Section: General Surgery

Original Research Article

THE ROLE OF SURGEON COMFORT SCALE IN LAPAROSCOPIC CHOLECYSTECTOMY: A COMPARATIVE ANALYSIS OF SPINAL VS GENERAL ANAESTHESIA

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Abstract

Background: Studies revealed that SA demonstrates less postoperative pain and more intraoperative complaints of anxiety and shoulder pain in comparison to GA. Which can also put an impact on operating surgeon, therefore we developed a likert scale-based Surgeon Comfort Scale (SCS) questionnaire and aims to investigate the role and efficacy of SCS in determining the comfort of the operating surgeon in conducting LC under GA vs SA. **Materials and Methods:** LC were conducted in 101 patients which were randomly divided via lottery method in two groups, GA (n=50) and SA (n=51). The standardization of questionnaire and Surgeon Comfort Scale (SCS) was done. The Surgeon's comfort was accessed using the scale and then were compared between the groups. **Result:** Two patients from GA and one from SA were removed from the study due to intraoperative complication. The diaphragmatic movement with respiration and right shoulder pain during operation were significantly more (p=0.003 and <0.001) in SA group as compared to GA group. Whereas, the rest of parameters of SCS were comparable between the two groups. Surgeon's comfort was higher for GA (100% vs. 94%) but not significantly different (p=0.256). **Conclusion:** The SCS was found to be useful in determining the satisfaction and comfort of the surgeon while conducting LC under SA or GA. Due to higher right shoulder pain, nervousness, and diaphragm moment in spinal group, surgeon satisfaction was more in GA group. We recorded that the patients and surgeons were more comfortable under GA.

INTRODUCTION

Cholecystectomy is a common treatment in gastrointestinal surgery, and the laparoscopic method has established itself as the gold standard for symptomatic cholelithiasis as well as chronic and acute cholecystitis. This procedure results in less postoperative pain, better cosmesis, shorter hospital stay and disability from work than open cholecystectomy.[1,2] However, the overall serious complication rate in laparoscopic cholecystectomy (LC) remains higher than that seen in open cholecystectomy.[3,4] LC is conventionally done under general anaesthesia (GA). Initially, the indications for spinal anaesthesia (SA) were reported for cases in which GA was difficult but now, it is a routine procedure for otherwise healthy patients also.[5,6] SA has the advantage of providing analgesia and total muscle relaxation in a conscious and compliant patient and an uneventful postoperative recovery. At the same time, it also protects against the potential complications of GA.[7]

Recent studies have illustrated that LC can be safely performed under SA with low pressure CO2 pneumoperitoneum.[8] The findings of these studies revealed that SA demonstrates less postoperative pain in comparison to GA.[9,10] Though, frequent intraoperative complaints of anxiety and shoulder pain were reported on using SA.[11] Which can also put an impact on operating surgeon, therefore we developed a likert scale based Surgeon Comfort Scale (SCS) questionnaire and the present study aims to investigate the role and efficacy of SCS in determining the comfort of the operating surgeon in conducting LC under GA vs SA. The review of related literature revealed that none work has been done on laparoscopic cholecystectomy that have

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included surgeon comfort scale. Hence, I have decided to conduct the present study.

MATERIALS AND METHODS

The study was conducted in Department of General Surgery of PG teaching tertiary centre LHDM & Dr Prem Hospital, Panipat. We did Prospective, Single centred, Randomized Control Trial (CTRI Acknowledgement Number: REF/2020/10/037453) for a duration of 18 months. Study included all patients with age 20-65 years having cholelithiasis and fit for surgery according to PAC. Exclusion criteria were ASA group IV, V and VI patients /patients having acute cholecystitis /cholangitis /acute pancreatitis /bleeding diathesis /local spinal deformity /COPD /Pregnancy. All patients were informed about the study and written informed consent was obtained. Random sampling of patients was done by using Lottery Method by putting 51 chits of SA and 50 chits of GA in a bowl. The patients were divided into two groups by pulling out one chit at a time. Group A underwent convential four port LC under GA and Group B underwent the same procedure by using SA. For both groups, the surgery was performed by the same consultant surgeon and anaesthesiologist. After the surgery, a Likert Scale based questionnaire was provided to the consultant surgeon to assess his comfort level during the surgery.[12]

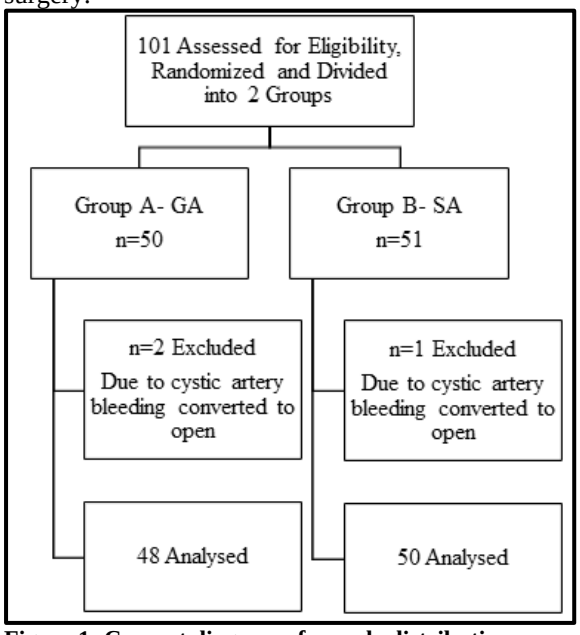

Figure 1: Consort diagram of sample distribution

During anaesthetic management each patient had received midazolam 1mg IV, Pantoprazole 40 mg IV, and Ondansetrone 4 mg IV as standard pre-anaesthetic medication. In the GA Group A, anaesthesia was induced in supine position with 2.0 mg/kg of Propofol, 0.1 mg/kg of Vecuronium and Fentanyl 2 µg/kg. After intubation, patient was placed in reverse trendelenburg position for surgery. Maintenance of anaesthesia was done with O2, N2O and Isoflurane. EtCO2 maintained between 35-45 mmHg. Post-surgery neuromuscular blockade was reversed with 50 µg/kg of Neostigmine and 10 µg/kg of Glycopyrrolate. In SA Group B, subarachnoid space was punctured with 25-gauge spinal needle between the L3 –L4 spine intervertebral space in sitting or left lateral decubitus position and 2.5-3.5 ml of hyperbaric 0.5% Bupivacaine was injected. Afterwards, patient was placed in the supine position with a head-down position. After confirming the anaesthesia at T4 level by pin prick, "go-ahead" was given. During the procedure, anxiety and right shoulder tip pain was treated with 2mg Midazolam, Fentanyl 50µg in IV boluses and 50mg Inj Propofol. The comfort of the surgeon during surgery was recorded by using Surgeon Comfort Scale (SCS) which was developed and standardized by the investigator by conducting the pilot study of 30 patients.

Standardization of the Scale

The reliability of Surgeon Comfort Scale was established on the basis of Split-Half Reliability. For this, items of the scale were divided in two parts by adapting the odd-even method. After applying Spearman-Brown Prophecy formula, the reliability coefficient (r) of Split-Half comes out to be 0.734 which is significant at 0.01 levels. The validity of the scale was calculated on the basis of content validity. For content validity, the items were given to the 20 experts (Surgeon and Anaesthetist) belonging to the field of Surgery to judge the relevancy of items and finalize the 10 items. The unanimity of experts about the items was taken as an indicator of content validity of the scale. Each item is followed by three alternative responses and scores are given according to the responses.

Table 1: Scoring Procedure

Alternative Responses	No	Somewhat	Yes
Score	0	1	2

Statistical Results

Table 2: Full Scale Statistical Results

Sr. No.	Surgeon Comfort Scale (SES)	Mean	S.D
I.		2.53	2.68

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Norms: Corresponding to the obtained raw scores, z-Scores norms have been prepared and presented in the table given below. The norms for interpretation of z-Scores and the range of raw scores to measure the level of Surgeon Comfort have been also given.

Table 3: Z-Scores for Surgeon Comfort Scale. Mean: 2.53 SD: 2.68

Raw Score	z-Score	Raw Score	z-Score	Raw Score	z-Score
0	-0.94	6	1.29	12	3.53
1	-0.57	7	1.66	13	3.9
2	-0.19	8	2.04	14	4.27
3	0.17	9	2.41	15	4.59
4	0.54	10	2.78		
5	0.92	11	3.16		

Table 4: Norms for Interpretation of the Level of Surgeon Comfort Scale

Sr. No.	Range of Raw Scores	Range of z-Scores	Grade	Levels of Comfort
1.	14 & above	4.27 & above	A	Difficult
2.	7-13	1.66 - 3.9	B	Mildly Difficult
3.	0-6	-0.94 - +1.29	C	Not Difficult

The total comfort score of the scale varies from 0-20 showing "Not difficult" to "Highly difficult" level of surgery. The higher score reflected high level of difficulty and vice-versa.

RESULTS

Table 5: The details of Comfort of the surgeon in groups

		Group A (n=48)		Group B (n=50)		Chi sq.	p-Value
		n	%	n	%		
Operation difficult	Yes/Somewhat	4	8.33	8	16.00	0.72	0.340
	No	44	91.67	42	84.00		
Inappropriate anaesthesia i.e. not up to the T4 level	Yes/Somewhat	0	0.00	3	94.00	1.29	0.256
	No	48	100.0	47	6.00		
Installation of port difficult	Yes/Somewhat	3	6.25	3	6.00	0.00	0.959
	No	45	93.75	47	94.00		
Difficulty during callot's triangle dissection	Yes/Somewhat	8	16.67	7	14.00	0.00	0.932
	No	40	83.33	43	86.00		
Difficulty during gall bladder bed dissection	Yes/Somewhat	17	35.42	14	28.00	0.33	0.567
	No	31	64.58	36	72.00		
Significant diaphragmatic movement with respiration	Yes/Somewhat	15	31.25	32	64.00	9.25	0.003*
	No	33	68.75	18	36.00		
Significant bleeding	Yes/Somewhat	16	33.33	15	30.00	0.02	0.891
	No	32	66.67	35	70.00		
Difficulty in retrieving gall bladder from epigastric port	Yes/Somewhat	11	22.92	9	18.00	0.12	0.724
	No	37	77.08	41	82.00		
Fluctuation in patient's vitals intraoperatively	Yes/Somewhat	12	25.00	15	30.00	0.11	0.743
	No	36	75.00	35	70.00		
Patient complaint of right shoulder pain during operation	Yes/Somewhat	0	0.00	21	42.00	23.22	<0.001*
	No	48	100.0	29	58.00		

*=Significant (p<0.05)

Table 6: Details of Comfortable, Mild Difficulty and Difficult Surgeon comfort Scale

	Group A (n=48)		Group B (n=50)		Chi sq.	p-value
	n	%	n	%		
Comfortable (0-7)	48	100	47	94.0	1.29	0.256
Mild Difficulty (8-14)	0	0.00	0	0.0		
Difficult (≥15)	0	0.00	3	6.0		

The present study was carried out that included a total 101 patients for laparoscopic cholecystectomy, in which 48 (47.52%) patients in general anaesthesia group and 50 (49.50%) in spinal anaesthesia group were included, whereas total 3 (2.97%) patients 2 patients from general anaesthesia and 1 patient from spinal anaesthesia were excluded from study due to the cystic artery bleeding.

In our study, the significant diaphragmatic movement with respiration and right shoulder pain during operation were significantly more (p=0.003 and <0.001) in SA group as compared to GA group

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[Table 5]. Whereas, the rest of parameters of SCS were comparable between groups.

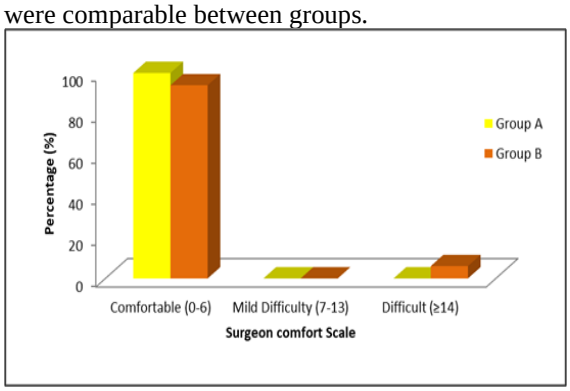

Figure 1: Bar chart shows the Comfortable, Mild Difficulty and Difficult Surgeon Comfort Scale

The [Table 6] illustrates that the Surgeon comfort was higher in group A as compared to group B but not significantly different (p=0.256).

DISCUSSION

This study revealed that surgeon comfort was notably higher in the GA group (100%) compared to the SA group (94%) as shown in Table 6. This finding contrasts with a previous study by Ellakany in 2013(13), which reported a significantly lower surgeon satisfaction score in the GA group (4.1) compared to the SA group (3). Interestingly, another study Kalaivani et al found no statistically significant difference in patient satisfaction between the two anesthesia groups. These collective results suggest that spinal anesthesia could be a viable option for patients undergoing laparoscopic cholecystectomy, offering a high level of patient satisfaction, despite the variations in surgeon comfort scores.[4,9,14]

CONCLUSION

The SCS was found to be useful in determining the satisfaction and comfort of the surgeon while conducting LC under SA or GA. Due to higher right shoulder pain, nervousness, and diaphragm moment in spinal group, surgeon satisfaction was more in GA group. We recorded that the patients and surgeons were more comfortable under GA. Although, more studies are needed to support the results.

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