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Original Research Article

THE EFFECT OF INTRAPERITONEAL ROPIVACAINE VERSUS BUPIVACAINE VERSUS NORMAL SALINE FOR POST-OPERATIVE PAIN MANAGEMENT IN PATIENTS UNDERGOING LAPAROSCOPIC CHOLECYSTECTOMY: A COMPARATIVE STUDY

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Abstract

Background: Local anesthesia instillation (intraperitoneal) during laparoscopic cholecystectomy is a safe and effective method for postoperative pain management. In our research, the role of bupivacaine, ropivacaine and normal saline on postoperative pain management was studied. Post operative pain at 0,4,8,12 and 24 hours was assessed using VAS and VRS scores. Time taken for first analgesic, amount of rescue analgesic, post operative nausea vomiting, and effect of drain on analgesic requirement were assessed. **Materials and Methods:** A total of 90 patients during January 2024 to December 2024, undergoing LC, were randomly divided into three groups, normal saline group(a) bupivacaine group (B) and ropivacaine group (C). Postoperative pain management was compared using different agents during laparoscopic cholecystectomy. **Result:** Comparing groups, A and B, VAS was statistically significant in group A as compared to group B at 0 hours($p<0.0001$), at 4 hours ($p<0.0001$), at 8 hours ($p<0.0001$), and at 12 hours ($p<0.0001$) and non-significant at 24 hours (p 0.847). Between group A and C, VAS was more in group A than group C at 0 hours ($p<0.0001$), at 4 hours (p 0.017) and at 8 hours (p 0.050) and non-significant at 12hrs (p 0.109) and at 24 hours (p 0.713). While comparing Group B with Group C, VAS of group C was more and statistically significant at 8hrs (p 0.047) and at 12 hrs (p 0.042) only and non-significant at 0 hrs (p 0.800), at 4 hrs (p 0.056) and at 24 hrs (p 0.550). Comparing groups, A and B, VRS was more and statistically significant in group A as compared to group B at 0 hours ($p<0.0001$), at 4 hours (p 0.005), at 8 hours ($p<0.0001$) and at 12 hours (p 0.001) and non-significant at 24 hours (p 0.0154). Between group A and C, VRS was more and statistically significant in group A than group C at 0 hours($p<0.0001$), at 4 hours (p 0.032) and at 8 hours (p 0.049) and non-significant at 12 hours (p 0.305) and at 24 hours (p 0.112). While comparing Group B with Group C, VRS of Group C was more and statistically significant at 8 hours (p 0.050) and at 12 hours (p 0.002) only and non-significant at 0 hours (p 0.808), at 4 hours (p 0.366) and at 24 h (p 0.759). The mean time in hours for first rescue analgesic was found to be statistically significant between group A and group B ($p<0.0001$), between group A and group C ($p<0.0001$) and between group B and group C ($p<0.0001$).The amount of rescue analgesic was statistically significant between Group A and group B (p 0.001), and between Group A and Group C (p 0.013) while as it was statistically non-significant between group B and Group C (0.543). The amount of rescue analgesics used in the three groups and whether drain was used or not, use of analgesic was found to be slightly higher but not statistically significant. **Conclusion:** In our study we found that IP bupivacaine and ropivacaine is an effective, economical, safe method of post-op pain management with better post-op recovery.

INTRODUCTION

Gall bladder diseases have known to mankind for over 2000 years.[1] The gold standard treatment for symptomatic cholelithiasis has remained Langenbuch's open cholecystectomy for over 100 years. The first laparoscopic cholecystectomy was performed by Muhe, a German surgeon in 1985. However the first laparoscopic cholecystectomy recorded in the medical literature was performed in March 1987 by Mouret, in Lyon, France.[2] The first laparoscopic surgery performed in India was by Tehemton E. Udawadia in 1990.[3] In September 1992 a National Institute of Health consensus conference held in Bethesda concluded that laparoscopic cholecystectomy was treatment of choice for cholelithiasis.[4]

Laparoscopic cholecystectomy has many advantages over open cholecystectomy including reduced pain, shorter hospital stay and recovery period, which affects the patient's earlier return to normal life and working activities.[5,6] In many centers patients are discharged on the first postoperative day. However, as experience expands further, few centers have recently shown that the operation is safe and feasible even as a day care procedure in properly selected patients.[7] From patient's perspective, reduced post operative pain is one of the greatest advantages of laparoscopic surgery compared with open surgery.[8-10]

Postoperative pain is unpredictable, which explains the need for systematic prevention of pain before the patient wakes up from anesthesia.[11] Pain following Laparoscopic cholecystectomy is multi-factorial and is differentiated into three components: visceral, abdominal wall and referred pain to shoulder.[12] Pain is worse in the first 24 hours; with visceral pain being worse than abdominal wall pain. Causes of pain may include distension induced neuropraxia of the phrenic nerves, residual intra-abdominal gas after laparoscopy, humidity of the insufflated gas, volume of the insufflated gas, wound size; trauma to the parietal peritoneum, presence of drains, anesthetic drugs and their postoperative effect. Carbon dioxide insufflation constitutes the most common means of achieving pneumo-peritoneum. Peritoneal irritation by carbonic acid, which is formed by reaction between CO2 and water and the creation of space between liver and diaphragm by residual pneumo-peritoneum has been implicated for visceral and shoulder tip pain.[13] The reason for marked variation of pain between individuals remains unclear but could be due to multiple factors including duration of surgery, the degree of invasiveness of the procedure, the experience of surgeon and the amount of perioperative bleeding. It could also be influenced by the size of the trocars, the use of suction to remove any blood and insufflated gas at the end of surgery.

Given the expanding role of ambulatory surgery and need to facilitate an earlier hospital discharge, improving postoperative pain control has become an important issue. Different modalities have been proposed to relieve postoperative pain after laparoscopy like non-steroidal anti-inflammatory drugs, opioids, intraperitoneal local anesthetics, port site in-filtration of local anesthetics, intraperitoneal saline, removal of insufflation gas or gas drains, low pressure abdominal insufflations, acetazolamide administration, use of N2O instead of CO24[14]. Local anesthetics are widely used, have a good safety profile and are available in long-acting preparations. Recently, the intra-operative use of local anesthesia during laparoscopy has generated interest. Earlier studies have shown that intraperitoneal instillation of local anesthetics decreases the incidence of post operative shoulder pain in gynecological surgeries. Intra-peritoneal injections of local anesthetic have been proposed to minimize postoperative pain after laparoscopic surgery.[15] Local anesthetics have been administered into the peritoneal cavity during minimally invasive procedures, such as laparoscopic cholecystectomy and gynecological laparoscopy for sterilization and diagnosis,[16] in addition to open abdominal procedures, such as total abdominal hysterectomy. Administration of intra-peritoneal local anesthetic (LA), either during or after surgery, is used by many as a method of reducing post-operative pain. Most of these initial studies have used small doses of bupivacaine or of lidocaine. The main advantage of using local anesthetics is that they do not have the adverse effects of opioids, which may delay recovery and discharge from hospital. These effects include postoperative nausea, sedation, impairment of return of gastrointestinal motility and pruritus. In addition, the time to return of bowel function in the postoperative period may be reduced when the use of opioids is obviated by administering local anesthetics. Intra-peritoneal ropivacaine nebulization was also used for pain relief after laparoscopic cholecystectomy.[17] It was found to be effective in reducing shoulder tip pain. Intraperitoneal ropivacaine injected during laparoscopic cholecystectomy significantly decreased post-operative pain when compared with injection of intra-peritoneal placebo.[18] Local infiltration of 1% ropivacaine combined with pre incisional low dose I.V ketamine reduces post-operative pain after laparoscopic cholecystectomy.[19]

MATERIALSANDMETHODS

This study was conducted at Al-Falah school of medical sciences and research centre in the department of general surgery. Patients were allocated to three groups of 30 patients each based on randomization list done with the help of computer software. Group A: Patients received 20

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ml of 0.9% normal saline as placebo (n = 30). Group B: Patients received 20 ml of 0.75% Ropivacaine (n = 30). Group C: Patients received 20ml of 0.50% Bupivacaine (n = 30). Study design was Prospective randomized double blind clinical study, involving Resident I :- Prepared the study drug according to groups allotted. Resident II :- Blinded to study groups, carried out the study All the patients received general anesthesia, standard technique. Before induction patients in all the 3 groups received 1 µg/kg Fentanyl intravenously, also intra-operatively Diclofenac sodium 1.5 mg/kg was administered to all patients intramuscularly.

Laparoscopic cholecystectomy was performed while the patient was positioned in a slight reverse Trendelenburg position with a 4-trocar technique. After completion of surgery the patient was positioned in Trendelenburg positionandThe surgeon sprayed 10 mL ofstudy solution into the hepato-diaphragmatic space, 5 mL in the area of the gallbladder, and 5 mL into the space between liver and kidney. Surgical wounds were infiltrated with local anaesthetic solution in all the three groups. Patients in whomdrain was used, the drain was clamped for 1hr and then clamp was released.Preoperatively, the patients were introduced to the concept of a visual analogue scale (VAS), visual rating Prince Henry scale (VRS). Postoperatively the patients were assessed for pain utilizing these two scales, shoulder pain and the number of analgesic doses required at 0hrs, 4hrs, 8hrs, 12hrs and 24hrs.

Visual analogue score:The VAS consists of a 10 cm scale representing varying intensity of pain from 0 cm (no pain) to 10 cm (worst imaginable pain).

Verbal Rating Prince Henry pain scale

The verbal rating Prince Henry pain scale consisted of 0-4 grades with:

0- No pain on cough,
1- pain on cough but not on deep breathing
2- pain on deep breathing but not on rest,
3- pain on rest slight and
4- pain on rest-severe.

Rescue analgesic consisted of Injection Diclofenac 75 mg IM utilized when the VAS was more than 3 and VRS was more than 3, to a maximum of 3 doses given at 8 hours interval. Injection Tramadol 0.5 mg/kg body weight was GIVEN intravenously diluted in 50ml saline even after giving Diclofenac patient with a VAS score of 5 or more. The study was undertaken with the following aim and objectives

1. To evaluate the post operative pain relief in laparoscopic cholecystectomy patients using intraperitoneal instillation of Ropivacaine or Bupivacaine or NS.
2. To compare the efficacy of Bupivacaine 0.5% with that of Ropivacaine 0.75% in relieving post operative pain.

RESULTS

The present study “The Effect of Intraperitoneal Ropivacaine Versus Bupivacaine Versus Normal Saline for Post-Operative Pain Management in patients undergoing Laparoscopic Cholecystectomy: A comparative study, was conducted over a period of one year January 2024 to December 2025, in the department of surgery, Al Falah school of medical science and research cente\re. Ninety consenting patients of either sex, admitted in the department of surgery for elective laparoscopic cholecystectomy were enrolled in the study after fulfilling the eligibility criteria.

Table 1: Group comparison for age of patients (years).

Groups	Age (years)(Mean ± SD)	p-value	Remarks
Group A&B			
Group A	50.43 ± 14.14	0.083	NS
Group B	44.50 ± 11.78		
Group A&C			
Group A	50.43 ± 14.14	0.348	NS
Group C	47.33 ± 11.00		
Group B&C			
Group B	44.50 ± 11.78	0.339	NS
Group C	47.33 ± 11.00		

The mean age of patients (years) in group A was 50.43 ± 14.14, in group B 44.50 ± 11.78 and in group C 47.33 ± 11.00 and was statistically non-significant among the three groups. The male number of patients in Group A, B and C were 9, 16 and 17 respectively. While as the female number of patients in Group A, B and C were 11, 14 and 13 respectively. Hence the total number of females was more than males and is statistically significant.

Table 2: Group comparison for sex distribution of patients

Sex distribution	No. of Patients (%)		
	Group A	Group B	Group C
Male	9 (30.00)	16 (53.33)	17 (56.67)
Female	21 (70.00)	14 (46.67)	13 (43.33)
p-Value	0.0002		
Remarks	S		

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Table 3: Group comparison for VAS score

Time interval	Mean ± Standard Deviation		p-value	Remarks
	Group A	Group B		
0 hour	4.17 ± 1.34	2.03 ± 0.61	<0.0001	S
4 hours	3.40 ± 1.40	2.17 ± 0.46	<0.0001	S
8 hours	3.13 ± 1.04	2.20 ± 0.71	<0.0001	S
12 hours	3.00 ± 1.14	2.02 ± 0.76	<0.0001	S
24 hours	1.63 ± 0.72	1.67 ± 0.61	0.847	NS

Comparing group, A and B, VAS was statistically significant in group A as compared to group B at 0 hours($p<0.0001$), at 4 hours ($p<0.0001$), at 8 hours ($p<0.0001$), and at 12 hours ($p<0.0001$) and non-significant at 24 hours (p 0.847).

Table 4: Group comparison for VAS score

Time interval	Mean ± Standard Deviation		p-value	Remarks
	Group A	Group C		
0 hours	4.17 ± 1.34	2.07 ± 0.37	<0.0001	S
4 hours	3.40 ± 1.40	2.60 ± 1.10	0.017	S
8 hours	3.13 ± 1.04	2.63 ± 0.93	0.050	S
12 hours	3.00 ± 1.14	2.53 ± 1.07	0.109	NS
24 hours	1.63 ± 0.72	1.57 ± 0.68	0.713	NS

Between group A and C, VAS was more in group A than group C at 0 hours ($p<0.0001$), at 4 hours (p 0.017) and at 8 hours (p 0.050) and non-significant at 12hrs (p 0.109) and at 24 hours (p 0.713).

Table 5: Group comparison for VAS score

Time interval	Mean ± Standard Deviation		p-value	Remarks
	Group B	Group C		
0 hour	2.03 ± 0.61	2.07 ± 0.37	0.800	NS
4 hours	2.17 ± 0.46	2.60 ± 1.10	0.056	NS
8 hours	2.20 ± 0.71	2.63 ± 0.93	0.047	S
12 hours	2.02 ± 0.76	2.53 ± 1.07	0.042	S
24 hours	1.67 ± 0.61	1.57 ± 0.68	0.550	NS

While comparing Group B with Group C, VAS of group C was more and statistically significant at 8hrs (p 0.047) and at 12 hrs (p 0.042) only and non-significant at 0 hrs (p 0.800), at 4 hrs (p 0.056) and at 24 hrs (p 0.550).

Table 6: Group comparison for VRS score

Time interval	Mean ± Standard Deviation		p-value	Remarks
	Group A	Group B		
0 hour	2.77 ± 0.57	1.80 ± 0.48	<0.0001	S
4 hours	2.27 ± 0.83	1.70 ± 0.65	0.005	S
8 hours	2.10 ± 0.76	1.33 ± 0.66	<0.0001	S
12 hours	2.00 ± 0.95	1.23 ± 0.77	0.001	S
24 hours	1.20 ± 0.85	0.90 ± 0.76	0.154	NS

Comparing group A and B, VRS was more and statistically significant in group A as compared to group B at 0 hours ($p<0.0001$), at 4 hours(p 0.005), at 8 hours ($p<0.0001$) and at 12 hours (p 0.001) and non-significant at 24 hours (p 0.0154).

Table7: Group comparison for VRS score

Time interval	Mean ± Standard Deviation		p-value	Remarks
	Group A	Group C		
0 hours	2.77 ± 0.57	1.87 ± 0.68	<0.0001	S
4 hours	2.27 ± 0.83	1.77 ± 0.94	0.032	S
8 hours	2.10 ± 0.76	1.70 ± 0.79	0.049	S
12 hours	2.00 ± 0.95	1.73 ± 1.05	0.305	NS
24 hours	1.20 ± 0.85	0.83 ± 0.91	0.112	NS

Between group A and C, VRS was more and statistically significant in group A than group C at 0 hours($p<0.0001$), at 4 hours (p 0.032) and at 8 hours (p 0.049) and non-significant at 12 hours (p 0.305) and at 24 hours (p 0.112).

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Table 8: Group comparison for VRS score

Time interval	Mean ± Standard Deviation		p-value	Remarks
	Group B	Group C		
0 hours	1.80 ± 0.48	1.87 ± 0.68	0.808	NS
4 hours	1.70 ± 0.65	1.77 ± 0.94	0.366	NS
8 hours	1.33 ± 0.66	1.70 ± 0.79	0.050	S
12 hours	1.23 ± 0.77	1.73 ± 1.05	0.002	S
24 hours	0.90 ± 0.76	0.83 ± 0.91	0.759	NS

While comparing Group B with Group C, VRS of group C was more and statistically significant at 8 hours (p 0.050) and at 12 hours (p 0.002) only and non-significant at 0 hours (p 0.808), at 4 hours (p 0.366) and at 24 h (p 0.759).

Table 9: Group comparison of time taken to receive first analgesic (hr)

Groups	Analgesic received (hours) (Mean ± SD)	p-value	Remarks
Group A&B			
Group A	2.83 ± 0.79	<0.0001	S
Group B	8.77 ± 0.77		
Group A&C			
Group A	2.83 ± 0.79	<0.0001	S
Group C	7.47 ± 1.28		
Group B&C			
Group B	8.77 ± 0.77	<0.0001	S
Group C	7.47 ± 1.28		

Mean time in hours for the first rescue analgesic in group A, group B and Group C was 2.83 ± 0.79, 8.77 ± 0.77 and 7.47 ± 1.28 respectively. On comparing the three groups, the mean time in hours for first rescue analgesic was found to be statistically significant between group A and group B (p<0.0001), between group A and group C (p<0.0001)and also between group B and group C (p<0.0001).

Table 10: Group comparison for analgesic used

Groups	Analgesic used(Mean ± SD)	p-value	Remarks
Group A&B			
Group A	1.83 ± 0.79	0.001	S
Group B	1.13 ± 0.78		
Group A&C			
Group A	1.83 ± 0.79	0.013	S
Group C	1.27 ± 0.91		
Group B&C			
Group B	1.13 ± 0.78	0.543	NS
Group C	1.27 ± 0.91		

Mean analgesic used in group A, group B and group C was 1.83 ± 0.79, 1.13 ± 0.78 and 1.27 ± 0.91 respectively. On comparing, the amount of rescue analgesic was statistically significant between Group A and group B (p 0.001), and between Group A and Group C (p 0.013) while as it was statistically non-significant between group B and Group C (0.543).

Table 11: Group comparison for drain

Drain	No. of Patients (%)					
	Group A	Group B	Group A	Group C	Group B	Group C
Yes	16 (53.33)	17 (56.67)	16 (53.33)	13 (43.33)	17 (56.67)	13 (43.33)
No	14 (46.67)	13 (43.33)	14 (46.67)	17 (56.67)	13 (43.33)	17 (56.67)
p-Value	0.632		0.164		0.063	
Remarks	NS		NS		NS	

Drain was used in 16 patients in Group A, in 17 patients in Group B and in 13 patients in Group C, and not used in 14 patients in Group A, in 13 patients in Group B and in 17 patients in Group C. Thus, the results are statistically non-significant.

Table 12: Group comparison for PONV

PONV	No. of Patients (%)					
	Group A	Group B	Group A	Group C	Group B	Group C
Yes	3 (10.00)	3 (10.00)	3 (10.00)	4 (13.33)	3 (10.00)	4 (13.33)
No	27 (90.00)	27 (90.00)	27 (90.00)	26 (86.67)	27 (90.00)	26 (86.67)
p-Value	1.000		0.461		0.461	
Remarks	NS		NS		NS	

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Majority of the patients in each of the three groups did not experience post-operative nausea or vomiting and the results are statistically non-significant.

Table 13: Group comparison for drain and analgesic used

Drain	Analgesic used		
	Group A	Group B	Group C
Yes	1.94 ± 0.77	1.18 ± 0.73	1.46 ± 0.66
No	1.71 ± 0.83	1.08 ± 0.86	1.12 ± 1.05

Comparison of the amount of rescue analgesics used in the three groups and whether drain was used or not, use of analgesic was found to be slightly higher but not statistically significant in patients where drain was used in each of the three groups.

Table 14: Distribution of subjects based on the time at which they received first rescue analgesic across the three Treatment Groups

Groups/Drug		1st Rescue Analgesic in hour								
		2	3	4	5	6	7	8	9	10
A	Count	12	11	5	2	0	0	0	0	0
	% within drug	40.0	36.6	16.6	6.66	0.0	0.0	0.0	0.0	0.0
B	Count	1	1	1	2	1	1	10	7	6
	% within drug	3.3	3.3	3.3	6.6	3.3	3.3	33.3	23.3	20.0
C	Count	2	1	1	1	4	3	12	6	0
	% within drug	6.6	3.3	3.3	3.3	13.3	10.0	40.0	20.0	0.0
Total	Count	12	11	6	3	5	5	25	17	6
	% within drug	13.3	12.2	6.6	3.3	5.6	5.6	27.8	18.9	6.7

In group A 93% of patients received the first rescue analgesic within 4 hours of surgery, in group B 60% of patients received the first rescue analgesic at 8 hours and in group C 80% of patients received the first analgesic within 8 hours of surgery.

DISCUSSION

In this study we compared the post operative pain relief in laparoscopic cholecystectomy cases using intra peritoneal bupivacaine 0.50%,ropivacaine 0.75% and normal saline. Total of 90 cases were studied, who were divided into 3 groups of 30 patients each.These three groups were observed in the post operative wards for the VAS, VRS, the vital parameters and for any adverse effects like nausea or vomiting.Time for first rescue analgesic and total amount of analgesic usedwas also noted.The demographic data was comparable to the literature.Laparo-scopic cholecystectomy was performed in Normal saline groupin 9 men and 21 women with mean age of 50 years and mean weight of 62 kgs, and in ropivacaine group in 16 men and 14 women with mean age of 44 years and mean weight of 66 kgs, and in bupivacaine group in 17 men and 13 women with mean age of 47 years and mean weight of 68 kgs.The total number of females i.e 48 in the study was more compared to that of males i.e 42 in the study groups.

The mean VAS in our study for group A i.enormal saline group was4.17 ± 1.34, 3.40 ± 1.40, 3.13 ± 1.04, 3.00 ± 1.14, and 1.63 ± 0.72 at 0, 4, 8, 12 and 24 hours respectively. The mean VAS in our study for group B i.e Ropivacaine was 2.03 ± 0.61, 2.17 ± 0.46, 2.20 ± 0.71, 2.02 ± 0.76 and 1.67 ± 0.61 at 0, 4, 8, 12 and 24 hours respectively. The mean VAS in our study for group C i.e Bupivacaine was 2.07 ± 0.37, 2.60 ± 1.10, 2.63 ± 0.93, 2.53 ± 1.07 and 1.57 ± 0.68 at 0, 4, 8, 12 and 24 hours respectively. Comparing normal saline group and ropivacaine group, VAS was statistically significant in normal saline group as compared to ropivacaine group at 0 hrs ($p<0.0001$), at 4 hrs ($p<0.0001$), at 8 hrs($p<0.0001$),and at 12 hrs ($p<0.0001$) and non-significant at 24 hr (p 0.847). Between normal saline group and bupivacaine group, VAS was more in normal saline group than bupivacaine group at 0 hrs ($p<0.0001$), at 4 hrs (p 0.017) and at 8 hrs (p 0.050) and non-significant at 12hrs (p 0.109) and at 24 hrs (p 0.713). While comparing ropivacaine group with bupivacaine group, VAS of bupivacaine group was more and statistically significant at 8hrs (p 0.047) and at 12 hrs (p 0.042) only and non-significant at 0 hrs (p 0.800), at 4 hrs (p 0.056) and at 24 hrs (p 0.550).

The mean VRS in our study for group A i.e Normal Saline was2.77 ± 0.57, 2.27 ± 0.83, 2.10 ± 0.76, 2.00 ± 0.95 and 1.20 ± 0.85 at 0, 4, 8, 12 and 24 hours respectively. The mean VRS in our study for group B i.e Ropivacaine was 1.80 ± 0.48, 1.70 ± 0.65, 1.33 ± 0.66, 1.23 ± 0.77 and 0.90 ± 0.76 at 0, 4, 8, 12 and 24 hours respectively. The mean VRS in our study for group C i.e Bupivacaine was1.87 ± 0.68, 1.77 ± 0.94, 1.70 ± 0.79, 1.73 ± 1.05 and 0.83 ± 0.91 at 0, 4, 8, 12 and 24 hours respectively. Comparing normal saline group and ropivacaine group, VRS was more and statistically significant in normal saline group as compared to ropivacaine group at 0 hrs ($p<0.0001$), at 4 hrs (p 0.005), at 8 hrs ($p<0.0001$) and at 12 hrs (p 0.001) and non-significant at 24 hrs (p 0.0154). Between normal saline group and bupivacaine group, VRS was more and statistically significant in normal saline group than bupivacaine group at 0 hrs ($p<0.0001$), at 4 hrs

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(p 0.032) and at 8 hrs (p 0.049) and non-significant at 12 hrs (p 0.305) and at 24 hrs (p 0.112). While comparing ropivacaine group with bupivacaine group, VRS of bupivacaine group was more and statistically significant at 8 hrs (p 0.050)and at 12 hrs (p 0.002) only and non-significant at 0 hrs (p 0.808), at 4 hrs (p 0.366) and at 24 hrs (p 0.759).

Narchi et al (1991) found intraperitoneal local anaesthetics to be more effective in reducing pain upto 48 hrs postoperatively in patients undergoing diagnostic laparoscopy.[20]

Utilizing 20 ml of either 0.25% bupivacaine or 0.5% lignocaine, Rademaker et al (1994) failed to demonstrate any reduction in postoperative pain.[21]

Using 20 ml of 0.5% bupivacaine, Pasqulucci et al. (1996) noted a decrease in pain and consumption of analgesics,[22]probably due to a complete block of afferents using higher concentrations and volumes than used by other authors.

Our results are in concordance with Labaille et al. (2002) who also found significant reduction in the visceral pain in patients receiving ropivacaine in gall bladder bed at the end of sur¬gery.[23] Our results are also in concordance with Shivhare et al. (2014) who found intraperitoneal instillation of ropivacaine to be more effective than placebo instillation at early postoperative hours in reducing postoperative abdominal pain after laparoscopic.[24]

In our study we also compared the use of drain or no drain in the three groups. Drain was used in 16 patients in the normal saline group, in 17 patients in ropivacaine group and in 13 patients in bupivacaine group and not used in 14 patients in normal saline group, in 13 patients in ropivacaine group and in 17 patients in bupivacaine group. The amount of rescue analgesics used in the three groups was compared on the basis of use of drain or no drain and it was found to be slightly higher but not statistically significant in patients where drain was used in each of the three groups.

In our study we compared the amount of rescue analgesic used in the three groups. Mean analgesic used in normal saline group, ropivacaine group and bupivacaine group was 1.83 ± 0.79, 1.13 ± 0.78 and 1.27 ± 0.91 respectively.On comparing, the amount of rescue analgesic was statistically significant between normal saline group and ropivacaine group (p 0.001), and between normal saline group and bupivacaine group (p 0.013) while as it was statistically non-significant between ropivacaine group and bupivacaine group (0.543).

In our study we also noted the time taken for the use of first rescue analgesics in the three groups. Mean time in hours for the first rescue analgesic in normal saline group, ropivacaine group and bupivacaine group was 2.83 ± 0.79, 8.77 ± 0.77 and 7.47 ± 1.28 respectively. Therefore, on comparing the three groups, the mean time in hours for first rescue analgesic was found to be statistically significant between normal saline group and ropivacaine group (p<0.0001), between normal saline group and bupivacaine group (p<0.0001) and also between ropivacaine group and bupivacaine group (p<0.0001). In the normal saline group 93% of patients received the first rescue analgesic within 4 hours of surgery, in the ropivacaine group 60% of patients received the first rescue analgesic at 8 hours and in the bupivacaine group 80% of patients received the first analgesic within 8 hours of surgery.

The adverse effects noted by us were nausea and vomiting, which were statistically non-significant among the three groups. Similar adverse effects of nausea and vomiting were found in almost all the studies on post op pain relief in laparoscopic cholecystectomy.

The present study revealed that both the local anaesthetics 0.50% bupivacaine as well as 0.75% ropivacaine were effective in decreasing the VAS and VRS scores upto12 hour post op.There is a significant reduction in VAS and VRS scores over the 12 hour period in both the treatment groups.

CONCLUSION

IP bupivacaine and ropivacaine for LC reduces pain in the initial post-op period, it is easy to administer with no adverse effects and may become a routine practice for this procedure. This simple, safe, inexpensive, effective technique thus improves the post-op in-hospital course and expediates early discharge. We advocate its use in all elective LC.

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