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Efficacy of Local Anesthetic in Post-Operative Laparoscopic Cholecystectomy

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Abstract | **Original Research Article**

***Background*:** Pain management is medically pertinent for optimal care in surgical patients. Although development and advancement in understanding of the pathophysiology of pain, analgesic's pharmacology and the development of better effective techniques for postoperative pain control, patients still continue to experience considerable discomfort. ***Objectives*:** To compare the efficacy (in terms of pain) of local anesthetic in postoperative laparoscopic cholecystectomy compared to control group. ***Methods*:** A total of 60 patients undergoing laparoscopic cholecystectomy and of age 20-50 year were included. Group A included the cases in which at the end of laparoscopic surgery, prior to port withdrawal, a local anesthetic mixture, a short acting (Lidocaine 2%) plus a long acting (Bupivacaine 0.5%) was instilled through the port lumen between the abdominal wall layers while group B included the cases in which conventional analgesics (narcotics and NSAID) was given post - operatively. All the patients were assessed by the researcher himself up to 12 hours post-operatively and efficacy was noted by Visual Analogue Scale (VAS). This study was conducted in Department of surgery Quaid e Azam Medical College Bahawalpur. Duration of study was 1 year from August, 2018 to August, 2019. ***Results*:** Efficacy in control of pain of Group A (local anesthetic) was seen in 22(73.33%) while in Group B (control group) was seen in07 (23.33%) patients as shown in Table VI (p- value = 0.0001). ***Conclusion*:** The study concluded that the efficacy of local anesthetic in postoperative laparoscopic cholecystectomy is better as compared to control group.

Keywords: Cholecystectomy, Local anesthetic, Post-operative pain.

INTRODUCTION

Laparoscopy is an excellent means to minimize the trauma and agony of the patient following surgery, however there still remains some challenge to minimize the post-operative pain in the patients. The pain reaches a maximum level within 6 hours of the procedure and then gradually decreases over a couple of days, but varies considerably between patients [1, 2]. The etiology of pain is complex, including damage to abdominal wall structures, the induction of visceral trauma and inflammation, and peritoneal irritation because of CO2 entrapment beneath the hemidiaphragms, neuropraxia of the phrenic nerve caused by distention of the diaphragm during gas insufflations, and/or acid milieu created by the dissolution of CO2. Postoperative pain can be partially or completely relieved by one of these methods (a) Systemic analgesics and adjuvant drugs, (b) Regional analgesia with local anesthetics, (c) Regional analgesia with epidural or intrathecal opioids, (d) Regional analgesia with combined local anesthetics and opioids, (e) Electrical analgesia achieved with transcutaneous electrical stimulation or electroacupuncture [2]. Local anesthetic instillation at the end of laparoscopy prevents postoperative pain and dramatically decreases the need for morphine. This technique improves patient comfort, shortens the stay in the postoperative care unit and decrease nursing care in the ward [3]. When administrated before surgery, infiltration of local anesthetics can decrease anesthetics and analgesic requirement during surgery as well as reduce the need for opioid containing analgesic postoperatively [4]. We have conducted this study to determine the efficacy (in terms of pain) of local anesthetic in post-operative laparoscopic cholecystectomy.

METHODOLOGY

Study conducted in Surgical Ward 2, Bahawal Victoria Hospital, from 2018 to 2019. 60 patients, fulfilling the inclusion criteria were selected, who are

diagnosed as symptomatic gallstone disease were admitted in the hospital, routine investigations such as CBC, Serum Electrolytes, RFTS, LFTS were done. After taking informed written consent and explaining all the risks and benefits of the procedure, the selected patients were placed randomly into two equal groups i.e. Group A & Group B, by lottery method. All selected cases will be offered to pick up a slip from total mixed up slips (half-slips contained letter 'A' and other half-slips contained letter 'B') and he/she was placed in that respective group. Group A included the cases in which at the end of laparoscopic surgery, prior to port withdrawal, a local anesthetic mixture, a short acting (Lidocaine 2%) plus a long acting (Bupivacaine 0.5%) was instilled through the port lumen between the abdominal wall layers while group B included the cases in which conventional analgesics (narcotics and NSAID) was given post-operatively. All the procedures were performed by the same surgeon (with at least 5 year's post-fellowship experience). All the patients were assessed by the researcher himself up to 12 hours post-operatively and efficacy (as per operational definitions) was noted. This all data (age, gender, duration of disease, duration of procedure, BMI, place of living and efficacy) was recorded on a specially designed proforma. All the data was entered and analyzed by using SPSS version 20.0. Chi-Square test was applied and P-value $\leq$ 0.05 was considered as significant.

Inclusion Criteria:

- All patients undergoing laparoscopic cholecystectomy.
- Duration of disease >3 months.
- Age 20-50 years.
- Both genders.

Exclusion Criteria:

- Any history of local anesthetic drugs sensitivity.
- Extensive intra-abdominal manipulations in case of sever gall bladder inflammation like abscess and phlegmon.
- Opium addiction as assessed on history.

OPERATIONAL DEFINITIONS:

1. **Post-operative Pain:** It was assessed by using visual analogue scale.
   - No Pain = 0, Mild Pain = 1-3, Moderate Pain = 4-6, Severe Pain = 7-10
2. **Efficacy:** was measured in terms of post-operative pain after 12 hours.
   - If patients had no or mild pain (VAS = 0-3), efficacy was considered as yes.
   - If patients had moderate or severe pain (VAS = 4-10), efficacy was considered as no.

RESULTS

Age range in this study was from 20 to 50 years with mean age of 38.52±7.13 years. The mean age of the patients 38(63.33%) were between 36 to 50 years of age. Out of these 60 patients, 15(25%) were male and 45(75%) female. Male female ratio was 1:3. Mean duration of surgery was 30.33±5.93 minutes. Mean BMI was 29.32±2.46 kg/m^2. Efficacy of Group A (local anesthetic) was seen in 22(73.33%) while in Group B (control group) was seen in 7(23.33%) patients as shown in Table I (p-value = 0.0001).

Table 1: Comparison of the efficacy (in terms of pain) of local anesthetic in post-operative laparoscopic cholecystectomy compared to control group

		Group A (n=30)		Group B (n=30)	
		No. of Patients	Age (%)	No. of Patients	Age (%)
EFFICACY	Yes	22	73.33	7	23.33
	No	8	26.67	23	76.67

*P-value = 0.0001 which is statistically significant.

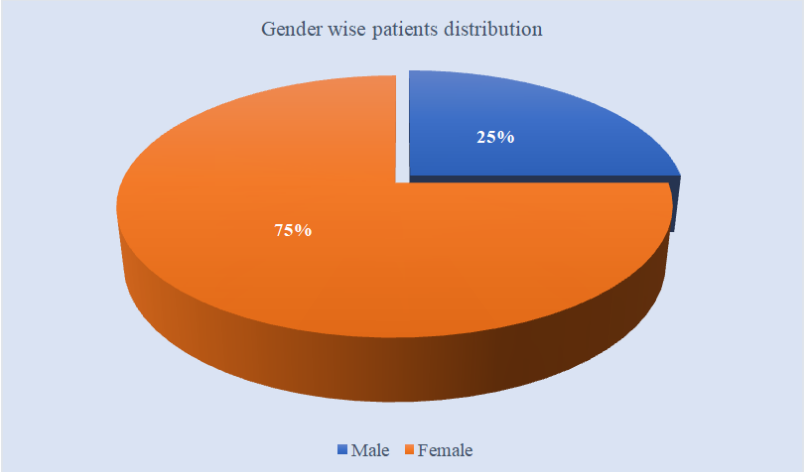

Figure I: Gender wise patients distribution (N=60)

DISCUSSION

Age range in this study was from 20 to 50 years with mean age of 38.52±7.13 years. The mean age of patients in group A was 38.67±7.88 years and in group B was 38.37±6.41 years. Majority of the patients 38(63.33%) were between 36 to 50 years of age. Out of these 60 patients, 15 (25.0%) were male and 45(75.0%) were females with male to female ratio of ratio of 1:3. In my study, efficacy of Group A (local anesthetic) was seen in 22 (73.33%) while in Group B (control group) was seen in 7(23.33%) patients as shown in Table VI (p-value = 0.0001). In a study by Vejdan SA *et al.*, [5] has compared the efficacy (in terms of no post-operative pain) of local anesthetic in post-operative laparoscopic cholecystectomy was seen in 65% patients and in control group was seen in 15% patients. Dath *et al.*, [6] compared bupivacaine with normal saline applied at the trocar incision site before closing the incision in patients undergoing laparoscopic cholecystectomy; they found that postoperative VAS values were significantly lower in patients receiving bupivacaine and recommended that local anesthetic application at the trocar incision site should be standard after laparoscopic cholecystectomy. Another study comparing incisional bupivacaine and normal saline applied before trocar placement in laparoscopic cholecystectomy interventions and found that postoperative pain, analgesia and antiemetic medication use were significantly lower in patients receiving local anaesthetics [7]. Lee and colleagues, [8] in their study where they compared preoperative and postoperative application of incisional and intraperitoneal bupivacaine (60 mL, 0.25%), found that pain was significantly lower in the pre-incisional infiltration group compared to that in postoperative incisional infiltration group, and preoperative and postoperative intraperitoneal infiltration groups, they recommended the preoperative application of local anesthetics in the incisional region. In the study of Gharaibeh *et al.*, [9] in which they compared intraperitoneal 0.25% bupivacaine with placebo in laparoscopic cholecystectomy surgeries, pain was found to be significantly lower in the group that received local anesthetics and they reported that application of bupivacaine to gallbladder bed was effective in reducing shoulder pain. Louizos and colleagues [10] reported that 20 mL of levobupivacaine application is effective in decreasing pain. Alam M S and Hoque H W [11] in their study aimed to evaluate the effect of intraperitoneal and port site instillation of local anesthetics on pain relief in early postoperative period following laparoscopic cholecystectomy. They concluded that Infiltration of bupivacaine in to port site and intraperitoneal space is simple, inexpensive and effective technique to minimize early postoperative pain and can be practiced for elective laparoscopic cholecystectomy [12]. Gouda M El-labban & Emad N Hokkam [13] in their randomized controlled study compared the effect of intraincisional vs intraperitoneal infiltration of levobupivacaine 0.25% on postoperative pain in laparoscopic cholecystectomy. They concluded that Intraincisional infiltration of levobupivacaine is more effective than intraperitoneal route in controlling post-operative abdominal pain. It decreases the need for rescue analgesia. Bisgaard T & Klarskov B [14] investigated the effects of a somato-visceral local anesthetic blockade on pain and nausea in patients undergoing elective laparoscopic cholecystectomy. They implied that a combination of incisional and intraabdominal local anesthetic treatment reduced incisional pain but had no effect on deep intra-abdominal pain or shoulder pain in patients receiving multimodal prophylactic analgesia after laparoscopic cholecystectomy. Hilvering B, Draaisma WA [15] aimed to determine the effect of combined subcutaneous infiltration and intraperitoneal instillation of levobupivacaine before the start of LC on postoperative abdominal pain up to 24 h after surgery. They concluded that combined subcutaneous and intraperitoneal administration of levobupivacaine did not influence postoperative abdominal pain after LC. George Pappas-Gogos & Konstandinos E. Tsimogiannis [16] designed a clinical trial to assess the use of preincisional and intraperitoneal ropivacaine, combinedwith normal saline, to reduce pain after laparoscopic cholecystectomy (LC). They concluded that Preincisional local infiltration plus intraperitoneal infusion of ropivacaine at the beginning of LC combined with normal saline infusion at the end of the procedure is a safe and valid method for reducing pain after LC. While anarray of evidence is found in favor of this simple and cost effective technique of instillation of local anesthetic intraperitoneally and port site, the practice of this method still eludes most surgeons in our country

CONCLUSION

This study concluded that the efficacy of local anesthetic in post-operative laparoscopic cholecystectomy is better as compared to control group. So, we recommend that local anesthetic in post-operative laparoscopic cholecystectomy should be used preferably in preventing post-operative pain which will make our patients more comfortable post-operatively and shorten the hospital stay.

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