POSTERIOR QUADRATUS LUMBORUM BLOCK VERSUS POSTERIOR TRANSVERSUS ABDOMINIS PLANE BLOCK FOR CESAREAN DELIVERY ANALGESIA: A RANDOMIZED CLINICAL TRIAL

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ABSTRACT

Background: Scarce studies directly compare posterior transversus abdominis (TAPB) versus quadratus lumborum type 2 (QLB2) as a part of multimodal analgesia in cesarean delivery. The aim of this study was to compare analgesic profile of ultrasound-guided posterior TAPB to those of ultrasound-guided QLB2. Time to first analgesic demand was the primary objective.

Methods: One hundred parturient undergoing elective cesarean delivery under spinal anesthesia with intrathecal fentanyl, two groups were randomly allocated to receive postoperative ultrasound guided posterior TAPB or QLB2. Both groups received 20 ml of bupivacaine 0.25% on each side of the abdomen. Patients were assessed for time of the first analgesic demand as a primary outcome. As secondary outcomes, total dose of fentanyl consumption at 24 h, dermatomal coverage of the blocks, visual analogue scale (VAS), the occurrence of postoperative complications, and patient satisfaction after 12 and 24 h postoperatively.

Results: QLB2 was associated with significant longer time for first request of analgesia, broader dermatomal coverage, significant lower VAS at 4,8 h during both rest and movement and at 24 h during movement only, and better satisfaction at both 12 and 24 h. Both groups were associated with stable hemodynamics through postoperative period with no significant difference between TAPB and QLB2 concerning side effects.

Conclusions: QLB2 has a longer time of first analgesic request and a better analgesic profile than posterior TAPB in cesarean delivery.

Keywords: Analgesia, obstetric; Cesarean sections; Regional anesthesia; Spinal anesthesia; postoperative pain; Visual analogue scale.

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INTRODUCTION

Cesarean delivery (C.D) is a common abdominal surgery with moderate to severe degree of post-operative pain that warrants an adequate postoperative pain control strategy for enhanced postoperative outcomes. Post CD pain is multifactorial. It has somatic component from incisional pain and visceral component from uterine involution, abdominal distention, and perineal discomfort [1, 2].

Inadequate control of acute postoperative pain carries adverse physical and psychological consequences for both mother and infant. It is associated with higher risk of postpartum depression or chronic post cesarean pain [3].

Multimodal analgesia is considered a constituent of enhanced postoperative recovery. It includes associate administration of intrathecal opioid as morphine or fentanyl, enteral or parenteral administration of NSAIDs, acetaminophen, and fascial plane blocks (FPB) as transversus abdominis plane block (TAPB), quadratus lumborum block (QLB)[4, 5].

Both TAPB and QLB show superior analgesic effects to placebo in absence of intrathecal morphine in cesarean deliveries[6, 7].

Posterior TAPB targets the most posterior part of the transversus abdominis plane [8]. Spread of injectate to thoracic paravertebral space or sticking to the aponeuroses may result in long duration of analgesia and reduction of visceral discomfort[9]. Carney and his colleagues [10] found a wide local anesthetic distribution from T5 to L1 that was confirmed by MRI examination after injection of posterior TAPB.

QLB is another FPB that was originally introduced by Blanco in 2007[11]. Four different types of QLB were modified later according to site of injection. QLB2, further known as posterior QLB, is carried out by injection of local anesthetic posterior to the quadratus lumborum muscle between it and erector spinae muscle. It`s analgesic distribution is supposed to be from T7 to L1[12].

Scarce studies directly compare efficacy of QLB2 block with posterior TAPB showing a better analgesia associated with QLB2. Limited studies reported the time for first request analgesia. Time to first analgesic request was markedly prolonged as reported by Verma and his colleagues [13] on the other hand another study involving QLB2 block showed shorter time[14]. We hypothesized that QLB2 may prolong time to first analgesic request with a better analgesic profile in patient who underwent CD surgery under spinal anesthesia with intrathecal fentanyl. Therefore, this comparative randomized clinical study in the cesarean delivery surgery was conducted to investigate the time to first analgesic demand as a primary objective. The secondary objectives were assessment of total fentanyl dose consumption at 24h postoperative, visual analogue scale (VAS) score, dermatomal coverage of fascial plane block, patients` satisfaction, and incidence of postoperative complications.

MATERIALS AND METHODS

This blinded randomized clinical trial was conducted at Mansoura University Hospital from March 2021 to March 2023. This study has followed the guidelines laid out by the World Medical Association in their Declaration of Helsinki for all operations involving human subjects. The study was approved from the Institutional Review Board (IRB) (MDP.21.01.55) on 27/1/2021, and registered at ClinicalTrials.gov (NCT04773730). After explanation of the study protocol, pain score, and drugs used a written informed consent to enroll in the study was obtained from parturient who fulfilled the criteria of inclusion and agreed to be included in this clinical trial.

One hundred parturient were randomly allocated by computer generated tables and group assignments that were concealed in sequential number sealed opaque envelopes into 2 equal groups: TAPB group (Group I) (n=50) and QLB2 group (Group II) (n=50).

Women who were aged between 20 and 40y, physical status II according to the American Society of Anesthesiologists (ASA), with a singleton pregnancy of at least 37 weeks' gestation, and scheduled for elective CD through a Pfannenstiel incision with exteriorization of the uterus under spinal anesthesia with intrathecal fentanyl were enrolled in the study.

Patients were not enrolled if their height < 150 cm, weight < 60 kg, body mass index (BMI) ≥ 35 kg/m^2, allergic to any of the drugs used in the study, had contraindications to spinal anesthesia (coagulopathy, increased intracranial pressure, or local skin infection), had renal impairment, or other contraindications to NSAIDS, or had significant cardiovascular, or hepatic abnormalities, or hypertensive disorders of pregnancy.

The subjects of the trial and the researchers evaluating postoperative outcomes were both blinded to the study groups. Primary investigator assessed patients' eligibility for the study based on inclusion, exclusion criteria. Anesthetic technique and the VAS using a horizontal scale of 0 to 100 mm (where 0 for no pain and 100 for the worst possible pain) were explained, (age, weight, height, and gestational age) were recorded, and basal hemodynamic parameters were measured and recorded (non-invasive blood pressure, heart rate, peripheral oxygen saturation). Premedication with 10 mg of metoclopramide was administered followed by the administration of 500 mL of crystalloids through an intravenous 18-gauge cannula.

Spinal anesthesia was conducted using 12.5 mg of hyperbaric bupivacaine .5% and 20 mcg of fentanyl with a 25-gauge spinal needle inserted at the L3-L4 or L4-L5 interspace while the patient was seated. Extent of the sensory blockage was determined by using a pinprick test every 5 minutes and recorded at 20 minutes post spinal anesthesia administration. If a T6 sensory level was not achieved after 20 minutes of spinal anesthesia administration, the spinal anesthesia was deemed unsuccessful, and the parturient was excluded from the trial. The degree of motor block after spinal anesthesia was measured using the Bromage scale[15] where 0 indicated no motor block with full range of motion in the hips, knees, and ankles, 1 indicating limited movement to the knees and feet, 2 indicating limited movement to the feet exclusively, and 3 indicating complete paralysis of the lower extremities. A big opaque screen separated the patient from the operating area. Hemodynamics were monitored intraoperatively and recorded at 10-minute intervals.

Patients were randomly allocated into two equal groups using computer generated random number table. The allocation was concealed in sealed, opaque, sequentially numbered envelopes.

At the end of surgery after skin closure, assistant nurse withdrew the envelope and gave it to the primary investigator who performed the fascial plane blocks. While the patient was still supine on the operating table with the opaque screen in place, a rolled sheet underneath the site of injection was applied to facilitate probe placement. Time of block performance that was defined as the time from sterilization of the skin till injection of local anesthetics at both sides of the abdominal wall was recorded by assistant nurse.

A linear 12-14 MHz array transducer was positioned transversely between the iliac crest and costal border in the anterior axillary line. Sliding of the transducer from medial to lateral to visualize the external oblique, internal oblique, and transversus abdominis muscles then further sliding of the transducer till the most posterior region of these three muscles which was recognized as the injection site. A 22-gauge needle was introduced in-plane Patients were transferred to post anesthesia care unit (PACU) where assessment was done by investigator blinded to group allocation. Assessment included duration of motor and sensory spinal anesthesia recovery at 30 minutes intervals for the first 4 hours setting the zero hour from time of intrathecal drug administration. Motor block recovery time was defined as complete recovery of motor power, in other words, Bromage score zero. Sensory regression of spinal anesthesia to L3 and S1 level was also recorded.

Block assessment regarding dermatomal coverage of FPB was started when sensory block of spinal anesthesia to L3 dermatome regressed which was tested according to dermatomal map by pinprick sensation. Evaluation of dermatomal coverage over each side of the abdominal wall was confirmed by alternation to cold sensation using ice cube, skin just below the clavicle at midclavicular line was a reference point to compare with. Any sensory blocking was then compared to dermatome charts that typically included the inguinal ligament L1, umbilicus T10, and subcostal margin T6 dermatomes [16].

VAS score on 100 mm scale was assessed at rest and on movement (hip flexion) or coughing if the patient couldn't move her legs yet at 1, 2, 3, 4, 6, 8, 10, 12, 18 and 24 hours postoperatively considering zero hour of assessment from performing the block.

If VAS score was greater than 30mm either during rest or movement, documentation of time as time of first analgesic request was done also known as pain free time and the first analgesic in the form of 30 mg of intravenous (IV) ketorlac and 1 gm of IV infusion of paracetamol was initially given then regularly every eight hours. Rescue fentanyl bolus doses of 0.5 mcg / kg were administered intravenously if VAS score remained more than 30. Postoperative fentanyl use was tracked for 24 h after from medial-to-lateral. Twenty mL of bupivacaine 0.25% was injected between the transversus abdominus muscle and the fascia deep to the internal oblique muscle under direct vision at each side of the abdominal wall.

In the QLB2 group, the antero-superior iliac spine was used as a reference point for positioning the 2-5 MHz curved array transducer transversely then the probe was slid cranially until the three abdominal wall muscles were visible, further sliding till the most posterior part of the three muscles leaving the internal oblique muscle, like a roof over the quadratus lumborum muscle then angulation of the probe slightly downward to identify the intermediate layer of the thoracolumbar fascia which appeared as a bright hyperechoic line. A 22-gauge spinal needle was inserted in-plane from medial to lateral, 20 mL of bupivacaine 0.25% was injected on the quadratus lumborum muscle's posterior surface at each side of the abdominal wall. block performance. Postoperative problems such as pruritis, gait disturbance, lower limb numbness or weakness during the patient's first walk, sedation, or nausea and/or vomiting were also documented as yes or no. At 12 and 24 hours postoperatively, patients` satisfaction with their analgesia was reported on a scale from 1 (poor), 2 (fair), 3 (good) to 4 (outstanding). Hemodynamics were recorded every hour for four hours postoperatively in PACU then every 6 hours in the ward. Time to first walk after anesthesia was also recorded.

Sample size was calculated using Power Analysis and Sample Size software program (PASS) version 15.0.5 for windows (2017) using data obtained from a pilot study conducted on 10 patients at Mansoura university hospital with post-operative time to first analgesic request as the primary outcome. Patients were allocated into two groups: Group I (TAPB) and Group II (QLB2). Time to first analgesic request was 3 ± 0.894 hours for the group I and 3.50 ± 0.529 hours for the group II. A sample size of 47 patients in each group was needed to achieve 90% power ($1-\beta$ or the probability of rejecting the null hypothesis when it is false) in the proposed study using two-sided two-sample unequal-variance t-test with a significance level (α or the probability of rejecting the null hypothesis when it is true) of 5%. 3 drop-out patients (5%) were expected in each group, so 50 patients were enrolled to each group.

Statistical analysis was performed using SPSS (IBM Chicago, USA) version 26 for Windows to collect and organize the data. The Kolmogorov-Smirnov test was used to check the normality of the numerical data, and the results were summarized as mean ± SD or median interquartile range. Percentages and frequencies were used to express the categorical data. When comparing continuous data between groups, we used the Mann-Whitney U

test for non-parametric data and the T test for independent samples for parametric data. To compare two sets of categorical data, either the Chi-square test or Fisher's exact test was utilized. For statistical significance, a probability of less than 0.05 was used.

RESULTS

One hundred patients were recruited, 50 were randomly allocated in each group (**Figure1)**. There was no statistically significant variation in one group's demographics from the other **(Table 1).** Significant prolongation of the time for first request of analgesia was observed in QLB2 group (4.43 ± 1.47 h) vs (3.83 ± 0.95 h) in TAPB group, total dose of fentanyl consumption at 24h was less in QLB2 yet not statistically significant **(Table 3)**. QLB2 group has lower VAS during rest and movement most times of assessment intervals however statistically significant values were at 4h (17.38 ± 9.10) vs (21.92 ± 9.44) in TAPB group during rest and (31.58 ± 14.54) in QLB2 vs (38.54 ± 13.39) in TAPB during movement, 8h (17.22 ± 7.67) vs (21.56 ± 12.29) during rest and (30.46 ± 10.27) vs (37.40 ± 14.29) during movement, at 24 h during movement only (41.10 ± 10.12) vs (46.18 ± 12.83) **(figure 2 A, B)**. As regard fascial plane block performance time, a significant lower block performance time was noted in TAPB reached 218.8 ± 44.91 seconds in TAPB versus 310.6 ± 64.80 seconds in QLB2. No significant difference regarding first time to walk after operation **(Table 2)**. Regarding postoperative assessment of dermatomal coverage of FPB, significantly wider dermatomal coverage occurred in QLB2 group that reached 7.20 ± 1.107 segments compared with 6.40 ± 0.857_segments in TAPB group (**Figure3A)**. The majority of patients (> 50%) showed dermatomal coverage at T9-L1 in both groups, meanwhile QLB2 showed significant caudal spread to L2 **(Figure 3B)**. Higher number of patients were more satisfied in QLB2 at 12,24h. More than 50% of patients in QLB2 reported a score of 4 (outstanding satisfaction) at both 12, 24h **(Table 4)**. Hemodynamic stability was found throughout the study period. Insignificant difference in the rate of side effects between both groups, 16% of participants had nausea, vomiting in TAPB group versus 8% in QLB2 that was treated by metoclopramide 10 mg, 12% of the cases had pruritis in TAPB group versus 4% in QLB2. We encountered a case of right lower limb weakness in QLB2 group.

Table 1: Demographic data and patient characteristics.

	TAPB (n= 50)	QLB2 (n= 50)	P value
Age (yr)	27.5 ± 5.30	26.6 ± 4.28	0.39
Height (cm)	163.9 ± 5.78	163.9 ± 4.99	0.99
Weight (kg)	82.9 ± 9.40	85.1 ± 9.94	0.24
BMI (Kg/m^2)	30.9 ± 2.81	31.6 ± 3.10	0.27
Parity	1.6 ± 0.86	1.6 ± 0.78	0.63
Gravidity	2.9 ± 1.20	3.2 ± 1.41	0.32
Gestational age (weeks)	38.2 ± 0.79	38.3 ± 0.91	0.56

Data is expressed as mean ± standard deviation. P is significant when < 0.05. TAPB transversus abdominus plane block, QLB2 quadratus lumborum block type 2. BMI: Body mass index. Kg: kilogram. Cm: centimeter. Kg/m^2: kilogram-meter squared. yr: year

Table 2: Neuro-axial block criteria.

		TAPB (n= 50)	QLB2 (n= 50)	95% CI	P value
Sensory level of spinal anesthesia at 20 minutes post intrathecal injection	**T4** **T5** **T6**	24 (48.0%) 19 (38.0%) 7 (14.0%)	30 (60.0%) 11 (22.0%) 9 (18.0%)		0.218
Time from Spinal anesthesia to end of surgery (min)		70.56 ± 21.637	66.50 ± 20.423	-4.29, 12.41	0.337
Motor block recovery time (min) (Bromage score 0)		230.16 ± 40.787	222.48 ± 46.338	-9.64, 25.00	0.381
Regression of spinal sensory level to L3 (min) (Zero-hour FPB mapping)		253.36 ± 49.555	249.24 ± 50.587	-15.75, 23.99	0.682
First walk after spinal (min)		397.20 ± 59.865	398.40 ± 75.468	-28, 25	0.673

Data is expressed as mean ±standard deviation. 95% CI: 95% confidence interval of the mean difference between both groups. P is significant when < 0.05. TAPB: transversus abdominis block, QLB2: quadratus lumborum block, sec: second, min: minute.

Table 3: Analgesic profile of fascial plane blocks.

	TAPB (n=50)	QLB2(n=50)	95% CI	P value
1ST analgesic request (hours)	3.83 ± 0.95	4.43 ± 1.47	-1.09, -0.11	**0.017***
fentanyl dose at 24h (mcg)	201.18 ± 64.11	179.12 ± 69.146	-4.40, 48.52	0.101
Data is expressed as mean ± standard deviation. 95% CI: 95% confidence interval of the mean difference between both groups. P is significant when < 0.05. mcg: microgram				

Table 4: Proportion of patients` satisfaction at 12 and 24 h postoperative

Satisfaction score		TAPB group (n= 50)	QLB2 group (n= 50)	P
12h	**1**	4 (8.0%)	2 (4.0%)	**0.042***
	2	10 (20.0%)	9 (18.0%)	
	3	17 (34.0%)	7 (14.0%)	
	4	19 (38.0%)	32 (64.0%)	
24h	**1**	4 (8.0%)	2 (4.0%)	**0.010***
	2	11 (22.0%)	10 (20.0%)	
	3	18 (36.0%)	6 (12.0%)	
	4	17 (34.0%)	32 (64.0%)	
Data is expressed as percentage and frequency. P is significant when < 0.05.				

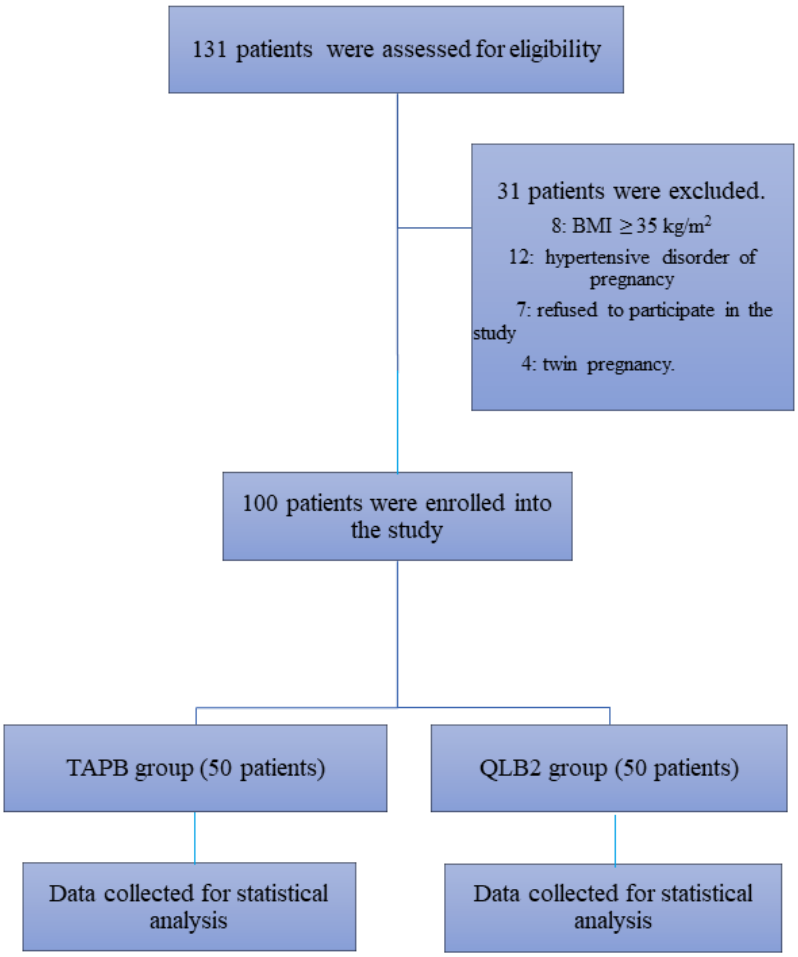
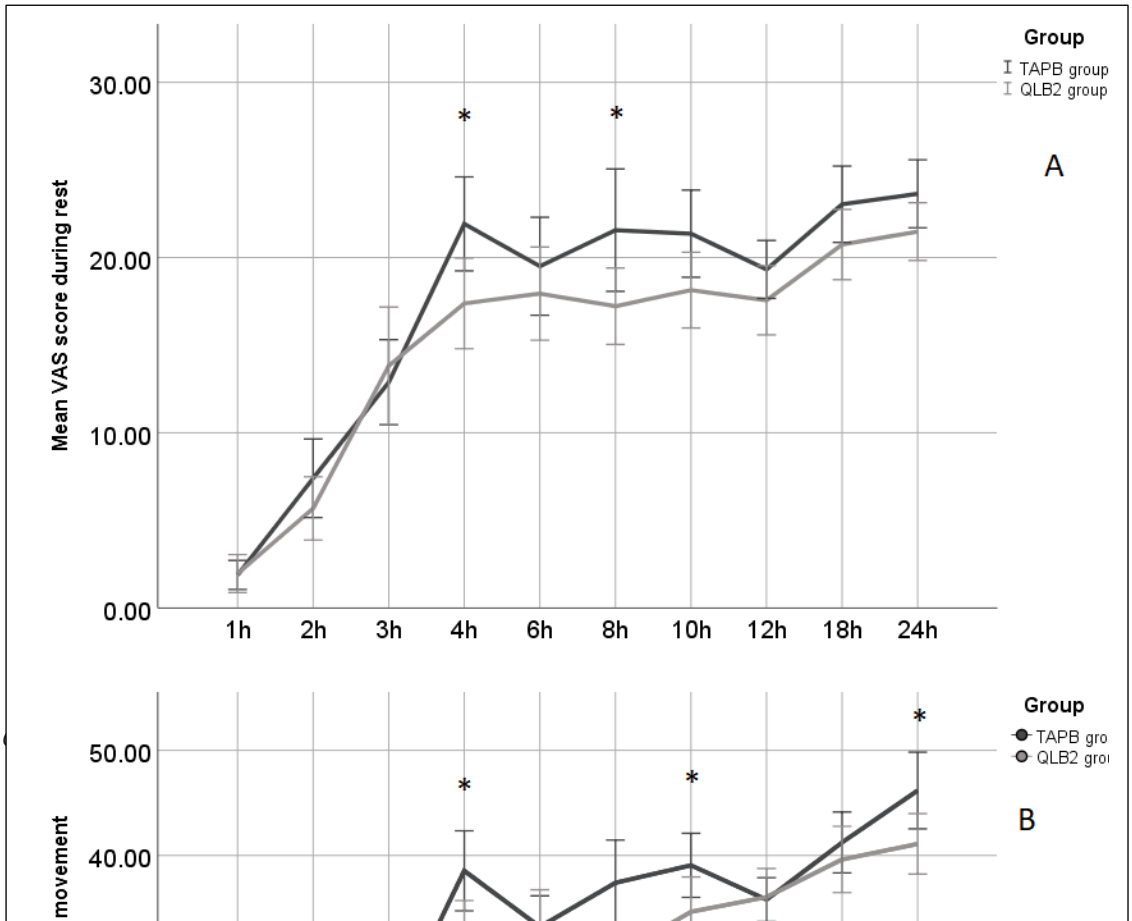
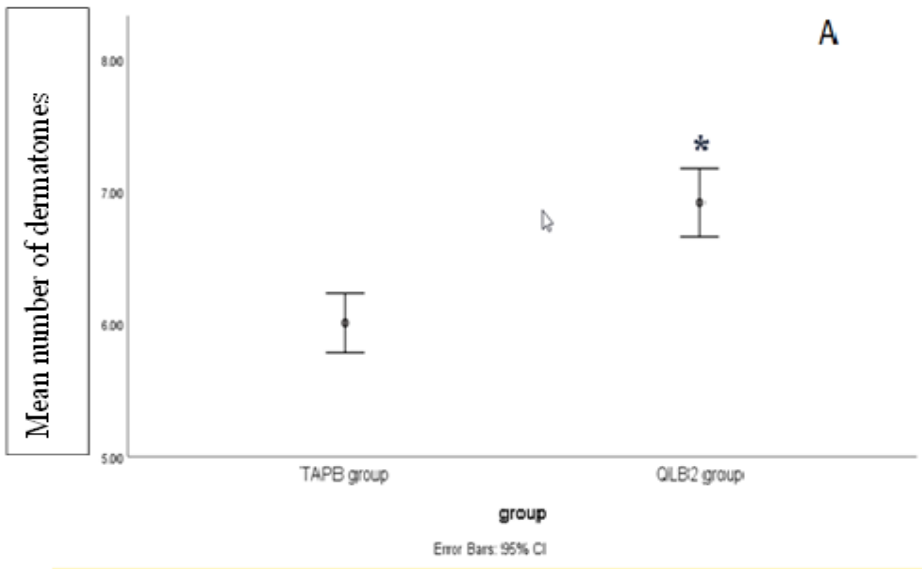


Figure 1: CONSORT flow diagram, QLB2: quadratus lumborum block type2, TAPB: transversus abdominis block, BMI : body mass index. Kg/m2: kilogram-meter squared.

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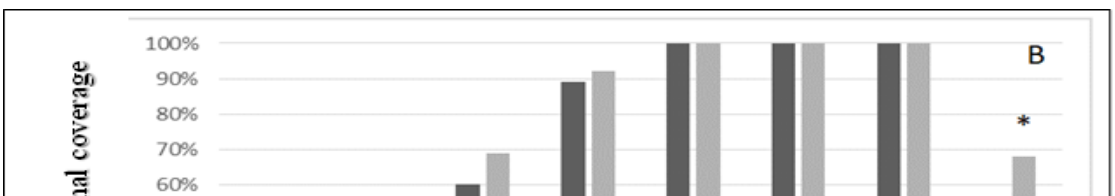
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DISCUSSION

In this study, QLB2 provided a better quality of post CD analgesia in the form of prolonged pain free time, a significant wider extent of dermatomal analgesia associated with significant reduction of VAS score during rest and movement or coughing at 4,8 h and during movement only at 24 h when compared to posterior TAPB group. Both facial plane blocks were safe and associated with hemodynamic stability. However, a better patient satisfaction was noticed in QLB2.

Multimodal analgesia has gained popularity owing to its role in enhanced postoperative recovery. Fascial plane blocks (FPBs) are now acknowledged as an important component of multimodal analgesia that lessens opiate consumption and resultant side effects [4, 17].

In FPB, the plane between two distinct layers of fascia is the target site for injection. Primarily, analgesia is obtained by the effect of local anesthetic on nerves running within this plane and adjacent tissues thereby inhibiting nociceptors and neurons within the plane itself. [18].

QLB2 analgesic mechanism is attributed to the spread of local anesthetics in the middle layer of the thoracolumbar fascia which is known for extensive sensory and sympathetic supply, and transversalis fascia [19].

Possible spread to the paravertebral space may be encountered in QLB2. Paravertebral space is a potential space that houses sympathetic trunk and spinal nerves. Paravertebral spread in QLB2 may add to the quality of postoperative analgesia. It provides analgesia not only to incisional pain but also has an effect on visceral pain [20, 21].

In absence of intrathecal opioid, many studies stated that both TAPB and QLB have a better analgesic profile than placebo including a lower morphine consumption after surgery and significant prolongation of time to first analgesia requirement [22-24].

The time to first analgesic request after spinal anesthesia depends on whether intrathecal opioid was used in addition to bupivacaine or not.

The type of that opioid whether morphine or fentanyl is also a factor. In a meta-analysis published in 2020, intrathecal fentanyl plus bupivacaine provided longer time of analgesia when compared to intrathecal bupivacaine alone. Intrathecal fentanyl in a dose of 25 mcg induced an approximately four hours postoperatively of pain free times [25].

The superiority of QLB analgesia as regards quality of analgesia when compared with TAPB has been reported in several studies. However, variable time of first analgesic request has been reported when QLB2 versus posterior TAPB were compared[13, 24].

. In the current study the use of QLB2 after spinal anesthesia with 12.5 mg bupivacaine and 20 mcg fentanyl resulted in significant prolonged time to first analgesic request when compared to TAPB P value 0.017.

Pangthipampai P and his colleagues [14] tested QLB2 for its pain free time after spinal anesthesia in CD cases. The time for first request of analgesia when spinal anesthesia was conducted with intrathecal bupivacaine alone reported to be 1.75 (0.75-2.75 h), but further lengthening up to 7.75 (5.67-9.83 h) occurred when intrathecal morphine was added to bupivacaine. The longer pain free time in Pangthipampai study when compared to our results may attributed to the use of higher doses of intrathecal bupivacaine and intrathecal morphine rather than fentanyl in the current study. It seems that, intrathecal opioid (morphine) analgesia extended beyond the effects of facial plane blocks and facial plane blocks may act as a tool to improve the quality of intrathecal fentanyl analgesia after surgery.

Kaplan Verma and his colleagues demonstrated significant prolongation of the time for first analgesic request in CD reaching up to 68.77 ± 1.74 h for QLB2 and 13.3 ± 1.21 h for TAPB, better VAS during both rest and movement through whole assessment intervals, as well as minimized requests for rescue analgesics. Intrathecal drugs used weren't mentioned in the methodology hence prolonged first analgesic request time can't be rationalized [13].

In the current study, postoperative pain severity measured by VAS was lower in QLB2 group during most of the study times but most of these reading was statistically insignificant. A significant reduction of VAS in QLB2 group was reported at 4, 8h during rest and 4, 8, 24 h during movement. Moreover, insignificant lower 24 hours total dose of fentanyl consumption was found in QLB2 group.

Aoyama and his coworker compared the analgesic effects of QLB2 versus posterior TAPB in laparoscopic gynecological surgeries and reported no significant difference between both groups in the first postoperative 24 hours regarding VAS during rest and movement and in total fentanyl consumption [26].

Blanco and his colleagues [27] compared QLB2 to TAPB. They reported significant reduction in PCA morphine consumption and demand in QLB2 group and insignificant difference in VAS between the two groups at 24h. A distinct multimodal analgesic plan was used without highlighting the time for first request analgesia (pain free time). Starting a fixed regimen of postoperative analgesic drugs regardless the patient response to the facial plane blocks` analgesia and to intrathecal 20 mcg fentanyl analgesia signaled by the time for first request analgesia might mask the short life analgesic effect of QLB2 and add an obstacle to the analgesic block assessment. Owing to the relatively short times of first request analgesia resulted in the current study (4.43 ± 1.47 h) in QLB2 versus 3.83 ± 0.95 h in TAPB and previously reported short time in a similar study[14], the authors claim that as a component of multimodal analgesia, FPBs may augment the quality of the intrathecal fentanyl analgesia postoperatively and QLB2 produces a better quality of analgesia compared to posterior TAPB when used as an adjuvant analgesia with intrathecal fentanyl in CD surgery.

Many studies assessed the dermatomal coverage of FPB [19, 28] and reported a wide local anesthetic distribution extending from T5 to L1 in TAPB and T7 to L1 in QLB2[10, 12] Yuki Aoyama and his colleagues reported that cutaneous distribution of QLB2 was slightly higher than posterior TAPB yet it was limited to cover mainly three dermatomes in most of cases, namely T11,T12,L1 and to lesser extent T10 [26]. In the current study a significant wider dermatomal analgesia that covers around 7.20 ± 1.107 segments with P value < 0.001 was reported in QLB2 group. It extended in both FPBs from T9 to L1 in the majority of the cases (>50%) with further caudal extension in QLB2 group to L2.

In the current study a better patient satisfaction was recorded in QLB2 group. This may be attributed to wider dermatomal coverage and lower VAS that may be a signal for visceral pain relief.

Hemodynamic stability was noted among both groups through the study period. Minor statistically insignificant side effects were encountered. We experienced one incidence of right lower limb weakness that was described on the first attempt to walk in the form of right gait deviation, the patient chose bed rest out of fear of falling. On examination there was a slight weakness of hip flexion. Six hours later, the patient was able to walk normally without experiencing any further issues. Few case reports of lower limb weakness due to QLB have been published, which has been linked to either paravertebral spread to L1-L2 or lumbar plexus or femoral nerve spread [29].

LIMITATIONS

Our study has several limitations. Firstly, delaying the time of FPB mapping to be started after regression of sensory level of spinal anesthesia to L3 level may render the assessment of FPB extension potentially inaccurate. Although the duration of intrathecal fentanyl in CD is well studied, yet we consider absence of a control group is one of our limitations. Lastly, small sample size and being a single centered study therefore, multicenter study is warranted.

In conclusion, multimodal analgesia is paramount technique in CD surgery. As a component of multimodal analgesia, QLB2 may produce better quality of postoperative analgesia when compared to posterior TAPB. It induces wider dermatomal analgesia, longer time for first request analgesia, lower VAS score and associated with a better satisfaction than posterior TAPB.

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