Journal of Cardiovascular Disease Research

ISSN: 0975-3583,0976-2833 VOL14, ISSUE 08, 2023

The Effect of Preoperative Versus Postoperative Intra-Incisional Infiltration of 0.25 % Bupivacaine on Early Postoperative Pain After Laparoscopic Cholecystectomy

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Abstract

Background: The Effect of Preoperative vs Postoperative Intra-Incisional Infiltration of 0.25% Bupivacaine on Early Postoperative Pain after Laparoscopic Cholecystectomy. **Objective:** To compare preoperative and Post-operative intra incisional nfiltration of local anesthetic. To see which is better effective in relieving early Post-operative pain following laparoscopic cholecystetctomy. **Material and Methods:** The patients who are getting admitted with symptomatic gallstone disease and the sample size was around 90 patients and it was Randomized into 2 groups of 45 each pre- incisional and post incisional. Subjects in pre-incisonal group will receive 20 ml of 0.25% bupivacaine in divided doses at all 4 ports before creation of ports. (10 ml for each 10mm ports and 5ml each for 5 mm ports) Subjects in post – incisional group will receive same dose and distribution of the agent following closure of the ports. Pain will be assessed using VAS score (visual analogue scale) Scoring from 0 – 10. At 2,4,8,12 & 24 hrs. Frequency of analgesic used over a 24-hour period will also be recorded. **Results:** Following data collection it was seen that subjects in the pre infiltration group had less post-operative pain compare to post infiltration group. Mean VAS scores were less in the pre infiltration than post group (P value <0.05). Frequency of analgesic use was also less in the pre compared to the post group ((P value <0.05). **Conclusion:** Pre incisional infiltration is a form of pre emptive analgesia that works on the principal of Spinal allodynia where treatment is initiated before the surgical procedure in order to reduce this sensitization. Hence is found to be more effective than Post incisional infiltration. This is a simple cheap practise to recude post-operative pain which can be done for all elective cases of laproscopic cholecystectomy.

Keywords: Laparoscopic Cholecystetctomy, Bupivacain.

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Introduction

Laparoscopic cholecystectomy is the commonest laparoscopic surgical technique done in most countries as an outpatient procedure for the last 10 years. The important advantages of laparoscopic surgical techniques include short duration of hospital stay, fast return to daily work routine and minimal discomfort.[1] Commonly, the patient complains of post-operative pain associated with respiratory movements, coughing and movements during the first postoperative hours, which may prolong hospital admission, increase postoperative morbidity and thereby delaying patients discharge. This leads to increase in the hospital costs. In general, pain experienced by patients after laparoscopic surgery vary among individuals. Conventional drugs used for pain relief have adverse effects. Narcotics for example induce nausea, vomiting and constipation.[2] Post-operative pain after laparoscopic cholecystectomy, can vary from

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moderate to severe, with the need for non-steroidal anti-inflammatory drugs or opiates, which help to control the pain effectively. Postoperative pain management has a major crucial physiological role in postoperative outcome. Although opioids can manage early post-operative pain after surgery, their adverse effects including nausea and vomiting may delay discharge. The different available post-operative pain management protocols can greatly decrease the need for opioids in such cases.[3] Post-operative pain management is one of the most important challenges, which a surgeon often faces. More than 70% of patients undergoing laparoscopic surgery have severe pain and 75% of these patients will develop chronic pain later. Different techniques for early postoperative pain management are required to attain optimum control. If pain free, patients can be discharged home on the first postoperative day itself. It is a safe intervention and is even suitable for an outpatient procedure in select patients. Pain relief and patient comfort during the early postoperative period is very important.[4] Pain on the day of surgery, is often reported as a diffuse abdominal, right upper quadrant and right shoulder. Reduction in postoperative pain following local anesthetic infiltration into the surgical incision was noticed in patients undergoing herniorrhaphy. Although some maneuvers were performed using intra-incisional local anesthesia infiltration, the outcome regarding decrease in pain severity and analgesic rescue were confusing. Local anesthetic agents are increasingly administered for pain management. Application of local anesthetic drugs in the skin incisions or intra-peritoneal administration after laparoscopic cholecystectomy, are done. In laparotomies with large incisions, this intervention is not suitable because a high dosage is required which may give rise to complications. This method has the benefit of having no opioid side effects which may lengthen postoperative hospital stay. Although Bupivacaine is used as the local anesthetic agent in such interventions, the timing and the route of infiltration of the agent is found to be different among practitioners. Multiple analgesic interventions using different targets and mechanisms have been investigated for their effect on early post-operative pain after laparoscopic cholecystectomy.[5] Assessment of pain after a laparoscopy will vary according to the procedure done, as the mechanism of pain is procedure specific. Postoperative pain is reduced when compared to open cholecystectomy, but effective analgesic treatment after laparoscopic cholecystectomy has remained a clinical challenge. In 17– 41% of the patients, pain is the commonest reason for overnight stay in the hospital, and is the primary reason for prolonged convalescence after Laparoscopic cholecystectomy. Moreover, it has been hypothesized that acute pain after laparoscopic cholecystectomy may be a predictor of chronic pain (e.g., postlaparoscopic cholecystectomy syndrome), but this has not been studied prospectively. The validity of data obtained from postoperative quantitative analysis (number needed to treat) has recently been questioned, because the data derived are from a variety of procedures, which may potentially hinder the interpretation of the number needed to treat for a specific procedure. Therefore, it was proposed that analgesic data and optimized analgesic treatment should be specific for the type of surgical procedure.[6] In addition, growing evidence suggests that treatment of postoperative pain should be multimodal and opioid sparing to accelerate recovery and avoid potential side effects. The fact that acute pain after laparoscopic cholecystectomy is complex in nature and does not resemble pain after other laparoscopic procedures suggests that effective analgesic treatment should be multimodal. Detailed prospective studies in individual laparoscopic procedures such cholecystectomy, gyneco-logic procedures, hernia repair, and fundoplication have shown procedure-related individual pain patterns requiring procedure-specific analgesic treatment regimens. In laparoscopic cholecystectomy, overall pain is a combination of three different and clinically separate components: incisional pain (somatic pain), visceral pain (deep intra-abdominal pain), and shoulder pain (presumably referred visceral pain).[7] Characteristically, overall pain after laparoscopic cholecystectomy carries a high inter individual variability in intensity and duration and is largely unpredictable. Pain is most intense on the day of surgery and on the

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following day and subsequently declines to low levels within 3– 4 days. However, pain may remain severe in approximately 13% of patients through-out the first week after laparoscopic cholecystectomy. In a recent systematic review of postoperative analgesia, the role of timing of treatment for postoperative pain relief was investigated (pre-emptive analgesia). Based on findings from a variety of surgical procedures, the authors concluded pre-emptive and postoperative analgesic effects were comparable.[8] The timing of intervention refers to analgesic treatment at the start versus end of surgery. The aim of the current study was to compare the effect of intra-incisional local anesthetic infiltration (bupivacaine) between pre-incision making period and post-incision suturing period for the control of early post- operative pain relief after laparoscopic cholecystectomy.

Methodology

This was prospective study was among 90 consecutive patients, and scheduled for elective laparoscopic cholecystectomy through under general anesthesia, was between the period of October 2016 till January 2018 and was approved from Institution Ethics Committee and was sought prior to the study.

Inclusion Criteria

- Patients of ASA (American Society of Anesthesiologists) grade I and II
- Age: 20 to 80 years
- Body weight: 50-90 kg

Exclusion Criteria

- Patients who were converted to open procedure
- Presence of Drains
- Additional procedure in the same setting (ERCP, CBD exploration)

Statistical Analysis

Quantitative variables were expressed as unpaired T test. Comparison between groups was done with non-parametric, Mann- Whitney test. Univariate analysis was performed. Variables were assessed using ANOVA and Schiff post hoc test. Chi- square test was used to assess the differences in categorical variables. P value of <0.05 using a two tailed test was considered significant.

RESULTS

It was computed that 90 patients were necessary for study, so that statistically significant results could be obtained. On completion of the study, the data obtained were compiled in a tabulated manner as a mean ± standard deviation. Frequencies were expressed as percentages.

Table 1: Age Distribution

	STUDY GROUP		
AGE	**PRE GROUP**	**POST GROUP**	**Total**
<30	7	7	14
31 - 40	9	9	18
41 - 50	13	7	20
51 - 60	7	9	16
61 - 70	6	10	16
> 70	3	3	6
TOTAL	45	45	90

Minimum age in pre infiltration group was 23 and the maximum 80, with a mean of 47.51. In the post infiltration group the minimum age was 19 and the maximum 77, with a mean of 48.69, p value > 0.05 (no statistical significance) There are 30 males and 60 females involved in the

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study, 14 males and 31 females in pre infiltration. 16 males and 29 females in the post infiltration group. P value was > 0.05 and there was no statistical significance. Gender distribution in the pre infiltration group was 31 % males and 69% females. In the post infiltration group 36% of the subjects were males and 64 % were females. In both the study groups the majority of the subjects were females. Statistical analysis showed that there is no statistical significance (P value > 0.05).

Table 2: Mean Age According to the Study Group

				95% CI for Mean			
	Mean	**SD**	**Std. Error**	**Lower**	**Upper**	**Min**	**Max**
PRE INFILTRATION	47.51	14.532	2.166	43.15	51.88	23	80
POST INFILTRATION	48.69	15.768	2.351	43.95	53.43	19	77
Total	48.1	15.089	1.59	44.94	51.26	19	80

Mean age in the two study groups were 47.51 and 48.69 respectively. Minimum duration of surgery in the pre infiltration group was 1.5 hours and the maximum is 3 hours. In post infiltration group it was 1.5 and 4 hrs respectively. Mean Visual Analogue Score (VAS) was found to decrease as time advances at 2 hours (pre / post - 4.49 / 5.58; SD - 1.342 / 1.32), 4hrs (pre / post - 3.87/5.09; SD-1.16 / 1.18), 8 hrs (pre / post - 3.09 / 4.71; SD - 1.041 / 1.141), 12hrs (pre / post - 2.36 / 3.69; SD - 0.743 / 1.104), 24hrs (pre / post - 1.58 / 2.49; SD - 0.621 / 0.944). The P value was < 0.001.

Table 3: Mean Vas Score According to the Study Group

					95% CI for Mean				
		Mean VAS	**SD**	**Std. Error**	**Lower**	**Upper**	**Min**	**Max**	**P value**
2 HRS	PRE INFILT.	4.49	1.342	0.2	4.09	4.89	2	7	
	POST INFILT.	5.58	1.323	0.197	5.18	5.98	3	8	<0.001
	Total	5.03	1.434	0.151	4.73	5.33	2	8	
4 HRS	PRE INFILT	3.87	1.16	0.173	3.52	4.22	2	6	
	POST INFILT	5.09	1.184	0.176	4.73	5.44	3	7	<0.001

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	Total	4.48	1.317	0.139	4.2	4.75	2	7	
8 HRS	PRE INFILT	3.09	1.041	0.155	2.78	3.4	1	5	
	POST INFILT	4.71	1.141	0.17	4.37	5.05	2	7	<0.001
	Total	3.9	1.358	0.143	3.62	4.18	1	7	
12 HRS	PRE INFILT	2.36	0.743	0.111	2.13	2.58	1	4	
	POST INFILT	3.69	1.104	0.165	3.36	4.02	2	6	<0.001
	Total	3.02	1.151	0.121	2.78	3.26	1	6	
24 HRS	PRE INFILT	1.58	0.621	0.093	1.39	1.76	1	3	
	POST INFILT	2.49	0.944	0.141	2.21	2.77	1	5	<0.001
	Total	2.03	0.917	0.097	1.84	2.23	1	5	

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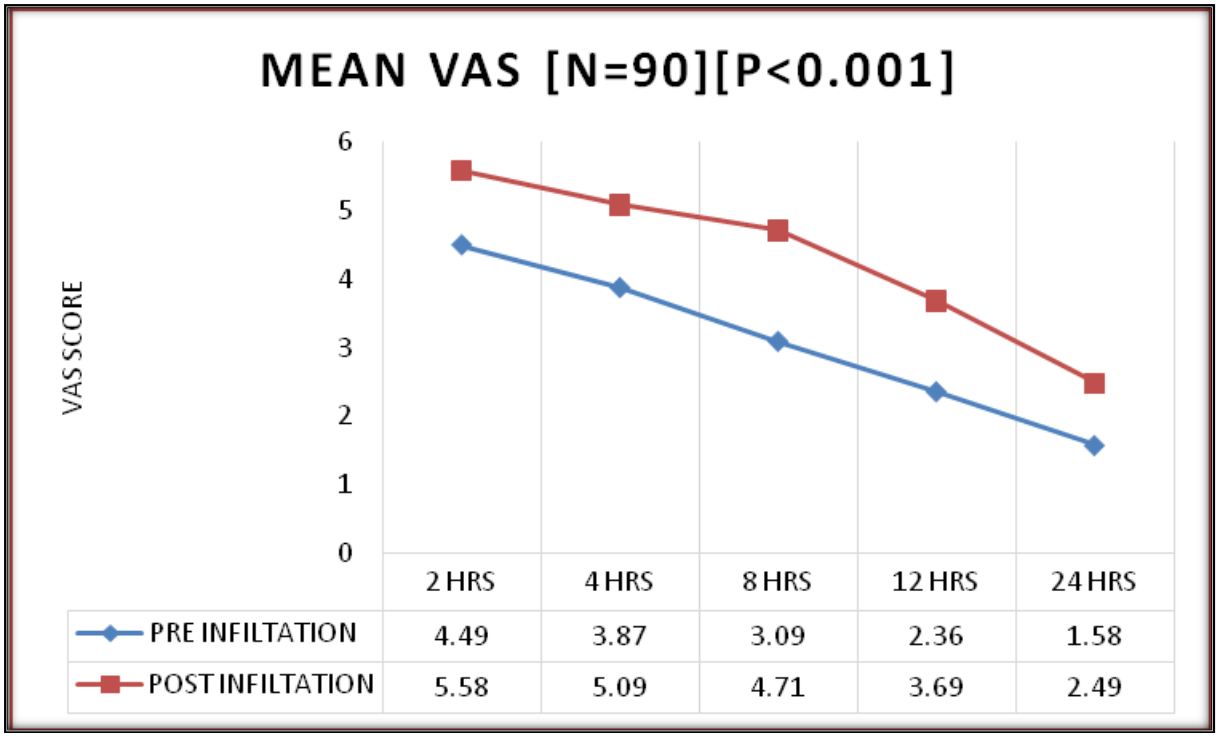

Figure 1: Line plot chart with mean VAS score

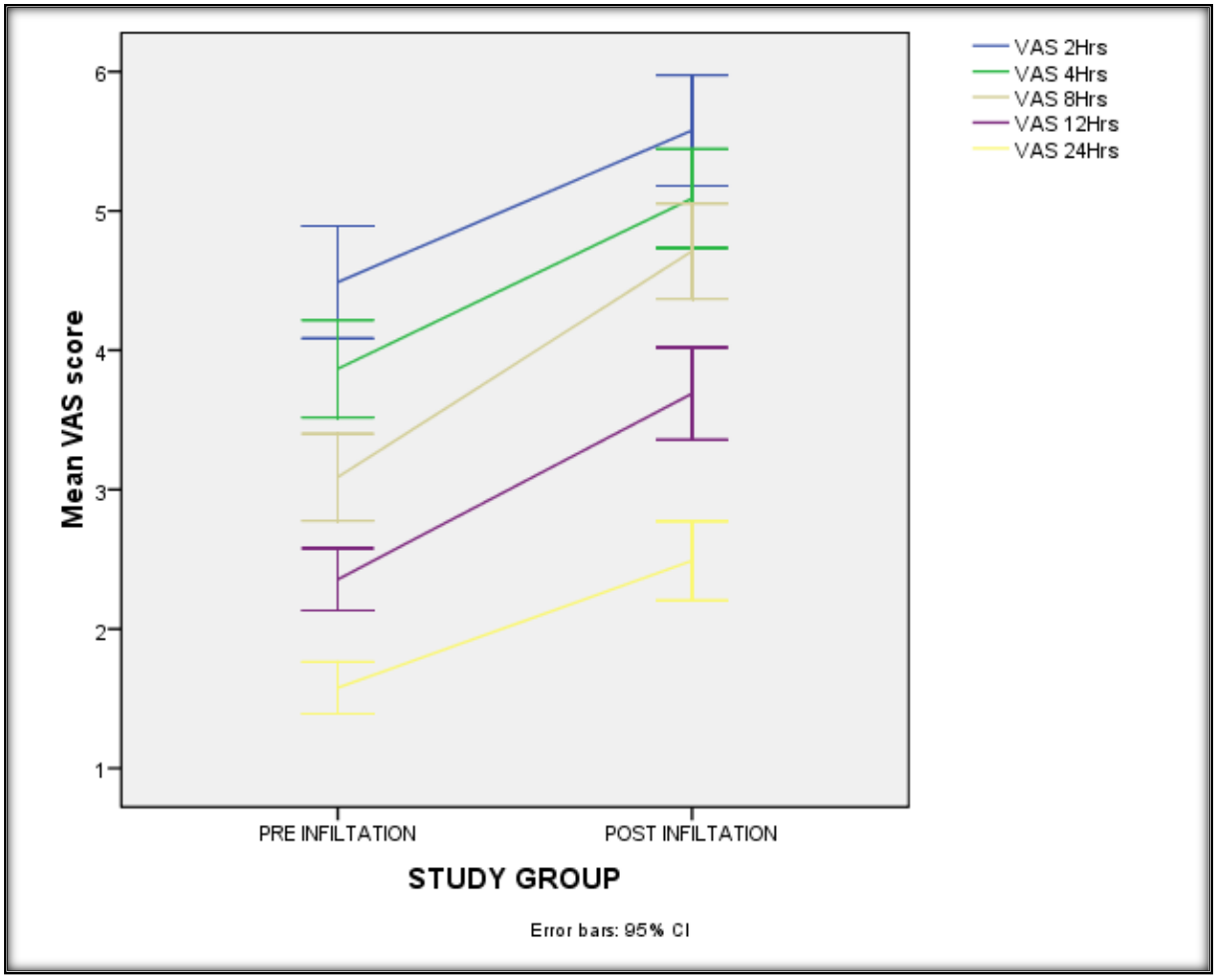

Figure 2: Error plot chart with Mean VAS against the study group

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Table 4: Mean VAS Score in the Pre Infiltartion Group

				95% CI for Mean				
	Mean VAS	**SD**	**Std. Error**	**Lower**	**Upper**	**Min**	**Max**	**Sig**
2 HRS	4.49	1.342	0.2	4.09	4.89	2	7	
4 HRS	3.87	1.16	0.173	3.52	4.22	2	6	
8 HRS	3.09	1.041	0.155	2.78	3.4	1	5	<0.05
12 HRS	2.36	0.743	0.111	2.13	2.58	1	4	
24 HRS	1.58	0.621	0.093	1.39	1.76	1	3	

Mean VAS score in the pre infiltration group at 2 hrs (MIN/ MAX-2/7), 4 hrs (MIN/ MAX-2/6), 8 hrs (MIN/ MAX-1/5), 12 hrs (MIN/ MAX-1/4), and 24 hrs (MIN/ MAX-1/3) are shown above. The P value was less than 0.005, showing statistical significant.

Table 5: Mean VAS Score in Post Infilatartion Group

				95% CI for Mean				
	Mean VAS	**SD**	**Std. Error**	**Lower**	**Upper**	**Min**	**Max**	**P Value**
2 HRS	5.58	1.323	0.197	5.18	5.98	3	8	
4 HRS	5.09	1.184	0.176	4.73	5.44	3	7	
8 HRS	4.71	1.141	0.17	4.37	5.05	2	7	<0.001
12 HRS	3.69	1.104	0.165	3.36	4.02	2	6	
24 HRS	2.49	0.944	0.141	2.21	2.77	1	5	

Mean Vas score in the Post infiltration group at 2hrs (MIN/MAX-3/8), 4hrs (MIN/MAX-3/7), 8hrs (MIN/MAX-2/7), 12hrs (MIN/MAX-2/6), and 24hrs (MIN/MAX-1/5) are shown above. The P value is <0.001 and is statistically significant.

Table 6: Association of Analgesic with the study Group

	ANALGESIC	**PRE INFILTRATION.**	**POST INFILTRATION**	**Total**	**P Value**
2 HRS	YES	34	41	75	
	NO	11	4	15	<0.05
4 HRS	YES	25	37	62	
	NO	20	8	28	<0.01
8 HRS	YES	10	35	45	
	NO	35	10	45	<0.001
12	YES	2	23	25	

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HRS	NO	43	22	65	<0.001
24 HRS	YES	1	7	8	
	NO	44	38	82	<0.05

Analgesic requirement in the study group at 2hrs (Pre / Post – YES / NO – 34 / 41 & 11 / 4), 4hrs (Pre / Post – YES / NO – 25 / 37 & 20 / 8), 8 hrs (Pre / Post – YES / NO – 10 / 35 & 35 / 10), 12 hrs (Pre / Post – YES / NO – 2 / 23 / 43 / 22) and at 24 hrs (Pre / Post – YES / NO – 1 / 7 & 44 / 38) are shown above.

The P value is < 0.05 and < 0.001 are considered statistically significant. Analgesic requirement was found to be more in post than in pre infiltration group at 2 hrs (POST / PRE - 91 / 76 %), 4hrs (POST / PRE – 82 / 56%), 8 hrs (POST / PRE – 78 / 22 %), 12 hrs (POST / PRE – 51 / 4%) and at 24 hrs (POST / PRE – 16 / 2%). Mean VAS score with Analgesia in study group at 2 hrs, 4hrs, 8hrs, 12hrs and at 24hrs are shown below. P value was less than 0.05 was considered significant and 0.001 as highly significant.

Table 7: Mean VAS Score after Analgesia in Study Group

		ANALGESIC - YES			**ANALGESIC - NO**		
	Group	**Mean**	**SD**	**P value**	**Mean**	**SD**	**P value**
2 HRS	PRE INFILT.	4.85	1.282		3.36	0.809	
	POST INFILT.	5.71	1.309	>0.05	4.25	0.5	>0.05
4 HRS	PRE INFILT.	4.28	1.137		3.35	0.988	
	POST INFILT.	5.38	1.063	>0.05	3.75	0.707	>0.05
8 HRS	PRE INFILT.	3.3	0.949		3.03	1.071	
	POST INFILT.	5.06	0.938	<0.05	3.5	0.972	>0.05
12 HRS	PRE INFILT.	3	0		2.33	0.747	
	POST INFILT.	4.04	1.224	>0.05	3.32	0.839	>0.05
		2	0		1.57	0.625	

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24 HRS	PRE INFILT.						
	POST INFILT.	3	0.577	>0.05	2.39	0.974	>0.05

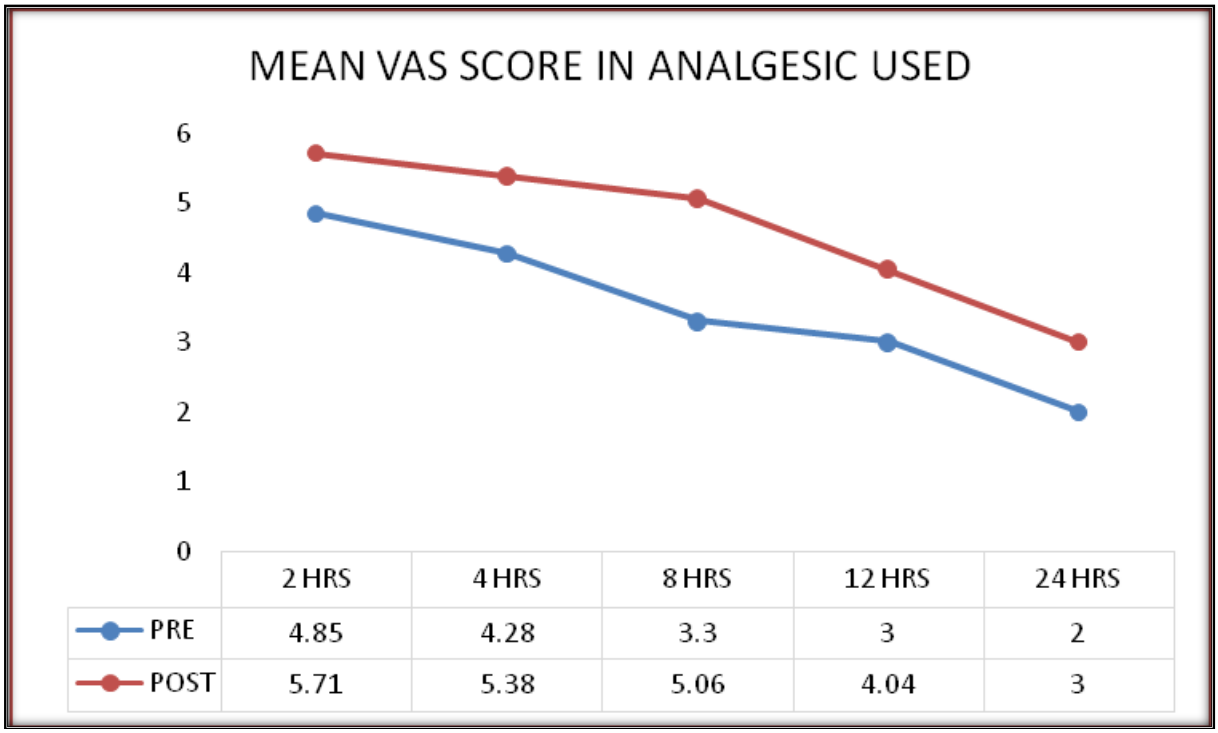

Figure 3: Mean vas Score with Analgesia in the Study Group

Mean VAS score and analgesic requirement were found to be less in the pre infiltration group, compared to post infiltration and was found to decrease with time. However, the decrease was found to be more in pre infiltration compared to post infiltration group. Analgesic requirement was found to be more in the post infiltration group compared to the pre infiltration group.

DISCUSSION

Following induction of anaesthesia, subjects in group 1 or pre infiltration group, were infiltrated with the local anaesthetic, 0.25 % bupivacaine, at the incision site, before the creation of the port. Group 2, or the post infiltration group, received the local anaesthetic, as above, after completion of the procedure and following closure of the ports. Visual Analogue Scores (VAS) were measured at regular intervals, at 2 hours, 4 hours, 8hours, 12 hours and at 24 hrs. The frequency of rescue analgesia was also recorded in each group with the help of the surgical ICU and ward staff. Post-operative data collection was blinded to the investigator, in order to avoid bias. It was observed that patients in pre infiltration group, have a less mean VAS score compared to those in post infiltration group.

Mean VAS scores in the pre infiltration group at 2 hrs (MIN / MAX – 2 / 7), 4 hrs (MIN / MAX – 2 / 6), 8 hrs (MIN / MAX – 1 / 5), 12 hrs (MIN / MAX - 1 / 4), 24 hrs (MIN / MAX – 1 / 3). As compared to mean Vas score in the Post infiltration group 2 hrs (MIN / MAX – 3 / 8), 4 hrs (MIN / MAX – 3 / 7), 8hrs (MIN / MAX – 2 / 7), 12hrs (MIN / MAX – 2 / 6), and at 24hrs (MIN / MAX – 1 / 5). The frequency of rescue analgesia was also less in pre infiltration group as compared to the post infiltration group. Requirement is found to be more in post, than in pre infiltration group at 2 hrs (POST / PRE – 91 / 76 %), 4 hrs (POST / PRE – 82 /56 %), 8 hrs

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(POST / PRE – 78 / 22 %), 12 hrs (POST / PRE – 51 / 4%) and at 24 hrs (POST / PRE – 16 / 2 %). P value less than 0.05 was considered significant and < 0.001 was highly significant. Several analgesic interventions with varying targets and mechanisms have been investigated for their influence on early pain after laparoscopic cholecystectomy. The requirement of analgesia will vary in different laparoscopic procedures and according to the number of ports used.

Therefore the validity of studies which includes all laparoscopic procedures, and non-procedure specific analyses, is questionable. Therefore, it is proposed that analgesic data and optimized analgesic treatment should be specific for the type of surgical procedure. In addition, growing evidence suggests that treatment of postoperative pain should be multimodal and opioid sparing to accelerate recovery and avoid potential side effects. There are numerous arguments for a procedure-specific assessment of the evidence of analgesic treatment after laparoscopic cholecystectomy. Postoperative pain is reduced when compared with traditional open cholecystectomy. But effective analgesic treatment after laparoscopic cholecystectomy has remained a challenge to the surgeons.[9] Literature review has shown that pain is the main reason for staying overnight in the hospital, in 17–41% of the patients, following laparoscopic cholecystectomy, when done as a day case. Pain is the dominant complaint and the primary reason for prolonged convalescence after laparoscopic cholecystectomy. It has been hypothesized that intense acute pain after laparoscopic cholecystectomy may predict development of chronic pain (e.g., post laparoscopic cholecystectomy syndrome).[10] However, this fact has not been borne out by prospective studies. The fact that acute pain after laparoscopic cholecystectomy is complex in nature and does not resemble pain after other laparoscopic procedures suggests that effective analgesic treatment should be multimodal. Detailed prospective studies in individual laparoscopic procedures such cholecystectomy, gynecologic procedures, hernia repair, and fundoplication have shown procedure-related individual pain patterns requiring procedure-specific analgesic treatment regimens. Laparoscopic cholecystectomy is now the treatment of choice for symptomatic cholelithiasis. The postoperative pain accompanied with this less invasive surgical intervention is commonly less severe, lasting less time than that after an open traditional cholecystectomy. Postoperative pain of this situation is an important issue mainly in the early postoperative period, causing lengthening of postoperative hospital stay. This type of postoperative pain attains a peak during the first few hours and a decrease in time. In laparoscopic cholecystectomy, overall pain is a combination of three different and clinically separate components. They include incisional pain (somatic pain), visceral pain (deep intraabdominal pain), and shoulder pain (referred visceral pain). The overall pain after laparoscopic cholecystectomy carries a high inter individual variability, both in intensity and duration and it is largely unpredictable. Pain is most intense on the day of surgery and on the following day. It subsequently declines to low levels within 3 to 4 days. However, pain may remain severe in approximately 13% of patients throughout the first week after laparoscopic cholecystectomy. In a recent systematic review of postoperative analgesia, the role of timing of treatment for postoperative pain relief was investigated, and in particular, preemptive analgesia. In this study timing of intervention refers to analgesic treatment at start of surgery versus at the end of the procedure. Local anesthetics prevent transmission of nerve signals from the trauma site to the spinal cord and also reduce neurogenic local inflammation at the trauma site. A meta-analysis showed that with respect to incisional instillation, seven out of eight trials favored the use of incisional local anesthetics. However, the methodology and the quality of the trials, were moderate or low. In four of the eight studies, incisional local anesthetics had significant opioid-sparing effects. A quantitative systematic analysis of postoperative visual analog scale pain scores from selected trials found significant analgesia within 0–6 h, 6–12 h, and even 12–24 after laparoscopic cholecystectomy compared with controls. These investigations used various doses and application sites, and the

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study quality was questionable. Conclusions on the exact analgesic duration are difficult, but median analgesic duration is at least 2–3 h after the end of surgery. Two trials investigated the effect of preemptive analgesic treatment but failed to show advantages of local anesthetics administered before incision as opposed to administration at the end of surgery.[11,12,13,14] Intraperitoneal instillation of local anaesthetic is also done to alleviate post-operative pain. The analgesic effects of intraperitoneal local anesthetic blockade after laparoscopic cholecystectomy versus placebo have been investigated in 24 randomized trials. Nine trials showed no difference and 15 trials demonstrated significant analgesic benefit. A recent study suggested a statistically significant weighted mean difference of 13 mm in visual analog scale scores in favor of intraperitoneal local anesthetic compared with placebo after laparoscopic cholecystectomy. However, a quantitative analysis of pooled data suggested that early instillation of intraperitoneal local anesthetics provided better postoperative pain control compared with instillation at the end of surgery. Here again pre-emptive analgesic treatment seem to have some beneficial effect. In a randomized trial conducted by Bisgaard et al, near-maximum dose of local anesthetic or placebo were administered. Ropivacaine (or saline as placebo) was infiltrated into the port incisions and ropivacaine (or saline) at several sites intra-peritoneally. Both treatment groups were given NSAIDs and acetaminophen in fixed doses and opioids when needed. It was found that the local anesthetic regimen significantly reduced incisional pain during the first 3 h postoperatively. No analgesic benefits on visceral pain or shoulder pain were found, but the overall pain was significantly reduced during the first 2 postoperative hours.[15] The patients who had ropivacaine, also had decreased opioid requirements during the first 3 postoperative hours. Nausea was significantly reduced in the ropivacaine group compared with the placebo group. These findings were later replicated in a similar trial by Lee et al.[16] Pain in post-laparoscopic cholecystectomy has a multifactorial origin. It originates from the incision area (somatic pain), from the gall bladder site (visceral pain) and due to pneumoperitoneum. The exact source of pain following laparoscopic techniques is at times, not discernable. Placement of trocars via the abdominal wall is the primary one, although intraperitoneal dissection and CO2 insufflations (with distension of abdominal wall and lengthened elevation of diaphragm, and in addition, with the patient being in head up position) cause the most of pain. Surgeons are aware of the analgesic effect of opiates in postoperative analgesia, but there are adverse effects. Somatovisceral local anesthetic protocols decrease incisional pain after laparoscopic cholecystectomy. Local anesthetic drugs cause antinociception by acting on the nerve membrane. They reversibly reduce the rate of depolarization and repolarization of excitable membranes (nociceptors). There are various local anesthetic agents administration routes, such as local parietal anesthesia, for potent control of postoperative pain. The use of local long lasting anesthetic decreases postoperative pain. Bupivacaine is one such effective local anesthetic. Patients can have an additional advantage from an intra-incisional local tissue infiltration of this anaesthetic. Bupivacaine has a half-life of 2.5 to 3.5 hours and has been shown to provide pain relief for a mean of six hours. The limit of safety of bupivacaine need for anesthesia is large. At the upper margin of 2.5mg / kg, 100 mg of bupivacaine may be administered safely in a patient with a lean body mass of 40 kg. Regarding the timing of local anesthetic administration during surgery, there are questions to be answered. Some have demonstrated no significant difference between the time of discharge and postoperative pain, while others showed that the timing of local anesthetic administration is important. In a study done at a tertiary care hospital, the authors assessed intra incisional infiltration of bupivacaine, before incision making and after incision suturing. It was shown that intra incisional infiltration of bupivacaine before incision making is a more potent method than after making the incision in managing postoperative abdominal pain after laparoscopic cholecystectomy. These conclusions were in accordance with those of Sarac et al. who compared incisional infiltration before surgery and incisional infiltration of local

ISSN: 0975-3583,0976-2833 VOL14, ISSUE 08, 2023

anesthetic at the end of surgery. They showed a more significant decrease in postoperative abdominal pain after intra incisional local infiltration of the anesthetic before the commencement of surgery. In their work, the mean pain intensity was 5.1 and 5.9 in the preoperative and postoperative groups, respectively. In the postoperative group, 50% of patients and 28% of patients in the preoperative group, needed analgesics ($P<0.05$). Seyyed et al. showed that 65% of patients responded effectively to local anesthetic infiltration for laparoscopic cholecystectomy without any requirement for non-steroidal anti-inflammatory agents or opiates. In the same study, only 5% needed opiates and 35% needed NSAIDs. The administration of local anaesthetic infiltration before the start of surgery delayed the time of the first administration of opiates and NSAIDs. In their control group which did not receive local anesthetic infiltration, 85% of patients needed opiates and 15% of patients needed NSAIDS. In a study conducted at Italy, it was found that there was a significant difference in the requirement of intravenous dose of Ketorolac between the two groups. In the pre-incisional group, the consumption of the analgesic drug was lower than in post incisional group. The pain was less intense in nature, during the first 24 to 48 hours. Local anesthetic agents used adequately may reduce the requirements for opiates in some situations and abolishes their need in others, which is why it is considered to be one of the main techniques for reducing adverse effects of opiates. Others, who used pre-incision local infiltration of bupivacaine, demonstrated the significant decrease of pain and analgesic needs post-laparoscopic cholecystectomy. Although minimal invasive surgery has reduced pain, it is not painless. We expected the action of bupivacaine to stop after six to eight hours. But there was no increase in pain severity at 24 hours postoperatively. The main action of bupivacaine was amelioration of pain peak during the first six hours after surgical intervention. If laparoscopic cholecystectomy is to be performed as an outpatient surgery, early postoperative pain must be managed well. Pre incisonal infiltration is a form of pr-emptive analgesia where the treatment is initiated before the surgical procedure, in order to reduce the sensitization. This is referred to as 'Spinal Allodynia'. Owing to this 'protective' effect on the nociceptive system, pre-emptive analgesia has the potential to be more effective than a similar analgesic treatment initiated after surgery. The immediate postoperative pain may be lowered and the development of chronic pain can be prevented. Many studies suggest that it may be possible, and preferable, to prevent or 'pre-empt' the neurophysiological and biochemical consequences of a noxious input to the CNS rather than to begin treatment when these consequences are already established. This kind of local anesthesia infiltration may decrease nursing and hospital costs, has less adverse effects and has no sedative action, which therefore leads to early recovery. Our study has a few limitations. The sample size is small. The inclusion and exclusion criteria limit patients undergoing laparoscopic cholecystectomy, with no major comorbid conditions and with appropriate body mass index Bupivacaine helps to reduce the intensity of the nociceptive stimuli generated at the time of incision. This could explain the efficacy of pre emptive administration of the drug at the trocar sites. The authors of other studies also recommend administering the local anesthetic drugs before the post site incisions are made during the surgery.

CONCLUSION

Local anesthetic drugs, if used appropriately, can decrease administration of narcotics in most of the patients. Port site infiltration of local anaesthetic is a simple method by which postoperative pain can be reduced. The frequency and dosage of narcotics being used for such patients can be considerably reduced and consequently the deleterious effects which follow the usage of narcotics.

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ISSN: 0975-3583,0976-2833 VOL14, ISSUE 08, 2023

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