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ORIGINAL RESEARCH

Staging Laparoscopy for Carcinoma Stomach, Comparison between Spinal Vs General Anaesthesia

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Abstract

Introduction: Laparoscopic operations are being performed under general anaesthesia (GA). Further studies are needed to establish whether these operations can be performed under spinal anaesthesia (SA) more effectively.

Aim & Objective: In this study we aimed to compare SA with GA among patients of carcinoma stomach undergoing laparoscopy for the staging of the disease.

Material & methods: The simple randomized controlled trial (RCT) was conducted at department of anaesthesia of a tertiary care hospital on 60 patients. Adult ASA I & II patients with carcinoma stomach scheduled for staging laparoscopy were recruited and divided into two groups; Group 1 (Group SA) & Group 2 (Group GA). The mode of induction and maintenance of anaesthesia in each group were standardized. Need for the conversion of SA to GA, surgeon satisfaction, patient satisfaction, evidence of perioperative shoulder tip pain and need of ionotropic drug for maintaining stable hemodynamics were statistically compared between 2 groups.

Results: Average age of patients in both groups was in mid 40s and significant results were found when compared on basis of gender. Not a single case had required the conversion of SA to GA. Surgeon satisfaction levels were same in both the techniques while better patient satisfaction levels and early discharges were noted in Group 1 (Group SA). Also, lesser evidence of perioperative shoulder tip pain were found in Group 1 (Group SA).

Conclusion: Laparoscopy is a good method for staging of carcinoma stomach and spinal anaesthesia can be the more efficient, cheaper and less risky mode of anaesthesia, particularly avoiding the major risks associated with the general anaesthesia.

Keywords: anaesthesia, carcinoma, general, laparoscopy, staging, spinal.

Introduction

Particularly in Indian region of the world, gastric cancer continues to be one of the most frequent cancer-related causes of death.[1] An accurate workup of the disease's extent has grown to be crucial for treatment planning as the multidisciplinary care of gastrointestinal cancer has developed over the past 10 years.

Although preoperative imaging techniques have significantly increased the diagnostic accuracy of wall infiltration & lymph node involvement, the detection of peritoneal dissemination still needs to be developed. Positive intra-peritoneal findings of free cancer

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cells have been linked to poor survival. Precise staging is the primary method that benefits the successful surgical intervention of cancer.[2,3] It has been hypothesized that staging laparoscopy is helpful in identifying unexpected peritoneal dissemination & in collecting minimally invasive peritoneal lavage fluid for cytological analysis.

Despite the fact that laparoscopic procedures are typically carried out under general anesthesia, recent studies have indicated that neuraxial blocks may be a good substitute in these procedures.[4] According to studies[5,6] achieving anesthesia between the T4 & T6 level with neuraxial blocks is sufficient for these procedures. In terms of postoperative discomfort, complications & procedure costs, spinal anaesthesia has also been demonstrated to produce better results than general anaesthesia.[7,8]

In this study we aimed to evaluate the technique of staging laparoscopy & comparison between the uses of general versus spinal anaesthesia.

Material & methods

The present prospective study was conducted at a tertiary care hospital in department of Anaesthesia for a period of 1 year among patients with carcinoma stomach. The study was approved by the institutional ethics committee of the allied college. Total 60 patients who were willing to participate in the research giving written informed consent were enrolled in the study.

The patients were enrolled on the basis of following inclusion/exclusion criteria

Inclusion criteria

1. Age above 18 years.
2. Histologically confirmed cases of carcinoma stomach.
3. ASA I & II patients.

Exclusion criteria

1. Patient refusing to take part in study
2. ASA III & IV
3. Patient with some active infection, having opioid allergy, contraindications for spinal anaesthesia.

Simple randomization was done and patients were divided into two groups: Group 1 consists of 30 patients who underwent staging laparoscopy with spinal anaesthesia & Group 2 consists of 30 patients who underwent staging laparoscopy with general anaesthesia.

We monitered the peripheral oxygen saturation (SpO2), heart rate (HR), noninvasive blood pressure (systolic, diastolic, & mean arterial pressure), & cardiac rhythm. After securing an intravenous catheter, patients in group GA were premedicated with inj midazolam (0.03 mg/kg IV), inj fentanyl (2 mcg/kg), inj glycopyrrolte (0.004 mg/kg) & inj ondansetron (0.1 mg/kg). After 2-3 minutes of preoxygenation with 100% O2, induction of anaesthesia was done with inj propofol (2-2.5 mg/kg) & inj atracurium (0.5 mg/kg) intravenously. Nasogastric tube was inserted before starting of the procedure. The patient's ventilatory settings during the procedure were set targeting the etCO2 between 35-40 mmHg. 50% O2/air combination in 2-3% sevoflurane was used to maintain general anesthesia.

For the spinal anaesthesia group, under all aseptic conditions, in sitting position, using 25 G Quincke's needle, 15-20 mg of heavy bupivacaine with 20 mcg fentanyl was injected in subarachnoid space either in L2-3 or L3-4 level. The level for spinal anaesthesia was targeted to T4-5. Ephedrine (6 mg) was administered in case of hypotension (target MAP >60 mmHg). Nasogastric tube was inserted before starting of the procedure. Sedation with inj midazolam (0.03-0.05 mg/kg) & inj fentanyl (1 mcg/kg) was given as preemptive analgesia

ISSN: 0975-3583,0976-2833 VOL14, ISSUE 02, 2023

& surgical procedure was started. In the event of bradycardia (HR < 45 bpm), atropine sulphate (0.6 mg i.v.,) was scheduled to be administered. Age, gender, ASA risk category, duration of surgery, & ephedrine & atropine use were noted. Prior to the surgery (after intubation in Group GA & after medication administration in Group SA), as well as at 5-minute intervals throughout the procedure, hemodynamic parameters peripheral oxygen saturation (SpO2), heart rate (HR), blood pressure (systolic, diastolic, & mean arterial pressure), cardiac rhythm, side effects, & shoulder pain were recorded. In SA group, additional inj fentanyl 1 mcg/kg was intended to be administered intravenously in the event of shoulder pain, & the reaction was documented.

Ten minutes prior to the conclusion of surgery, participants in the general anaesthesia group received inj metoclopramide 10 mg & inj tramadol 1.5 mg/kg intravenously. Both groups had their postoperative VAS scores taken at the 0th, 1st, 4th, 8th, 12th, & 24th hours. Inj paracetamol (15 mg/kg) was given as an analgesic to patients in both groups with VAS values above 4 throughout the postoperative period. The development of postoperative nausea & vomiting was monitored in patients (PONV). The patients in SA group (group 1) were monitored for urine retention throughout the postoperative period because it was anticipated that this problem would occur following spinal anesthesia. Visual analog satisfaction scale was used to record the patient and surgeons satisfaction. The patients were compared on the basis of staging of carcinoma and side effects of anesthesia technique.

Statistical analysis was done using SPSS software (version 21.0). In the study using descriptive statistical methods (mean, standard deviation, median, frequency, ratio, minimum, maximum) quantitative data were compared. For the comparison of the parameters showing normal distribution we used "Student t-Test", & Mann Whitney U par test was used for the comparison of the parameters with non-normal distribution. Pearson's chi-Square test & Fisher's exact test were used to compare qualitative data. For intragroup pairwise comparisons of non-normally distributed parameters, "Friedman Test" & "Wilcoxon Signed Ranks" test were used. Significance was set at p value less than 0.05.

Results

There was no statistically significant difference between group 1 and group 2 in terms of Age, ASA scores and operation time. Statistically significant difference was observed when comparison was done on the basis of gender. (Table 1)

Table 1: Comparison of demographic data among two groups

Variable		**Group 1**	**Group 2**	**P value**
Age (years)	**Mean ±SD**	**47.32 ± 14.63**	**46.23 ± 13.65**	**0.713**
Gender (%)	Male	14	7	0.043
	Female	16	23	
ASA	ASA I	17	18	0.531
	ASA II	13	12	
Operation time	Mean ±SD	44.56 ± 11.78	49.35 ± 25.22	0.978

The staging of carcinoma was done and it was found that the most common T stage on laparoscopy was T3. The most common N stage on laparoscopy was N0 and N2. (Table 2)

Table 2: Staging of stomach carcinoma by laproscopy

Laproscopic T staging	**Histopathological staging**					
	T1/T2		**T3**		**T4**	
	Group 1	**Group 2**	**Group 1**	**Group 2**	**Group1**	**Group 2**
T 1/ T2	3	2	1	2	0	1
T3	2	3	9	9	4	2

ISSN: 0975-3583,0976-2833 VOL14, ISSUE 02, 2023

T4	0	0	1	0	10	11
Laproscopic N staging	N0		N1		N2	
N0	13	12	1	2	4	5
N1	1	2	2	3	2	1
N2	3	4	2	0	2	1

There was no difference between the groups in terms of surgical satisfaction scores. Patient satisfaction scores were found to be higher in spinal anesthesia group ($p<0.001$). Shoulder pain was observed in 75% patients in Group 1 (SA group) and 90% in group 2 (GA group) and results were significant. There was a statistically significant difference between the groups regarding the use of ephedrine (60% in group 1 and 0% in group 2, $p=0.001$. (Table 3)

Table 3: comparison of side effects between groups

Variable	Group 1	Group 2	P value
Surgeon satisfaction	8	8	0.523
Patients' satisfaction	9	6	0.001
Shoulder pain	75%	90%	0.003
Ephedrine	60%	0	0.001

Discussion

The present study was done to compare the spinal and general anaesthesia among 60 patients for staging laparoscopy in carcinoma of stomach patients. The mean age of patients in both the groups was in 40s and females were higher in both the groups. The mean operation time was 44 minutes in group 1 & 49 minutes in group 2.

The fundamental conclusion of this study is that both anaesthesia techniques - general anesthesia and spinal anesthesia - produced favorable conditions for laparoscopic surgery that were efficient, comfortable, and safe. In Group 1, shoulder pain was a problem, but it was adequately managed, and no patient needed general anesthesia. In group 1, the level of patient satisfaction was higher. Doctors made no mention of any variations in surgical satisfaction across the groups.

Right shoulder pain is one of the main intraoperative issues with laparoscopic surgery under spinal anesthesia. According to earlier research [9,10] keeping intra-abdominal pressure below 10 mmHg lessens respiratory discomfort and right shoulder pain caused by diaphragm irritation. In our study, 30% of patients in Group 1 experienced minor, transient right shoulder pain despite frequently administering sedation with midazolam and fentanyl to avoid shoulder pain and restlessness. 35.5% of the subjects receiving spinal anesthesia in one trial reported right shoulder pain. Of them, 8.9% experienced minor, momentary shoulder pain, 22.2% needed fentanyl, and 4.4% experienced right shoulder pain that persisted after the administration of fentanyl and necessitated switching to general anesthesia.[11] In a study involving 300 patients, 87.3% of the patients had right shoulder pain while laparoscopic surgery was initiated under spinal anesthesia.[12] Only 9.93% of patients who had shoulder pain received additional 100 mg tramadol; instead, 90.03% of them experienced pain relief through massage. Nonetheless, the surgeon chose general anesthesia in 0.67% of the patients. 12.29% of 3492 individuals who underwent spinal anesthesia in a retrospective analysis reported experiencing neck or shoulder pain. Despite sedoanalgesia [13], a change to general anesthesia was necessary in 0.004% of the patients. Although the discomfort was slight and quickly subsided, we believe it was caused by the fentanyl injection. No patient needed to be converted to general anesthetic because of shoulder pain.

ISSN: 0975-3583,0976-2833 VOL14, ISSUE 02, 2023

In general, prior studies have found that patients receiving spinal anaesthesia were discharged sooner than those in the general anesthetic group.[14,15] In our study, every patient was released from the hospital on the first postoperative day. In actuality, patients under spinal anesthesia were permitted to leave the hospital early, but they were required to stay for a full 24 hours due to surgical considerations.

While choosing the type of anesthesia to be used, consideration for the needs of the patient is crucial. Patients in the spinal anesthesia group in a previous study were said to be generally happy with the anaesthesia method. In the same study, 3 patients who received general anesthesia were reasonably satisfied while 26 patients who received general anesthesia were greatly satisfaction.[14] These outcomes mirror those of Group 1 in our study, which we conducted.

In our investigation, the surgery satisfaction scores were comparable across groups. In a prior study, doctors rated the surgical environment and muscle relaxation as poor (1), good (2), or exceptional (3), and the mean surgical satisfaction was recorded as 2.4 points for both groups.[5] In the investigations carried out, the surgeons also reported that the spinal anesthetic technique had good muscle relaxation, no technical issues had been found, and the outcomes were comparable in the general anesthesia and the spinal anesthesia groups. These findings support the notion that spinal anesthesia is a viable alternative to general anesthesia for laparoscopy because they are similar to those found in our study.

Laparoscopy has been established as a safe alternative to open approach for the cancer of stomach. Additional benefits of the laparoscopic approach include decreased immune suppression, decreased postoperative pain, early ambulation, and other advantages of minimally invasive surgery.[16]

Conclusion

The findings of this study allow us to draw the conclusion that, spinal anesthesia may be used as a less risky alternative to general anesthesia in patients, particularly when the risk of general anesthesia is too high in patients with predetermined difficult conditions.

Laparoscopy is a good method for staging of carcinoma stomach and spinal anaesthesia can be the more efficient, cheaper and less risky mode of anaesthesia, particularly avoiding the major risks associated with the general anaesthesia

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ISSN: 0975-3583,0976-2833 VOL14, ISSUE 02, 2023

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