

Original Article

EFFECT OF INTRAPERITONEAL INSTILLATION OF BUPIVACAINE INJECTION IN TERMS OF POST-OPERATIVE PAIN AND DURATION OF HOSPITAL STAY IN PATIENTS UNDERGOING LAPAROSCOPIC CHOLECYSTECTOMY

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Objective: To assess the outcome of intraperitoneal instillation of bupivacaine injection in terms of post-operative pain (visual analogue score) and duration of hospital stay (in hours) in patients undergoing laparoscopic cholecystectomy.

Material and Methods: In this study, a total of 150 patients were recruited after fulfilling the inclusion/exclusion criteria to assess the outcome of intraperitoneal instillation of bupivacaine injection in terms of post-operative pain (visual analogue score) and duration of hospital stay (in hours) in patients undergoing laparoscopic cholecystectomy.

Results: Most of the patients were between 41-50 years of age, mean age was 39.76±2.31, 44%(n=66) male and 56%(n=84) females. Stay at hospital (in hours) after laparoscopic cholecystectomy showed the 8.67%(n=13) stayed <9 hours, 89.33%(n=134) 9-18, 2%(n=3) 18-24 hours and no patient with >24 hours, 8.67%(n=13) had excellent, 89.33%(n=134) had good and only 2%(n=3) had fair outcome (pain relief).

Conclusion: The assessment of outcome of intraperitoneal instillation of bupivacaine injection in terms of post-operative pain (visual analogue score) and duration of hospital stay (in hours) in patients undergoing laparoscopic cholecystectomy is found considerably good and may be promoted for use in routine clinical practices to make laparoscopic cholecystectomy more safe and effective.

Keywords: Laparoscopic cholecystectomy, intraperitoneal instillation, bupivacaine injection, post operative pain.

Introduction

Laparoscopic operative procedures have revolutionized abdominal surgery. There are several advantages of it like: a smaller and more cosmetic incision, reduced blood loss and shorter postoperative hospital stay.¹ Laparoscopic cholecystectomy is the treatment of choice for symptomatic cholelithiasis. Although there are clear benefits compared with open surgery, postoperative pain after Laparoscopic cholecystectomy remains an issue. Pain can prolong hospital stay and lead to increased morbidity.^{1,2} After laparoscopic cholecystectomy patients complain more of visceral pain as a result of stretching of the intra abdominal cavity, peritoneal inflammation and phrenic nerve irritation caused by residual carbon dioxide in the peritoneal cavity.^{3,4} There is no general agreement on effective postoperative pain control. Different regimens have been proposed to relieve pain after laparoscopic surgery, such as non-steroidal anti-inflammatory drugs, local wound anesthetics, intra peritoneal anesthetics, intra peritoneal saline, gas

drainage, heated gas, low-pressure gas and nitrous oxide pneumoperitoneum.⁵ Administration of intra peritoneal local anesthetic, either during or after surgery, is used by many surgeons.⁶ This technique was first evaluated in patients undergoing gynaecological laparoscopic surgery. Its application in laparoscopic cholecystectomy was initially examined in a randomized trial in 1993.² This technique is safe, simple without side effects, reduces additional analgesia requirement and results in decreased hospital stay.⁶ The rationale of the study was to assess the outcome of intraperitoneal instillation of bupivacaine injection in laparoscopic cholecystectomy in order to reduce procedure related morbidity in terms of postoperative pain and hospital stay. If found effective in large number of cases, can be promoted to be used in routine clinical practice.

Materials and Methods

Study Design: This was descriptive study.

Setting: Study was carried out in Department of Surgery, Unit-II Services Hospital, Lahore.

Sample size of 150 cases of laparoscopic cholecystectomy was calculated with 95% confidence level, 5% margin of error and taking expected percentage of good outcome i.e. 90% after 24 hours of intraperitoneal instillation of bupivacaine injection in patients undergoing laparoscopic cholecystectomy.

Sample Technique: Non probability purposive sampling.

Sample Selection:

Inclusion Criteria:

- a. Symptomatic gallstones requiring laparoscopic cholecystectomy diagnosed on ultrasonography.
- b. 20-50 years of both male and female patients.
- c. Elective surgical procedure.

Exclusion Criteria:

- a. Patients with acute cholecystitis diagnosed on raised TLC
- b. Patients requiring per-operative cholangiogram or common bile duct exploration with dilated biliary passage or raised alkaline phosphatase
- c. Patients requiring conversion to open procedure
- d. Patients with history of allergy to local anesthetic agents

Data Collection Procedure: Patients fulfilling the inclusion criteria were recruited from OPD department. A detailed history was taken including demographic data (age, sex and address). Patients were requested to sign and informed consent. They were assured regarding confidentiality and expertise used for the particular procedure and were educated for an anticipated better outcome. The effect modifiers like age was controlled through stratification. Laparoscopic cholecystectomy was done under general anaesthesia. 100mg of bupivacaine diluted in 100ml of saline was used.

Fifteen minutes before the end of procedure the intra-peritoneal instillation was made under the surface of both domes of the diaphragm, the gall bladder bed and the dissected Callot's triangle keeping the patient in head down 20° & right tilt 20° position.

The instillation was done with the help of an irrigation cannula. Postoperative patients were assessed for pain using visual analogue scale and analgesic requirement both non-narcotics and narcotics and number of hours the patient remained admitted was noted. The intensity of the pain was recorded for all patients using visual analogues score (VAS) at 0,9,18 and 24 hours after the surgery. The outcome was assessed after 24 hours of surgery as excellent, good, fair and poor.

Data Analysis Procedure: All the collected data was entered and analyzed using SPSS version 11.0. The variables were analyzed using simple descriptive statistics, calculating mean and standard deviation for numerical values like age and number of days of hospital stay. Frequency and percentages were calculated for qualitative variables like sex and outcome in terms of (excellent, good, fair and poor).

Results

In this study, a total of 150 patients were recruited after fulfilling the inclusion/exclusion criteria to assess the outcome of intraperitoneal instillation of bupivacaine injection in terms of post-operative pain (visual analogue score) and duration of hospital stay (in hours) in patients undergoing laparoscopic cholecystectomy.

Age distribution of the patients is computed and presented in **Fig-1**, Gender distribution of the patients shows 44%(n=66) male and 56%(n=84) females. **Table-1**.

Stay at hospital (in hours) after laparoscopic cholecystectomy is shown in **Fig-2**.

The outcome according to operational definition was analyzed and recorded, presented in **Table-2**.

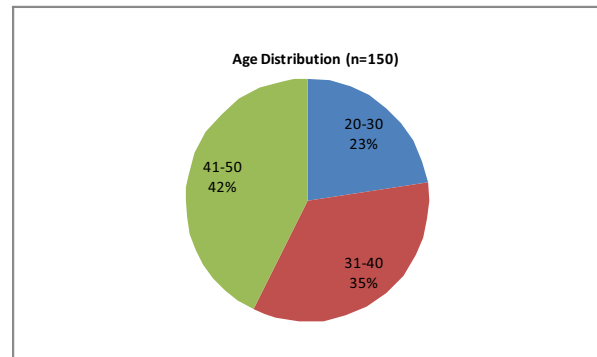


Fig-1: Age distribution of the subject (n=150).

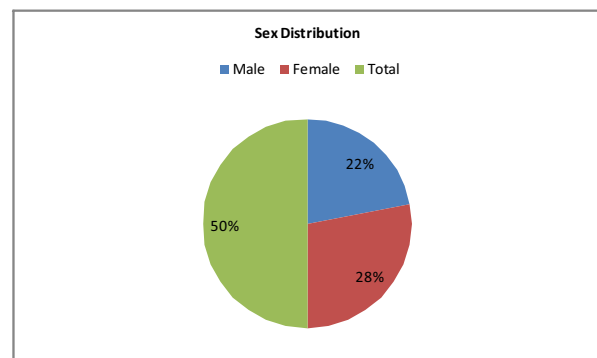


Fig-2: Sex distribution of the subject (n=150).

Table-1: Stay At Hospital (in hours) (n=150).

Hours	No of Patients	%Age
<9	13	8.67
9-18	134	89.33
18-24	03	02
>24	00	00
Total	150	100

Table-2: Outcome of Intraperitoneal Instillation of Bupivacaine Injection painf .

Outcome	No of Patients	%Age
Excellent	13	8.67
Good	134	89.33
Fair	03	02
Poor	00	00
Total	150	100

Discussion

Laparoscopic cholecystectomy has become an established form of treatment for patients with symptomatic gall stones. Although thought to result in less postoperative pain, studies conducted by Rademaker BM and Joris J have shown that patients undergoing laparoscopic cholecystectomy may experience considerable pain after laparoscopic cholecystectomy.^{7, 8} In start, no general agreement was found on effective postoperative pain control. The various methods used with variable success were NSAID'S⁹ infiltration of wound with local anaesthetics¹⁰ and intermittent intramuscular narcotics.¹¹ Administration of intra peritoneal local anesthetic, either during or after surgery, is used by many surgeons.⁶ In our study, we found excellent results in 8.67%(n=13), who had no pain intensity and also no need of additional analgesia and further the patients also stayed for <9 hours and discharged early while 89.33%(n=134) patients were recorded with good outcome and stayed at hospital for 9-18 hours with 1-3 intensity of pain on VAS while only 2%(n=3) had 4-7 intensity of pain and stayed upto 24 hours in the hospital. The findings of our study are closely in agreement with a study conducted by Maharjan SK⁵ who recorded 10% excellent outcome and 90% good outcome, fair and poor outcome was recorded 0%. The slight difference in the current study and above study was that we recorded only 2%

of the patients fair outcome and this difference is not significant. Jiranantar V,¹² conducted a study to find out the effectiveness of intraperitoneal instillation of bupivacaine for postoperative laparoscopic cholecystectomy pain relief, especially specific pain (visceral pain, shoulder pain and epigastric pain). Eighty ASA (American Society of Anesthesiologists) 1 and 2 patients were randomly assigned to receive either 20 ml of 0.5 per cent bupivacaine (n=39) or the same volume of saline (n=41) instilled under direct vision into the hepato-diaphragmatic space, near and above the hepatoduodenal ligament and above the gall bladder bed at the end of surgery. The intensity of visceral pain, shoulder pain and epigastric pain was assessed at 1, 6, 24 and 48 h after surgery using a visual analogue scale (100 mm VAS) and verbal rating "Prince Henry" pain scale (VRS).

Surprisingly, they recorded that there were no statistical differences between the two groups for the time when analgesia was first required, VAS, VRS and total analgesic consumption and concluded that intraperitoneal instillation of bupivacaine does not show any advantage for postoperative analgesia after laparoscopic cholecystectomy.

On the other hand, Hernández-Palazón J and colleagues¹³ assessed the analgesic effect of the intraperitoneal administration of bupivacaine and morphine in patients undergoing laparoscopic cholecystectomy, there were 30 patients in each group: Group 1, physiological saline 30 mL; Group 2, bupivacaine 0.25% 30 mL; Group 3, bupivacaine 0.25% 30 mL plus morphine 2 mg. In addition, Group 2 received 2 mg intravenous (i.v.) morphine in 2 mL saline, and Groups 1 and 3, 2 mL saline intravenously. The postoperative analgesic requirement was assessed by the total dose of metamizol administered by an i.v. patient-controlled analgesia (PCA) device. Pain, vital signs, supplemental analgesic consumption and side-effects were recorded for all patients for 24 h, and concluded that in patients undergoing laparoscopic cholecystectomy, the intraperitoneal administration of morphine plus bupivacaine 0.25% reduced the analgesic requirements during the first 6 postoperative hours compared with the control group. However, the combination of intraperitoneal bupivacaine 0.25% and i.v. morphine was more effective for treatment of pain after laparoscopic cholecystectomy. In another study, Mraović B, Jurisic T, Kogler-Majerac V and Sustic A¹⁴ in 1997 determine the effects of intraperitoneal administration of bupivacaine on pain after laparoscopic

Cholecystectomy were studied in a prospective, double-blind, randomised trial and concluded that reducing pain with intraperitoneal bupivacaine is effective, easy to administer, and without side-effects. However, the outcome of intraperitoneal instillation of bupivacaine injection in laparoscopic cholecystectomy in order to reduce procedure related morbidity in terms of postoperative pain and hospital stay is significantly good and found effective in large number of cases, and this technique may be promoted for use in routine clinical practices.

Conclusion

The assessment of outcome of intraperitoneal instillation of bupivacaine injection in terms of post-operative pain (visual analogue score) and duration of hospital stay (in hours) in patients undergoing laparoscopic cholecystectomy is found considerably good and may be promoted for use in routine clinical practices to make laparoscopic cholecystectomy more safe and effective.

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