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Evaluation of Intraperitoneal Bupivacaine for Pain Relief after Laproscopic Cholecystectomy

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Abstract
Background:- *Cholecystectomy is now widely practised. There are various methods of pain relief.*
Aim of our study *is to asscess the analgesic effect of intraperitoneal bupivacaine in laproscopic cholecystectomy.*
Material and Method:- *A prospective randomized study was conducted in which patients were enrolled for group1 (20 ml of saline injected) and group 2 (20 ml of 0.5% of bupivacaine with adrenaline injected). Postoperative pain was assessed by VAS at regular interval, shoulder pain, and requirement of analgesic.*
Results:- *results shows that VAS score was significantly low (p= <0.001) in group 2 at 1,4 and 8 hrs. Pain was low but not statistically significant in 12 and 24 hrs.*
Conclusion:- *intraperitoneal bupivacaine reduces pain in initial postoperative period after laproscopic cholecystectomy.*
Keywords:- *bupivacaine, intraperitoneal, laproscopic, VAS score.*

Introduction

Laproscopic cholecystectomy is now an well-established form of treatment for patients with symptomatic gallstone. Patient may experienced considerable pain after Laproscopic cholecystectomy[(1,2)]. As it is relatively new procedure, there is no general agreements as effective postoperative pain control. The various methods use are NSAIDs [(3)], infiltration of local anaesthesia[(4)], and intermittent intramuscular narcotics[(5)]. It is recognised that laproscopic shoulder tip pain is a common complaint and may delay discharge from hospital[(6)] .

Narchi et al observed reduction in postoperative shoulder pain in minor gynaecological surgery after intraperitoneal instillation of local anaesthesia [(7)].

The present study was conducted in patients undergoing laproscopic cholecystectomy using 20ml of 0.5% bupivacaine with adrenaline 1:200000.

Material and Method

The study was conducted in dept. of surgery in index medical college hospital and research centre, Indore from period 1 jan 2015 to 31 dec 2015.after taking approval from hospital ethical committee.

Study was performed in 40 consecutive patients listed for elective laproscopic cholecystectomy for symptomatic gallstone surgery

Patient selected are level ASA 1 and 2 .

Age group between 20 to 65 of either sex

Exclusive criteria are acute cholecystitis, patient who did not give consent and those who did not understand VAS.

Patients were randomized into one of two group

Group A patient received 20ml of 0.9% normal saline as placebo (n=20)

Group B patient received 20ml of 0.5% bupivacaine with adrenaline 1:200000 (n=20)

All operation were performed by a single surgeon by using four port techniques The local anaesthetic or placebo solution was sprayed on the upper surface of liver, on right sub diaphragmatic space to allowed to diffuse into the hepatodiaphragmatic space , near and above the hepatodudenal ligaments and above the gallbladder fossa. And also the drug was instilled before deflation of pneumoperitoneum and in 20^0 head down tilt maintained for 20 minutes

This was done using irrigation catheter inserted via subcostal port under direct laproscopic vision.

Postoperatively the patients were assessed for pain utilizing visual analogue score, shoulder pain and number of analgesic dose required. Above parameter were assessed at 1, 4,8,12 and 24 hrs.

The VAS consist of a 10cm scale representing varying intensity of pain from 0 (no pain) to 10 (worst imaginable pain).

Rescue analgesic consist of inj. Diclofenac 75mg/ml utilized when VAS was more than 6.

The BP, HR, and RR were also assessed at above time.

Result

The characteristics of the both patient group, including factors likely to increase postoperative pain, such as bile spillage from punctured gallbladder, or difficult dissection due to adhesion from previous surgery, are shown in table 1. There was no difference in characteristics between these groups.

Both the groups were comparable for age, sex and preoperative vital signs.

The VAS was higher in group 1 as compare to group 2 at 1hr ($p<0.001$), 4^{th} hr ($p<0.001$) and 8^{th} hr ($p<0.05$) postoperative hour and difference was statistically significant. At12th and 24^{th} hr VAS was not significantly difference.table2

None of the patients in either of the groups had shoulder pain up to 8 hours postoperatively. At 12^{th} and 24^{th} hr the number of patient having shoulder pain was higher in group 1 than group 2, however this difference was not statistically significant.

The amount of analgesic requirement was also higher in group 1 then group 2 but difference was statistically significant only 4^{th} hr .

37 patients were discharged the morning after surgery and remaining 3 patients were discharged the same evening.

Table I. Characteristics of patients in the two group

	Saline	Bupivacaine
Number in group	20	20
Age (years)*	45 (15.8)	43(14.7)
Male:female ratio	4:21	3:23
Previous surgery	3	*3*
Gallbladder puncture	*2*	*2*
Length of operation (min)*	39.0 (17.4)	40.6(15.4)
* Mean (± SD)		

Table II. Visual analogue pain scores in the two groups*

Time after surgery	1 h	4 h	8 h	12 h	24 h
Saline	3.55	2.87	1.69	1.52	0.12
Bupivacaine	1.73	1.12	2.41	1.48	0.16
P#	< 0.001	< 0.001	<0.05	NS	NS
* Mean pain scores		# Student's t test			

Discussion

The results of the present study demonstrate that intraperitoneal instillation of bupivacaine with adrenaline produced lower VAS upto 8 hours postoperatively. The postoperative analgesic requirements are also less but there is no difference in the shoulder pain between the two groups.

Utilizing 20 ml of either 0.25% bupivacaine or 0.5% of lignocaine, Rademaker et al[(1)] failed to demonstrate any reduction in postoperative pain. A possible explanation of the failed effect given by them was the small amount of local anaesthetics used as compared to Narchi et al.[(7)]

Visceral pain accounts for the major discomfort experienced in early postoperative periods whereas shoulder tip pain become main complaint on second day.[(2)]

Keeping in view the importance of positioning while instilling the local anaesthetic Scheinin et al. administered100ml of either 0.15% plain bupivacaine or with adrenaline in 20^0 head down tilt maintained for 20 minutes.[(8)] They found no relief of pain after laproscopic cholecystectomy. The lack of analgesic efficacy can be attributed to the lower concentration of bupivacaine used and more extensive and long duration of surgery compared to gynaecological laproscopies.

Using 20ml of 0.5% bupivacaine ,Pasqulucci et al noted a decrease in pain and consumption of analgesics probably due to a complete block using of afferents higher concentration and volumes than used by other authors.[(9)]

It is the concentration of solution which is important in laproscopy cholecystectomy rather than volume. Also drug in was instilled 20^0trendelberg position so as to encourage its accumulation in gall bladder bed.

Our study relief in pain was noted up to 8 hrs. postoperatively. Chundrigar et al also noted pain relief only up to 2hr with intraperitoneal administration of 0.25% bupivacaine [(10)]. This could be related to the lower concentrations used by them compare to our study.

Conclusion

Intraperitoneal bupivacaine instillation for laproscopic cholecystectomy reduces pain in the initial postoperative period, it is easy to administer with no adverse effects and may become a routine practice for procedure.

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