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ORIGINAL ARTICLE

Quadratus lumborum block in laparoscopic inguinal hernia repair: A single center study.

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ABSTRACT… Objective: To evaluate the efficacy of QL block in patients undergoing laparoscopic TEP inguinal hernia repair. **Study Design:** Randomized Clinical Trial. **Setting:** Kalsoom International Hospital, Islamabad. **Period:** Dec 2022 to June 2023. **Methods:** In this, all patients between the ages of 18 and 70 who were scheduled for laparoscopic TEP inguinal hernia repair to repair a one-sided inguinal hernia and did not have any complications related to the hernia. In one group, the patients received general anesthesia and in the other group, the patients were given sedation along with a technique called QL block. Age, gender, pain score on VAS at 1 hours, 6 hour and 12 hours after procedure was noted. Comparison of pain according to the VAS by type of anesthesia was done between the two groups and independent sample t-test was applied to see the statistical significant. **Results:** The patients' mean age was 43 + 9.09 years. Around 70% of the patients were males, while 30% were females, indicating a male predominance. The study's outcome was the mean pain score after 1 hour, 6 hours, and 12 hours. The two techniques of anesthesia utilized in the two groups were compared in terms of pain. The mean VAS at 1 hour after the initiation of anesthesia was not significantly different between the two groups, but it was statistically significant at 6 and 12 hours (p value of 0.001). **Conclusion:** QL block is a safe and effective alternative for patients undergoing TEP inguinal repair because to the observed reduction in early postoperative pain, shorter hospitalization, and cheaper anesthetic and hospital costs. Although our research showed that pain was significantly reduced for up to 12 hours after the operation, more information is needed before we can confidently endorse it for widespread use.

Key words: Hernia Repair, Inguinal Hernia, Postoperative Pain, QL Block.

INTRODUCTION

Inguinal hernia repair is one of the most common surgical procedures done on the surgical floor. Laparoscopic hernia repair lowers postoperative discomfort, analgesic use, and chronic pain. Recurrence is similar regardless of the different approach.[1] QLBs target the quadratus lumborum muscle in the lower back. This reduces procedure-related pain. As Laparoscopic TEP inguinal hernia repair is minimally invasive and multiple abdominal wall incisions are performed instead of one major one. The treatment minimizes abdominal organ damage and consequences. Laparoscopic TEP inguinal hernia repair is popular due to its smaller incisions, reduced pain, faster recovery, and minimum scarring. Dissecting, meshing, and closing the hernia defect. Anesthesia is always needed for patient comfort.[2]

QLB targets inguinal and anterior abdominal wall nerves, blocking these provides surgical TEP inguinal hernia analgesia.[3] The QLB provides local anesthetic, reducing the usage of systemic opioids, which can cause respiratory depression, nausea, and drowsiness. Opioid reduction preserves respiratory function, reducing respiratory issues.[4] By minimizing narcotic use and improving pain management, the QLB speeds recovery, reduces hospital stays, and increases time back at work or school. The QLB, like any anesthetic technique, should be adopted after thorough consideration of the patient's medical history, needs, and the healthcare team's skills.[5,6]

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The purpose of this study was to examine the advantages of a specific type of anesthesia called QL block in patients undergoing laparoscopic TEP inguinal hernia repair. The study focused on how this type of anesthesia affected postoperative discomfort, the length of time patients stayed in the hospital, and the associated costs.

METHODS

The trial included all patients aged 18–70 who were scheduled for surgery to cure a one-sided inguinal hernia without complications at the Kalsoom international Hospital, Islamabad during 01-12-22 to 1-6-23. Patients needed to be healthy and anesthesia-ready. All patients signed a letter outlining the study before the operation. The hospital's Ethics Committee approved the study to ensure ethical conduct. (981/C-30.11.2022)

The lead investigator randomly assigned patients to two groups before surgery. This random allocation ensured fairness in choosing which patients would receive general anesthesia and which would receive sedation with QL block. One group received general anesthesia (group G), while the other received sedation with QL block (group Q).

All study participants had laparoscopic TEP inguinal hernia repair. This method involves making small abdominal incisions and guiding surgical instruments with a laparoscope. The laparoscope lets the surgeon see the hernia and surrounding tissues without a big incision. Compared to open surgery, this less invasive method reduces discomfort, recovery time, and scarring. The study excluded patients based on criteria. Non-adults were excluded. Patients with reoccurring hernias, scrotal hernias, and ASA physical status greater than three were excluded. These criteria ensure participant safety and suitability for study goals.

Both groups used standardized general anesthetic and laparoscopic TEP inguinal hernia repair methods. This consistency assures study homogeneity and accurate outcomes. Before the surgery started, all the patients were under continuous cardiac monitoring with pulse oximetry, non-invasive blood pressure measurement and sedation level of the patients was accessed by the consultant anesthesiologist attending a particular patient.

All operations were performed using the same surgical method. There was no patient who could not participate in the trial due to some unforeseen technical difficulty. Following surgery, patients were monitored for signs of awareness and pain (using a visual analog scale; VAS) in the recovery area. Patients were checked on every 10 minutes until their level of consciousness reached 9; once this occurred, pain was evaluated and a light snack was offered. During the procedure, intravenous ketoprofen (100 mg) and morphine (2 mg) were given to manage pain. No anti-inflammatory medications were used. Only routine medications given as per the hospital protocols were given. No further opioids or anti-emetics were required in any of the groups.

Data analysis was done using SPSS 23. Age, gender, pain score on VAS at 1 hours, 6 hour and 12 hours after procedure was noted. Comparison of pain according to the VAS by type of anesthesia was done between the two groups and independent sample t-test was applied to see the statistical significant.

RESULTS

A total of 100 patients were enrolled in this study before the surgery. All individuals underwent laparoscopic TEP inguinal hernia repair. All patients had continuous cardiac monitoring with pulse oximetry, non-invasive blood pressure measurement, and sedation assessment by the consultant anesthesiologist.

Mean age of the patients was 43 + 9.09 years with relatively equal distribution of the patients in the two groups. (Shown in the Table-I and Figure-1) Distribution of the gender among the two groups is shown in the Table-II. Around seventy percent of the patients were males while around thirty percent were females, showing a male predominance of patients of inguinal hernia.

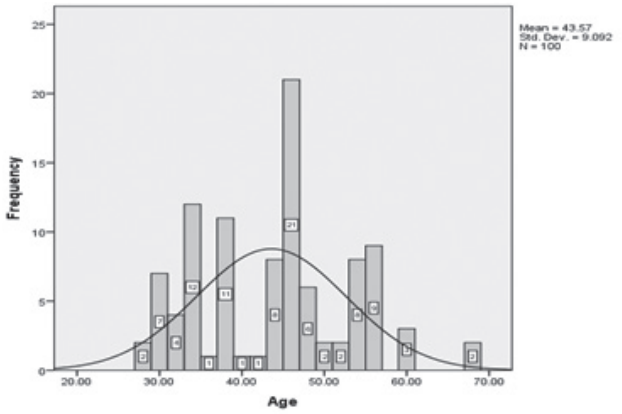

Figure-1. Showing the distribution of age of the patients enrolled in the study. (n=100)

Age (Group)	Group		Total	P-Value
	A	B		
up to 30	5	7	12	0.246
	10.0%	14.0%	12.0%	
31-45	23	29	52	
	46.0%	58.0%	52.0%	
46-60	22	14	36	
	44.0%	28.0%	36.0%	
Total	50	50	100	
	100.0%	100.0%	100.0%	

Table-I. Showing the distribution of the patients in various age groups (n=100).

Gender	Group		Total	P-Value
	A	B		
Male	37	34	71	0.330
	74.0%	68.0%	71.0%	
Female	13	16	29	
	26.0%	32.0%	29.0%	
Total	50	50	100	
	100.0%	100.0%	100.0%	

Table-II. Showing the distribution of the gender of the patients in the study (n=100)

Outcome of the study was the mean pain score (as assessed using the Visual analogue scale – VAS) in the after 1 hour, 6 hours and 12 hours. Pain was compared between the two techniques of anesthesia used in the two groups. Table-III showing the mean pain scores of the patients of Group A and B on the specified intervals. Mean VAS at 1 hour of start of the anesthesia was not much different between the two groups, but it was statistically significant at 6 hours and 12 hours interval. Mean VAS was 3.12 + 0.71 versus 2.30 + 0.58 at 6 hours interval and 4.58 + 1.01 versus 2.74 + 0.63 at 12 hours interval, p value of < 0.001 (significant)

Pain score at Various Time Intervals	Group	N	Mean	Std. Deviation	P-Value
VAS-1	G	50	2.12	0.68	0.271
	Q	50	1.96	0.75	
VAS-6	G	50	3.12	0.71	0.00
	Q	50	2.30	0.58	
VAS-12	G	50	4.58	1.01	0.00
	Q	50	2.74	0.63	

Table-III

DISCUSSION

Inguinal hernia repair is a common global procedure, leading to the search for affordable alternatives. Laparoscopic repair is preferred over open surgery for resuming routine tasks and reducing chronic discomfort. However, open surgery has a higher cost and hospital stay due to general anesthesia.[7,8]

QL blocks provide pain management for abdominal surgeries by injecting local anesthetics near the quadratus lumborum muscle, offering broader, longer-lasting relief compared to TAP blocks.[9] Dr. Blanco pioneered ultrasound-guided QL blocks for postoperative pain management and inguinal hernia surgery. The QL2 block, administered at the quadratus lumborum muscle, relieves pain in sensory areas of the abdominal wall and inguinal, corresponding to dermatomes T4-L1.[3,10]

Our study reported that patients undergoing TEP inguinal repair were found to benefit from QL block, as it resulted in less postoperative pain. Studies have shown a shorter hospital stay, and lower anesthetic and hospital costs as well. In a study, there were a total of 46 patients with this condition, and their ages ranged from 18 to 80. In the study with 46 patients, those who had a QL block had a much lower median pain score (2 versus 4) than those who received general anesthesia. This difference was statistically significant. As a direct consequence of this, the first group had a much shorter median length

of hospital stay (six versus twenty-four hours, respectively). QL block group can also reduce anesthesia and hospitalization expenditures.[7]

Like our study reported, in another study on 50 patients, researchers investigated the effects of quadratus lumborum blocks on pain management after surgery. The findings revealed that the group of patients who received quadratus lumborum blocks experienced a significant reduction in their need for pain-relieving medications during the first 24 hours following the surgery ($P<0.05$). This means that they required fewer analgesics to manage their pain compared to another group of patients. Patients with quadratus lumborum blocks reported lower pain ratings at various time intervals after surgery, according to the FLACC scale. Quadratus lumborum blocks were consistently more effective than transversus abdominis plane blocks, indicating a more effective postoperative treatment. Quadratus lumborum blocks patients reported higher satisfaction with pain relief and overall patient comfort compared to other groups.

A study comparing quadratus lumborum blocks and transversus abdominis plane blocks for pain management found that quadratus lumborum blocks provided longer-lasting, successful pain relief compared to transversus abdominis plane blocks, resulting in greater comfort and reduced pain.[11] In a retrospective analysis, the advantages of spinal and locoregional anesthesia were identical.[12]

Tzovaras et al. discovered that while 94 patients had safe laparoscopic hernia surgery under spinal anesthesia, there were thirty three percent, sixteen percent, and thirteen percent rates of urine retention, bradycardia, and low blood pressure, respectively.[13] Despite urine retention has been mentioned as a postoperative concern in several studies[12-14], none of the patients in the current investigation had this issue. Six hours after surgery, individuals who got a QL block were able to leave the hospital because their early postoperative discomfort was less severe. They had less discomfort 24 hours after discharge, which helped them recover more quickly due to a number of reasons, such as early ambulation, the absence of paralytic ileus, and the lack of a requirement for stronger analgesics.

Open surgery is less expensive due to locoregional anesthesia, while laparoscopic surgery with 24-hour hospital stay and general anesthesia is more expensive. Laparoscopic surgery has the highest cost-benefit ratio.[15,16]

CONCLUSION

Considering the reported decline in early postoperative discomfort, shorter hospitalization, lower anesthesia and hospital expenditures, and QL block is a secure and successful alternative for patients having TEP inguinal repair. Our study reported significant reduction in pain till 12 hours of the procedure; further variables should be accessed for proper recommendation of its routine use.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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3	Ayesha Saleem	Data collection, Entry, Analysis.	
4	Muhammad Ayyub Anjum	Discusison writing & review of manuscript.	
5	Shahbaz Hussain	Data analysis and review of manuscript.	
6	Mubashar Abrar	Manuscript writing and data entry.	