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COMPARISON BETWEEN DIFFERENT APPROACHES OF UNILATERAL QUADRATUS LUMBORUM BLOCK WITH 0.5% ROPIVACAINE FOR POSTOPERATIVE ANALGESIA FOLLOWING LOWER ABDOMINAL SURGERY

Anaesthesiology

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ABSTRACT

Background and Aims: The Quadratus Lumborum muscle is part of the posterior abdominal wall dorsal to the iliopsoas muscle. It originates from the medial half of the iliac crest and inserts into the lower medial border of the 12th rib. It has four small tendinous insertions to the apices of the transverse processes of the upper four lumbar vertebrae. The ventral rami of the spinal nerve roots (including the subcostal and iliohypogastric nerves) pass between the Quadratus Lumborum and its anterior fascia. Quadratus Lumborum plane block is a posterior abdominal wall block, first described by Blanco et al [1]. The local anaesthetic (LA) spreads to the paravertebral space and has been successfully used for abdominopelvic surgeries in paediatric and adult patients. Various techniques of this block have been described, which lead to the differential spread of LA with varied sensory and motor blockades.[2] This study aims to assess pain in postoperative period for 24 hours in three approaches of quadratus lumborum block. **Methods:** This is a Double-blind Randomised controlled trial
The 60 participants were divided into three groups.
Group I- QL1 (LATERAL) : 20 ml of 0.5 %ropivacaine injected lateral to quadratus lumborum muscle
Group II- QL 2 (POSTERIOR) : 20 ml of 0.5 %ropivacaine injected posterior to quadratus lumborum muscle
Group III- QL 3 (ANTERIOR) : 20 ml of 0.5 %ropivacaine injected anterior to quadratus lumborum muscle
RESULTS
At 30 mins: analgesia was adequate in all three groups with VAS score of 3 (mild pain) in only 10% of patients who received QLB1. At 4 hours: 25% of QLB1 patients recorded VAS 4 and 10% of QLB2 recorded VAS 3 or more and required rescue analgesia, whereas no patient from group 3 ie QLB3 required rescue analgesia. At 6 hours: 25% of QLB 1 patients recorded VAS 4 and 20% of QLB2 patients recorded VAS 4 or more and required rescue analgesia, whereas only 20 % of patients who received QLB3 experienced mild pain (VAS 2). At 12 hours: 78% of QLB1 patients recorded VAS 4 or more, 42% of QLB2 patients recorded VAS 4 or more and required rescue analgesia, whereas no patient required rescue analgesia in QLB3 group. At 24 hours: 95% of QLB1 patients recorded VAS 4 or more , 33% of QLB2 patients recorded VAS 4 or more, 15% of QLB3 patients recorded VAS 4 or more and required rescue analgesia. **Conclusion:** In Anterior Quadratus Lumborum Block analgesia was observed up to 24 hrs with lower VAS scores and the extent of analgesia was also superior to that of posterior and lateral quadratus lumborum block

KEYWORDS

INTRODUCTION

Background Of Study

Regional anaesthesia for postoperative analgesia aims to reduce the side effects and dependence caused by traditionally used opioid analgesics[1] and aid in patients' swift transition back to normal and early mobilisation in the postoperative period.

A Quadratus Lumborum plane block is a posterior abdominal wall block, first described by Blanco et al.[2] The local anaesthetic (LA) spreads to the paravertebral space and has been successfully used for abdominopelvic surgeries in paediatric and adult patients. Various techniques of this block have been described, which lead to differential spread of LA with varied sensory and motor blockades. Quadratus Lumborum muscle is surrounded by thoracolumbar fascia, which has three layers: the anterior layer that blends to transversalis fascia laterally and the fascia of psoas major medially. The middle layer lies between Quadratus Lumborum and the erector spinae muscle. The posterior layer is posterior to the erector spinae muscle. In anterior or transmuscular approach, the drug is deposited in between the anterior borders of QL and psoas major. In the posterior approach, the drug is deposited between the posterior surfaces of QL and thoracolumbar fascia. In lateral approach, the drug is deposited lateral to the quadratus lumborum muscle, targeting the interfascial plane between the quadratus lumborum muscle and the transversalis fascia.

METHOD

This double blind RCT conducted in Department of Anaesthesiology at GSVM Medical College and associated LLRH Kanpur over 14 months from january 2023 to june 2024. Approval was obtained from the institutional ethics committee (Ethics Committee, GSVM Medical College, kanpur Ref no: EC/BMHR/2022/153, dated 31-12-2022)

73 patients scheduled for lower abdominal surgery were assessed for eligibility. Four patients who refused to participate were excluded. All enrolled patients (n=69) were randomly assigned to one of the three treatment groups (n=23 each). Nine patients were excluded due to changes in surgical modality (n=5) and technical difficulty during usg (n=4). Twenty patients in each group were included in the final analysisWritten consent was obtained from all participants after explaining the nature of the study.Patients were subjected to detailed history that included demographic data and full general examination including weight and height measurements and vital signs (Heart rate, non-invasive arterial blood pressure, respiratory rate and oxygen saturation) were assessed at operation room and before the start of anaesthesia and monitored repetitively for the first 24 postoperative hours.

Upon arrival at the operating room, the patients were placed in the supine position and an 18-gauge catheter was inserted intravenously in the dorsum of the hand. Ringer lactate solution 10 ml/kg was infused intravenously over 10 minutes before the initiation of the local block.Standard monitoring probes attached (electrocardiography, non-invasive blood pressure, oxygen saturation, and temperature).All groups received pre-emptive conscious sedation by IV administration of 2 mg midazolam.

Ultrasound-guided Quadratus Lumborum Block Technique: Unilateral ultrasound-guided quadratus lumborum block was performed using a SonoSite M-Turbo ™ (SonoSite, Inc., Bothell, WA, USA) ultrasound machine and a linear probe 5-13 MHz with a protective plastic sheath.

Each patient was placed in the lateral position. After sterile prepping and draping, the transducer was placed in a transverse orientation on the flank between the costal margin and the iliac crest in the anterior axillary line (triangle of Petit) three abdominal muscles are identified and traced posteriorly to obtain an image of then boat or leaf shaped quadratus lumborum muscle bordered by the lateral edge of the TLF, L3/L4 transverse process medially, psoas major muscle anteriorly and the erector spinae muscle posteriorly.

The provider inserts the needle in an in-plane approach and advances it through the anterior abdominal muscles until it reaches the anterolateral edge of QL. accurate placement results in the spread of

local anaesthetic between QL and the middle layer of the TLF. - lateral quadratus lumborum block.

For the anterior QLB, the patient is placed in the lateral decubitus position with the ultrasound probe placed above the iliac crest at the mid-axillary line. The provider moves the probe posteriorly to identify the QL and Psoas muscle then insert the needle in an in-plane approach through the QL muscle and the middle TLF layer between QL and Psoas muscle. Correct needle placement and injection results in the spread of local anaesthetic between these two muscles.

For the posterior QLB,. The provider identifies the posterior border of QL and places the needle tip at that point. Proper placement should result in the spread of local anaesthetic through the middle TLF layer and into the interfascial triangle.

To evaluate the extent of sensory blockade by using pinprick test. The classic dermatomes have been used:
T6, xiphoid process
T10, umbilicus
T12, pubic bone area
L1, inguinal ligament.

Under strict aseptic precautions, similar technique was followed for group II lateral QLB with 0.5% ropivacaine and for group III posterior QLB with 0.5% ropivacaine.

Standard anaesthesia given and after the reversal of anaesthesia patient was shifted to post post-operative unit.

The presence and severity of pain, and extent of the block were assessed at 30 min, 4 hrs, 6 hrs, 12 hrs and 24 hours by an investigator who was blinded to group allocation (anaesthesia resident). The severity of pain at rest was assessed using a 10-cm Visual analogue Scale (0 = no pain and 10 = worst imaginable pain).

IV Tramadol requirement during the first 24 hours postoperatively was recorded.

The participants were divided into three groups.
Group I-QL1 (LATERAL)
Received ultrasound-guided quadratus lumborum block with 20 mL of 0.5% ropivacaine one side of the abdominal wall
Group II – QL 2 (POSTERIOR)
Received ultrasound-guided quadratus lumborum block with 20 mL of 0.5% ropivacaine.
Group III– QL 3 (ANTERIOR)
Received ultrasound-guided quadratus lumborum block with 20 mL of 0.5% ropivacaine

RESULT

Group I had 18 males (90%) and 2 females (10%). Group II included 13 males (65%) and 7 females (35%). Group III comprised 15 males (75%) and 5 females (25%). The differences in gender distribution among the groups were not statistically significant, as indicated by a p-value of 0.170.

Group I had a mean heart rate (HR) of 85.0±12.9 beats per minute, a respiratory rate of 15.1±1.9 breaths per minute, a systolic blood pressure (SBP) of 122.7±16.8 mmHg, and a diastolic blood pressure (DBP) of 78.2±10.5 mmHg. Group II had an average HR of 86.1±10.6 beats per minute, a respiratory rate of 15.5±1.7 breaths per minute, an SBP of 123.7±13 mmHg, and a DBP of 78.6±9.8 mmHg. Group III had an average HR of 83.3±13.1 beats per minute, a respiratory rate of 15.0±1.6 breaths per minute, an SBP of 128.9±17.0 mmHg, and a DBP of 83.8±11.9 mmHg. The differences in these hemodynamic parameters among the groups were not statistically significant, as indicated by the p-values (HR: 0.769, respiratory rate: 0.648, SBP: 0.417, DBP: 0.195).

At baseline, the SpO2 levels were 99.0±0.6% in Group I, 99.1±0.6% in Group II, and 99.2±0.7% in Group III. At 30 minutes, the SpO2 levels were 99.1±0.7% in Group I, 99.2±0.7% in Group II, and 99.3±0.8% in Group III. At 4 hours, the SpO2 levels were 99.45±0.68% in Group I, 99.30±0.73% in Group II, and 99.2±0.76% in Group III. At 6 hours, the SpO2 levels were 99.4±0.7% in Group I, 99.5±0.6% in Group II, and 99.3±0.8% in Group III. At 12 hours, the SpO2 levels were 99.3±0.84% in Group I, 99.3±0.68% in Group II, and 99.4±0.68% in Group III. At 24 hours, the SpO2 levels were 99.6±0.54% in Group I, 99.6±0.48% in Group II, and 99.3±0.8% in Group III. The differences in SpO2 levels among the groups were not statistically significant at any interval (p-value >0.05).

30 Minutes

Visual analogue Scale (VAS) score at 30 minutes, Group I had 25% of patients with a score of 0, 50% with a score of 1, 15% with a score of 2, and 10% with a score of 3. Group II had 30% of patients with a score of 0, 55% with a score of 1, and 15% with a score of 2. Group III had 75% of patients with a score of 0, 25% with a score of 1, and none with scores of 2 or 3.

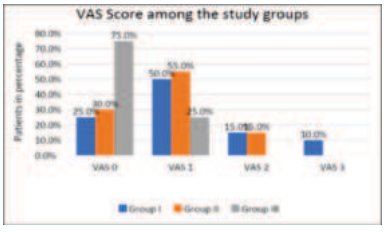
The mean VAS scores were 1.1±0.9 for Group I, 0.85±0.67 for Group II, and 0.25±0.44 for Group III, with a significant p-value of 0.001.

No patients in any group required rescue analgesia.

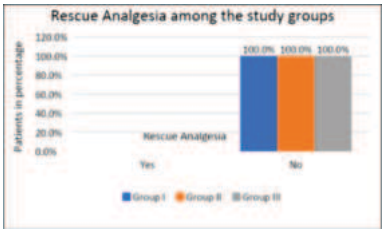
The extent of sensory block varied, with Group I having the highest percentage at T12 (50%) and L1 (60%), Group II at T12 (55%) and T9 (60%), and Group III at T8 (40%) and L1 (60%). The differences in sensory block extent were significant, with a p-value of less than 0.001.

Distribution Of The Studied Patients Based On Variables Among Study Groups At 30 Minutes

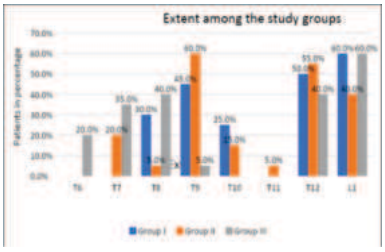
At 30 Minute		Group I (n=20)	Group II (n=20)	Group III (n=20)	p-value
VAS	0	5 (25.0%)	6 (30.0%)	15 (75.0%)	0.012
	1	10 (50.0%)	11 (55.0%)	5 (25.0%)	
	2	3 (15.0%)	3 (15.0%)	0 (0.0%)	
	3	2 (10.0%)	0 (0.0%)	0 (0.0%)	
	Mean±SD	1.1±0.9	0.85±0.67	0.25±0.44	0.001
Rescue Analgesia	Yes	0 (0.0%)	0 (0.0%)	0 (0.0%)	--
	No	20 (100.0%)	20 (100.0%)	20 (100.0%)	
Extent	T6	0 (0.0%)	0 (0.0%)	4 (20.0%)	<0.001
	T7	0 (0.0%)	4 (20.0%)	7 (35.0%)	
	T8	6 (30.0%)	1 (5.0%)	8 (40.0%)	
	T9	9 (45.0%)	12 (60.0%)	1 (5.0%)	
	T10	5 (25.0%)	3 (15.0%)	0 (0.0%)	
	T11	0 (0.0%)	1 (5.0%)	0 (0.0%)	
	T12	10 (50.0%)	11 (55.0%)	8 (40.0%)	
	L1	12 (60.0%)	8 (40.0%)	12 (60.0%)	



VAS Score Among Study Groups At 30 Minutes



Rescue Analgesia Among The Study Groups At 30 Minutes



Extent Among The Study Groups At 30 Minutes

4 Hours

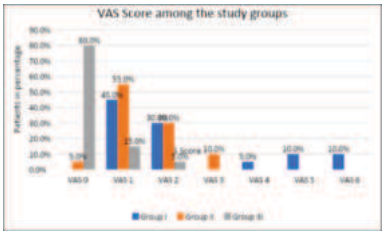
Visual analogue Scale (VAS) score at 4 hours, Group I had no patients with a score of 0, 45% with a score of 1, 30% with a score of 2, and 10% with scores of 3, 5, and 6. Group II had 5% of patients with a score of 0, 55% with a score of 1, 30% with a score of 2, and 10% with a score of 3. Group III had 80% of patients with a score of 0, 15% with a score of 1, and 5% with a score of 2. The mean VAS scores were 2.35±1.7 for Group I, 1.45±0.75 for Group II, and 0.25±0.55 for Group III, with a significant p-value of less than 0.001.

Rescue analgesia was required by 20% of patients in Group I, while none in Groups II and III needed it, with a p-value of 0.014.

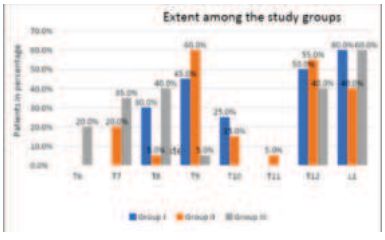
The extent of sensory block varied, with Group I having the highest percentage at T12 (75%) and L1 (25%), Group II at T12 (60%) and T10 (45%), and Group III at T8 (30%) and L1 (60%). The differences in sensory block extent were significant, with a p-value of less than 0.001.

Distribution Of The Studied Patients Based On Variables Among Study Groups At 4 Hours

At 4 Hours		Group I (n=20)	Group II (n=20)	Group III (n=20)	p-value
VAS	0	0 (0.0%)	1 (5.0%)	16 (80.0%)	<0.001
	1	9 (45.0%)	11 (55.0%)	3 (15.0%)	
	2	6 (30.0%)	6 (30.0%)	1 (5.0%)	
	3	0 (0.0%)	2 (10.0%)	0 (0.0%)	
	4	1 (5.0%)	0 (0.0%)	0 (0.0%)	
	5	2 (10.0%)	0 (0.0%)	0 (0.0%)	
	6	2 (10.0%)	0 (0.0%)	0 (0.0%)	
	Mean±SD	2.35±1.7	1.45±0.75	0.25±0.55	<0.001
Rescue Analgesia	Yes	4 (20.0%)	0 (0.0%)	0 (0.0%)	0.014
	No	16 (80.0%)	20 (100.0%)	20 (100.0%)	
Extent	T6	0 (0.0%)	0 (0.0%)	4 (20.0%)	<0.001
	T7	0 (0.0%)	3 (15.0%)	6 (30.0%)	
	T8	1 (5.0%)	2 (10.0%)	6 (30.0%)	
	T9	8 (40.0%)	6 (30.0%)	4 (20.0%)	
	T10	9 (45.0%)	9 (45.0%)	0 (0.0%)	
	T11	2 (10.0%)	1 (5.0%)	0 (0.0%)	
	T12	15 (75.0%)	12 (60.0%)	8 (40.0%)	
	L1	5 (25.0%)	7 (35.0%)	12 (60.0%)	



VAS Score Among Study Groups At 4 Hours



Extent Among Study Groups At 4 Hours

6 Hours

Visual analogue Scale (VAS) score at 6 hours, Group I had no patients with a score of 0, 25% with a score of 2, 30% with a score of 3, 15% with a score of 4, and 5% with scores of 6 and 7. Group II had no patients with a score of 0, 25% with a score of 1, 35% with a score of 2, 40% with a score of 3, 15% with a score of 4, and 5% with a score of 6. Group III had 60% of patients with a score of 0, 20% with a score of 1, and 20% with a score of 2.

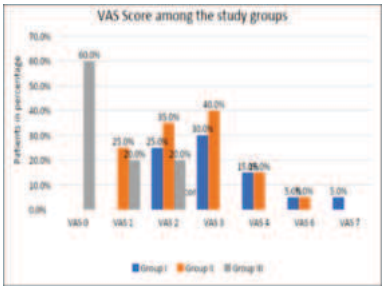
The mean VAS scores were 3.31±1.4 for Group I, 2.45±1.3 for Group II, and 0.60±0.82 for Group III, with a significant p-value of less than 0.001.

Rescue analgesia was required by 12.5% of patients in Group I and 5% in Group II, while none in Group III needed it, with a p-value of 0.253.

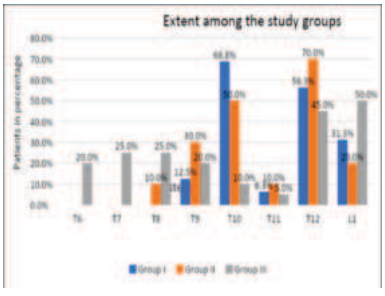
The extent of sensory block varied, with Group I having the highest percentage at T10 (68.8%) and T12 (56.3%), Group II at T12 (70%) and T10 (50%), and Group III at T12 (45%) and L1 (50%). The differences in sensory block extent were significant, with a p-value of 0.002.

Distribution Of The Studied Patients Based On Variables Among Study Groups At 6 Hours

At 6 hours		Group I (n=20)	Group II (n=20)	Group III (n=20)	p-value
VAS Score	0	0 (0.0%)	0 (0.0%)	12 (60.0%)	<0.001
	1	0 (0.0%)	5 (25.0%)	4 (20.0%)	
	2	5 (25.0%)	7 (35.0%)	4 (20.0%)	
	3	6 (30.0%)	4 (40.0%)	0 (0.0%)	
	4	3 (15.0%)	3 (15.0%)	0 (0.0%)	
	6	1 (5.0%)	1 (5.0%)	0 (0.0%)	
	7	1 (5.0%)	0 (0.0%)	0 (0.0%)	
	Mean±SD	3.31±1.4	2.45±1.3	0.60±0.82	<0.001
Rescue Analgesia	Yes	2 (12.5%)	1 (5.0%)	0 (0.0%)	0.253
	No	14 (87.5%)	19 (95.0%)	20 (100.0%)	
Extent	T6	0 (0.0%)	0 (0.0%)	4 (20.0%)	0.002
	T7	0 (0.0%)	0 (0.0%)	5 (25.0%)	
	T8	0 (0.0%)	2 (10.0%)	5 (25.0%)	
	T9	2 (12.5%)	6 (30.0%)	4 (20.0%)	
	T10	11 (68.8%)	10 (50.0%)	2 (10.0%)	
	T11	1 (6.3%)	2 (10.0%)	1 (5.0%)	
	T12	9 (56.3%)	14 (70.0%)	9 (45.0%)	
	L1	5 (31.3%)	4 (20.0%)	10 (50.0%)	



VAS Score Among Study Groups At 6 Hours



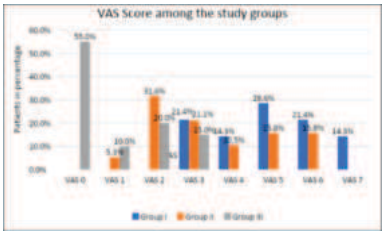
Extent In The Among Study Groups At 6 Hours

12 Hours

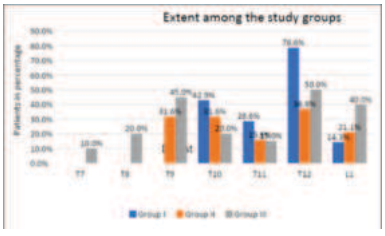
Visual analogue Scale (VAS) score at 12 hours, Group I had no patients with a score of 0, 21.4% with a score of 3, 14.3% with a score of 4, 28.6% with a score of 5, 21.4% with a score of 6, and 14.3% with a score of 7. Group II had no patients with a score of 0, 5.3% with a score of 1, 31.6% with a score of 2, 21.1% with a score of 3, 10.5% with a score of 4, 15.8% with a score of 5, and 15.8% with a score of 6. Group III had 55% of patients with a score of 0, 10% with a score of 1, 20% with a score of 2, and 15% with a score of 3. The mean VAS scores were 4.93±1.3 for Group I, 3.47±1.6 for Group II, and 0.95±1.1 for Group III, with a significant p-value of less than 0.001. Rescue analgesia was required by 64.3% of patients in Group I and 31.6% in Group II, while none in Group III needed it, with a p-value of less than 0.001. The extent of sensory block varied, with Group I having the highest percentage at T12 (78.6%) and T10 (42.9%), Group II at T12 (36.8%) and T9 (31.6%), and Group III at T9 (45%) and L1 (40%). The differences in sensory block extent were significant, with a p-value of 0.060.

Distribution Of The Studied Patients Based On Variables Among Study Groups At 12 Hours

At 12 Hours		Group I (n=20)	Group II (n=20)	Group III (n=20)	p-value
VAS	0	0 (0.0%)	0 (0.0%)	11 (55.0%)	<0.001
	1	0 (0.0%)	1 (5.3%)	2 (10.0%)	
	2	0 (0.0%)	6 (31.6%)	4 (20.0%)	
	3	3 (21.4%)	4 (21.1%)	3 (15.0%)	
	4	2 (14.3%)	2 (10.5%)	0 (0.0%)	
	5	4 (28.6%)	3 (15.8%)	0 (0.0%)	
	6	3 (21.4%)	3 (15.8%)	0 (0.0%)	
	7	2 (14.3%)	0 (0.0%)	0 (0.0%)	
	Mean±SD	4.93±1.3	3.47±1.6	0.95±1.1	<0.001
Rescue Analgesia	Yes	9 (64.3%)	6 (31.6%)	0 (0.0%)	<0.001
	No	5 (35.7%)	13 (68.4%)	20 (100.0%)	
Extent	T7	0 (0.0%)	0 (0.0%)	2 (10.0%)	0.060
	T8	0 (0.0%)	0 (0.0%)	4 (20.0%)	
	T9	0 (0.0%)	6 (31.6%)	9 (45.0%)	
	T10	6 (42.9%)	6 (31.6%)	4 (20.0%)	
	T11	4 (28.6%)	3 (15.8%)	3 (15.0%)	
	T12	11 (78.6%)	7 (36.8%)	10 (50.0%)	
	L1	2 (14.3%)	4 (21.1%)	8 (40.0%)	



VAS Score In The Among Study Groups At 12 Hours



Extent In The Among Study Groups At 12 Hours

24 Hours

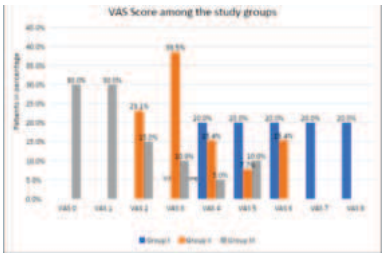
The table showed the distribution of patients based on VAS score & rescue analgesia at 24 hours across three groups. For the Visual Analogue Scale (VAS) score, Group I had no patients with a score of 0 or 1, but 20% with scores of 4, 5, 6, 7, and 8. Group II had no patients with scores of 0 or 1, 23.1% with a score of 2, 38.5% with a score of 3, 15.4% with a score of 4, 7.7% with a score of 5, and 15.4% with a score of 6. Group III had 30% of patients with a score of 0, 30% with a score of 1, 15% with a score of 2, 10% with a score of 3, 5% with a score of 4, and 10% with a score of 5.

The mean VAS scores were 6.0±1.5 for Group I, 3.54±1.3 for Group II, and 1.6±1.6 for Group III, with a significant p-value of less than 0.001.

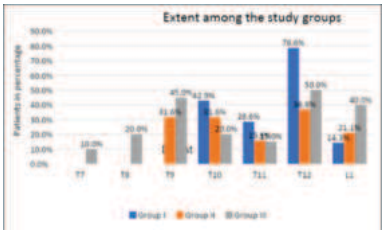
Rescue analgesia was required by 80% of patients in Group I, 23.1% in Group II, and 10% in Group III, with a p-value of 0.004.

Distribution Of The Studied Patients Based On Variables Among Study Groups At 24 Hours

At 24 Hours		Group I (n=20)	Group II (n=20)	Group III (n=20)	p-value
VAS	0	0 (0.0%)	0 (0.0%)	6 (30.0%)	<0.004
	1	0 (0.0%)	0 (0.0%)	6 (30.0%)	
	2	0 (0.0%)	3 (23.1%)	3 (15.0%)	
	3	0 (0.0%)	5 (38.5%)	2 (10.0%)	
	4	1 (20.0%)	2 (15.4%)	1 (5.0%)	
	5	1 (20.0%)	1 (7.7%)	2 (10.0%)	
	6	1 (20.0%)	2 (15.4%)	0 (0.0%)	
	7	1 (20.0%)	0 (0.0%)	0 (0.0%)	
	8	1 (20.0%)	0 (0.0%)	0 (0.0%)	
	Mean±SD	6.0±1.5	3.54±1.3	1.6±1.6	<0.001
Rescue Analgesia	Yes	4 (80.0%)	3 (23.1%)	2 (10.0%)	0.004
	No	1 (20.0%)	10 (76.9%)	18 (90.0%)	
Extent	T7	0 (0.0%)	0 (0.0%)	2 (10.0%)	0.060
	T8	0 (0.0%)	0 (0.0%)	4 (20.0%)	
	T9	0 (0.0%)	6 (31.6%)	9 (45.0%)	
	T10	6 (42.9%)	6 (31.6%)	4 (20.0%)	
	T11	4 (28.6%)	3 (15.8%)	3 (15.0%)	
	T12	11 (78.6%)	7 (36.8%)	10 (50.0%)	
	L1	2 (14.3%)	4 (21.1%)	8 (40.0%)	



VAS Score In The Among Study Groups At 24 Hours



Extent In The Among Study Groups At 24 Hours

DISCUSSION

The quadratus lumborum block is a versatile regional anaesthesia technique that can be tailored to address various types of abdominal, pelvic, and lower extremity pain. Its precise administration under ultrasound guidance allows for targeted pain relief with potential benefits over systemic analgesia alone.

The effectiveness of each QL block approach in providing analgesia can vary depending on the specific clinical context. For instance, QL3 and QL1 blocks are commonly used for acute pain management after surgeries, while QL2 blocks are more focused on chronic back pain. Each approach has its advantages in targeting specific areas of pain, and the choice should be tailored to the individual patient's needs and the surgical or pain management goals.

In this study 20 ml of 0.5% ropivacaine was administered under ultrasound guidance inthree different approaches ie lateral (QLB1), posterior (QLB2) and anterior (QLB3) or transmuscular to assess the time duration of postoperative analgesia and extent of block in these approaches

After the completion of surgery block was administered patient was shifted to post operative ward and at time duration of 30 min, 4 hours, 6 hours, 12 hours and 24 hours analgesia and extent of analgesia was assessed using VAS and pin prick test respectively.

In all three groups there was no significant difference in hemodynamics at different time interval p value > 0.5

Rescue analgesia , injection tramadol 100mg IV was given to patients whose VAS was 5 or more at anytime duration in postoperative period and the patient was excluded from subsequent follow up and analysis

At 30 mins no significant difference was observed hemodynamically in all three groups, and analgesia was adequate in all three groups with VAS score of 3 (mild pain) in only 10% of patients who received QLB1. The mean VAS scores were 1.1±0.9 for Group I, 0.85±0.67 for Group II, and 0.25±0.44 for Group III, with a significant p-value of 0.001.The extent of sensory block varied, with Group I having the highest percentage at T12 (50%) and L1 (60%), Group II at T12 (55%) and T9 (60%), and Group III at T8 (40%) and L1 (60%). The differences in sensory block extent were significant, with a p-value of less than 0.001.

At 4 hours 10 % of QLB2 patients recorded VAS 3 and 25 % of QLB1

recorded VAS 4 or more and required rescue analgesia, where as no patient from group 3 ie QLB3 required rescue analgesia.The mean VAS scores were 2.35±1.7 for Group I, 1.45±0.75 for Group II, and 0.25±0.55 for Group III, with a significant p-value of less than 0.001. The extent of sensory block varied, with Group I having the highest percentage at T12 (75%) and L1 (25%), Group II at T12 (60%) and T10 (45%), and Group III at T8 (30%) and L1 (60%). The differences in sensory block extent were significant, with a p-value of less than 0.001.

At 6 hours 20% of QLB 2 patients recorded VAS 4 and 25% QLB1 patients recorded VAS 4 or more and required rescue analgesia, where as only 20 % of patients who received QLB3 experienced mild pain (VAS 2). The mean VAS scores were 3.31±1.4 for Group I, 2.45±1.3 for Group II, and 0.60±0.82 for Group III, with a significant p-value of less than 0.001. Rescue analgesia was required by 12.5% of patients in Group I and 5% in Group II, while none in Group III needed it, with a p-value of 0.253. The extent of sensory block varied, with Group I having the highest percentage at T10 (68.8%) and T12 (56.3%), Group II at T12 (70%) and T10 (50%), and Group III at T12 (45%) and L1 (50%). The differences in sensory block extent were significant, with a p-value of 0.002.

At 12 hours 42% of QLB2 patients recorded VAS 4 or more ,78% of QLB1 patients recorded VAS 4 or more and required rescue analgesia, where as 45% patients of QLB3 experienced mild pain (VAS 1-3).The mean VAS scores were 4.93±1.3 for Group I, 3.47±1.6 for Group II, and 0.95±1.1 for Group III, with a significant p-value of less than 0.001. Rescue analgesia was required by 64.3% of patients in Group I and 31.6% in Group II, while none in Group III needed it, with a p-value of less than 0.001. The extent of sensory block varied, with Group I having the highest percentage at T12 (78.6%) and T10 (42.9%), Group II at T12 (36.8%) and T9 (31.6%), and Group III at T9 (45%) and L1 (40%). The differences in sensory block extent were significant, with a p-value of 0.060.

At 24 hours 33% of QLB2 patients recorded VAS 4 or more , 95% of QLB1 patients recorded VAS 4 or more, 15 % of QLB3 patients recorded VAS 4 or more and required rescue analgesia.The mean VAS scores were 6.0±1.5 for Group I, 3.54±1.3 for Group II, and 1.6±1.6 for Group III, with a significant p-value of less than 0.001. Rescue analgesia was required by 80% of patients in Group I, 23.1% in Group II, and 10% in Group III, with a p-value of 0.004.

Further studies with larger population could validate our findings. Other studies in which different surgeries could be included.

Comparrison of quadratus lumborum block with other regional anaesthesia techniques could validate QLB efficacy in various lower abdomen surgey

Investigate the long-term efficacy of QL block in chronic pain management, particularly in conditions like chronic low back pain or failed back surgery syndrome

Research the efficacy of combining QL block with other regional anesthesia techniques or with systemic analgesics to optimize pain control and reduce

Further refine ultrasound-guided techniques for anterior transmuscular QL block to improve accuracy and safety, particularly in obese or anatomically challenging patients.

CONCLUSION

Unilateral quadratus lumborum block represents a promising technique for enhancing perioperative pain management in lower abdominal surgeries. Its efficacy in reducing pain, opioid consumption, and facilitating recovery underscores its potential to improve patient outcomes.

In our study patients were divided into three groups that is lateral, posterior and anterior quadratus lumborum block where each patient received 20 ml of 0.5% ropivacaine unilaterally under ultrasound guidance and patients were assessed for postoperative analgesia and the extent of the block using VAS and pinprick respectively

There were no significant differences in the VAS score of QLB1 QLB2 and QLB3 at 30 min 4 hours and 6 hours which indicate equal efficacy of the three approaches of quadratus lumborum block in lower abdominal surgery patients who received anterior quadratus lumborum block were reported to have lower VAS scores in contrast to that of posterior and lateral quadratus lumborum block at 12 and 24 hours

In Anterior Quadratus Lumborum Block analgesia was observed upto 24 hrs with lower VAS scores and the extent of analgesia was also superior to that of posterior and lateral quadratus lumborum block

This study contributes valuable insights into regional anaesthesia techniques, specifically QLB variations, and their impact on postoperative pain management. Further research could explore long-term outcomes, complications, and patient satisfaction to optimize perioperative care strategies.

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