MAK HILL Publications Research Journal of Medical Sciences

Research Article
doi: 10.59218/makrjms.2024.1.21.27

A Prospective, Randomised Study to Assess the Hemodynamic Changes in Patient Undergoing Lap Cholecystectomy with or Without Transversus Abdominis Plane Block Ultrasound Guided While Creating Pneumoperitonium

[1]Sony Mathew and [2]Priyanka Ghosh

[1]Department of Anesthesiology, Pt. Madan Mohan Malaviya Hospital, New Delhi, India

[2]Department of Anesthesiology, Critical Care, NH Rabindranath Tagore International Institute of Cardiac Sciences, Kolkata, India

ABSTRACT

Laparoscopic cholecystectomy is a frequent minimally invasive operation that is increasingly being performed in the hospital. The anterior abdominal wall incisions during port incision add significantly to the pain experienced during laparoscopic cholecystectomy. TAP block has a lengthy history and there is now substantial clinical expertise around TAP block. The effects of TAP block are more prominent when administered prior to surgery and these effects are dosage dependent on local anaesthetic. During laparoscopic surgery, carbon dioxide-induced pneumoperitoneum affects multiple homeostatic systems, including changes in acid-base balance, cardiovascular and pulmonary physiology and stress response. Pneumoperitoneum-related cardiovascular alterations include an increase in mean arterial pressure, a reduction in cardiac output and an increase in systemic vascular resistance. To determine whether administering ropivacaine with an ultrasound-guided transversus abdominal block bilateral during a lap cholecystectomy prevents hemodynamic alterations while producing pneumoperitonium. The current study was prospective and randomly chosen. A tertiary level multi-specialty hospital in Kolkata the Department of NH Rabindranath Tagore International Institute of Cardiac Sciences, conducted this study from July 2019 to November 2019. in our study that group A's mean arterial pressure before induction was much higher than group B's, however the difference between the two group's mean arterial pressures before induction was not statistically important (p = 0.401). Compared to group A, group B's mean arterial pressure was much higher soon before pneumoperitonium, Despite the fact that the difference in mean arterial pressures between the two groups was not statistically significant (p = 0.837). The mean arterial pressure values were statistically significant in two groups After pneumoperitonium, 3 min, 10 min, 20 min, 30 min, 40 min, 50 min, 60 min, 70 min, 80 min and 90 min. In group-B the mean total consumption of rescue analgesia was significantly higher [205.08±25.76] than group-A [58.47±18.92] and difference of mean total consumption of rescue analgesia in two groups was statistically significant (p<0.001). In group-A the mean time for the request of rescue analgesia was significantly higher [931.02±55.14] than group-B [38.17±7.37] and difference of mean time for the request of rescue analgesia in two groups was statistically significant (p<0.001). We discovered that 59 (100%) individuals in group A had suggested undergoing a laparoscopic choleycystectomy (LC). Laparoscopic choleycystectomy (LC) was the proposed procedure for 59 (100%) of the group B patients. We conclude that patients who received TAP block had higher intraoperative hemodynamic stability than those who did not receive TAP block. It was discovered that a 0.2% ropivacaine TAP block with B/L ultrasound guidance, administered right after induction, can minimize hemodynamic alterations during lap cholecystectomy while producing pneumoperitonium. Among other groups not receiving TAP blocks.

OPEN ACCESS

Key Words
Lap cholecystectomy, general anesthesia, ropivacaine, pneumoperitonium, Transversus abdominal block

Corresponding Author
Sony Mathew,
Department of Anesthesiology, Pt. Madan Mohan Malaviya Hospital, New Delhi, India

Author Designation
[1]Senior Resident
[2]Associate Consultant

Received: 8 October 2023
Accepted: 26 October 2023
Published: 27 October 2023

Citation: Sony Mathew and Priyanka Ghosh, 2024. A Prospective, Randomised Study to Assess the Hemodynamic Changes in Patient Undergoing Lap Cholecystectomy with or Without Transversus Abdominis Plane Block Ultrasound Guided While Creating Pneumoperitonium. Res. J. Med. Sci., 18: 21-27, doi: 10.59218/makrjms.2024.1.21.27

INTRODUCTION

The patient's posture the addition of exogenous insufflations gas CO_2 and higher intra-abdominal pressure because of pneumoperitoneum are all factors that contribute to the physiological alterations seen during laparoscopic surgery[1].

The pneumoperitoneum results in an increase in intra-arterial pressure, CO2 absorption and the stress-related neurohormonal response. Infradiaphragmatic venous and arterial blood flow are hampered by elevated intra-abdominal pressure. Increases in heart rate and ventricular stroke work result in a reduction in cardiac output. The patient is positioned backwards during a laparoscopic cholecystectomy. To cause the viscera to gravitationally pull away from the surgical site, assume a Trendelenburg position. It enhances breathing and is regarded favorably for breathing[2]. Within 5 min after the beginning of gas insufflations the ventricular and circulation alterations can be felt. More than 15 mmHg of pressure is associated with severe pathophysiologic effects, however these effects are reversible during a two-hour period.

The sensory nerve supply to the anterior-lateral abdominal wall is impacted by the TAP block. To block the lateral cutaneous branch of the dorsal rami L1-L3.3, the ilioinguinal and iliohypogastric nerves and the T7-L2 intercoastal nerve, local anesthetic is injected between the internal oblique abdominal muscle and the transverse abdominal muscle. Direct ultrasound imaging of the afflicted anatomy and local anesthetic administration may be included in a TAP block alternative method[3].

Because ropivacaine is lipophilic and less likely to penetrate thickly myelinated motor fibers, it has a selective effect on the pain-transmitting A and C nerves rather than the motor-related A fiber. Potentiating this effect is dose-dependent potassium channel inhibition[4].

The gold standard in the treatment of symptomatic gallbladder diseases such as cholecystitis and cholelithiasis. Is laparoscopic cholecystectomy (LC)[5,6]. Even though it is thought to be less invasive, the early postoperative period is marked by substantial pain[7,8]. Effective pain management is essential for improving clinical outcomes and accelerating postoperative ambulation. The more frequent adverse effects of conventional opioid pain medication are postoperative nausea and vomiting (PONV) and excessive drowsiness. Different kinds of analgesics or local anesthetics may be used in multimodal pain management techniques to improve pain relief and lessen side effects following surgery[9].

To enhance postoperative pain management, a multimodal strategy was adopted that included a relatively recent type of regional nerve blocker is the transversus abdominis plane (TAP) block. A local anesthetic is injected into the abdominal wall's neurovascular plane, which contains nerves from T6 to L1, using ultrasonography or anatomical landmark guidance[10]. Despite the existence of numerous systematic evaluations examining the efficacy of TAP block the various surgical methods resulted in pain levels that varied[11-12]. Additionally, the results from diverse surgical populations might not be applicable to the particular population having LC. Additionally, it is unlikely that the local anesthetic disseminated from the landmark technique will provide the essential sensory blockage over the cholecystectomy incision area[13].

MATERIAL AND METHODS

Study site: NH Rabindranath Tagore International Institute of Cardiac Sciences, a tertiary level multi-speciality hospital in Kolkata.

Study population: Subject admitted for laparoscopic cholecystectomy.

Study design: A Prospective, randomized study.

Period of study: The research was carried out between July and November of this year.

Inclusion criteria:

- Patient posted for laproscopic cholecystectomy
- Age between 25-60 of both gender
- Patient willing to give written informed consent
- Physical status I and II of the American Society of Anesthesiologists
- Hypertensive patient not more than one antihypertensive medicine
- Patient not on any antiplatelet or anticoagulation drug
- No other comorbidities

Exclusion criteria:

- Patient refusal for procedure
- Ageless tha 25 and more than 60 years
- Diabetes mellitus
- Drug or alcohol abuse
- BMI>30
- Coagulation disorder
- Allergy to local anaesthesia
- Renal/Cardiovascular/Respiratory/Hepatic/Neurological disorder
- Opioid dependence
- Surgery>100 min

MATERIALS AND METHODS

The institutional ethics committee approved the project. The patient provided written permission. For 8 hrs every month the patient was kept nil. Standard monitoring, comprising EKG leads, Plethysmograph probe, non-invasive blood pressure and end-tidal carbon dioxide, was used during the procedure for all patients undergoing laparoscopic cholecystectomy. For three min the patient was preoxygenated with 100% oxygen. The patient was then pre-medicated with midazolam 0.02 mg kg^{-1}, followed by fentanyl 1.5 mcg kg^{-1}, propofol 2 mg kg^{-1} and atracurium 0.5 mg kg^{-1} to aid intubation.

Once the patient has been intubated and hooked up to a ventilator. For maintenance, oxygen, nitrogen, and isoflurane with 1 MAC were utilized, coupled with a maintenance dosage of atracurium. Subjects assigned to GROUP A received an ultrasonic guided b/l TAP block. The ultrasonic probe was positioned at the mid axillary line between the costal border and the iliac crest in this case. Under continuous vision, a 22 G Quincke's spinal needle was inserted between the internal oblique and transverse abdominis muscles using ultrasound guidance. When the needle tip was put between the internal oblique and transversus abdominis muscles following negative blood aspiration to rule out vascular puncture, a modest volume of medication (1-2 mL) was administered to widen the plane between the muscles. The solution was seen spreading in the form of an oval black shape. The remaining medicine was then administered in 20 cc increments on each side, with a toxic dosage in mind. The surgeons where told to put the first incision 15 min after the TAP block, Baseline vitals noted After the block is given we were observe heart rate and mean arterial pressure (MAP) changes before induction ,before pneumoperitonium just after pneumoperitonium 3, 10, 20, 30, 40, 50, 60, 70, 80, 90, and 100 min after creating pneumoperitonium and one reading 10 min after after desufflation similarly subjects who was randomized to GROUP B was received standard general anesthesia Without TAP BLOCK here also heart rate, mean arterial blood pressure are measured at same time intervals. EVEN number case was given TAP block and ODD number case was without TAP block.

All patients were given slow IV infusion of paracetamol 1000 mg over a period of 20 min after induction. Intra-opearative if the MAP value is more than 20% of the baseline it was manage with either with increasing mac of inhalation to 1.5 or beta blockers or GTN infusion. Similarly intraoperative hypotension when MAP is less than 20% of baseline was manage with giving fluids or with inotropes. Tachycardia (hrs>100) was manage by metoprolol 1 mg bolus over 1-2 min, bradycardia (hrs <60) was manage by giving 0.6 mg of atropine.

At the end of laprascopic cholecystectomy both the groups were observed at 30 min (PACU), 1, 4, 8, 12, 16-24 hrs in ward after surgery for pain assessment.

Method of measurement of outcome of interest: Visual Analogue Scale (VAS) to assess pain relief.

The time for first rescue analgesia when VAS score is 4 or more than 4 is noted for rescue analgesia (Tramadol) 50 mg along with anti-emetic prophylaxis ondansetron 4 mg iv is given. Total amount of Tramadol given in 24 hrs was noted:

- Side effects and possible complication
- post op nausea and vomiting
- vessel and or visceral organ puncture
- local anaesthetic allergy and toxicity

Side effects and rare complication arising out of the procedure was managed according to standard treatment guideline.

RESULTS

Although the difference between the two group's mean heart rates immediately following pneumoperitonium was statistically significant (p = 0.270), group B's mean heart rate was substantially higher than group A's. The mean heart rate in group B before pneumoperitonium was not noticeably greater than in group A but the difference between the two group's mean heart rates before pneumoperitonium was not statistically significant (p = 0.463). The difference in the mean heart rate immediately following pneumoperitonium between groups A and B was statistically significant (p<0.001), with group B having a heart rate that was substantially greater than group A's. The difference in the mean heart rates in the two groups at 3 minutes after pneumoperitonium was significantly significant in group B (p<0.001), where it was much greater than in group A. The difference in the mean heart rates in the two groups at 10 min after pneumoperitonium was statistically significant (p<0.001) in group B, where it was much greater than in group A. Difference between the means heart rates in the two groups 20 min after pneumoperitonium was statistically significant (p<0.001) in group B, where it was much greater than in group A. Difference between the means heart rates in the two groups 30 min after pneumoperitonium was statistically significant (p<0.001) in group B, where it was much greater than in group A. Difference between the means heart rates in the two groups 40 min after pneumoperitonium was statistically significant (p<0.001) in group B, where it was much greater than in group A. Difference between the means heart rates

Table 1: Distribution of mean heart rate at different time interval in two groups

	Group							
	Group A			Group B				
	Mean	Median	Std. Deviation	Mean	Median	Std. Deviation	P-value	Significance
Heart rate before induction (B0)	83.29	85	8.09	82.9	84	4.58	0.27	Not Significant
Heart rate before just pneumoperitonium (p0)	72.37	72	4.36	72.88	74	4.85	0.463	Not Significant
Heart rate immediately after pneumoperitonium (p1)	71.91	72	3.87	99.98	100	3.67	<0.001	Significant
Heart rate 3min after pneumoperitonium (P3)	73.25	74	3.38	99.95	100	2.18	<0.001	Significant
Heart rate 10 min. after pneumoperitonium (P4)	72.14	72	3.92	101.98	102	3.23	<0.001	Significant
Heart rate 20 min after pneumoperitonium (P5)	72.97	73	4.54	100.15	100	3.31	<0.001	Significant
Heart rate 30 min after pneumoperitonium (P6)	73.29	74	4.26	102.1	102	3.53	<0.001	Significant
Heart rate 40 min after pneumoperitonium (P7)	72.15	72	4.13	99.22	100	2.59	<0.001	Significant
Heart rate 50 min after pneumoperitonium (P8)	71.27	72	4.21	99.71	100	3.37	<0.001	Significant
Heart rate 60 min after pneumoperitonium (P9)	72.27	72	4.01	99	99	2.55	<0.001	Significant
Heart rate 70 min after pneumoperitonium (P10)	72.71	72	3.96	99.73	100	3.33	<0.001	Significant
Heart rate 80 min after pneumoperitonium (P11)	72	72	4.26	98.85	98	3.27	<0.001	Significant
Heart rate 90 min after pneumoperitonium (P12)	73.34	74	4.38	99.64	100	2.23	<0.001	Significant

Table 2: Distribution of mean arterial pressure at different time interval in two groups

	Group							
	Group A			Group B				
	Mean	Median	SD	Mean	Median	SD	p-Value	Significance
Mean arterial pressure (mm Hg) before induction(a0)	81.66	81.00	3.18	81.29	80.00	2.54	0.401	Not Significant
Mean arterial pressure (mm Hg) Just before pneumoperitonium (M0)	82.05	82.00	3.27	82.10	81.00	3.03	0.837	Not Significant
Mean arterial pressure (mm Hg) Immedidiately after pneumoperitonium (m1)	82.59	83.00	3.31	102.39	102.00	2.79	<0.001	Significant
Mean arterial pressure (mm Hg) 3 min after pneumoperitonium (m3)	82.61	82.00	3.03	102.42	102.00	2.47	<0.001	Significant
Mean arterial pressure (mm Hg) 10 min after pneumoperitonium (m4)	82.36	82.50	3.55	102.61	102.00	2.59	<0.001	Significant
Mean arterial pressure (mm Hg) 20 min after pneumoperitonium (m5)	81.42	80.00	3.29	101.46	102.00	2.22	<0.001	Significant
Mean arterial pressure (mm Hg) 30 min after pneumoperitonium (m6)	82.90	83.00	3.39	102.12	102.00	2.32	<0.001	Significant
Mean arterial pressure (mm Hg) 40 min after pneumoperitonium (m7)	82.90	83.00	3.39	102.12	102.00	2.32	<0.001	Significant
Mean arterial pressure (mm Hg) 50 min after pneumoperitonium (m8)	82.37	82.00	2.89	99.76	99.00	4.03	<0.001	Significant
Mean arterial pressure (mm Hg) 60 min after pneumoperitonium (m9)	82.56	82.00	3.23	100.81	100.00	3.27	<0.001	Significant
Mean arterial pressure (mm Hg) 70 min after pneumoperitonium (m10)	82.32	82.00	2.97	100.37	100.00	2.80	<0.001	Significant
Mean arterial pressure (mm Hg) 80 min after pneumoperitonium (m11)	82.39	82.00	3.01	99.75	100.00	2.93	<0.001	Significant
Mean arterial pressure (mm Hg) 90 min after pneumoperitonium (m12)	83.25	84.00	2.24	101.73	102.00	3.22	<0.001	Significant
Mean arterial pressure (mm Hg) 100 min after pneumoperitonium (m13)	82.49	82.00	3.37	102.32	102.00	2.94	<0.001	Significant
Mean arterial pressure (mm Hg) 10 min after desuuflation (c1)	81.98	81.00	3.15	100.59	100.00	2.67	<0.001	Significant

Table 3: Distribution of mean total consumption of rescue analgesia and time for the request of rescue analgesia in two groups

	Group							
	Group A			Group B				
	Mean	Median	SD	Mean	Median	SD	p-value	Significance
Total consumption of rescue analgesia	58.47	50.00	18.92	205.08	200.00	25.76	<0.001	Significant
Time for the request of rescue analgesia	931.02	935.00	55.14	38.17	40.00	7.37	<0.001	Significant

in the two groups 50 min after pneumoperitonium was statistically significant (p<0.001) in group B, where it was much greater than in group A. Difference between the means heart rates in the two groups 60 min after pneumoperitonium was statistically significant (p<0.001) in group B, where it was much greater than in group A. Difference between the means heart rates in the two group A 70 min after pneumoperitonium was statistically significant (p<0.001) in group B, where it was much greater than in group A. Difference between the means heart rates in the two groups 80 min after pneumoperitonium was statistically significant (p<0.001) in group B, where it was much greater than in group A. Difference between the means in the mean heart rates in the two groups 90 min after pneumoperitonium was statistically significant (p<0.001) in group B, where it was much greater than in group A.

The difference between the mean arterial pressures before induction in the two groups was not statistically significant (p = 0.401), whereas group A's mean arterial pressure was substantially greater than group B's. The difference between the mean arterial pressures before pneumoperitonium in the two groups was not statistically significant (p = 0.837), although group B's mean arterial pressure was substantially greater than group A's. The difference between the mean arterial pressures immediately following pneumoperitonium in the two groups was statistically significant (p<0.001) in group B, where it was much greater than in group A. The difference in the mean arterial pressures in the two groups 3 min after pneumoperitonium was statistically significant (p<0.001) in group B, which was also significantly higher than group A. The difference between the mean arterial pressures in the two groups at 10 min after pneumoperitonium was statistically significant (p<0.001) in group B, where it was much greater than in group A. In group B, where it was much higher than in group A the difference in mean arterial pressure between the two groups 20 min after pneumoperitonium was statistically significant (p 0.001). In group B, where it was much higher than in group A the difference in mean arterial pressures between the two groups 30 min after pneumoperitonium was statistically significant (p<0.001). The difference in the mean arterial pressures in the two groups 40 min after pneumoperitonium was statistically significant (p<0.001) in group B, which was also significantly higher than group A. In group B, where it was much higher than in group A the difference in mean arterial pressure between the two groups 50 min after pneumoperitonium was statistically significant (p 0.001). In group B, where it was much higher than in group A the difference in mean arterial pressures between the two groups 60 min after pneumoperitonium was statistically significant (p 0.001). In group B, where it was much highe T than in group A the difference between the mean arterial pressures in the two groups 70 min after pneumoperitonium was statistically significant (p 0.001). In group B, where it was much higher than in group A the difference in mean arterial pressure between the two groups 80 min after pneumoperitonium was statistically significant (p 0.001). In group B, where it was much higher than in group A the difference in mean arterial pressure between the two groups 90 min after pneumoperitonium was statistically significant (p 0.001). In group B, where it was much higher than in group A the difference in mean arterial pressures between the two groups 100 min after pneumoperitonium was statistically significant (p 0.001). At 10 min following deflation, group B's mean arterial pressure was statistically substantially different from group A's (p 0.001), and group B was also significantly higher than group A.

Group B had a much greater mean total intake of rescue analgesia than did group A, with a statistically significant difference between the two group's mean total intake of rescue analgesia (p<0.001). Group A took much longer on average than group B to request rescue analgesia and this difference in mean time between the two groups was statistically significant (p<0.001).

DISCUSSION

Group A: The case group had standard general anesthesia with 0.25% ropivacaine diluted in 20 ml bilaterally, while Group B: The control group received standard general anesthesia without TAP BLOCK.

The patients in group A had a mean age of 39.24±7.45 years, according to our findings. The average age of the patients in group B was 39.37±7.56 years. There was no statistically significant difference in the two group's mean age distributions (p = 0.895). In group A, 4 (6.78%) patients were between the ages of 21 and 30, 25 (42.37%) patients were between the ages of 31 and 40, 26 (44.07%) patients were between the ages of 41 and 50 and 4 (6.78%) patients were between the ages of 51 and 60. In group B, there were 6 (10.17%) patients in their 51-60th year, 7 (11.86%) patients in their 21-30th year, 23 (38.98%) patients in their 31-40th year and 23 (38.98%) patients in their 41-50th year. The difference in age in years between the two groups was not statistically significant (p = 0.686), group-A patients consisted of 24 females and 35 males, or 40.68-59.32% respectively. In group B, there were 43 (72.88%) male patients and 16 (27.12%) female patients. There was no statistically significant difference between the two groups in terms of sexual orientation (p = 0.120). 20 (33.9%) and 39 (66.1%) patients in group A, respectively, had ASA category II and I, respectively. In group B, 16 (27.12%) and 20 (33.9%) patients, respectively, had ASA category II and I, respectively. The association between the two group's ASA statuses was not statistically significant (p = 0.424).

We discovered that between the two groups, there was no statistically significant difference in the average height (p = 0.346). The mean weight distributions of the two groups did not differ statistically (p = 0.577). The mean body mass indices of the two groups did not differ statistically significantly (p = 0.991). The difference between the two group's mean heart rates was not statistically significant (p = 0.607). The difference in the distribution of the two group's mean systolic blood pressure was not statistically significant (p = 0.867). There was no statistically significant difference in the two group's mean diastolic blood pressure distributions (p = 0.398). The patients in group-A had a mean arterial pressure of 95.88±5.32 mm Hg (mean standard deviation). The patients in group-B had a mean arterial pressure of 96.32±4.22 mm Hg. In neither group was the distribution of mean arterial pressure statistically significant (p = 0.355). The average operation time for the patients in group-A was 116.95±3.10 min. The average operation time for the patients in group-B was 116.88±2.53 minutes. The difference in the average operation time between the two groups was not statistically significant (p = 0.559).

We discovered that the difference in mean heart rate before just pneumoperitonium in two groups was not Significant in statistics (p = 0.463) however, the heart rate immediately following pneumoperitonium, as well as 3 min, 10 min, 20 min, 30 min, 40 min, 50 min, 60 min, 70 min, 80 min and 90 min later, were. Similar research was discovered by Karnik *et al*.[14] who reported that the TAP block group's intraoperative heart rates were considerably lower than the local infiltration group's at port insertion, 30 and 60 min and Qin *et al*.[15] discovered that the addition of dexmedetomidine to ropivacaine for transversus abdominis plane block significantly decreased a dose-dependent relationship between mean arterial pressure and heart rate (p<0.05), along with a decrease in intake of anesthesia and opioids throughout the surgery (p<0.05).

At the moment of port insertion and 30 min into the operation, Karnik *et al*.[14] discovered that the mean arterial pressure was also lower in the TAP block group. However, we discovered in our study that group A's mean arterial pressure before induction was much higher than group B's, however, the difference between the two group's mean arterial pressures before induction was not statistically significant (p = 0.401). Compared to group A, group B's mean arterial pressure was much higher soon before pneumoperitonium, although the difference between the two group's mean arterial pressures was not statistically significant (p = 0.837). The mean arterial pressure values were statistically significant in two groups 3 min, 10 min, 20 min, 30 min, 40 min, 50 min, 60 min, 70 min, 80 min and 90 min after pneumoperitonium.

sharkwy *et al*.[16] whereas the mean visual analogue scale was significantly lower in the laparoscopically guided transversus abdominis plane block group than in the trocar site local anesthetic infiltration group at 3,6 and 12 hrs (p = 0.049,p = 0.011, and p = 0.042, respectively), there was no statistically significant difference between the two groups at 1, 18, and 24 hrs (p = 0.34, p = 0.41 and P = 0.61, respectively). At 6, 12 and 24 hrs, women with trocar site infiltration consumed considerably more narcotics than women with transversus abdominis plane block (p = 0.04, p = 0.038 and p = 0.031, respectively). The transversus abdominis plane block group under laparoscopic guidance had considerably higher patient satisfaction (p = 0.035).

The typical post-op need for rescue analgesia arrival in the PACU was found to be the same in both groups, however the difference between the average post-operative requirement for rescue analgesia arrival in the PACU in the two groups was not statistically significant (p = 1.000). The difference in the mean post-operative required of rescue analgesia for 1 hrs in the two groups was statistically significant (p<0.001), with group B having a considerably larger requirement than group A. The difference between the mean post-operative required of rescue analgesia 4 hrs in the two groups was statistically significant (p<0.001), with group-B having a considerably larger requirement than group-A. The difference between the mean post-operative required of rescue analgesia 8 hrs in the two groups was statistically significant (p<0.001), with group-B having a considerably larger requirement than group-A. The difference between the mean post-operative requirement of rescue analgesia for 12 hrs in the two groups was statistically significant (p<0.001) in group B, where it was much higher than in group A. The difference in the mean post-operative requirement of rescue analgesia 16 hrs in the two groups was statistically significant (p<0.001), with group B having a substantially higher requirement than group A. The difference between the mean post-operative required of rescue analgesia 24 hrs in the two groups was statistically significant (p<0.001), with group-B having a considerably larger requirement than group-A.

Karnik *et al.*[14] found that for intra- and right away postoperative analgesia in pediatric laparoscopic procedures, TAP block is superior to local infiltration. We discovered that group B consumed much more rescue analgesics on average than group A did. There was a statistically significant difference in mean total consumption between the two groups (p 0.001). The average time to request rescue analgesia in group A was much longer than in group B, and the difference in mean time was statistically significant (p 0.001)[17-19].

We discovered that 59 (100%) individuals in group A had suggested undergoing a laparoscopic choleycystectomy (LC). Laparoscopic choleycystectomy (LC) was the proposed procedure for 59 (100%) of the group B patients 9 (15.25%) participants in group A experienced nausea. 21 (35.59%) participants in group B experienced nausea. There was a statistically significant association between nausea in the two groups (p = 0.011). Three (5.08%) of the patients in group A vomited. 18 (30.51%) of the patients in group B vomited. Vomiting was statistically associated with both groups (p<0.001). In group A, none of the 59 patients (100%) had hypersensitivity. In group B, none of the 59 patients (100%) had hypersensitivity. 49 (83.55%) of the patients in group A received one dosage of rescue analgesia, while 10 (16.95%) received two doses. Five patients (8.47%) in group B received three doses of rescue analgesia, 43 (36.44%) received four doses and 11 (18.64%) received five doses. Statistically significant (p<0.001) was the association between the total numbers of rescue analgesia doses in the two groups.

CONCLUSION

We get to the conclusion that patients who received TAP block had higher intraoperative hemodynamic stability than those who did not receive TAP block. It was discovered that a 0.2% ropivacaine TAP block with B L^{-1} ultrasound guidance, administered right after induction, can minimize hemodynamic alterations during lap cholecystectomy while producing pneumoperitonium. Among other groups not receiving TAP blocks. In patients who did not undergo TAP block compared to those who did the need for rescue analgesia post-operatively was higher, which was also statistically significant. The need for rescue analgesia and intraoperative opioids was also markedly diminished in the TAP block group. Patients who did not undergo TAP block experienced higher nausea and vomiting than those who did and this difference was statistically significant. In comparison to bupivacaine, ultrasound-guided TAP block with ropivacaine offers good analgesia in the first hrs after surgery. However, in terms of the need for a 24 hrs cumulative rescue analgesic, both medications are comparable. A safe and efficient method of postoperative analgesia 24 hrs following a laparoscopic cholecystectomy is USG guided TAP block.

REFERENCES

1. Sood, J., 2014. Advancing frontiers in anaesthesiology with laparoscopy. World J. Gastroenterol., 20: 14308-14314.
2. Marco, A.P., C.J. Yeo and P. Rock, 1990. Anesthesia for a patient undergoing laparoscopic cholecystectomy. Anesthesiol., 73: 1268-1269.
3. McDonnell, J.G., B.D. O'Donnell, T. Farrell, N. Gough, D. Tuite, C. Power and J.G. Laffey, 2007. Transversus abdominis plane block: A cadaveric and radiological evaluation. Regional. Anesthesia. Pain. Med., 32: 399-404.
4. Kindler, C.H., M. Paul, H. Zou, C. Liu, B.D. Winegar, A.T. Gray and C.S. Yost, 2003. Amide local anesthetics potently inhibit the human tandem pore domain background k+ channel TASK-2 (KCNK5). J. Pharmacol. Exp. Ther., 306: 84-92.
5. Bucher, P., F. Pugin, N.C. Buchs, S. Ostermann and P. Morel, 2011. Randomized clinical trial of laparoendoscopic single-site Versus conventional laparoscopic cholecystectomy. Br. J. Surg., 98: 1695-1702.
6. Keus, F., J. De Jong, H.G. Gooszen and C.J. Laarhoven, 2006. Laparoscopic versus open cholecystectomy for patients with symptomatic cholecystolithiasis. Cochrane. Database. Syst. Rev., Vol. 18. 10.1002/14651858.cd006231
7. Bisgaard, T., B. Klarskov, H. Kehlet and J. Rosenberg, 2003. Preoperative dexamethasone improves surgical outcome after laparoscopic cholecystectomy. Ann. Surg., 238: 651-660.
8. Barczynski, M. and R.M. Herman, 2003. A prospective randomized trial on comparison of low-pressure (LP) and standard-pressure (SP) pneumoperitoneum for laparoscopic cholecystectomy. Surg. Endosc., 17: 533-538.
9. Buvanendran, A. and J.S. Kroin, 2009. Multimodal analgesia for controlling acute postoperative pain. Curr. Opin. Anaesthesiol., 22: 588-593.
10. Rozen, W.M., T.M.N. Tran, M.W. Ashton, M.J. Barrington, J.J. Ivanusic and G.I. Taylor, 2008. Refining the course of the thoracolumbar nerves: A new understanding of the innervation of the anterior abdominal wall. Clin. Anat., 21: 325-333.
11. Oliveira, G.S.D., L.J. Castro-Alves, A. Nader, M.C. Kendall and R.J. McCarthy, 2014. Transversus abdominis plane block to ameliorate postoperative pain outcomes after laparoscopic surgery. Anesthesia. Analg., 118: 454-463.
12. Charlton, S., A.M. Cyna, P. Middleton and J.D. Griffiths, 2010. Perioperative transversus abdominis plane (TAP) blocks for analgesia after abdominal surgery. Cochrane. Database. Syst. Rev., Vol. 12. 10.1002/14651858.cd007705.pub2
13. Carney, J., O. Finnerty, J. Rauf, D. Bergin, J.G. Laffey and J.G.M. Donnell, 2011. Studies on the spread of local anaesthetic solution in transversus abdominis plane blocks. Anaesthesia., 66: 1023-1030.
14. Karnik, P., N. Dave, H. Shah and K. Kulkarni, 2019. Comparison of ultrasound-guided transversus abdominis plane (TAP) block versus local infiltration during paediatric laparoscopic surgeries. Indian J. Anaesth., 63: 356-360.
15. Qin, Z., C. Xiang, H. Li, T. Liu and L. Zhan *et al.*, 2019. The impact of dexmedetomidine added to ropivicaine for transversus abdominis plane block on stress response in laparoscopic surgery: A randomized controlled trial. BMC Anesthesiol., Vol. 19. 10.1186/s12871-019-0859-7
16. sharkwy, I.A.E., E.H. Noureldin, E.A. Mohamed and A.A. Mohamed, 2018. Laparoscopic-guided transversus abdominis plane block versus trocar site local anesthetic infiltration in gynecologic laparoscopy. Gynecol. Surg., Vol. 15.
17. Baytar, Ç., C. Yilmaz, D. Karasu and S. Topal, 2019. Comparison of ultrasound-guided subcostal transversus abdominis plane block and quadratus lumborum block in laparoscopic cholecystectomy: A prospective, randomized, controlled clinical study. Pain Res. Manage., 2019: 1-6.
18. Lepner, U., J. Goroshina and J. Samarütel, 2003. Postoperative pain relief after laparoscopic cholecystectomy: A randomised prospective double-blind clinical trial. Scand. J. Surg., 92: 121-124.
19. Rakesh, C., H.L. Dunna and K. Aparanji, 2019. The effectiveness of intraperitoneal hydrocortisone on post-operative pain in laparoscopic cholecystectomy. J. Evolution. Med. Dental. Sci., 8: 1381-1385.