ORIGINAL ARTICLE

Intraperitoneal Instillation of Bupivacaine: A Technique to Reduce Post-Operative pain and duration of hospital stay in patients experiencing Laparoscopic Cholecystectomy

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ABSTRACT

Aim: To determine post-operative pain and duration of hospital stay after intraperitoneal instillation of bupivacaine injection in patients experiencing laparoscopic cholecystectomy
Settings: Department of Surgery, Bahawal Victoria Hospital, Bahawalpur.
Duration of study: From: July 2015 to December 2015
Results: Mean age of the patients was 39.76±2.31 years, 66(44%) male and 84(56%) females. Stay at hospital (in hours) after laparoscopic cholicystectomy was recorded and 13(8.67%) stayed <9 hours, 134(89.33%) stayed for 9-18 hours, 3(2%) stayed for 18-24 hours and no patient was recorded with >24 hours stay at hospital, 13(8.67%) had excellent results no pain (after 24 hours) stayed <9 hrs and having no requirement of additional analgesia, 134(89.33%) had good outcome with 1-3 intensity of pain on visual analogue scale and also no requirement of additional analgesia, while only 3(2%) stayed for 18-24 hours in the hospital because of 4-7 intensity of pain.
Conclusion: Intraperitoneal instillation of bupivacaine injection in terms of post-operative pain (visual analogue score) and duration of hospital stay (in hours) is found considerably good in patients experiencing laparoscopic cholecystectomy, it may be promoted for use in routine clinical practices to make laparoscopic cholecystectomy more safe and effective.
Keywords: Laparoscopic cholecystectomy, intraperitoneal instillation, bupivacaine injection

INTRODUCTION

Laparoscopic operative techniques have revolutionized abdominal surgery. There are various advantages of it like including a minor and more cosmetic incision, reduction in blood loss and shorter stay at hospital after the surgery[1]. Cholecystectomy performed laparoscopically is the treatment of choice in patients presenting with symptomatic cholelithiasis.

Though, laparoscopic cholecystectomy has clear and significant advantages compared to open surgery, postoperative pain after performing laparoscopic cholecystectomy remains a challenging issue for the surgeons and may be a causative factor for prolonged stay at hospital after the surgery and leads to increased morbidity[1,2]. Patients complain visceral pain after the surgery due to the stretch of intra-abdominal cavity, phrenic nerve irritation because of presence of carbon dioxide in peritoneal cavity and phrenic nerve irritation[3]. On the other hand, in cases undergoing open cholecystectomy, the type of pain is parietal pain[4]. Still, there is no agreement regarding effective control of post-operative pain. Various regimens are proposed for relieve in pain after laparoscopic cholecystectomy including such non-steroidal anti-inflammatory drugs (NSAIDs), intra peritoneal anesthetics, local wound anesthetics, gas drainage, intra peritoneal saline, heated gas, nitrous oxide pneumoperitoneum and low-pressure gas.[5] Various surgeons use intra-peritoneal local anesthetic agents, either during or after the procedure[6]. Firstly, this technique was examined in gynecological laparoscopic surgeries. Initially, in 1993, in a randomized control, it was applied in laparoscopic cholecystectomy[2]. This technique is considered as simple, safe, no side effects, decreases the need of additional analgesia and finally results in decreased hospital stay[6].

In this study, we assess the outcome of intraperitoneal instillation of bupivacaine in patients undergoing laparoscopic cholecystectomy to reduce postoperative pain and hospital stay.

MATERIAL AND METHODS

A total of 150 diagnosed cases of symptomatic gallstones and requiring laparoscopic cholecystectomy of either gender and between 20-50 years of age were selected for elective surgical procedure. We excluded those cases with acute cholecystitis diagnosed on raised TLC, requiring common bile duct exploration or per-operative cholangiogram or with dilated biliary passage or raised alkaline phosphatase, conversion to open

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procedure and having history of allergy to local anesthetic agents.

All these patients were enrolled from out patients' department of Surgery, Bahawal Victoria Hospital, Bahawalpur during July 2015 to December 2015. A detailed history of the participants was recorded including demographic data. Patients were required to sign and informed consent. They were assured regarding confidentiality and expertise used for the particular procedure and educated for an anticipated better outcome. General anesthesia was used for laparoscopic cholecystectomy. Intra-peritoneal instillation with 100mg of bupivacaine diluted in 100 ml of normal saline just 15 minutes before the end of the surgery, we adopted the head of the patients down 20° & right tilt 20° position. An irrigation cannula was used to for the instillation. The patients were assessed after the surgery for intensity of pain by using VAS and requirement of analgesics either narcotics or non-narcotics, we also recorded the duration of hospital stay. By using visual analogues scale at 0 hr, 9hr, 18 and 24 hours after the surgery. The outcome was recorded after 24 hours of surgery as poor, good, fair and excellent.

The collected was analyzed using simple descriptive statistics, calculating mean±sd for numerical values like age and duration of stay at hospital. Qualitative variables like sex and outcome in terms of (poor, faire, good and excellent) were evaluated as frequency & percentages.

RESULTS

Age distribution of the patients is computed and presented in Table 1, most of the patients were recorded between 41-50 years of age 64(42.66%), 52(34.67%) were recorded between 31-40 years, 34(22.67%) were recorded between 20-30 years, mean and s.d. was calculated as 39.76±2.31.

Gender distribution of the patients shows 66(44%) male and 84(56%) females (Table 2). Stay at hospital (in hours) after laparoscopic cholecystectomy was recorded and 13(8.67%) stayed <9 hours, 134(89.33%) stayed for 9-18 hours, 3(2%) stayed for 18-24 hours and no patient was recorded with >24 hours stay at hospital (Table 3). The outcome according to operational definition was analyzed and recorded, presented in Table 4, where 13(8.67%) had excellent results no pain (after 24 hours) stayed <9 hrs and having no requirement of additional analgesia, 134(89.33%) had good outcome with 1-3 intensity of pain on visual analogue scale and also no requirement of additional analgesia, while only 3(2%) stayed for 18-24 hours in the hospital because of 4-7 intensity of pain (Table 4).

Table 1: Age distribution of the subjects (n=150)

Age (in years)	n	%age
20-30	34	22.67
31-40	52	34.67
41-50	64	42.66
Total	150	100

Mean and standard deviation 39.76±2.31

Table 2: Gender distribution (n=150)

Gender	n	%age
Male	66	44
Female	84	56
Total	150	100

Table 3: Stay at hospital (in hours) (n=150)

Hours	n	%age
<9	13	8.67
9-18	134	89.33
18-24	03	2
>24	00	00
Total	150	100

Table 4: Outcome of intraperitoneal instillation of bupivacaine injection (n=150)

Outcome	n	%age
Excellent	13	8.67
Good	134	89.33
Fair	03	2
Poor	00	00
Total	150	100

DISCUSSION

In our study, we found excellent results in 13(8.67%), who had no pain intensity and also no need of additional analgesia, moreover the patients also stayed at hospital for <9 hours and discharged early while 134(89.33%) cases had good outcome and their stay was recorded between 9-18 hours with 1-3 intensity of pain on VAS, only 3(2%) of the cases had 4-7 intensity of pain and stayed in hospital for upto 24 hours. These findings are nearly in agreement with a Maharjan SK[5] who recorded 10% patients with excellent, 90% had good outcome while no case was found with fair and poor outcome. The slight difference in the current study and above study is not significant.

Jiranantarat V and colleagues[7] examined the effectiveness of intraperitoneal instillation of bupivacaine for relief of postoperative laparoscopic cholecystectomy pain. Patients were randomly assigned to receive either 20 ml of 0.5% bupivacaine (n=39) or the same quantity of saline (n=41), instilled direct into the hepato-diaphragmatic space. The intensity of pain was assessed at 1 hour, 6 hour, 24 hours and 48hours after surgery, they also used visual analogue scale. Surprisingly, they did not find any significant difference in two groups regarding the

time when analgesia was first' required, and concluded that intra-peritoneal instillation of bupivacaine has no advantage for the requirement of after performing laparoscopic cholecystectomy.

On the other hand, Hernández-Palazón J and colleagues[8] determined the effect of instillation of bupivacaine and morphine intraperitoneally in subjects undergoing laparoscopic cholecystectomy, there were 30 cases in each group: Group 1 included physiological saline 30 mL; Group 2 had bupivacaine 0.25% 30mL while in Group 3, bupivacaine 0.25% 30mili litre+morphine 2 milligram was administered. In addition, Group 2 cases received 2 milligram intravenous morphine in 2 milliliter saline while Groups 1 and 3, 2 milliliter saline intravenously. The requirement of postoperative analgesic was recorded by calculating the total dose of metamizol given by an intravenous patient-controlled analgesia (PCA) device. They concluded that patients receiving intraperitoneal administration of morphine+ bupivacaine 0.25% decreased the analgesic need during the first six hours postoperatively compared with the control group. Though, the combination of intra-peritoneal bupivacaine 0.25% and intravenous morphine was showing more effectiveness for the management of pain after performing laparoscopic cholecystectomy.

Another prospective, double-blind, randomized trial by Mraović B and co-workers[9] in 1997 recorded the effects of administration of intra-peritoneal bupivacaine with regards to pain after laparoscopic cholecystectomy and concluded that the use of intraperitoneal bupivacaine is effective, no side-effects and also easy to administer.

Finally, our results are in agreement with other above mentioned studies and it is determined that intraperitoneal instillation of bupivacaine after laparoscopic cholecystectomy regarding reduction of procedure related morbidity in terms of postoperative hospital stay and pain significantly good and effective in a large number of cases while this technique may be promoted for use in routine clinical practices.

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