

# Assessment of Postoperative Pain Relief Following Use of Spinal Anesthesia and General Anesthesia for Patients Undergoing Laparoscopic Cholecystectomy: A Comparative Study

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## ABSTRACT

**Background:** 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. Hence; we planned the present study to assess postoperative pain relief following use of spinal anesthesia and general anesthesia for patients undergoing laparoscopic cholecystectomy.

**Materials & Methods:** The present study it included assessment of postoperative pain relief following use of spinal anesthesia and general anesthesia for patients undergoing laparoscopic cholecystectomy. A total of 50 patients were included in the present study and 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. 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.

**Results:** 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.

**Conclusion:** In controlling postoperative pain, single shot of spinal is more effective in comparison to general anesthesia.

**Key words:** General Anesthesia, Laparoscopic Cholecystectomy, Spinal Aesthesia.

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## INTRODUCTION

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.<sup>1,2</sup> It was thought that laparoscopy cholecystectomy necessitates endotracheal intubation. This was to prevent aspiration, abdominal discomfort and hypercarbia which was expected secondary to induction of CO<sub>2</sub> pneumoperitoneum.<sup>3-6</sup> Recent studies about spinal and epidural anesthesia for laparoscopic cholecystectomies verified the safety and availability of this procedure. Regional anesthesia demonstrates less postoperative pain and less neuroendocrine stress response comparing with GA.<sup>7,8</sup>

Hence; we planned the present study to assess postoperative pain relief following use of spinal anesthesia and general anesthesia for patients undergoing laparoscopic cholecystectomy.

## MATERIALS & METHODS

The present study was conducted in the Department of Anaesthesia and Critical Care, Saraswathi Institute of Medical Sciences, Hapur Road, Anwarpur, Uttar Pradesh (India) and it included assessment of postoperative pain relief following use of spinal anesthesia and general anesthesia for patients undergoing laparoscopic cholecystectomy. Ethical approval was obtained from institutional ethical committee and written consent was obtained after explaining in detail the entire research protocol. A total of 50 patients were included in the present study and 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. Exclusion criteria for the present study included:

- Patients with symptomatic cholecystitis,
- Patients history of any other systemic illness,
- Patients with any known drug allergy

Preoperative assessment of hemodynamic parameters was done in all the patients. Continuous monitoring of hemodynamic parameters was done in all the patients throughout the surgery. 10 ml/kg of ringer lactate was given to the group B subjects. Group A subjects were preoxygenated with 100% for 3 min; premedication with IV metoclopramide 10 mg and dexamethasone 8 mg; preemptive analgesia with 0.1 mg/ kg nalbuphine was done. Propofol was used for the induction of anesthesia in group B

subjects. Isoflurane was used for maintenance of anesthesia. Same technique was used for performing LC in patients of both the study groups. Reversal of neuromuscular blockade with intravenous neostigmine and glycopyrrolate was done in all the patients at the end of the surgery. Once the patients were fully awake, extubation was done followed by shifting of the patients into the ward. 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. 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.<sup>8</sup>

All the data were summarized in Microsoft excel sheet and were analyzed by SPSS software. Chi- square test was used for assessment of level of significance.

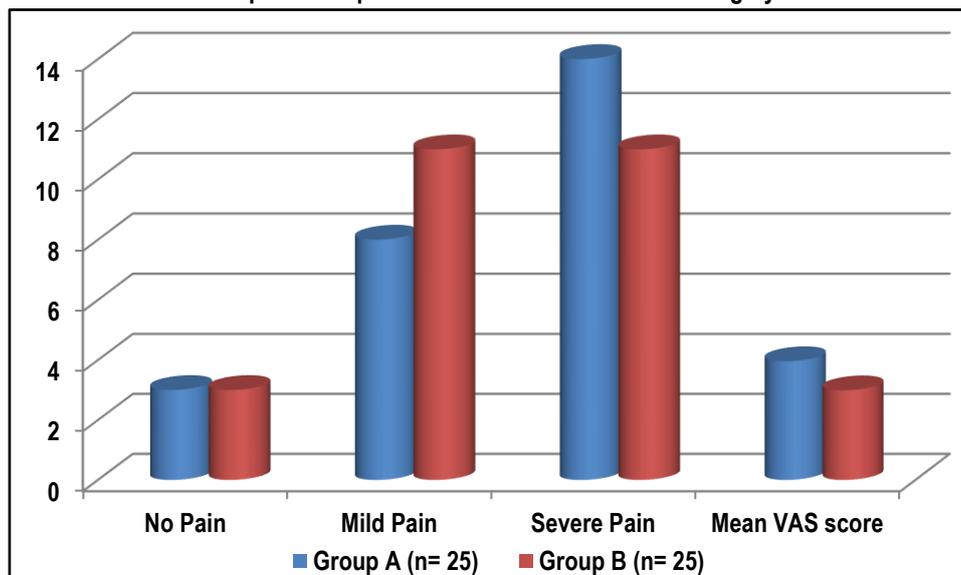
**Table 1: Demographic data**

Parameter	Group A	Group B
Number of subjects	25	25
Mean age (years)	44	45
Males	10	9
Females	15	16
Mean weight (kg)	59.2	62.1

**Table 2: Comparison of VAS at the end of the surgery**

VAS	Group A (n= 25)	Group B (n= 25)	P- value
No Pain	3	3	0.04
Mild Pain	8	11	
Severe Pain	14	11	
Mean VAS score	3.96	2.99	

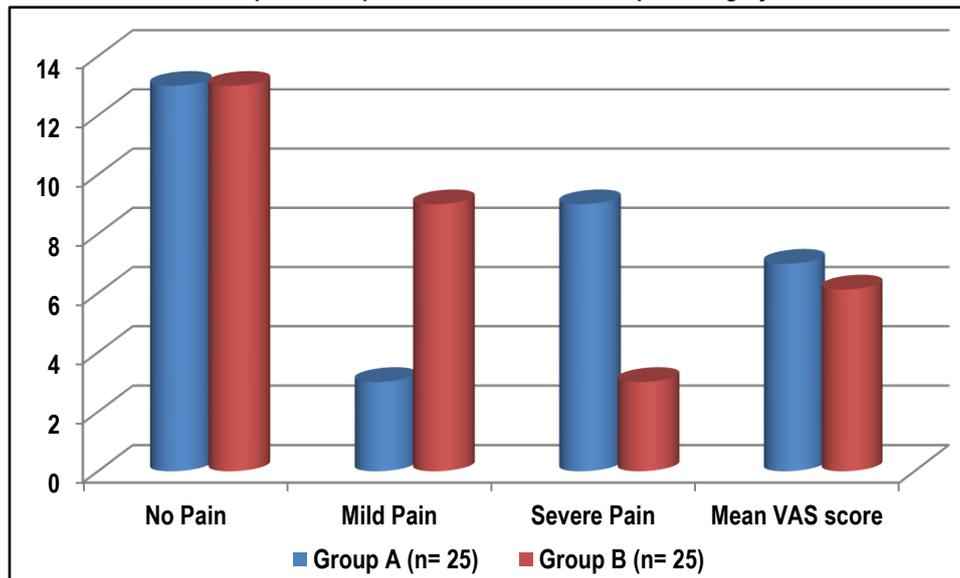
**Graph 1: Comparison of VAS at the end of the surgery**



**Table 3: Comparison of VAS at 6 hours post-surgery**

VAS	Group A (n= 25)	Group B (n= 25)	P- value
No Pain	13	13	0.01
Mild Pain	3	9	
Severe Pain	9	3	
Mean VAS score	6.99	6.12	

Graph 2: Comparison of VAS at 6 hours post-surgery



## RESULTS

A total of 50 patients were included in the present study, which were scheduled to undergo LC for the removal of gallstones. All the patients were divided broadly into two study groups with 25 patients in each group. In one group, patients underwent LC under GA, while in the other group, patients underwent LC under SA. Mean age of the patients of Group A and Group B was 44 years and 45 years respectively. There were 10 males and 15 females in group A, while there were 9 males and 16 females in group B respectively. Mean weight of the patients of the Group A and Group B was 59.5 and 62.1 Kg respectively. In the present study, 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.

## DISCUSSION

LC under regional anesthesia alone has been reported only occasionally in the past; these reports included patients unfit to receive general anesthesia, mainly patients with severe chronic obstructive airway disease. Regional anesthesia has been used for laparoscopy in healthy patients almost exclusively in combination with general anesthesia to extend the analgesic effect during the early postoperative period.<sup>6,7</sup>

In the present study, a total of 50 patients were included, which were scheduled to undergo LC for the removal of gallstones. All the patients were divided broadly into two study groups with 25 patients in each group. In one group, patients underwent LC under GA, while in the other group, patients underwent LC under SA. Donmez T et al investigated the availability, safety and side effects of combined spinal/epidural anesthesia (CSEA) and compared it with GA for LC. Forty-nine patients who have a LC plan were included into the study. The patients were randomly divided into GA (n = 25) and CSEA (n = 24) groups. Intraoperative and postoperative adverse events, postoperative pain levels were compared between groups. Anesthesia procedures and surgeries for all patients were successfully completed. After the organization

of pneumoperitoneum in CSEA group, 3 patients suffered from shoulder pain (12.5%) and 4 patients suffered from abdominal discomfort (16.6%). All these complaints were recovered with IV fentanyl administration. Only 1 patient developed hypotension which is recovered with fluid replacement and no need to use vasopressor treatment. Postoperative shoulder pain was significantly less observed in CSEA group (25% vs. 60%). Incidence of postoperative nausea and vomiting (PONV) was less observed in CSEA group but not statistically significant (4.2% vs. 20%). In the group of CSEA, 3 patients suffered from urinary retention (12.5%) and 2 patients suffered from spinal headache (8.3%). All postoperative pain parameters except 6th hour, were less observed in CSEA group, less VAS scores and less need to analgesic treatment in CSEA group comparing with GA group. They concluded that CSEA could be used safely for laparoscopic cholecystectomies.<sup>9</sup>

Mean age of the patients of Group A and Group B was 44 years and 45 years respectively. There were 10 males and 15 females in group A, while there were 9 males and 16 females in group B respectively. 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 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%). Perioperatively, 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 postoperation, 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.<sup>10</sup>

## CONCLUSION

Under the light of above mentioned data, the authors conclude that in controlling postoperative pain, single shot of spinal is more effective in comparison to general anesthesia. However; further studies are recommended.

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