

Multimodal Analgesia after Laparoscopic Cholecystectomy; A Comparative Study Between Three Different Techniques

F.A.Abd El- Fatah , E.F.Gad Allah, E.S.Abd El-Azeem and E.M.Abd ElAzeem

Anesthesiology and ICU Dept., Faculty of Medicine, Benha Univ., Benha, Egypt

E-Mail: drfatmaahmed86@gmail.com

Abstract

Patients undergoing laparoscopic cholecystectomy often experience severe post-operative pain and may develop into chronic pain. current study compared the efficacy and safety of intraperitoneal instillation of bupivacaine alone, intraperitoneal instillation of bupivacaine and dexmedetomidine; and ultra-sound guided transversus abdominis plane block for post-operative pain relief after laparoscopic cholecystectomy. This prospective study was conducted on 90 patients undergoing laparoscopic cholecystectomy. Patients were randomized into three groups: group I [n=30]: patients will be given Intraperitoneal bupivacaine 50 ml 0.25%; group II [n=30]: patients will be given Intraperitoneal bupivacaine 50 ml 0.25% + dexmedetomidine 1µg/kg and group III [n=30]: patients Will receive bilateral in-plane ultrasound guided transversus abdominis plane block with of bupivacaine 0.25% . At the end of surgery. Postoperative VAS pain scores, time to first analgesic requirement, total dose of rescue analgesic, hemodynamic parameters and incidence of postoperative nausea and vomiting were all recorded. VAS scores were significantly lower in group III and group II compared with group I postoperative. Total dose of rescue analgesic was significantly lower in group III compared with group II and group I. Time to the first analgesic dose was significantly longer in group III and group II compared to group I . There was increased incidence of postoperative nausea and vomiting in group III. T A P block is more effective in postoperative analgesia.

Keywords: Postoperative analgesia, Laparoscopic cholecystectomy, Intraperitoneal instillation, T A P block.

1. Introduction

More than 80% of patients undergoing surgical methods encounter intense postoperative torment and mossycup oak about them report card the seriousness Similarly as moderate, severe, or amazing [1].

Post-agent torment then afterward laparoscopy contrasts Extensively from that seen then afterward laparotomy. Laparotomy effects basically in parietal agony [abdominal wall], while ache On laparoscopy effects starting with extending of the intra-abdominal cavity, perithelium inflammation, Also diaphragmatic aggravation created Eventually Tom's perusing remaining carbon-dioxide in the peritoneal [2].

A lot of people alternatives need aid accessible for the medication of postoperative agony to laparoscopic cholecystectomy [L C], including systemic [i. E. , opioid Also non-opioid] analgesics Also territorial [i. E. , neuraxial What's more peripheral] pain relieving strategies [3]. Territorial anesthesia Also absense of pain could a chance to be used to fundamentally diminish postoperative agony scores Also save the utilization from claiming systemic opioids [4].

2. Patients and methods

After the approval of the institutional ethical committee of Benha university hospital, this Prospective, single blind randomized study was conducted on 90 patients with laparoscopic cholecystectomy, between the age of 18–60 years old, American Society of Anesthesia [ASA] I and II, undergoing laparoscopic cholecystectomy operation. Refusal to participate, Morbid obesity, renal insufficiency, generalized or local infection and ASA physical status III-IV were excluded.

The participants were allocated into three groups of 30 in each by a random sequence number generated by

the computer kept in sealed envelopes. group I [n=30]: patients will be given Intraperitoneal bupivacaine 50 ml 0.25%; group II [n=30]: patients will be given Intraperitoneal bupivacaine 50 ml 0.25% + dexmedetomidine 1µg/kg and group III [n=30]: patients Will receive bilateral in-plane ultrasound guided transversus abdominis plane block with of bupivacaine 0.25% .

Preanesthetic investigations were fulfilled in all patients, Patients were pre-medicated with IV midazolam 0.02 - 0.05 mg/kg , 10 minutes before the operation an 18-gauge intravenous [IV] catheter was inserted.

Pre-oxygenation with 100% oxygen [O₂] was done for 3 min. General anesthesia was induced with fentanyl 1-2 mcg/kg and propofol 2–3 mg/kg followed by rocuronium 0.5–0.8 mg/kg to facilitate endotracheal intubation.

Anaesthesia was maintained with isoflurane 1.2% and rocuronium 0.15 mg/kg as a maintenance dose every 30 minutes till the end of the procedure.

Heart rate was continuously monitored and mean arterial blood pressure [MAP] was measured every 5 minutes throughout the procedure .

2.1. At the end of the surgery

the study solution was given intraperitoneally before removal of trocar in Trendelenburg's position, into the hepato-diaphragmatic space, on gall bladder bed and near and above hepatoduodenal ligament in group I and group II. Regional block was induced in group III as following bilateral in-plane ultrasound guided transversus abdominis plane block with of bupivacaine 25% with the same volume as group I and group II.

Reversal of neuromuscular block was done using neostigmine 0.04- 0.07 mg/kg and atropine 0.02 mg/kg. The patient was extubated after fulfilling the criteria of full reverse. After emerging from anesthesia, the patient

was transferred to the post anesthesia care unit [PACU] for a 24 hours observation period.

Postoperative analgesia regimen was standard in all groups. Primary outcome measure included Pain rescue-analgesia consumption in the first 24 hours [time of first rescue analgesic, total rescue analgesic requirement].

2.2 Statistical analysis

The clinical data were recorded on a report form. These data were tabulated and statistically analysed using the computer program SPSS [Statistical package for social science] version 20

3. Results

Ninety patients were recruited in this study, 30 patients in each group. As regards age, weight, height and ASA status, current study showed no significant statistical difference between both groups with P-value > 0.05

Regarding comparison of VAS in the three groups, VAS was lower in group III than group II and it was

lower in group II more than group I when measured at rest and on patient's movement at 6, 12 and 24 hours post-operatively [p - value < 0.001] so there was a statistically significant differences in the post-operative period between these groups Table (1) , as shown in Fig (1) and Fig (2).

As regard, morphine consumption; which includes the time of first rescue analgesia and total dose of morphine consumption during 24 hours postoperative, current study showed longer duration of analgesia in group III. Also, the total dose of morphine consumption was lower in group III

As regard MAP :- At 6 , 12 and 24 hours the patients in group III and group II were hemodynamically stable more than group I as MAP was high in group I more than group III and group II .

As regard heart rate:- At 6, 12 and 24 hours the patients in group III and group II were hemodynamically stable more than group I as heart rate was high in group I more than group III and group II .

Table (1) Visual analogue scale in all groups during 24 hours post-operative

Post-operative Visual analogue scale		Group I	Group II	Group III	p-value
On arrival to PACU	At rest	0.5[0-1]	0[0-1]	0[0-1]	P=0.56
	On movement	0[0-1]	1[0-1]	2[2-3]	p= 0.055
One hour	At rest	1[0-1]	0[0-1]	0[0-1]	P= 0.26
	On movement	1[0-1]	1[1-1.25]	2[1-3]	P = 0.49
Two hours	At rest	1[1-2]	1[1-2]	1[0-2]	P =0.23
	On movement	0[0-1]	1[0-1]	2[1-3]	P =0.37
6 hours	At rest	2[2-3]	2[1-2]	1[1-2]	P <0.001**
	On movement	3[3-3]	2[2-2]	2[1-3]	p<0.001**
12 hours	At rest	4[3-4]	3[3-3]	2[2-3]	P<0.001**
	On movement	5[4-5]	3[3-3]	3[2-3]	p<0.001**
24 hours	At rest	5[5-6]	4[3-4]	4[2-4]	P<0.001**
	On movement	5[5-6]	4[3-4]	3[2.75-4]	p<0.001**

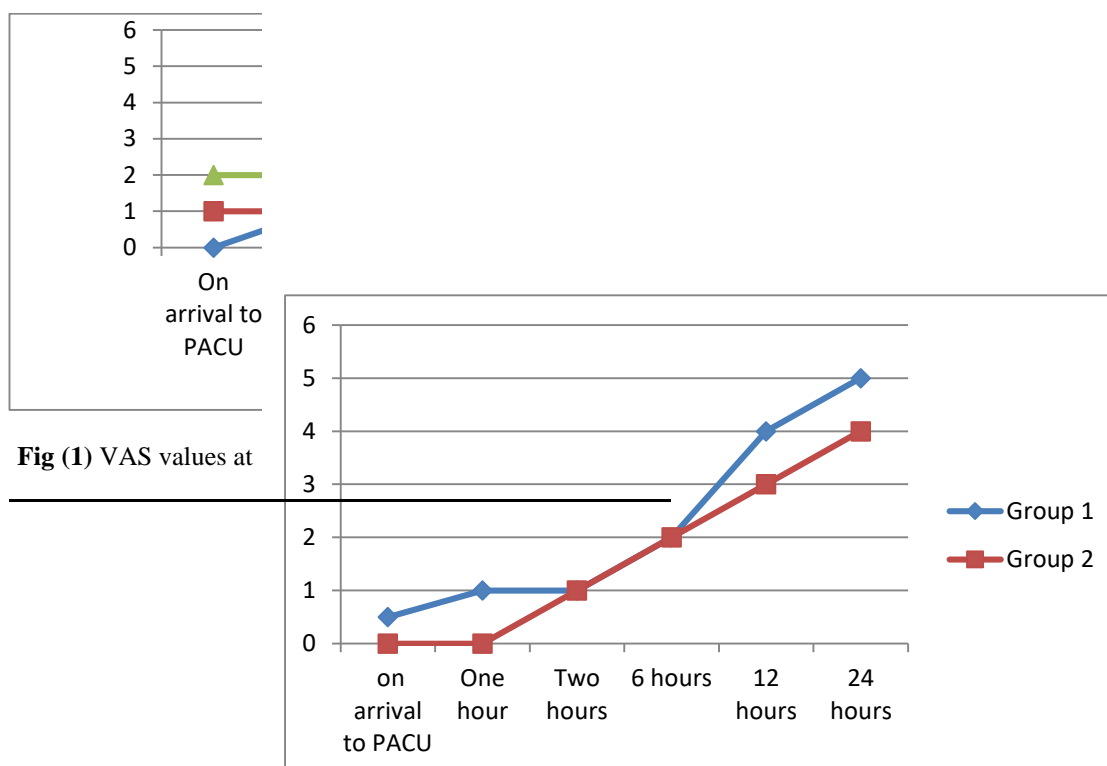


Fig (2) VAS values on patient's movement

4. Discussion

Laparoscopic cholecystectomy brings about lesser postoperative ache or diminished pain relieving utilization compared for open cholecystectomy. However, torment after laparoscopy might be direct alternately indeed extreme to a percentage of patients. Also, it might oblige opioid medicine.

Instillation of an intraperitoneal nearby analgesic to decrease postoperative torment need not be contemplated through randomized trials for more than 10 years. Those recommended components of activity will be that those nociceptive receptors in the peritoneal aggravation need not be blocked. Toward the neighborhood analgesic as well as systemic absorption might happen through those huge peritoneal surface, including a more terrific pain relieving impact [5].

Tap square given compelling analgesia, the point when utilized likewise and only a multimodal pain relieving regimen in the first 24 postoperative hours. Accordingly, tap square decreased the seriousness of postoperative torment in the first 24 postoperative hours toward more than 70%. [6]. In regards to correlation of vas and morphine utilization in the three groups, there were noteworthy contrasts in the post-operative time when measured at rest. Also, once patient's development in 6, 12, and 24 hours post-operatively, at the most part, qualities were easier to clinch alongside assembly iii more than one assembly ii, this may be steady with Ayca Sultan of Swat Sahin who discovered that those prerequisites for postoperative analgesics were essentially easier in the gathering who accepted a bigger volume in any case, an easier centralization of nearby analgesic result [7].

Srinivas Rapolu et al., compared anti-nociceptive impacts about intraperitoneal instillation of bupivacaine plain versus more bupivacaine with dexmedetomidine for patients undergoing laparoscopic cholecystectomy. They discovered that pain scores were essentially more level in the one assembly b. At contrasted with gathering b throughout the whole span of the examine. There might have been statistically noteworthy distinction to pain score during 6, 8, 12, 18, 24 hours then after surgery. Time will be a prerequisite about 1st measurement salvage absence of pain might have been prolonged in the aggregation b [8].

5. Conclusion

TAP block is more effective in postoperative analgesia after laparoscopic cholecystectomy.

References

- [1] T.J. Gan, P. Diemunsch, A.S. Habib, Kovac A, Kranke P, Meyer TA, Watcha M, Chung F, Angus S, Apfel CC, Bergese SD, Candiotti KA, Chan MT, Davis PJ, Hooper VD, *Anesth Analg*, Vol. 118[1], PP 85-113. doi: 10.1213, 2014.
- [2] M.E. Esmat, M.M. Elsebae, M.M. Nasr, Elsebaie SB, Combined low pressure pneumoperitoneum and intraperitoneal infusion of normal saline for reducing shoulder tip pain following laparoscopic cholecystectomy. *World J Surg*, Vol. 30, pp 1969-73, 2006.
- [3] H. Kehlet, J.B. Dahl: The value of "multimodal" or "balanced analgesia" in postoperative pain treatment. *Anesth Analg*, Vol. 77: PP1048, 1998.
- [4] Linda Le-Wendling MD, Olga Nin MD, Xavier Capdevila MD, *Cancer Recurrence and Regional Anesthesia: The theories, the data, and the future in outcomes*, October, Vol. 77, PP1048, 2015.
- [5] A. Trikoupis, T. Papavramidis, E. Kyurdzhieva, I. Kesisoglou, Vasilakos D., Intraperitoneal administration of ropivacaine during laparoscopic cholecystectomy, Vol. 14 AP12-5. *EJA*, PP 27:222, 2010.
- [6] J.G. McDonnell, G. Curley, J. Carney, A. Benton, The analgesic efficacy of transversus abdominis plane block after Caesarean delivery, A randomized controlled trial. *Anesth Analg*, Vol. 106, PP186-91, 2008.
- [7] A. Ayc, Sultan Sahin, Necmiye Ay, Nuri Alper Sahbaz, Mehlika Kocabas, Akay, Yavuz Demiran and Abdurrahim Derbent, analgesic effect of ultrasound-guided transversus abdominis plane block using different volumes and concentrations of local analgesics after laparoscopic cholecystectomy, *Journal of International Medical Research*, Vol. 45[1] PP 211-219, 2017.
- [8] Srinivas Rapolu, K Anil Kumar, and Syed Ali Aasim., A comparative study on intraperitoneal bupivacaine alone or with dexmedetomidine for post-operative analgesia following laparoscopic cholecystectomy, *IAIM*, Vol. 3[12], PP33-40, 2016.