



Comparison of intraincisional and intraperitoneal infiltration of local anaesthetic in laparoscopic cholecystectomy to control early postoperative pain.

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ABSTRACT... Objective: To compare the effects of intraincisional and intraperitoneal infiltration of local anaesthetic to relieve early postoperative pain in laparoscopic cholecystectomy. **Study Design:** Randomized Control Trial. **Setting:** Department of Anaesthesia and Surgery, Madinah Teaching Hospital Faisalabad. **Period:** July 2017 to March 2018. **Material & Methods:** A sample of 100 patients with American Society of Anaesthesiologists Physical status (ASA) I and II, undergoing laparoscopic cholecystectomy were selected using simple random sampling technique. Patients were randomly assigned into groups A and B. Group A patients received intraperitoneal infiltration of 20 ml solution of 0.25% bupivacaine and group B patients received intraincisional infiltration of 20 ml solution of 0.25% bupivacaine. **Results:** Demographic characteristics were not significantly different in both groups. Our study showed that Group A patients had better pain relief as compared to group B patients. Visual analogue score (VAS) for pain relief at 0, 3, 6, 12 and 24 hours was statistically different in both groups. The requirement of rescue analgesia between group A and B was found to be 12% and 38% which is statically significant (p value 0.003). **Conclusion:** intraperitoneal infiltration of Bupivacaine offers better postoperative pain relief after laparoscopic cholecystectomy and is associated with less analgesic requirement in early postoperative period.

Key words: Infiltration, Laparoscopic Cholecystectomy, Local Anaesthetic, Pain Relief.

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INTRODUCTION

Laparoscopic cholecystectomy is one of the most frequently performed minimally invasive surgical procedures.^{1,2} The procedure has many advantages like less postoperative pain,³ early mobility as well as early hospital discharge as compared to open cholecystectomy.⁴ Despite these advantages the procedure is associated with varying degrees of postoperative pain. It is seen in early postoperative hours and then subsides slowly over 1 to 2 days. Pain is particularly more with coughing, movement and deep breathing. Postoperative pain has three components visceral pain, parietal pain and shoulder pain.⁵ This pain leads to delayed ambulation as well as longer hospital stay which increases the burden on both the hospital and patients.

Different pain relief methods are being practiced

for postoperative pain relief after laparoscopic cholecystectomy such as systemic opioids, NSAIDs, epidural or Intrathecal opioids, local anaesthetic infiltration of surgical site as well as port sites.⁶ Each method has its own advantages and disadvantages.

Local anaesthetic infiltration is simple, safe and cost effective method for pain relief. It avoids complications associated with opioids such as postoperative nausea vomiting and respiratory depression.⁷ Patient has smooth recovery and early discharge from hospital. Bupivacaine is an amide local anaesthetic. It has long duration of action. Its onset of action is 1 to 10 minutes while its effect lasts for upto 9 hours.⁸

Literature shows a number of randomized trials showing advantages of local anaesthetic

infiltration, there are however studies showing no proven benefit especially regarding reduction in opioid requirement. So the clinical significance is in general questionable.⁹ This randomized control trial was performed to compare the efficacy of local anaesthetic infiltration at port site with intraperitoneal spillage and intraincisional infiltration for postoperative pain relief after laparoscopic cholecystectomy.

MATERIAL & METHODS

Study was carried out in departments of Anaesthesia and surgery Madina Teaching Hospital Faisalabad from July 2017 to March 2018. One hundred patients of 20 to 70 years age were selected. This was a randomized controlled trial. Patients with ASA I and ASA II, scheduled to undergo laparoscopic cholecystectomy were included in study. Patients were randomly divided into two equal groups A and B. Group A patients received intraperitoneal infiltration of local anaesthetic while group B patients received port site infiltration of local anaesthetic. Patients with acute cholecystitis, choledocholithiasis and previous abdominal surgery were excluded.

After written informed consent, 100 patients prepared for laparoscopic cholecystectomy in general surgery department were selected according to inclusion criteria. Exclusion criteria was strictly followed. During preoperative visit the patients were introduced with visual analogue scale (VAS) showing a 10cm straight line marked from 0 no pain to 10 worst imaginable pain. The patients were told to mark on the line to describe the intensity of pain.

Lottery method was used for random distribution of patients into two groups A and B each consisting of 50 patients.

Detailed data of patients was collected i.e. height, weight, ASA status, baseline blood pressure, heart rate and oxygen saturation prior to anaesthesia administration.

Double blind technique was used for the study. Surgeon was responsible for patient randomization and site of local anaesthetic administration

while resident doctor was responsible for data collection. The resident doctor as well as patient were unaware of the site of local anaesthetic administration.

Patients were pre-oxygenated and anaesthesia was induced using Propofol 2mg/kg. Tracheal intubation was achieved with the help of atracurium besylate 0.5mg/kg. Anaesthesia was maintained with 1% Sevoflurane, nitrous oxide and oxygen 1:1. Intraoperative analgesia was given using nalbuphine sodium. Additional doses of atracurium besylate were given if required. Standard monitoring was performed using B.P., heart rate, SpO₂, ETCO₂ and ECG.

The pneumoperitoneum was established. Intra abdominal pressure was maintained at 12mmHg. All operations were carried out using four ports, 10mm umbilical and 10mm subxiphoid in midline, 5mm in right subcostal area on midclavicular line and another 5mm on the front of axillary line. Group A patients received peritoneal instillation of 20 ml, 0.25% bupivacaine at the end of procedure while group B patients received port site infiltration of 20ml, 0.25% bupivacaine, 6ml for 10mm ports and 4ml for 5mm ports respectively.

Residual muscle paralysis was reversed with neostigmine 0.04mg/kg and atropine 0.01mg/kg at the end of procedure. After extubation patients were shifted to PACU. After 30 minutes of monitoring patients were shifted to parent ward.

Our outcome variables were; Pain assessment by VAS and requirement of rescue analgesic. Pain assessment was performed at 0, 3, 6, 12 and 24 hours postoperatively. Record of onset of pain and rescue analgesia was maintained by resident doctors. Tramadol 100mg was given as rescue analgesia.

The data was analysed using SPSS version 20. Mean and standard deviation (S.D.) were used for quantitative variables like age, height, weight and numeric pain score. Frequency and percentages were used for qualitative variables like gender, requirement for rescue analgesia. Independent t-test was used to compare quantitative variables

like numeric pain scores. Chi square test was used to compare qualitative variables like requirement for rescue analgesia. P-value equal to or less than 0.05 was considered to be statistically significant.

RESULTS

The study included 100 patients with 50 patients assigned in each group A and B.

Demographic variables were not statically significant between two groups except weight of patients the p value being 0.025. Table-I & II shows quantitative and qualitative variables of two groups and their comparison, respectively.

Regarding the outcome variables, VAS score at 0,3,6,12 and 24 hours was statistically significant when compared between two groups as shown in Table-III. The requirement for rescue analgesia

was also statistically significant between two groups. Requirement for rescue analgesia was 12% in group A as compared to 38% in group Bas shown in Table-IV.

DISCUSSION

Although postoperative pain after laparoscopic cholecystectomy is less severe and of shorter duration as compared to open surgery, patients feel pain and discomfort of varying intensity.¹⁰ The pain demands effective pain relief to ensure early mobility, shorter hospital stay and early resumption of routine activities. The pain usually subsides in 1 to 2 days. The postoperative pain after laparoscopy has several components.¹¹

The pain usually occurs in right upper quadrant (visceral), port sites (somatic) and shoulder tip (due to pneumoperitoneum).¹²

Variable	Group A	Group B	Total	P-Value
Age (years)	40.5±11.72	44.7±12.87	42.6±12.424	0.091
Height (cm)	157.86±7.01	158.38±6.9	158.12±6.93	0.709
Weight (kg)	66.8±9.62	62.76±8.1	64.78±9.08	0.025
Duration (min)	32±4.95	30.9±5.78	31.45±5.38	0.309

Table-I. Quantitative variables comparison of two groups.

Variable	Sub group	Group A	Group B	P-Value
Gender N=100	F: N=85 (%)	42 (49.4%)	43 (50.6%)	0.779
	M: N=15 (%)	8 (53.3%)	7 (46.7%)	

Table-II. Qualitative variables comparison of two groups.

ASA status	I: N=66 (%)	32 (64%)	34 (68%)	0.673
N+1000	II: N=34 (%)	18 (36%)	16 (32%)	

Post-operative VAS	Group A	Group B	P-Value
VAS at 0 hours	3.22 ± .582	3.82 ± .7201	0.0001
VAS at 3 hours	3.04 ± .533	3.68 ± .713	0.0001
VAS at 6 hours	3.04 ± .533	3.68 ± .713	0.0001
VAS at 12 hours	3.02 ± .515	3.76 ± .847	0.0001
VAS at 24 hours	3.02 ± .622	3.44 ± .644	0.001

Table-III. Analysis of VAS of two groups postoperatively.

Outcome	Group A	Group B	P-Value	
Requirement of Rescue analgesia	No (n=75) (%)	44 (58.7%)	31 (41.3%)	0.003
	Yes (n=25) (%)	6 (24%)	19 (76%)	

Table-IV. Requirement of rescue analgesic for two groups postoperatively.

Various studies have been carried out to demonstrate postoperative pain control with local anaesthetics after laparoscopic surgery and proved the effective role of local anaesthetics in this regard.¹³⁻¹⁵ In this study we analysed the effectiveness of intraperitoneal infiltration of bupivacaine injection in comparison to port site infiltration after laparoscopic cholecystectomy.

GeunJooChoi et al¹⁶ concluded that intraperitoneal administration of local anaesthetics is an effective method of postoperative pain relief including visceral, somatic and shoulder pain.

Singh R R et al¹⁷ demonstrated effectiveness of port site instillation of bupivacaine at the beginning and end of laparoscopic procedures. Omar Abuelaish and colleagues from Jordan also reported similar findings.⁷ However, Saurabh Agrawal¹⁸ concluded that intraperitoneal instillation of bupivacaine does not reduce postoperative pain significantly. Marcelo S also described similar observations.¹⁹

A study carried out by Gouda M El- labban et al²⁰ concluded that intracincisional infiltration of levobupivacaine is more effective than intraperitoneal infiltration for postoperative pain relief. Similarly, Lepner et al²¹ observed better postoperative pain relief with port site local anaesthetic infiltration.

We observed that intraperitoneal infiltration of bupivacaine is an effective method of postoperative pain control after laparoscopic cholecystectomy as compared to port site infiltration of local anaesthetic.

CONCLUSION

Intraperitoneal infiltration of bupivacaine significantly reduces postoperative pain in laparoscopic cholecystectomy and there is less demand for rescue analgesia as compared to port site local anesthesia infiltration.

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2	Nazim Hayat	2nd Author, Data collection.	
3	Saira Saleem	3rd Author, Critical review of the article, proof reading.	
4	Farhan Javaid	4th author, References & Review.	
5	Ayesha Rehman	Data collection, References.	
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