Comparison of post-operative pain relief following use of spinal anesthesia and general anesthesia for patients undergoing laparoscopic cholecystectomy

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Abstract:

Background: Laparoscopic cholecystectomy is a minimally invasive surgical procedure used to remove the gallbladder. The procedure is usually done under general anesthesia and takes about an hour. The present study was conducted to assess post-operative pain relief following use of spinal anesthesia and general anesthesia for patients undergoing laparoscopic cholecystectomy. **Materials & Methods:** 48 patients scheduled for laparoscopic cholecystectomy of both genders were divided into 2 groups of 24 each. Group I included subjects that underwent LC under general anesthesia, and group II included subjects that underwent LC under spinal anesthesia. Assessment of postoperative pain at the end of the surgery and at seven hours post-surgery was done with visual analogue scale (VAS). **Results:** Group I had 14 males and 10 females and group II had 13 males and 11 females. In group I and group II, at end of the surgery there was no pain in 6 and 4, mild pain in 7 and 5, severe pain in 11 and 15. 6 hours post-surgery there was no pain in 14 and 13, mild pain in 5 and 7 and severe pain in 5 and 4 in group I and II respectively. The difference was significant (P< 0.05). **Conclusion:** Spinal anesthesia is more effective in comparison to general anesthesia in reducing post- operative pain in patients undergoing laparoscopic cholecystectomy.

Key words: Laparoscopic cholecystectomy, pain, VAS

Introduction

Laparoscopic cholecystectomy is a minimally invasive surgical procedure used to remove the gallbladder. The procedure is performed using a laparoscope, a thin tube with a camera and light at the end, which is inserted through a small incision in the abdomen. The surgeon then uses other instruments inserted through other small incisions to remove the gallbladder.[1] The procedure is usually done under general anesthesia and takes about an hour. Laparoscopic cholecystectomy is commonly performed for conditions such as symptomatic gallstones, gallbladder inflammation (cholecystitis), gallbladder polyps, or gallbladder cancer. However, it may not be suitable for individuals with certain medical conditions, severe inflammation, or extensive scarring in the abdomen.[2]

As with any surgical procedure, laparoscopic cholecystectomy does carry some risks, including infection, bleeding, injury to surrounding structures, bile duct injury, and complications associated with anesthesia. General anaesthesia (GA) is the anaesthetic technique of choice for laparoscopic cholecystectomy (LC). Regional anaesthesia too (spinal/epidural/combined spinal epidural) has been reported as a sole technique for performing LC as an alternative to GA for LC. Initially it was reported only for cases who were otherwise high- risk candidates for general anaesthesia, more recently it has been reported as a routine technique for otherwise healthy patients also. It was thought that laparoscopy cholecystectomy necessitates endotracheal intubation.[3]

Spinal anaesthesia itself induces peripheral vasodilatation. Hence, there is a fear that laparoscopic procedure done under spinal anaesthesia may result in hypotension.[4] Indeed, effects of CO2 pneumoperitoneum on intra-operative haemodynamics under SA is not a well studied scenario. This was to prevent aspiration, abdominal discomfort and hypercarbia which was expected secondary to induction of CO2 pneumoperitoneum.[5] The present study was conducted to assess post-operative pain relief following use of spinal anesthesia and general anesthesia for patients undergoing laparoscopic cholecystectomy.

Materials & Methods

The present study consisted of 48 patients scheduled for laparoscopic cholecystectomy of both genders. All gave their written consent to participate in the study.

Data such as name, age, gender etc. was recorded. Patients were divided into 2 groups of 24 each. Group I included subjects that underwent LC under general anesthesia, and group II included subjects that underwent LC under spinal anesthesia. Assessment of postoperative pain at the end of the surgery and at seven hours post-surgery was done with visual analogue scale (VAS). Severity of VAS was defined as: No pain-less than 2 score, Mild- less than 3 to 6 score, and sever-7 and above score. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

Results

Table I Distribution of patients

Groups	Group I	Group II
Agent	general anesthesia	spinal anesthesia
M:F	14:10	13:11

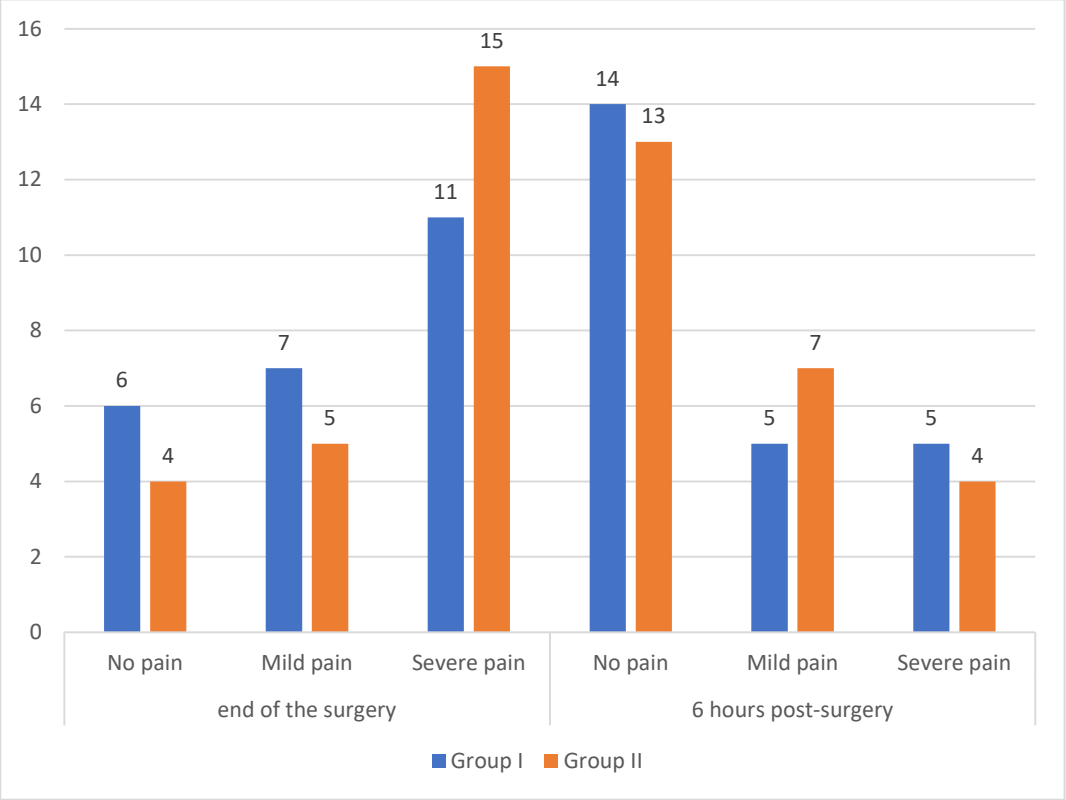
Table I shows that group I had 14 males and 10 females and group II had 13 males and 11 females.

Table II Comparison of VAS

Parameters	Variables	Group I	Group II	P value
end of the surgery	No pain	6	4	0.02
	Mild pain	7	5	
	Severe pain	11	15	
6 hours post-surgery	No pain	14	13	0.05
	Mild pain	5	7	
	Severe pain	5	4	

Table II, graph I shows that in group I and group II, at end of the surgery there was no pain in 6 and 4, mild pain in 7 and 5, severe pain in 11 and 15. 6 hours post-surgery there was no pain in 14 and 13, mild pain in 5 and 7 and severe pain in 5 and 4 in group I and II respectively. The difference was significant (P< 0.05).

Graph I Comparison of VAS



Discussion

Laparoscopic cholecystectomy can be performed under spinal anesthesia, which is a regional anesthesia technique that numbs the lower half of the body.[6] Instead of general anesthesia, where the patient is completely unconscious, spinal anesthesia allows the patient to remain awake during the procedure while providing effective pain relief.[7] Laparoscopic cholecystectomy performed under spinal anesthesia offers several potential advantages, such as reduced risks associated with general anesthesia, shorter recovery time, and fewer postoperative side effects.[8] However, the choice of anesthesia technique depends on various factors, including the patient's medical history, preferences, and the surgeon's recommendation.[9] It's essential to consult with your healthcare provider to determine the most appropriate anesthesia option for your specific situation.[10] The present study was conducted to assess post-operative pain relief following use of spinal anesthesia and general anesthesia for patients undergoing laparoscopic cholecystectomy.

We found that group I had 14 males and 10 females and group II had 13 males and 11 females. Tiwari et al[11] evaluated efficacy, safety and cost benefit of conducting laparoscopic cholecystectomy under spinal anaesthesia (SA) in comparison to general anaesthesia (GA). Group A and Group B received general and spinal anaesthesia by standardised techniques. Both groups underwent standard four port laparoscopic cholecystectomy. Mean anaesthesia time, pneumoperitoneum time and surgery time defined primary outcome measures. Intraoperative events and post operative pain score were secondary outcome measure. Out of 235 cases enrolled in the study, 114 cases in Group A and 110 in Group B analysed. Mean anaesthesia time appeared to be more in the GA group (49.45 vs. 40.64, P = 0.02) while pneumoperitoneum time and corresponding the total surgery time was slightly longer in the SA group. 27/117 cases who received SA experienced intraoperative events, four significant enough to convert to GA. No postoperative complications noted in either group. Pain relief significantly more in SA group in immediate post operative period (06 and 12 hours) but same as GA group at time of discharge (24 hours). No late postoperative complication or readmission noted in either group.

We found that in group I and group II, at end of the surgery there was no pain in 6 and 4, mild pain in 7 and 5, severe pain in 11 and 15. 6 hours post-surgery there was no pain in 14 and 13, mild pain in 5 and 7 and severe pain in 5 and 4 in group I and II

respectively. In a study by Gupta et al[12], a total of 50 patients were broadly divided into two study groups with 25 patients in each group; Group A included subjects that underwent LC under general anesthesia, while Group B included subjects that underwent LC under spinal anesthesia. Visual analogue scale (VAS) was used at the end of the surgery for assessing the postoperative pain at the end of the surgery and at seven hours post-surgery. While comparing the mean VAS at the end of the surgery in between the two study groups, significant results were obtained. While comparing the mean VAS 7 hours postoperatively, significant results were obtained. Postoperative pain score in the Group B patients was comparatively less in comparison to the subjects of Group A.

Uzman S et al[13] assessed the feasibility, efficacy, and side effects of combined spinal epidural anesthesia (CSEA) in LA. Thirty-three American Society of Anesthesiologist (ASA) physical status classification grade I patients underwent LA under CSEA. CSEA was performed using the needle-through-needle technique at the L3-L4 interspace. Preoperative and postoperative adverse events related to CSEA, patient satisfaction, and postoperative pain levels were recorded. LA under CSEA was performed successfully in 33 patients (84.6%). Pre- operatively, right shoulder pain was observed in 8 patients (24.1%), abdominal discomfort in 6 (18.2%), anxiety in 5 (15.2%), hypotension in 2 (6.1%) and nausea-vomiting in 1 (3%). In the first 24 hours after LA, headache, urinary retention, right shoulder pain, and postoperative nausea/vomiting (PONV) occurred in 18.1%, 12.1%, 9.1%, and 0% of patients, respectively. In the first 6 hours post operation, no patients had operation-site pain that required analgesic treatment. Thirty-one patients (94%) evaluated their satisfaction with the procedure as good or moderate. CSEA is an efficient and suitable anesthesia technique in LA for ASA physical status classification grade I healthy patients.

The limitation the study is small sample size.

Conclusion

Authors found that spinal anesthesia is more effective in comparison to general anesthesia in reducing post- operative pain in patients undergoing laparoscopic cholecystectomy.

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