



TRANSVERSES ABDOMINIS PLANE BLOCK VERSUS QUADRATUS LUMBORUM BLOCK FOR POSTOPERATIVE ANALGESIA AFTER CAESAREAN SECTION.

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ABSTRACT

BACKGROUND- Caesarean section for baby delivery is one of the most common surgical procedures being performed worldwide. Effective early postoperative analgesia remains priority and it can improve maternal outcome. Multimodal analgesia remains standard for post operative analgesia following caesarean section. Truncal block, including transversus abdominis plane (TAP) block and quadratus lumborum block play an important roles in multimodal analgesia. Aim of this study was to compare TAP block versus QL block for analgesic efficiency after caesarean section under general anaesthesia. **METHODS** – This prospective randomized control study was done in tertiary care hospital from June 2021 to December 202, 80 patients were enrolled and randomized into two groups TAPB and QL group with 40 patients each. Ultrasound guided TAP block and QL block with 20 ml of 0.2% Ropivacaine was given on each side was given postoperatively before extubation. Patients were observed for 24 hours, Inj Tramadol intravenous was given as rescue analgesia. Patients were evaluated for analgesic efficiency, time to rescue analgesia, number of doses, average analgesic dose were noted along with median VAS score. **RESULTS-** Average dose requirement for rescue analgesia was higher in TAPB group than QL group. Number of patients requiring analgesia was 80% in TAPB and 27.5% in QL group. Time to rescue analgesia was 820 minutes in TAPB group and 1414 minutes in QL group. Median VAS scores were comparable between two groups initially; significant difference was seen at 6 hours postoperatively, with maximum difference seen at 12 hours interval. Beyond 18 hours difference in median VAS scores between two groups was insignificant. No complications with either of procedures were noted. **CONCLUSIONS** - Analgesic efficacy of QL block is better than TAP block. Median VAS scores were lower and time to first analgesic demand was prolonged, with reduced total analgesic consumption in 24 hours.

KEYWORDS : Caesarean section, Analgesia, TAP block, QL block.

INTRODUCTION

Caesarean section for baby delivery is one of the most common surgical procedures being performed worldwide. Post operative pain remains a concern and affects maternal satisfaction^[1]. It can affect early breast feeding^[2], is predictor of maternal depression^[3] and can increase maternal morbidity and mortality.

Effective early postoperative analgesia remains priority and it can improve maternal outcome. Multimodal analgesia remains standard for post operative analgesia following caesarean section. It includes neuraxial anaesthesia with intrathecal or epidural opioids along with intravenous, intramuscular or oral medication. Truncal block, including transversus abdominis plane (TAP) block, quadratus lumborum (QL) block, rectus sheath block and hernia block, plays important roles in multimodal analgesia^[4,5]. Peripheral nerve blocks are not routinely used in obstetric analgesia. However TAP blocks and QL blocks are increasingly being used to improve analgesic outcomes recently^[6]. Peripheral blocks allow for decreased opioid requirement and hence decreased opioid related complications^[7,8].

Transversus abdominis plane block was described by Rafi and is a landmark technique^[9]. Here local anaesthetic is injected into the plane between transverse abdominis and the internal oblique, resulting in blockade of afferent nerves supplying anterior abdominal wall. Ultrasound guided TAP block has been shown to be a simple, safe and effective method of providing postoperative analgesia^[10]. Ultrasound guided TAP block is being effectively used for analgesia in various abdominal surgeries, such as caesarian sections, appendectomies, laparoscopic procedures, and inguinal hernia repairs.

The QL block, which is applied to the anterolateral aspect of the QL muscle, was first described by Blanco^[11] in 2007. It involves injecting local anaesthetics into the thoracolumbar fascia. QL block can result in a widespread sensory blockade.

In this study we aim to compare analgesic efficiency and duration of TAP block with QL block after caesarean section and also report any adverse effect if observed. Study was conducted in patients requiring general anaesthesia.

METHODS

The study was conducted in Government Medical College Srinagar, a tertiary care hospital from June 2021 to December 2021 and was approved by local ethics committee.

Eighty (80) patients who were scheduled to undergo caesarean section under general anaesthesia were included in the study. The patients were randomly assigned into two groups, TAPB group and QL group, of 40 patients each using computer generated random numbers. Written informed consent was obtained from each patient in the study. This was a single center, prospective randomized controlled study. Patient and postoperative pain evaluators were blinded to the study.

Inclusion criteria were American Society of Anesthesiologists physical status I or II with age of 18 to 45 years; a normal singleton pregnancy with a gestation of at least 37 weeks. Exclusion criteria were inability to comprehend or use the verbal rating pain scoring system, allergy to local anaesthetics, congenital coagulopathy, anatomic abnormalities and localized infection.

Patients were made familiar with visual analogue scale score identifying 0 as no pain and 10 as worst imaginable pain.

Demographic data as age, weight, ASA status and parity were registered.

In operating room, peripheral intravenous cannula (18G) was secured and co-loading done with 500 ml of ringer lactate. Standard monitoring started by electrocardiography (ECG), non-invasive blood pressure, and pulse oximetry. General anaesthesia was then induced by rapid sequence induction and patients intubated. Patients were then mechanically ventilated and anaesthesia maintained intraoperatively. Intravenous fluids were given per body weight and according to intraoperative loss. Analgesics given intraoperatively included i.v Fentanyl (2mg/kg) and i.v Paracetmol (15mg/kg)

Ultrasound guided TAP block and QL blocks were given after completion of surgery and before extubation. In both groups, the block using ultrasound was performed and patients received 20 mL of 0.2% Ropivacaine for each side.

TAP block was given in supine position using a linear ultrasound probe (6-12 MHz). QL block type 2 with posterior approach was given in lateral position.

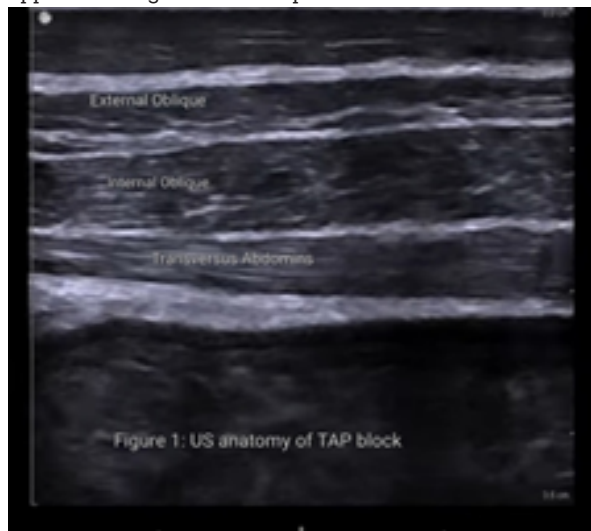


Figure 1: US anatomy of TAP block



Figure 2: Posterior QL block

All patients were evaluated for postoperative pain relief for the next 24 h. Visual analogue scale (VAS) was used for assessment of postoperative pain. Patients were assessed for pain at 0, 2, 4, 6, 12 and 24 hours. If patient had VAS > 3, rescue analgesia Inj. Tramadol 2mg/kg was given intravenously. The time for first rescue analgesia was noted. Total dose of rescue analgesia given over 24 h was noted.

The data obtained was analysed using statistical package for the social sciences (SPSS) software (version 20, IBM, USA). The data was expressed as mean, frequency and percentage.

Quantitative data was analysed using independent sample median test and Chi square test. P < 0.05 was considered statistically significant. The differences in continuous parameters between the two groups was analysed using unpaired students t test.

RESULTS

80 patients were enrolled in the study. 40 patients were included in each group of TAPB and QLB.

Table 1: Demographic Data Of Two Groups (mean).

Demographic character	TAPB (n=40)	QLB (n=40)
Age (years)	27.1	26.5
Weight (Kg)	74.7	75.3
Height (cm)	149.7	152.2
ASA status I/II	12/28	14/26

From the demographic data as depicted in Table 1, two groups seem to be comparable. Mean age in TAPB group was 27.1 years and in QLB group it was 26.5 years. The distribution of ASA I and II in TAPB group was 30% and 70%, respectively, and in QLB group it was 35% and 65%, respectively.

Time to rescue analgesia for group TAPB was 820 minutes for TAPB group and 1414 minutes for QLB group. The difference is significant with p value 0.000. Number of patients requiring rescue analgesia is 32 (80%) in TAPB group and 11 (27.5%) in QLB group. The difference is significant with p value of 0.001. The average requirement of rescue analgesia Inj Tramadol was less in QLB group than in TAPB group.

Table 2: Analgesic Efficiency

	TAPB group	QLB group	P Value
Time to rescue analgesia (min)	820	1414	0.000
Number of patients requiring rescue analgesia	32 (80%)	11 (27.5%)	0.001
Average requirement of rescue analgesia (Tramadol in mg)	15.2	75.5	

The visual analogue scale of TAP and QLB groups was compared at 0, 2, 4, 6, 12 and 24 hours. Median scale of the TAP group at 0, 2, 4, 6, 12 and 24 hours was 0, 2, 2, 3, 3 and 4 respectively and median score of the QLB group at 0, 2, 4, 6, 12, 24 hours was 0, 1, 2, 2, 2, 2. (Table 3)

Table 3: Median VAS scores

Time (hours)	TAP VAS score	QLB VAS score	P Value
0	0	0	0.965
2	1	1	0.442
4	2	2	0.321
6	3	2	0.003
12	3	2	0.001
18	3	3	0.121
24	4	4	0.584

By 4 hours postoperative interval no statistically significant difference was seen in the pain scores of two groups (p > 0.05), however 6 hours postoperatively significant difference was seen in between two groups; maximum difference was noted at 12 h interval postoperatively. Beyond 18 hours difference in VAS score between two groups was statistically insignificant.

No postoperative complications like hypotension, bradycardia, arrhythmia, nausea or vomiting was observed in any of the patients.

DISCUSSION

This study was designed to assess analgesic efficiency of TAP block and compare it with QL block in pregnant patients undergoing caesarean section under general anaesthesia.

Caesarean section at our institute is usually done under spinal anaesthesia. But there are specific indications for general anaesthesia in both elective and emergency surgeries. With spinal anaesthesia there remains some blockade in post surgical period so patient requires lesser analgesia immediately after the surgery. But after general anaesthesia pain is more profound immediately after the surgery and management is challenging. Without timely and effective treatment, acute postoperative pain can turn into persistent chronic postoperative pain^[12].

Recently, with the rise in enhanced recovery after surgery, nerve blocks have become the key link in multimodal analgesic regimes^[13].

The result of our study shows that the QL block provides more effective analgesia compared to TAP block. Pain relief with QL block was more long lasting and required lesser rescue analgesia. Only few studies have been done comparing QL block with well established TAP block, our study is in agreement with these studies where QL block has been shown to be superior to TAP block in providing postoperative pain relief^[14,15,16].

The analgesic efficacy and longer lasting effect of QL block have been attributed to visceral pain relief as a result of spread of local anaesthetic (LA) to thoracic paravertebral and epidural space^[17]. In TAP block, it is postulated that it blocks the thoracolumbar nerves T10 to L1 and provides adequate somatic analgesia without any visceral blockade^[18].

No complication was seen in any of the groups hence reaffirming safety profile of these two ultrasound guided peripheral blocks.

Limitation of this study was that ultrasound guided blocks are operator dependant and it also needs assistance for positioning of anaesthetized patient during procedure. Also in present study we only used single injection technique. Further research is needed to identify the roles of other peripheral blocks like paravertebral nerve blocks and erector spinae blocks for cesarean delivery analgesia.

CONCLUSION

From the observations and analysis of the present study, as a part of multimodal analgesia both the techniques seem to be effective without any complications, however it can be concluded that analgesic efficacy of QL block is better than TAP block. Median VAS scores were lower and time to first analgesic demand was prolonged, with reduced total analgesic consumption in 24 hours.

Proper implementation of these peripheral nerve blocks can lead to increased maternal satisfaction, decreased opioid use and their side effects, better bonding of baby with mother with early breast feeding. We advocate use of these peripheral blocks, particularly QL block as a part of multimodal analgesia particularly in women undergoing cesarean section under general anaesthesia.

REFERENCES

1. Carvalho B, Cohen SE, Lipman SS, Fuller A, Mathusamy AD, Macario A. Patient preferences for anesthesia outcomes associated with cesarean delivery. *Anesthesia and Analgesia* 2005; 101: 1182-7.
2. Hirose M, Hara Y, Hosokawa T, Tanaka Y. The effect of postoperative analgesia with continuous epidural bupivacaine after cesarean section on the amount of breast feeding and infant weight gain. *Anesthesia and Analgesia* 1996; 82: 1166-9.
3. Eisenach JC, Pan PH, Smiley R, Smiley R, Lavand'homme P, Landau R, Houle TT. Severity of acute pain after childbirth, but not type of delivery, predicts persistent pain and postpartum depression. *Pain* 2008; 140: 87-94.
4. Oksuz G, Bilal B, Gurkan Y, Urfalioglu A, Arslan M, Gisi G, Oksuz H. Quadratus lumborum block versus transversus abdominis plane block in children undergoing low abdominal surgery: a randomized controlled trial. *Reg Anesth Pain Med.* 2017;42(5):674-9.
5. Chakraborty A, Khemka R, Datta T. Ultrasound-guided truncal blocks: a new frontier in regional anaesthesia. *Indian J anaesth.* 2016;60(10):703-11.
6. Mitchell KD, Smith CT, Mechling C, Wessel CB, Orebaugh S, Lim G. A review

- of peripheral nerve blocks for cesarean delivery analgesia. *Regional Anesthesia and Pain Medicine* 2020; 45:52-62.
7. Elizaga AM, Smith DG, Sharar SR, Edwards WT, Hansen ST Jr. Continuous regional analgesia by intraneural block: Effect on postoperative opioid requirements and phantom limb pain following amputation. *J Rehabil Res Dev.* 1994; 31(3):179-87.
8. Johns N, O'Neill S, Ventham NT, Barron F, Brady RR, Daniel T. Clinical effectiveness of transversus abdominis plane (TAP) block in abdominal surgery: a systematic review and meta-analysis. *Colorectal Dis.* 2012; 14(10):e635-42.
9. Rafi A. Abdominal field block: A new approach via the lumbar triangle. *Anaesthesia.* 2001;56:1024-6.
10. McDonnell JG, O'Donnell B, Curley G, et al. The analgesic efficacy of transversus abdominis plane block after abdominal surgery: A prospective randomized controlled trial. *Anesth Analg.* 2007;104:193-7.
11. Blanco R. Tap block under ultrasound guidance: the description of a "no pops" technique 271 [abstract]. *Reg Anesth Pain Med.* 2007; 32:S130.
12. Lovich-Sapola J, Smith CE, Brandt CP. Postoperative pain control. *Surg Clin N Am.* 2015;95(2):301-18.
13. Wick EC, Grant MC, Wu CL. Postoperative multimodal analgesia pain management with nonopioid analgesics and techniques: a review. *JAMA surgery.* 2017;152(7):691-7.
14. Blanco R, Ansari T, Riad W, Shetty N. Quadratus lumborum block versus transversus abdominis plane block for postoperative pain after cesarean delivery: a randomized controlled trial. *Reg Anesth Pain Med.* 2016;41: 757-762.
15. McCrum CL, Ben-David B, Shin JJ, Wright VJ. Quadratus lumborum block provides improved immediate postoperative analgesia and decreased opioid use compared with a multimodal pain regimen following hip arthroscopy. *J Hip Preserv Surg.* 2018;5:233-239.
16. Oksuz G, Bilal B, Gurkan Y, et al. Quadratus lumborum block versus transversus abdominis plane block in children undergoing low abdominal surgery: A randomized controlled trial. *Reg Anesth Pain Med.* 2017;42:674-679.
17. Murouchi T. Quadratus lumborum block intramuscular approach for pediatric surgery. *Acta Anaesthesiol Taiwan.* 2016;54:135-136.
18. Abrahams MS, Horn JL, Noles LM, Aziz MF. Evidence-based medicine: Ultrasound guidance for truncal blocks. *Reg Anaesth Pain Med.* 2010;35(2 Suppl):S36-42.