

Original article:

Comparative Evaluation of Efficacy of Spinal and General Anesthesia in Patients Undergoing Laparoscopic Cholecystectomy: An Observational Institutional Based Study

Dr. Jasavaroyan

Assistant Professor, Department of Anaesthesiology, Dr. B. R. Ambedkar Medical College & Hospital, Bangalore, Karnataka, India.

Corresponding Author: Dr. Jasavaroyan., Assistant Professor, Department of Anaesthesiology, Dr. B. R. Ambedkar Medical College & Hospital, Bangalore, Karnataka, India.

Abstract:

Background: Although general anaesthesia is considered the choice of anaesthesia for laparoscopy, regional anaesthesia in the form of spinal anaesthesia provides unique advantages over general anaesthesia. Hence; the present study was undertaken for comparing the efficacy of spinal and general anesthesia in patients undergoing laparoscopic cholecystectomy (LC).

Materials & Methods: Sample size for the present study was chosen to be 80. Among these 80 patients, 40 patients underwent LC under spinal anesthesia, while the remaining 40 patients underwent LC under the hands of general anesthesia. All the surgical procedures were commenced under the hands of skilled and experienced surgeons. Preoperative hemodynamic and biochemical profile of all the subjects was recorded in Microsoft excel sheet. Postoperatively, all the hemodynamic vitals were recorded in separate sheets. Patient satisfaction score was recorded in all the patients on a scale of zero to ten. All the results were recorded in Microsoft excel sheet and were analyzed by SPSS software.

Results: Patient satisfaction score was significantly higher among patients of the spinal anesthesia group. Incidence of nausea and vomiting was significantly higher among patients of the general anesthesia group in comparison to the spinal anesthesia group.

Conclusion: In terms of occurrence of postoperative patient satisfaction score and nausea and vomiting, spinal anesthesia was safer in comparison to general anesthesia.

Keywords: General, Laparoscopic Cholecystectomy, Spinal.

INTRODUCTION

Since its introduction into the surgeon's armamentarium, laparoscopic cholecystectomy (LC) has become the operation of choice for patients with cholelithiasis, as it is associated with lesser postoperative pain and discomfort, better cosmesis, shorter hospital stay and a chance for early return to work.^{1, 2} However, on occasion, the procedure can be associated with serious, potentially life-threatening complications; these may arise due to injury to part of the biliary tree (biliary complications) or from procedure-related injury to other organs/ systems (non-biliary complications). Although general anaesthesia is considered the choice of anaesthesia for laparoscopy, regional anaesthesia in the form of spinal anaesthesia provides unique advantages over general anaesthesia.^{3- 5} The only limiting factor for use of spinal anaesthesia in laparoscopy is patient's discomfort with pneumoperitoneum and the associated shoulder tip pain.⁶ Hence; the present study was undertaken for comparing the efficacy of spinal and general anesthesia in patients undergoing laparoscopic cholecystectomy (LC).

MATERIALS & METHODS

The present study was conducted in the Department of Anaesthesiology, Dr. B. R. Ambedkar Medical College & Hospital, Bangalore, Karnataka (India) and it included comparison of efficacy of spinal and general anesthesia in patients undergoing laparoscopic cholecystectomy (LC). Sample size for the present study was chosen to be 80. Among these 80 patients, 40 patients underwent LC under spinal anesthesia, while the remaining 40 patients underwent LC under the hands of general anesthesia. All the surgical procedures were commenced under the hands of skilled and experienced surgeons. Preoperative hemodynamic and biochemical profile of all the subjects was recorded in Microsoft excel sheet. Postoperatively, all the hemodynamic vitals were recorded in separate sheets. Follow-up of records of all the patients were maintained for recording the presence of any postoperative complication. Patient satisfaction score was recorded in all the patients on a scale of zero to ten. All the results were recorded in Microsoft excel sheet and were analyzed by SPSS software. Chi-square test was used for assessment of level of significance.

RESULTS

In the present study, a total of 80 subjects scheduled to undergo LC were analyzed. Among these 80 patients, 40 patients underwent LC under spinal anesthesia, while the remaining 40 patients underwent LC under the hands of general anesthesia. Mean age of the patients of the spinal anesthesia group and general anesthesia group was 45.2 years and 44.6 years respectively. Mean BMI of the patients of the spinal anesthesia group and general anesthesia group was 27.5c years and 26.3 kg/m² respectively. There were 18 males and 22 females in the spinal anesthesia group, while there were 15 males and 25 females in general anesthesia group respectively. Patient satisfaction score was significantly higher among patients of the spinal anesthesia group. Incidence of nausea and vomiting was significantly higher among patients of the general anesthesia group in comparison to the spinal anesthesia group.

Graph 1: Comparison of demographic data

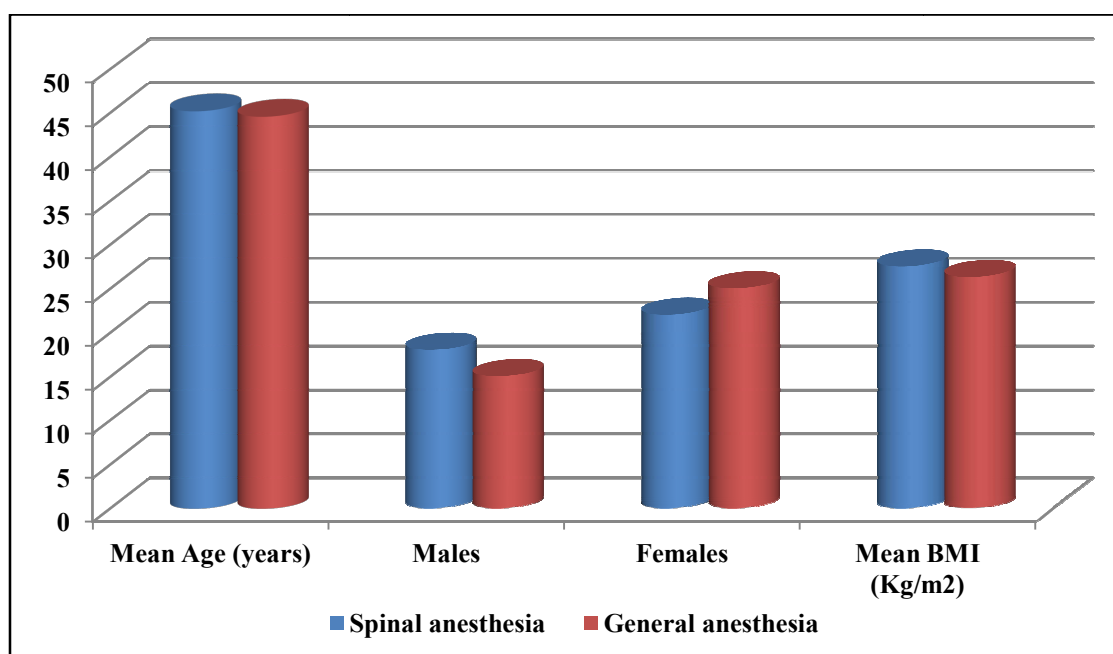


Table 1: Comparison of postoperative patient pain score

Parameter	Spinal anesthesia	General anesthesia	p- value
Patient satisfaction score	7.8	6.1	0.00 (Significant)

Table 2: Incidence of postoperative complications

Postoperative complication	Spinal anesthesia	General anesthesia	p- value
Nausea	2	6	0.00 (Significant)
Vomiting	3	7	0.00 (Significant)

DISCUSSION

In the present era of surgical innovation, there is constant development and expansion of various types of laparoscopic surgery in which the incisions made are increasingly small. It is well established that laparoscopic surgery, in comparison with more traditional methods, results in fewer post-operative complications and leads to earlier patient mobility and recovery of the normal activities of daily life. The safety of laparoscopic cholecystectomy (LC) for the elderly has also been confirmed in many studies as an acceptable procedure and is now the preferred method for cholecystectomy.⁷⁻⁹

The first cholecystectomy was performed in 1882, with the first laparoscopic cholecystectomy occurring only approximately 100 years later in 1985. The advent of laparoscopic surgery is an example of a technology that has significantly changed the way surgeons operate today. In its infancy, laparoscopy was beset with numerous obstacles to its progress.^{10, 11}

In the present study, a total of 80 subjects scheduled to undergo LC were analyzed. Among these 80 patients, 40 patients underwent LC under spinal anesthesia, while the remaining 40 patients underwent LC under the hands of general anesthesia. Mean age of the patients of the spinal anesthesia group and general anesthesia group was 45.2 years and 44.6 years respectively. Mean BMI of the patients of the spinal anesthesia group and general anesthesia group was 27.5c years and 26.3 kg/m² respectively. There were 18 males and 22 females in the spinal anesthesia group, while there were 15 males and 25 females in general anesthesia group respectively. Hamad and Ibrahim El-Khattary used spinal anesthesia for laparoscopic cholecystectomy for the first time in a small series of healthy patients but they had used nitrous oxide as a pneumoperitoneum instead of standard carbon dioxide. Recently, it has been shown that laparoscopic cholecystectomy can be done successfully using carbon dioxide pneumoperitoneum under spinal anesthesia in healthy patients with symptomatic gallstone disease.¹²

In the present study, patient satisfaction score was significantly higher among patients of the spinal anesthesia group. Incidence of nausea and vomiting was significantly higher among patients of the general anesthesia group in comparison to the spinal anesthesia group. Laparoscopic surgery has been demonstrated to be safe and effective and leads to reduced postoperative pain, shortened hospital stay, faster recuperation, and earlier return to normal function. This is combined with an improved cosmetic result, leading in many cases to improved patient satisfaction. Mehta PJ et al compared spinal anesthesia with the gold standard general anesthesia for elective laparoscopic cholecystectomy in healthy patients. Controlled, prospective, randomized trial of 60 patients with symptomatic gallstone disease and American Society of Anesthesiologists status I or II were operated for laparoscopic cholecystectomy under spinal (n=30) or general (n=30) anesthesia between the

academic years March 2009 and July 2010. All the procedures were completed by the allocated method of anesthesia, as there were no conversions from spinal to general anesthesia. Pain was significantly less at 4 hours ($P<0.0001$), 8 hours ($P<0.0001$), 12 hours ($P<0.0001$), and 24 hours ($P=0.0001$) after the procedure for the spinal anesthesia group, compared with those who received general anesthesia. There was no difference between the two groups regarding complications, hospital stay, recovery, or degree of satisfaction at follow-up. Spinal anesthesia is adequate and safe for laparoscopic cholecystectomy in otherwise healthy patients and offers better postoperative pain control than general anesthesia without limiting the recovery.¹³

CONCLUSION

Under the light of above obtained data, the authors conclude that in terms of occurrence of postoperative patient satisfaction score and nausea and vomiting, spinal anesthesia was safer in comparison to general anesthesia. However; further studies were recommended.

REFERENCES

1. Tzovaras G, Fafoulakis F, Pratsas K, Georgopoulou S, Stamatiou G, Hatzitheofilou C. Laparoscopic cholecystectomy under spinal anesthesia: A pilot study. *Surg Endosc* 2006;20:580-2.
2. Phillips PA, Amaral JF. Abdominal access complications in laparoscopic surgery. *J Am Coll Surg*. 2001;192:525–36.
3. Sinha R, Gurwara AK, Gupta SC. Laparoscopic surgery using spinal anesthesia. *JLS* 2008;12:133-8.
4. Vaghadia H, Viskari D, Mitchell GW. Selective spinal anaesthesia for out patient laparoscopy. *Can J Anaesth* 2001;48:256-60.
5. Rodgers A, Walker N, Schug S, McKee A, Kehlet H, van Zundert A, et al. Reduction of postoperative mortality and morbidity with epidural or spinal anesthesia: Results from overview of randomised trials. *BMJ* 2000;321:1493.
6. Chilvers CR, Goodwin A, Vaghadia H, Mitchell GW. Selective spinal anesthesia for outpatient laparoscopy. V: Pharmacoeconomic comparison vs general anesthesia. *Can J Anesth* 2001;48:279-83.
7. Yeh CC, Ko SC, Huh BK, Kuo CP, Wu CT, Cherng CH, et al. Shoulder tip pain after laparoscopic surgery analgesia by collateral meridian acupuncture (shiatsu) therapy: A report of 2 cases. *J Manipulative Physiol Ther* 2008;31:484-8.
8. Bingener-Casey J, Richards ML, Strodel WE, Schwesinger WH, Sirinek KR. Reasons for conversion from laparoscopic to open cholecystectomy: A 10-year review. *J Gastrointest Surg*. 2002;6:800–5.
9. Z'graggen K, Wehrli H, Metzger A, Buehler M, Frei E, Klaiber C. Complications of laparoscopic cholecystectomy in Switzerland. A prospective 3-year study of 10,174 patients. *Swiss Association of Laparoscopic and Thoracoscopic Surgery. Surg Endosc*. 1998;12:1303–10.
10. van Gulik TM. Langenbuch's cholecystectomy, once a remarkably controversial operation. *Neth J Surg* 1986;38 (5) 138- 141.
11. Reynolds W Jr. The first laparoscopic cholecystectomy. *JLS* 2001; 5(1): 89- 94.
12. Hamad MA, El-Khattary OA. Laparoscopic cholecystectomy under spinal anesthesia with nitrous oxide pneumoperitoneum: A feasibility study. *Surg Endosc* 2003;17:1426-8
13. Mehta PJ, Chavda HR, Wadhwa AP, Porecha MM. Comparative analysis of spinal versus general anesthesia for laparoscopic cholecystectomy: A controlled, prospective, randomized trial. *Anesth Essays Res* 2010;4:91-5.