



**ORIGINAL RESEARCH PAPER**

**Anaesthesiology**

**ULTRASOUND GUIDED TRANSVERSUS ABDOMINIS PLANE BLOCK USING 0.375 % ROPIVACAINE FOR POST OPERATIVE ANALGESIA AFTER LOWER SEGMENT CESARIAN SECTION [LSCS]:A RANDOMIZED DOUBLE BLIND CONTROL STUDY**

**KEY WORDS:** TAPB, Ropivacaine, post-operative analgesia.

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**ABSTRACT**

**Background:** Ultrasound guidance has led a surge of interest in Transversus abdominis plane (TAP) block for postoperative analgesia in post-delivery lower segment cesarian section[LSCS]. It is one of the most widely used regional analgesic techniques and important component for postoperative analgesia.

**Aim and objectives:** Efficacy of TAP block with Ropivacaine and normal saline for post-operative analgesia after LSCS, time to first analgesic request was noted in all the subjects, number of doses of rescue analgesia (tramadol).

**Method:** A double blind, prospective randomized controlled trial study, 40 mothers undergoing elective or emergency cesarian delivery were randomised to receive TAP block. The 1st group received bilateral 20 ml of 0.375% ropivacaine while the 2nd received the same volume of 0.9% normal saline at the end of the surgery after obtaining informed consent. All the subjects received a standard spinal anaesthesia. Breakthrough pain was treated with tramadol. Post-operatively, all the subjects were observed at 30mins, 1, 3, 6, 12 & 24 h in ward.

**Result:** First request of rescue analgesic was 310±18.53 minutes in R group, when compared with 86±9.85minutes in the C group and Total Tramadol consumption was less in R group (105±15.3mg) than in C group (308±16.09 mg).

**Conclusion:** we conclude that 0.375% Ropivacaine provided longer duration of analgesia in study group than control group when used in TAP block for patients undergoing LSCS.

**INTRODUCTION:**

PAIN – is defined as an unpleasant sensory and emotional experience associated with actual or potential tissue damage. In spite of advances in the knowledge, skill and sophisticated technology, many patients continue to experience considerable discomfort during postoperative period due to pain. [1]

Lower segment caesarean section (LSCS) is a major surgical procedure with substantial post-operative pain. [2] Good Pain control following LSCS is essential to facilitate early mobilisation. Achieving good pain relief is challenging because of the altered physiology and of the possibility of transmission of drugs through breast milk.

TAP block First described by Rafi et al, in 2001 its provided analgesia by blocking the 7th to 11th intercostal nerves (T7-T11), the subcostal nerve (T12), and the ilioinguinal nerve (IIN) and iliohypogastric nerve (IHN) (L1-L2). [3]

Transversus abdominis plane (TAP) block is one of the regional analgesic techniques reducing the postoperative pain of abdominal surgeries. [4]

Various local anaesthetic agents have been used to provide effective and adequate postoperative analgesia.

The purpose of this randomised study was to evaluate the efficacy of ultrasound guided TAP block for post-operative analgesia LSCS pain using 0.375% Ropivacaine and 0.9% normal saline.

**METHOD:**

After obtaining informed written patient consent, we studied 40 patients age between 18-40 years belonging to ASA I – II grade with no major systemic disease, who were scheduled for caesarean section under spinal anaesthesia were enrolled into this study. Exclusion criteria were a history of drug allergy or local anaesthetic toxicity, BMI (body mass index) > 35 kg/m<sup>2</sup> and pregnancy weight < 50 kg (to limit maximum ropivacaine dose to 3 mg/kg), contraindications to regional anaesthesia (bleeding diathesis, infection at the site of block and peripheral neuropathy), severe medical conditions such

as severe pre-eclampsia and eclampsia and patients who had intra-operative complications like post-partum haemorrhage.

The patients were randomly divided into two groups. The group sequence was concealed in sealed opaque envelopes. The anaesthesiologists, the subjects were blinded to the group assignment.

Group A [STUDY GROUP]: USG guided TAP block with 20 ml of 0.375% ropivacaine each side.

Group B [CONTROL GROUP]: USG guided TAP block with 20 ml of Normal Saline each side.

On arrival to the operation theatre, all monitors were attached, and baseline values were recorded. Under all aseptic and antiseptic precaution, SAB was performed in sitting position. Heart rate, blood pressure & pulse oximetry was monitored in the operating room.

At the end of the surgery, bilateral USG (ultrasound) guided TAP block was performed using either 20 ml of 0.375% ropivacaine (obtained by mixing 10 ml of 0.75% ropivacaine with 10 ml of normal saline) or 20 ml saline on each side.

After preparing the skin with antiseptic solution, a linear high frequency ultrasound probe (6-13 MHz, Sonosite MTurbo©) was placed transversely on the anterolateral abdominal wall between the iliac crest and the costal margin.

Under US guidance, the three layers of muscles –external oblique, the internal oblique, and the Transversus abdominis were identified. The needle was then introduced through the skin anteriorly in the plane of the ultrasound beam and advanced into the fascial plane between the internal oblique and Transversus abdominis muscles. Hydro dissection with saline (2-5 ml) was used to separate the fascial layers. After a negative test dose, 20 ml of the study solution was injected. TAP block was performed in a similar fashion on the opposite side. After completion of the procedure, patients were shifted to the post anaesthesia care unit (PACU) before transferring them to the ward.

All the subjects were assessed at 30 min, 1, 6, 12, 18 & 24 h after surgery for pain. All the subjects were asked to rate their pain

at rest and on movement using a visual analogue scale (VAS) with '0' representing no pain and '10' being the worst pain. Rescue analgesia (100 mg tramadol IV) was administered if VAS > 4 on movement or if the mother demanded for it. The time to first analgesic request was noted in all the subjects.

**RESULT:**

In our study the mean time for first request of rescue analgesic was 310±18.53 minutes in R group, when compared with 86±9.85 minutes in the C group, with p value <0.05 was statistically very significant as shown in table 2 and fig 1.

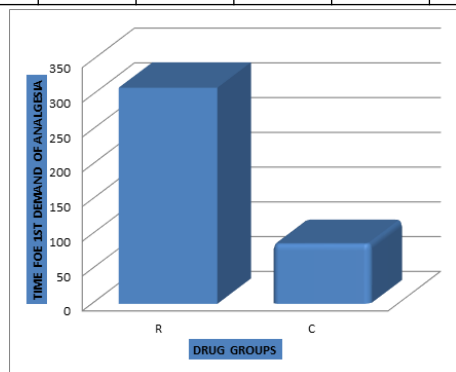
Total Tramadol consumption was less in R group (105±15.3mg) than in C group (308±16.09 mg), the mean difference was statistically significant as shown in (table 1).

**Table 1: Total Tramadol Requirement**

GROUP	N	MEAN	SD	SE	P VALUE
R	20	105	15.390	3.44	<0.05
N	20	308	16.092	3.598	

**Table 2: Time For First Demand Of Analgesic In Minutes**

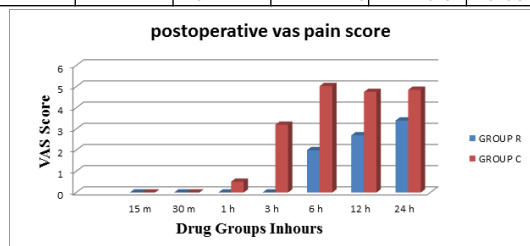
GROUP	N	MEAN	SD	SE	P VALUE
R	20	310.9	18.538	4.145	<0.05
N	20	86.25	9.851	2.23	



**FIG. 1 Chart For First Demand Of Analgesic**

**Table 3: Vas Pain Score**

VAS SCORE	GROUP R		GROUP C		P VALUE
	MEAN	SD	MEAN	SD	
15 m	0	0	0	0	>0.05
30 m	0	0	0	0	>0.05
1 h	0	0	0	0	>0.05
3 h	0	0	0.510146	0.477	<0.05
6 h	2	0.648	3.2	0.824	<0.05
12 h	2	0.648	5.026226	1.541	<0.05
24 h	2.7	0.47	4.75	0.91	<0.05



**FIG. 2. Postoperative Vas Pain Scores**

Postoperative VAS Pain scores were significantly reduced in R group in all the time when compared to C group as shown in table 3& fig 2.

**DISCUSSION:**

Patients after Caesarian Section go through pain post operatively. Most of this pain is experienced after the abdominal wall incision.

After a Caesarean delivery (CD), TAP blocks have been shown to play a valuable role in providing adjunctive analgesia for patients who are undergoing CD with spinal anaesthesia without intrathecal morphine (ITM). [5-7] and provide analgesic benefit to patients undergoing CD with general anaesthesia. [6-9]

Ultrasound based studies have shown their superiority and accuracy over the blind abdominal wall injections. [10]

The present study showed that when administered via ultrasound-guided TAP block, the plain solution of ropivacaine (0.375%) provides more effective pain relief in the immediate post-operative period as compared to control group. Also Reduced Tramadol requirements in the first 24 postoperative hours as compared with the control group.

We selected Tramadol for rescue analgesia as several studies have confirmed the analgesic effects of single-dose intramuscular tramadol 50–100 mg can provide effective postoperative.

All patients in Ropivacaine group breathed deeply, coughed freely, moved without limitation and showed good satisfaction as compared to Normal saline group.

Our study results had demonstrated that end operative TAP block Reduced VAS score significantly in the study group at all the intervals when Compared to C group. Interestingly the VAS score was zero in study Group for the first 4 hours which itself explains the effectiveness of TAP block.

The reason for prolonged duration of analgesic effect after TAP Blockade may be due to the relatively poor vascularisation and slowed drug clearance from Transversus abdominis plane, and may be due to avoidance of central sensitization by giving TAP block end operatively.

Complications like peritoneal and visceral punctures related to TAP block were not encountered in our study. Farooq M, Carey M. in 200832 reported a case of Liver Trauma with a blunt regional anaesthesia needle while performing Transversus Abdominis Plane Block.

The use of ultrasound to confirm needle position is a promising approach that should further reduce the risk of this complication

**CONCLUSION:**

So, By This study we concluded that a bilateral USG guided TAP block with single injection of 0.375% Ropivacaine using provides lower postoperative severity of pain, reduced total postoperative rescue analgesics requirements and prolonged time for the first analgesic request as compared with control group after Caesarian Section under spinal anaesthesia when it is used as multimodal analgesia. We recommend TAP block should be included as analgesia in the postoperative period for women after Caesarian Section delivery.

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