ORIGINAL ARTICLE

Quadratus Lumborum Block versus Transversus Abdominis Plane Block for Postoperative Pain Management after Total Abdominal Hysterectomy

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Abstract

Background: Post-operative analgesia is of vital importance to prevent various undesirable side effects such as respiratory complications, venous thromboembolism, and increased hospital stay. The transversus abdominis plane (TAP) block and Quadratus lumborum (QL) block has been used for post-operative pain relief in various abdominal surgeries as part of the multimodal analgesic approach. Therefore, this randomized, prospective study was conducted to compare the post-operative analgesic efficacy of QL block and TAP block in patients undergoing abdominal hysterectomy.

Methods: This study was carried out in the Department of Anaesthesia, Analgesia, Palliative & Intensive Care Medicine, Dhaka Medical College Hospital, Dhaka. Patients of ASA status I and II, planned for total abdominal hysterectomy under spinal anaesthesia were selected and randomly allocated into two groups (Group A – TAP Block and Group B – QL Block). Hemodynamic status, time of onset of sensory block, mean duration of postoperative analgesia, the amount of rescue analgesic requirements as well as intensity of post-operative pain were assessed at different point of time. Visual analog scale (VAS) was used to assess the postoperative pain. Total morphine consumption in 24 hours and time required for 1st postoperative analgesic were recorded.

Results: A total of 60 patients were included in this study. The onset of sensory block was faster in Group B than A (22.6±6.5 min & 16.3±5.2 min). VAS score was higher among group A at 10th hours and 18th hours. In case of group B, VAS score was more at 14th hour. Post operatively 1st demand of analgesia was earlier in Group-A (10.4±1.5 vs 14.1±1.7) ($p< 0.001$). Total analgesic requirement was higher in Group- A than Group B (18.7±4.6 vs11.2±3.8) ($p< 0.001$).

Conclusion: Quadratus Lumborum Block produces longer duration of analgesia, provides optimum post-operative pain control and maintain an excellent hemodynamics than TAP block in patients undergoing abdominal hysterectomy.

Keywords: TAP block, QL block, TAH, Local anaesthetics, Postoperative analgesia

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Introduction

Total abdominal hysterectomy (TAH) is a major surgical procedure associated with a significant postoperative pain and morbidity. Pain after hysterectomy is often multifactorial and arises from different sources. Uterine innervation stems from a variety of sources. Parasympathetic nerves stemming from S2 to S4 conglomerate into the cervical ganglion of Frankenhauser. Sympathetic nerves, the predominant influence in uterine innervation, descend from T7-T8 to the internal iliac plexus bilaterally to meet their parasympathetic counterparts[1]. Together these nerves innervate not only the uterus, but also the bladder and upper vagina. Within the uterus nerves terminate both within muscle fibers and the endometrium itself. The perineum is innervated by the pudendal nerve, which also enters the spinal cord at the S2-S4 levels. Although these systems are primarily responsible for the function of the uterus, the perception of pain stems from different sites[1]. The sources of pain following abdominal hysterectomy may include a combination of incision pain, pain from deeper visceral structures, and dynamic pain or pain on movement, such as during straining, coughing, or mobilizing that may be severe. The main aim of multimodal analgesia is to obtain synergistic or additive analgesia, allowing a smaller dose of each drug with improved safety profile and less side effects. This can be achieved by combining analgesics acting at different locations of the pain pathway[2]. Currently, intravenous patient-controlled analgesia (PCA) using non-opioids and opioid analgesics widely preferred for postoperative pain relief. Opioids such as morphine are often administered by PCA, but this may cause sedation, nausea, vomiting and other side effects. Many initiatives are taken to reduce the postoperative opioid requirement and its adverse effects. Therefore, a well-planned analgesic protocol is required to ensure early mobilization following gynecologic surgery, decrease stay in post-anesthetic care unit (PACU) and shorten hospitalization durations, and to improve patients' comfort[3].

There are several types of abdominal truncal blocks with different effects, such as paravertebral block (which can last for 24 h when using long-acting local anesthetic), TAP block and rectus sheath block (which have shorter time of analgesia), and Quadratus Lumborum Block (QLB)4. Previous study reported TAP block can effectively treat postoperative pain as part of multimodal analgesia in patients undergoing total abdominal hysterectomy[4].

The TAP block targets the somatic nerves on the anterior abdominal wall, most commonly using a subcostal or lateral approach. The subcostal approach delivers local anesthesia between the rectus abdominis and transversus abdominis muscles (along the subcostal margin), through to the transversus abdominis plane, between the internal oblique and transversus abdominis muscles. This targets the anterior cutaneous branches of T6–T10, although more reliably of T7–T9. It is therefore suitable for unilateral, midline, upper-abdominal incisions. The lateral TAP block delivers local anesthesia in the same plane, but at the mid-axillary level, providing cutaneous analgesia for lower-abdominal incisions (T10–12)[5]. Numerous clinical trials have examined the role of the TAP block following a variety of surgical procedures. Until recent meta-analyses, its clinical efficacy was presumed[6]. It is now increasingly apparent, however, that the cutaneous analgesia provided by TAP blocks is modest.

Blanco was the first who described the quadratus lumborum block (QLB). Somatic pain after upper and lower abdominal surgery can be controlled by QLB[7]. QLB can be performed for all generations (adult, pediatrics, and pregnant)[8,10].QLB is considered to be an easy technique to learn as it is easy to get the key sonoanatomic markers for QLB. The novice can learn this block after only a few performance of the procedure[11]. QLB produces effective postoperative analgesia after abdominal surgery, laparoscopic surgery, anterior abdominal wall surgery, and hip and femur surgery. The analgesic effect of QLB covers 24–48 h. While some authors inserted catheter for continuous infusion of the local anesthetic drug to extend the duration of postoperative analgesia, others added dexamethasone to local anesthetic to extend the effect of local anesthetic drugs[10].

QLB is not technically difficult to be done because it is a superficial fascial block between posterior abdominal wall muscle (QL and erector spinae). QLB type 2 (posterior approach) is safer than QLB type 1 (anterolateral) or the transmuscular approach (in between QL and psoas muscles). QLB does not aim to target a nerve but rather a fascial plane that is very bright, hyperechoic, and easily dissected. More superficial point of injection is safer (chance of bowel

injury and intraperitoneal injection are less because the needle tip is separated from the peritoneum by the QL muscle) with better ultrasonographic resolution[10]. The key for the analgesic effect for the QL block is the thoracolumbar fascia (TLF). TLF is a complex tubular structure formed from connective tissue. It is formed by binding of aponeuroses and fascial layers covering the back muscles. TLF connects the lumbar paravertebral region with the anterolateral abdominal wall. TLF continues cranially with endothoracic fascia, caudally with the fascia iliaca, its medial side attached to the thorasic and lumbar vertebrae, potentially ensuring the spread of anesthetics in the craniocaudal direction. It is suggested that the analgesic effect for the QL block is due to spread of the local anesthetics along the TLF and the endo-thoracic fascia into the paravertebral space[9].

Blanco et al. reported that QLB was better than TAP block after cesarean section as it was associated with longer analgesic time (exceeding 24 h), less opioid consumption, and wider spread of analgesia. TAP block affected from T10 to T12 dermatomes while QLB covered from T7 to T12 dermatomes, and they explained their results by the spread of local anesthetics drugs either into the paravertebral space or in the thoracolumbar plane (which contains mechanoreceptors and high-density network of sympathetic fibers), this extensive spread with the QLB produced analgesia for somatic and visceral pain[12]. The spread of local anesthetics during QLB to paravertebral space, recorded that the dermatome segments from T4 to L2 were covered by single shot QLB and they proved that by injecting contrast solution posteriorly which accumulated at the lateral border of QL, then spread in the posterior-cranial fashion to the anterior aspect of the QL and psoas major to paravertebral space. Compared TAP block and QLB in pediatric patients undergoing lower abdominal surgery and reported that TAP block group showed significantly higher postoperative FLACC scores than QLB group ($P < 0.05$); furthermore, the patients received total amount of analgesia in the first 24 h postoperatively was significantly higher in TAP block group than in QLB group ($P < 0.05$). Parent's satisfaction scores were lower in TAP block group than in QLB group[6]. Therefore, aim of this study is to compare the post-operative analgesic efficacy of QL block and TAP block in patients undergoing abdominal hysterectomy at our setting.

The advantage of QLB over TAP block is its ability to provide better sensory coverage and visceral analgesia even with a single injection6.It provides analgesia by blocking the spinal nerves from T6 to L1. It can be given by various approaches such as posterior, anterior, anterolateral, and intramuscular. The drug spread, dermatome coverage, and duration of analgesia may be different in different approaches. As per our literature search, the efficacy posterior QLB in TAH has not been studied. Hence, this study aimed to evaluate the analgesic efficacy of QLB (posterior approach) for postoperative analgesia in patients undergoing TAH under spinal anesthesia.

Methods

This randomized prospective study was conducted in Dhaka Medical College & hospital with collaboration of department of obstetrics & gynecology for 6 months on 60 adult female patients with American Society of Anesthesiologists (ASA) Physical Status Class I and II, aged between 45 and 60 years, and scheduled for total abdominal hysterectomy surgery after approved by local ethical committee. Patients were excluded from the study if they showed infection at injection site, allergy to local anesthetics, coagulation disorders, obesity (BMI>30)kg/m², physical or mental diseases which could interfere with the evaluation of pain scores, or kidney failure or liver failure. Written and informed consent was taken from each patient. Every patient received an explanation to the purpose of the study and they were ensured privacy to participant and confidentiality of data.

Patients were randomly allocated into two equal groups (each 30 patients): Group A (30 patients): Each patient was given subarachnoid block plus bilateral TAP block, Group B (30 patients): Each patient was received subarachnoid block plus bilateral QLB. All patients were assessed preoperatively by history taking, physical examination, and laboratory evaluation.

On arrival of the patients to the operative room patient identification was confirmed and informed consent was checked. Then with the permission of the patients an intravenous cannula was inserted in forearm with aseptic precution & intravenous fluid was started before block procedure. Patients were attached with stranded monitoring system like

electrocardiography, noninvasive blood pressure and pulse oximetry. Sub-arachnoid block was performed in all patients in the sitting position. Following identifying the L4-5 intervertebral space, skin antisepsis was done with chlorhexidine allowed to dry. Then local anaesthetic infiltration was performed using 1% lignocaine. 25G Quincke spinal needle was used for sub-arachnoid block. The subarachnoid space was identified by spontaneous reflux of CSF and 3 mL (15 mg) of 0.5% hyperbaric bupivacaine was administered. Patients were immediately placed in the supine position and haemodynamic parameters were monitored.

At the completion of the surgery and before transferred to PACU, with the patient was still in the supine position and fully monitored, the QL block or TAP block was performed.

Before performance of the block skin was disinfected with by using chlorhexidine-alcohol or povidone iodine if the patient was allergic to chlorhexidine-alcohol .After than local anaesthetic agent was apply at the site of the niddle prick. The ultrasound probe was used aseptically. The ultrasound machine SonoScape,model: A5 (Sonoscape Medical Corp, Guangdong,China) with a linear ultrasound transducer(5-11MHz) was use for the block. Then Group A was received bilateral TAP block and Group was received bilateral QLB at the completion of the surgery and before transferred to PACU. Investigator was performed the block procedure & administration of medication.

In TAP group, the probe was located between the iliac crest and the lower costal margin in the anterior axillary line at the level of umbilicus, and the layers of abdominal wall was identified (external oblique, internal oblique, and transverse abdominis muscles). In-plane technique was used and the tip of the needle was inserted between the internal oblique and transverse abdominis muscles. After negative aspiration (to exclude intravascular injection) & hydrodissection with 2 ml normal saline, 20 mL of 0.25% bupivacaine was injected. The same technique was performed on the other side.

In QL group, the patient was positioned supine with lateral tilt to perform the block, and the transducer placed at the level of the anterior superior iliac spine and moved cranially until the three abdominal wall muscles were clearly identified. The external oblique muscle was followed posterolaterally until its posterior border was visualized (hook sign), leaving underneath the internal oblique muscle, like a roof over the QL muscle. The probe was tilted down to identify a bright hyperechoic line that was represented the middle layer of the thoracolumbar fascia. The needle was inserted in plane from anterolateral to posteromedial. The needle tip was placed between the thoracolumbar fascia and the QL muscle, and after negative aspiration (to exclude intravascular injection) & hydrodissection with 2 ml normal saline, 20 mL of 0.25% bupivacaine was injected. The same technique was performed on the other side.

In PACU room on duty anaesthesiologist was collected Patient's postoperative data. Who was trained how to fill up preformed structured questionnaire and unaware of the study procedure. Visual analog scale (VAS) was used to assess the postoperative pain following faces scale; if VAS >3 postoperatively16, intravenous morphine was titrated every 5 min in 3-mg increments (2 mg in patients weighing <60 kg), and pain was assessed every 5 mins until pain relief, defined as a VAS score of 3 or less. 24 hours postoperative total morphine consumption was recorded. At the same time, time required for 1st postoperative analgesia was record in minutes. Any side effects recorded as hypotension (systolic arterial pressure <90 mmHg), arrhythmia, bradycardia (HR <50 beat/min), nausea or vomiting, lower limb muscle weakness, or any other complications.

Results

In this study total of 60 patients fulfilling inclusion/-exclusion criteria were randomly divided into two groups where one group received TAP block and other received QL block. While comparing the two groups by age it was found that majority of the patients i.e. 50% in group A and 56.4% in group B were between 50-59 years, followed by 30% in group A and 26.6% in group B were above the age of 60 years. Mean age was found to 54.1±6.4 vs. 56.5±6.7 years. No significant differences were found between groups with respect to age.

Table I: Distribution of the patients according to Age

Characteristics Age	Group A (n=30)	Group B (n=30)	P value
40-49 years	6(20%)	5 (16%)	
50-59 years	15 (50%)	17 (56.4%)	
60 year and above	9 (30%)	8(26.6%)	
Mean±SD	54.1±6.4	56.5±6.7	0.75

Values are expressed as Mean±SD and within parenthesis percentage (%) over a column in total.
*P value student 't' Test was performed.

All patients were with ASA physical status I and II. In Group A, 11(44%) of patients had ASA I and 14(56%) had ASA status II. In Group B, 10(40%) of patients had ASA I and 15(60%) had ASA II. In case of BMI, the patients of group A had mean BMI 22.6±3.8 and group B had mean BMI 25.3±4.1.There had no statistically significant difference in these characteristics of patients between the two groups as p>0.05.

Table II: Comparison of American Society of Anesthesiologist (ASA) physical status and BMI between two groups

Characteristics		Group A (n=30)	Group B (n=30)	P value
ASA	Class I	13 (43.3%)	12 (40%)	0.63
	Class II	17 (56.7%)	18 (60%)	0.72
BMI (kg/m²)		22.7±3.8	25.5±4.1	0.81

Values are expressed as Mean±SD and within parenthesis percentage (%) over a column in total.
*P value chi-squared Test was performed.

Table III shows the time to onset of sensory block. Onset of sensory block was faster in Group B than A (22.8±5.6 min & 17.2±4.7 min) which had statistically significant difference in these characteristics of patients between the two groups as p>0.05. On comparison of the required time to achievement of sensory loss between groups, required time was 16-20 minute in 15(60%) patients of group-B, but 14 (46.7%) patients' needs 21-25 min in group A.

Table III: Time to onset of sensory block (n=60)

Time (min)	Group M (n=30)	Group F (n=30)	P value
10-15	2(6.7%)	6(20%)	
16-20	9(30%)	18(60%)	
21-25	14(46.7%)	4(13.3%)	
>25	5(16.6%)	2(6.7%)	
Mean ± S.D.	22.8±5.6 min	17.2±4.7 min	0.016

P- Value was achieved by student t test.

The mean duration of surgery (129.5±16.7 min vs 124.4±19.2 min) between two groups which had no statistically significant (p>0.05). At baseline no significant difference of heart rate alteration was detected in between groups; mean heart rate was found 81.4±6.5 beat/min in group A and 84.7±7.2 beat/min in group B. Postoperative heart rate and other hemodynamic status were evaluated at 1h, 4h, 6h, 10h,14h,18h and 24h after surgery. Present study shows that, at 1hr after mean heart rate was 78.1±6.8 beat/min and 74.7±7.6 beat/min in group A and group B respectively. At 10 hr moderate increased of heart rate in group-A and mean heart rate was 82.5±7.2 beat/min, but at that time mean heart rate was 71.3±5.8 in group B which was statistically significant p<0.05. So it is found that heart rate was more stabilize those patients getting QL block (Fig I).

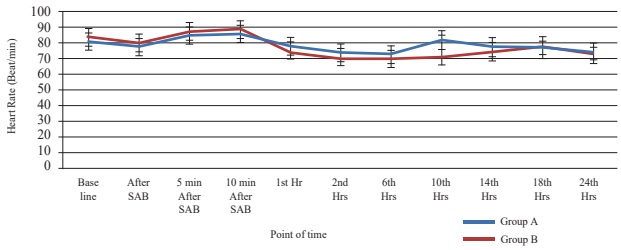

Fig I: Mean HR during perioperative period (Beat/Min)

Regarding the mean blood pressure (MAP) during follow up, after 1hr of operation, mean MAP was found 88.3±7.1mmHg in group A and 91.7±9.3mmHg in group B. After 24hr, mean MAP was 84.1±6.7 mmHg in group A, 83.2±5.3 mmHg in group B. The mean blood pressure (MAP) was not significant (p>0.05) between two groups (Fig II).

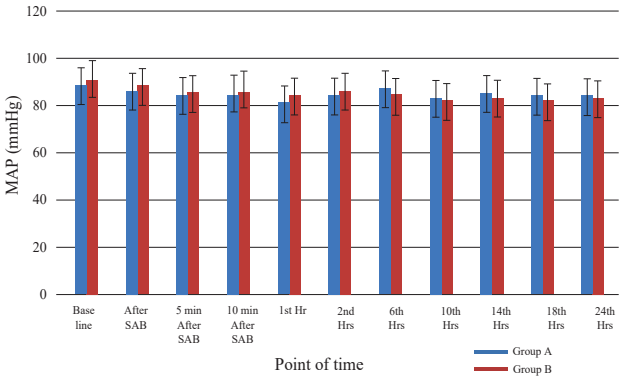

Fig II: Mean mean blood pressure (MAP) during perioperative period (mmHg)

Mean value of Visual Analogue Score (VAS) on min 30,2rd, 6th ,10th ,14th ,18th and 24th hours on post-operative day were 0.65±0.31, 1.10±0.53, 1.40±0.50, 3.8±1.60, 1.8±1.45, 4.2±1.80 and 2.2±1.75 in group A and 0.50±0.23, 0.80±0.41, 1.2±0.43, 1.4±0.71, 3.4±1.15, 1.6±1.25 and 1.9±1.20 in group B. VAS score was higher among group A at 10th hours and 18th hours. In case of group B VAS score was more at 14th hour. At that time VAS score was statistically significant ($p<0.05$) between the two groups. After 24 hours there was no significant difference in VAS score among two groups. VAS score was significantly decreased after receiving rescue analgesia among the both group (Table IV).

Table IV: VAS score of the patients in PACU.

VAS score	Group A (n=24)	Group B (n=23)	P value
Hour1	0.65±0.31	0.50±0.23	0.027*
Hour2	1.10±0.53	0.80±0.41	0.073*
Hour6	1.40±0.50	1.2±0.43	0.063*
Hour10	3.8±1.61	1.4±0.71	0.001*
Hour14	1.8±1.45	3.4±1.15	0.061*
Hour18	4.2±1.80	1.6±1.25	0.076*
Hour24	2.2±1.75	1.9±1.20	0.132*

Values are expressed as Mean±SD. * Student t-test was performed to compare the mean VAS score of both groups.

Table V shows the Distribution of the study patients according to rescue analgesic requirement. In this study post-operative pain was treated according to operational definition. If pain not alleviated and pain score ≥4, rescue medication was given as Inj. Morphine 3 mg intravenous as incremental until the pain was subside that was VAS score < 4. Post operatively 1st demand of analgesia was earlier in Group-A (10.4±1.5 vs 14.1±1.7) hrs. The difference was statistically significant (p=<0.001). Total analgesic requirement was higher in Group-A>B (18.7±4.6 vs11.2±3.8) mg which was statistically significant (p=<0.001).

Table V: Distribution of the study patients according to Time of 1st analgesic requirement (hour) and Total opioid consumption (mg)

Variable	Group A (n=30)	Group B (n=30)	P value
Time of 1st analgesic requirement (hour)	10.4±1.5	14.1±1.7	<0.001
Total opioid consumption (mg)	18.7±4.6	11.2±3.8	<0.001

P- Value was achieved by student t test.

Discussion

Effective postoperative pain management can positively influence patient outcome following any surgery. Side effects are the major concern with conventional analgesic regimes. Most of the times patients require regional anesthetic techniques to minimize opioid use and provide an alternative to neuro-axial procedures, especially after major abdominal surgeries to improve the recovery. Both TAP block and QL block such alternative for post-operative analgesia after TAH.

The ultrasound-guided transversus abdominis plane (TAP) block after various abdominal surgical procedures showed improved recovery and pain score. This technique is opioid sparing and has demonstrated greater satisfaction with pain relief. But conventional approaches such of TAP block provides effective somatic analgesia with minimal or no visceral blockade. The need for visceral blockade to provide better postoperative pain relief led to a more posterior approach that involves injecting the local anesthetic adjacent to the quadratus lumborum (QL) muscle.

While comparing the two groups by age it was found that majority of the patients i.e. 48% in group A and 56% in group B were between 50-59 years, followed by 32% in group A and 28% in group B were above the age of 60 years. Mean age was found to 48.2±11.5 years. No significant differences were found between groups with respect to age. In Group A, 11(44%) of patients had ASA I and 14(56%) had ASA status II. In Group B, 10(40%) of patients had ASA I and 15(60%) had ASA II. In case of BMI, the patients of group A had mean BMI 22.6±3.8 and group B had mean BMI 25.3±4.1.There had no statistically significant difference in these characteristics of patients between the two groups as $p>0.05$.
Sindwani G,et al., also found that demographic data such as age, body mass index (BMI), ASA and duration of surgery were comparable in both the groups when they implement QL block in renal transplant surgery[13].

On comparison of the required time to achievement of sensory loss between groups, required time was 16-20 minute in 15(65.2%) patients of group-B, but 11(45.8%) patients' needs 21-25 min in group A. Onset of sensory block was faster in Group B than A (22.6±6.5 min & 16.3±5.2 min) which had statistical-

ly significant difference in these characteristics of patients between the two groups as p<0.05.

The block failure rate 4% (1 in numbers) in group A and group B the block failure rate 8% (2 in numbers) which was not significant between the groups. The block failure patients were excluded from the study. The mean duration of surgery (129.5±16.7 min vs 124.4±19.2 min) between two groups which had no statistically significant (p>0.05).

No significant difference of heart rate alteration was detected in between groups in the most of the time except at 10 hrs. At 10 hrs moderate increased of heart rate in group-A and mean heart rate was 82.5±7.2beat/min, but at that time mean heart rate was 71.3±5.8 in group B which was statistically significant p<0.05. So it is found that heart rate was more stabilize those patients getting QL block. The blood pressure was stabilizing in both groups in postoperative periods. But the mean systolic blood pressure was 129.7±10.2 mmHg in group-A and 120.3±8.28 mmHg in group-B at 10th hours. The difference was statistically significant (p<0.05). But following that systolic blood pressure was maintained almost similar in both groups of patients. Regarding the mean blood pressure (MAP) during follow up times was not significant (p>0.05) between two groups.

VAS score was higher among group A at 10th hours and 18th hours. In case of group B VAS score was more at 14th hour. At that time VAS score was statistically significant (p<0.05) between the two groups. After 24 hours there was no significant difference in VAS score among two groups. VAS score was significantly decreased after receiving rescue analgesia among the both group. Post operatively 1st demand of analgesia was earlier in Group-A (10.4±1.5 vs 14.1±1.7) hrs. The difference was statistically significant (p< 0.001). Total analgesic requirement was higher in Group-A>B (18.7±4.6 vs11.2±3.8) mg which was statistically significant (p< 0.001).

Quadratus lumborum block was effective for postoperative pain management after laparoscopic colorectal surgery. Patients in the QLB group used significantly less sufentanil than TAP Block group at 24 and 48 hours (P<.05), but not at 6 hours (P<0.33) after laparoscopic colorectal surgery. No significant differences in NRS results were found between the two groups at rest or during movement (P>0.05). Incidence of dizziness in the QLB group was lower than in TAPB group (P<0.05)[14].

Parihar et al.also concluded that Ultrasound Guided nerve blocks (TAP block and QL block) can be used as a part of multimodal analgesia for better postoperative pain relief in lower abdominal surgeries like LSCS especially when given before the resolution of spinal anaesthesia. Further it was observed that QLB was superior to TAP block in terms of better pain control (duration and quality) as shown by lower VAS score, demand for the first rescue analgesia which was delayed and total consumption of rescue analgesia was less in the first 48 hours[15]. Verma, et al also observed that Time for rescue analgesic requirement was higher in the QL group than the TAP group (mean ± SD: 68.77 ± 1.74 h vs. 13.3 ± 1.21 h) (P < 0.001). The QL group had significantly less analgesic demand (P < 0.001) at 2, 4, 6, 12, 24, 36, 48 and 72 h post-CS. The VAS at rest and movement was significantly reduced in the QL group at all times[11].

Our result also supported by Abd Ellatif and Ahmed who observed QLB group had statistically significant lower hemodynamic changes 15 min after performing the block to the end of surgery (P<0.05), highly significant lower visual analogue scale score in the first postoperative 4 h (P<0.001), highly significant lower intraoperative fentanyl dose (P<0.001), significant longer time for the first rescue analgesic, lower analgesic doses given in the first 24 h postoperatively (P<0.001), and higher parent satisfaction compared with TAP block group[16].

Patients in QL group consumed significantly less fentanyl and morphine than patients in TAP group, VAS for pain was significant higher in TAP group than in QL group at all times, the duration of postoperative analgesia was shorter in TAP group than in QL group, the number of patients requested analgesia was significantly higher in TAP group than in QL group[6].

Our result was in line with the result recorded by Blanco et al., who reported that QLB was better than TAP block after cesarean section as it was associated with longer analgesic time (exceeding 24 h), less opioid consumption, and wider spread of analgesia.

TAP block affected from T10 to T12 dermatomes while QLB covered from T7 to T12 dermatomes, and they explained their results by the spread of local anesthetics drugs either into the paravertebral space or in the thoracolumbar plane (which contains mechanoreceptors and high-density network of sympathetic fibers), this extensive spread with the QLB produced analgesia for somatic and visceral pain[12].

A systematic review and meta-analysis of randomized controlled trials by Liu et al. had showed that QL block provides better pain management with less opioid consumption than TAP block after abdominal surgery. In addition, there are no differences between TAP block and QL block with respect to PONV[17]. Similar results have been published in earlier studies and the major advantage of QL block was considered to be its analgesic action similar to opioid analgesics, yet avoiding the adverse effects such as nausea and vomiting[18].

It is surprising that several studies, such as a study by Tupper-Carey et al. revealed that TAP block performed for skin incision in laparoscopic appendectomy did not significantly improve the outcomes of postoperative analgesia in adults[19]. Moreover, a study by Sandeman et al. showed that TAP block offered no extra benefit over local anesthesia infiltration in children undergoing laparoscopic appendectomy[20].

In a case report, Wikner reported to have found an unexpected motor weakness of the lower limb following the lateral QLB, which he thought could have resulted from weakness of psoas, iliacus,and quadriceps muscle involvement due to the spread of drug to the lumbar plexus[21]. However, in our study, we did not find any lower limb weakness in any of our patients. In our study none of the patients developed any complication in both the study groups Karasu D, et al compared TAP block versus QL block for postoperative analgesia following lower abdominal surgeries and concluded that the adverse events associated with escalating doses of morphine, such as pruritus, nausea, somnolence, and respiratory depression can also be avoided by lower doses required with QL block[22]. But in our study we did not observed any complication like local anaesthetic toxicity, intravascular injection, nerve injury, bleeding, hypotension, tachycardia in both group.

The results of this study concluded that QLB has to be taken into account as an effective technique for pain management in the patients undergoing Total Abdominal Hysterectomy, being associated with more intraoperative hemodynamic stability, longer postoperative analgesic time, and less rescue analgesics consumption compared with TAP block.

Conclusions:

Quadratus Lumborum Block significantly reduces morphine consumption and increased duration of analgesia in the postoperative period than the patients who received Transversus Abdominis Plane Block in Patients Undergoing Total Abdominal Hysterectomy.

Declaration

Ethics approval

The study was approved by Institutional Review Board (IRB) of Dhaka Medical College, Dhaka, Bangladesh.

Author Contributions

Conception and development of the idea *NA*
Writing *NA,NASR*
Data analysis *AR, NA*
Data collection *MAP, MMR, MSH*
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