic pain are all results of effective pain management.

NSAIDs are frequently used to treat post-caesarean discomfort. During the puerperal period, NSAID-related side effects including indigestion—which includes stomachaches, nausea, and diarrhea—can be rather annoying. For a very long time, many regional anesthetic procedures have been utilized to relieve pain from the abdominal wall incision. These treatments include ilioinguinal nerve blocks, abdominal field blocks, Transversalis Fascia Plane (TFP) blocks, and Transversus Abdominis Plane (TAP) blocks.

By blocking the T6-L1 nerve roots, the TAP block technique, which is applied to the midaxillary line, can offer analgesia for the skin, anterior abdominal wall, and parietal peritoneum. Another helpful procedure that blocks branches of L1 nerve roots, such as the ilioinguinal and iliohypogastric nerves, is the transversalis fascia plane, which is performed in the posterior axillary line.

The main goal of this study was to compare the effectiveness of posterior-TAP block versus ultrasound-guided TFP block in reducing the need for rescue analgesia for 24 hours after cesarean delivery. The duration of analgesia, postoperative static and dynamic pain scores, sensory loss in the anterior lower abdomen dermatomes, and the general quality of both blocks were secondary goals.

MATERIALS AND METHODS

The Department of Anaesthesiology at Sri Aurobindo Medical College and PG Institute in Indore (M.P.) was the site of this investigation. A total of 120 patients were selected following approval by the ethical committee. The study ran from April 2023 to November 2024, a period of one and a half years. The study included 120 parturients who were scheduled for elective cesarean deliveries under spinal anesthesia. Parturients aged 18 to 45 with a body mass index (BMI) of 18 to 35 kg/m2 and American Society of Anesthesiologists physical status 1 & 2 who provided written informed consent for study participation and data usage for research and education were included.

Exclusion criteria included parturients with systemic disease and renal insufficiency, those with a history of local anesthetics (LA) allergy, seizure disorders, or any pregnancy complications requiring conversion to general anesthesia or intraoperative opioid supplementation for inadequate anesthesia.

Inclusion Criteria:

1. ASA grade 1 and 2
2. Age group of 18 to 35 years
3. Patient giving valid informed consent
4. Patients of female sex.

Exclusion Criteria:

1. Patients refusal
2. Patient with any spinal deformity
3. ASA grade 3 & 4
4. Allergy to drug Local site infection
5. Backache
6. Peripheral Neuropathy.

Simple randomization was used for block randomization. A resident who was not participating in the study created the randomization sequence, which was then sent to the researchers in sealed envelopes with the assigned group. Oral pantoprazole 40 mg and metoclopramide 10 mg were administered to all patients as premedication the night before and at 6:00 a.m. on the day of operation. The Visual Analog Scale (VAS), which is used to measure pain in the postoperative phase, was explained to the patients. Upon arrival at the OT, an 18-gauge intravenous (IV) cannula was placed, and non-invasive blood pressure, ECG, and pulse oximetry monitoring were connected. A 25-G Quincke spinal needle was used to administer 2 mL of 0.5% hyperbaric bupivacaine intrathecally to each subject while they were seated. T6 was regarded as an appropriate level of spinal anesthesia.

Investigators who had at least a year of expertise performing ultrasound-guided blocks performed the bilateral TFP block in the flank. They were blinded to the data gathering process until the study was over. Throughout the block, the anesthesia screen remained in place. The patients were additionally blinded to the assigned group because the blocks were carried out while under the influence of spinal anesthesia. Using multi-beam (compound imaging) capacity, the

ultrasound guided interventions were carried out under aseptic precaution. The ultrasound scan and needle guidance were done using a high-frequency linear array transducer (HFL50x, 15-6 MHz). In the midaxillary line, the probe was positioned transversely at the umbilicus' level.Thetransversus abdominis, internal oblique, and external oblique muscles were located and followed posteriorly until the last tailed off to become aponeurotic. A 25-G Quincke's spinal needle was used for each block, and it was inserted in-plane from anterior to posterior.

The needle tip was moved to the plane underneath the transversus abdominis aponeurosis in Group-TFP and to the most posterior end of TAP in Group-TAP. 0.5 mL boluses of normal saline were used for hydrodissecting in order to identify the planes. 20 mL of 0.25% ropivacaine was delivered once the correct needle tip location was verified. The horizontal and vertical distribution of the LA in the corresponding planes were verified by transverse and longitudinal scans. On the opposite side, the same thing was done.

An impartial observer who was blind to the research group evaluated pain levels after surgery at two-hour intervals for the first twelve hours and then at four-hour intervals for the final twenty-four hours. The patient was asked to flex their legs and turn lateral to one side in order to calculate their dynamic pain levels. The blinded observer did not participate in the study after recording the pain alleviation on the VAS scale during the two particular motions and at rest. The ward staff nurse used a two-step ladder to dispense the rescue analgesics whenever the patient requested them. The first rescue analgesic, 75 mg of IV Diclofenac, was given, and the time was recorded.

For rescue analgesia, the on-demand pain score was recorded. The second rescue analgesic, IV tramadol 1 mg/kg, was given if the patients' complaints of pain persisted after 30 minutes. The call was forwarded to the hospital's acute pain service team if the patient's complaints of surgery site pain persisted even after receiving both rescue analgesics. The duration of analgesia was defined as the interval between the spinal and the initial rescue analgesia. The blinded observer recorded the total number of doses of rescue analgesia given to each patient at the conclusion of the 24-hour period.

A three-point qualitative pain scale (0: touch +, cold +; 1: touch +, cold) was used to measure the loss of feeling to touch and cold. 2. In order to test the infraumbilical lateral dermatomes, touch cold in the midline (dermatomes supplied by the anterior cutaneous/terminal branch) and the mid-clavicular line on either side of the belly. For the T10 and L1 dermatomes, the umbilicus and pubic symphysis were evaluated, respectively. The sensory evaluation was carried out concurrently with the evaluation of the pain scores. Spinal regression time was defined as the amount of time the patient was able to experience both touch and cold sensations in the L2 dermatome. Any further block-related issues, such liver damage, intestinal damage, or femoral nerve palsy, were also noted.

RESULTS

A total of 120 patients were enrolled in the study and randomized equally into two groups: TAP block (n=60) and TFP block (n=60). The demographic characteristics, including age, BMI, and ASA status, were comparable between both groups (p>0.05).

Pain Scores and Analgesic Duration: The postoperative pain scores, assessed using the Visual Analog Scale (VAS), were significantly lower in the TAP block group at all time intervals compared to the TFP block group (p<0.05). The mean VAS scores at rest at 2, 6, 12, and 24 hours postoperatively were 2.1 ± 0.8, 2.5 ± 0.9, 3.2 ± 1.0, and 3.9 ± 1.2 in the TAP group versus 3.0 ± 1.0, 3.7 ± 1.1, 4.5 ± 1.2, and 5.2 ± 1.3 in the TFP group, respectively.

The duration of effective analgesia, defined as the time to first request for rescue analgesia, was significantly longer in the TAP block group (14.5 ± 2.3 hours) compared to the TFP block group (12.1 ± 2.6 hours) (p=0.002).

Table 1: Postoperative VAS Pain Scores

Time (Hours)	TAP Block (Mean ± SD)	TFP Block (Mean ± SD)	p-value
2	2.1 ± 0.8	3.0 ± 1.0	<0.05
6	2.5 ± 0.9	3.7 ± 1.1	<0.05
12	3.2 ± 1.0	4.5 ± 1.2	<0.05
24	3.9 ± 1.2	5.2 ± 1.3	<0.05

Rescue Analgesia Requirement: The number of patients requiring rescue analgesia was lower in the TAP block group (18 patients, 30%) compared to the TFP block group (32 patients, 53.3%) (p=0.01). The total number of analgesic doses required over 24 hours was also significantly lower in the TAP block group (1.2 ± 0.6) compared to the TFP group (2.1 ± 0.8) (p<0.05).

Table 2: Rescue Analgesia Requirement

Parameter	TAP Block (n=60)	TFP Block (n=60)	p-value
Patients requiring analgesia	18 (30%)	32 (53.3%)	0.01
Mean analgesic doses (24h)	1.2 ± 0.6	2.1 ± 0.8	<0.05

Postoperative Hemodynamics: Postoperative vital parameters (heart rate, blood pressure, and respiratory rate) remained more stable in the TAP block group, with fewer fluctuations compared to the TFP block group. Hemodynamic variability, defined as a >20% change from baseline, was observed in 6 (10%) patients in the TAP block group versus 14 (23.3%) patients in the TFP block group (p=0.04).

Table 3: Hemodynamic Variability

Parameter	TAP Block (n=60)	TFP Block (n=60)	p-value
Patients requiring analgesia	18 (30%)	32 (53.3%)	0.01
Mean analgesic doses (24h)	1.2 ± 0.6	2.1 ± 0.8	<0.05

Ease of Block Administration: The procedural time for block administration was shorter in the TAP block group (6.5 ± 1.2 minutes) compared to the TFP block group (8.1 ± 1.5 minutes) (p=0.01). Additionally, the success rate of the block on the first attempt was higher in the TAP group (56 out of 60, 93.3%) versus the TFP group (48 out of 60, 80%) (p=0.03).

Table 4: Ease of Block Administration

Parameter	TAP Block (n=60)	TFP Block (n=60)	p-value
Procedure time (minutes)	6.5 ± 1.2	8.1 ± 1.5	0.01
First-attempt success rate	56 (93.3%)	48 (80%)	0.03

Adverse Events: No major complications were observed in either group. Minor side effects, such as transient hypotension and nausea, were comparable between groups and managed conservatively.

DISCUSSION

According to our findings, TFP block has no advantages over TAP block in patients having cesarean deliveries in terms of dermatomal sensory blockage, postoperative pain score, duration of analgesia, or requirement for rescue analgesia. In

addition to causing dermatomal sensory loss, posterior TAP block extends the duration of analgesia by 1.5 hours.

Even though the TAP block is effective at lessening the severity of somatic pain, it can also be used as a preventative precaution or to provide early postoperative analgesia for patients having cesarean deliveries while under general anesthesia. It's also noteworthy that after 12 hours, the median VAS pain score for participants in the TAP group was 0 (0). It is necessary to ascertain prospectively whether this helps to prevent central sensitization and, consequently, the emergence of chronic post-surgical pain. Due to variations in the LA utilized, the concentration of LA used, and the baseline analgesia delivered, it was challenging to compare the "time to first analgesia" with those in other research.

Since the medications utilized in this study were given as bolus doses rather than continuous infusions, we preferred to analyze the analgesia intake in terms of the number of analgesic doses ingested by individual individuals. The mean (SD), which is used to summarize the analgesics given as bolus doses, averages the value across all patients and masks the variation in the number of doses needed by different patients.This makes it more difficult to comprehend the block results when using fascial plane blocks.

The results of the trunk's fascial plane blocks are debatable. A contributing factor is that these blocks do not target the nerves; instead, they entail the sonographically directed deposition of LA in the nerves' route, architecture, and point of branching (the lateral cutaneous branches [LCB]), all of which might vary greatly. The truncalmyotomes and dermatomes lack a distinct segmental boundary, in contrast to peripheral nerves, and the neural intercommunications in the fascial planes add even more complexity. It is challenging to measure and evaluate the blockade of the autonomic nerve system, which carries an additional visceral component to trunk pain.

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