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A Prospective Study to Evaluate Feasibility of Laproscopic Cholecystectomy under Regional Anaesthesia

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Abstract

Context: Feasibility of laproscopic cholecystectomy under regional anaesthesia.

AIM: This study aims to evaluate the feasibility of laproscopic cholecystectomy under regional anaesthesia.

Subject And Methods: In this study 33 adult patients posted for elective laproscopic cholecystectomy, were explained about the procedure and decided to be given spinal or combined spinal plus epidural(CSE) anaesthesia, according to the choice of the patient.

After putting spinal / CSE, patients were made to lie head down position to achive adequate level of sensory block i.e., T6. After that, patient was made to lie in reverse Trendelenburg position for laproscopic cholecystectomy.

Feasibility was evaluated on the basis of Anaesthesia time, surgical time, complications due to pneumo-peritoneum such as shoulder tip pain and need for conversion to General Anaesthesia. Intra-operative vitals were noted at 5 minutes interval. While post-operative pain at 1st,6th, 12th and 24th hour were, noted.

Result: In 95% of patients, surgery was successfully done under regional anaesthesia. Three patients were converted to general anaesthesia due to bradycardia, adherence of gall bladder to duodenum, plus neuraxial block failure. In terms of anaesthesia time, the mean time taken for spinal anaesthesia was more than GA, but was statistically insignificant. Discomfort due to pneumo-peritoneum in form of shoulder tip pain was observed in 5% patients. Post- operative pain was measured by visual analog pain score, where 85% of patients reported pain of 0 scae in post op period.

Cholecystectomy is commonest surgery of the biliary tract and second most common operative procedure today word wide[1,2]. Langenbuch's open cholecystectomy remained the gold standard for symptomatic cholecystectomy for over a century, but due to higher incidence and greater degree of morbidity, complications (internal haemorrhage etc) and mortality associated with open cholecystectomy, the technique evolved into laproscopic cholecystectomy.

It has number of advantages compared to conventional therapy, including reduced pain, patient satisfaction, better cosmetically, reduced cost, early recovery, reduced hospital stay, and early return to work[3,4].

In general surgery today, one of the most commonly undertaken procedures is laproscopic cholecystectomy with more than 500,000 performed annually with an overall complication rate 1.5% and the mortality rate less than 0.1%.

With improved skill and availability of better instruments, laproscopic cholecystectomy can be done with single incision and has advantage of better cosmosis and reduced post-operative pain.

For all laproscopic procedures need to create pneumo-peritoneum, asks for endotracheal intubation and mechanical ventilation. the increased intra-abdominal pressure along with increased carbon dioxide load on lungs are supposed to be better managed under general anaesthesia (GA).

Recent literature has showed small no. of cases, who were deemed high risk for GA, and were done under regional anaesthesia[5,6]. Which led to introduction of regional anaesthesia for laproscopic procedures on healthy subjects as well[7.]

The incidence of post-operative morbidity like nausea, vomiting, dizziness, respiratory complications, thromboembolism and pneumonia were much less as compared to GA. Also, the need for post-operative anti emetics and analgesics and the incidence of other complications was much lower when compared to GA.

So, even though the emerging trends shows that laproscopic cholecystectomy can be performed safely under regional anaesthesia, it is still is not accepted worldwide[8,9]. We did a prospective study to evaluate the feasibility of laproscopic cholecystectomy under regional anaesthesia in healthy subjects.

Material and Methods

Study Design

This prospective, interventional study was conducted on 60 patients with chronic calculus cholecystitis attending general surgery OPD of PGIMER, DR R M L Hospital, New Delhi from1.11.2014 to 29.2.2016.

Patient selection

The inclusion criteria was to include all patients with gall stone disease. While exclusion was based on patient refusal for spinal anaesthesia, acute calculus cholecystitis, empyema gall bladder, previous upper abdominal surgery, ASA grade 3and 4, gall bladder malignancy. Patient with known sensitivity to local anaesthetic (bupivacaine and xylocaine), patients with spinal deformities and other contraindications for spinal anaesthesia like bleeding diathesis, infection, operated spine, uncontrolled diabetes mellitus, hypertension, neuropathy and BMI more than 35kg/m^2.

Methodology

After taking ethical committee clearance from competent body ,Preoperatively patients and relatives were informed in their own language about the disease , types of operation (laproscopic and open) , types of anaesthesia available (spinal and general anaesthesia), advantage and disadvantage of both types of anaesthesia , intra operative and post-operative complications associated with both types of anaesthesia , risk of conversion of anaesthesia from spinal anaesthesia to general anaesthesia .

Randomisation

The potential candidates for the study were cases of chronic calculus cholecystitis undergoing elective laproscopic cholecystectomy.

After doing thorough pre anaesthetic check-up, pre - operative advice given. Patients were explained in detail about possible intraoperative events like

vomiting, shoulder pain, anxiety. Also, about the possibility of converting to general anaesthesia and open cholecystectomy.

As a premedication 2 tablets of charcoal, and dulcolex were given on the night prior to the surgery, to lessen colonic distension. They were advised to take light diet and kept fasting after 10 pm, night before operation. They were also advised to empty bladder before being shifted to operation theatre.

Anaesthetic Management

Pre anaesthetic medication included ranitidine 50 mg IV, and ondansetron 4 mg IV, as a standard method. Pre-operative values of HR, MAP, RR, SPO2 were recorded. Single shot dose of prophylactic second generation cephalosporin was given during induction.

Patients were pre-hydrated with ringer lactate solution before putting spinal anaesthesia. After that patients were made to sit, and under all aseptic conditions the subarachnoid space was punctured between the L2-L3 apophyses with a 26G cut bevel or pencil point needle. After confirming the backflow of CSF ,3-3.5 ml of 0.5% heavy bupivacaine was injected. The patient was made to lie in the head down position (5-15%) till the anaesthesia up to the level of T6 is achieved. Level was confirmed by pin prick sensation. Along with the standard pulse oximetry, blood pressure monitoring at every 5minutes interval was done. Any, hypotension was managed with extra intravenous fluid or IV mephentermine (5mg) boluses. For anxiety 1mg midazolam and for pain IV fentanyl @1mcg/kg body weight was given. All the patient related data was recorded on pre formed proforma, during peri operative period. Intra operative pulse rate, blood pressure, respiratory rate, and oxygen saturation along with incidence of shoulder pain and any other difficulty was noted in a table format at every 5 minutes interval.

Surgical technique

All the painting and draping was done during head down position after giving spinal. Pneumoperitoneum was created only up to the pressure of 10 mm of hg. And was maintained same through-out the procedure. Nasogastric tube was inserted in those cases where surgeon wanted to deflate stomach. After second port placement, 16-20 ml of 2% xylocaine was sprayed between liver bed and diaphragm from epigastric port and allowed to remain there for 3-4 minutes in head down position (10-15degree). This was done to minimise the stretch pain (shoulder pain). After that patient was placed in reverse trendelenburg position and table tilted to left. Once gall bladder was removed, during closure of ports, subcutaneous infiltration of incision site with 0.5% bupivacaine was done in all cases.

Intra-operative Monitoring

Along with the basic monitoring at adequate interval, following parameters were also noted.

a. Anaesthesia time: defined as time from first incision to final suture
b. Surgery time: defined as time from first incision to final suture
c. Pneumoperitoneum: defined as time from CO2 insufflation through veress needle, till the expulsion of all CO2 at the end of the procedure
d. Intraoperative significant events were defined as pain in the right shoulder, anxiety, headache, nausea, and abdominal discomfort.

The duration of surgery, intraoperative gas consumption, per operative findings (adhesions in the vicinity of gall bladder), intraoperative complications (pain, bile spillage, bleeding, visceral injury) along with reason for conversion into general anaesthesia, if any

conversion from laproscopic to open cholecystectomy were recorded.

Post-Operative Care

IV fluids and IV antibiotics were continued up to 6-8 hours after surgery. Patient were monitored for the following

1. pulse, blood pressure, temperature and respiratory rate
2. appearance of bowel sounds
3. passage of flatus and passage of urine
4. billiary peritonitis / ileus jaundice
5. post operative pain and requirement of analgesics
6. post operative nausea or vomiting and requirement of anti-emetics

All patients received first dose of analgesics with IV tramadol 100 mg in post-operative room and subsequent doses given as and when required by the patients. The time of first dose of post-operative analgesics as well as the total requirement of post-operative analgesia recorded for each patient. The degree of post-operative pain was assessed by means of visual analog pain scale (VAS) at 1,6,12, and 24 hours.

The post-operative complications (like vomiting, right shoulder tip pain, surgical site infection and common bile duct injury), ambulation time, length of hospital stay, and patient satisfaction were recorded.

Patients were discharged according to their performance status and are asked to follow up in 7 days.

The outcome of procedure was assessed by the following parameters

In intra-operative Period

a. Duration of surgery
b. Rate of conversion
c. Reason for conversion
d. Intraoperative complications
e. Intraoperative hypotension / bradycardia
f. Cystic artery /hepatic artery injuries
g. Bile spillage
h. Visceral injuries

In Post-operative Period

a. Vitals
b. Post-operative complications like intensity of post-operative pain on visual analog pain scale, requirement of analgesics, complaints of nausea /vomiting and requirement of anti-emetics, also any sign of peritonitis
c. Length of hospital stay
d. Post-operative patient satisfaction

Statistical Analysis

Statistical analysis was done using computer software package SPSS v21.0. Data is presented as mean +/- SD. Continuous numerical data was compared using t-test analysis and Ordinal Numerical data was compared using Wilcoxon rank sum analysis. Nominal data was compared using Chi Square test. P-value<0.05 was taken as significant.

Results

Total 60 patients were included in this study. Out of which 23.3% were female and 76.7% were male. The mean duration of surgery was 52.6+/-13.3 minutes with the range of 30 to 95 minutes.

In 95% of patient's, surgery was performed under spinal anaesthesia successfully, means out of 60 patients, only 3 were converted to general anaesthesia. The reason for conversion was bradycardia, adherence of gall bladder to duodenum, plus severe intraoperative and failure of neuraxial block in one patient.

Out of 60 patients, 2 were converted from laproscopy to open because of adherent gall bladder and frozen calot's triangle, but could be done under spinal anaesthesia.

About 13.3 % subjects needed additional sedation, 10% had intraoperative pain, 5% had shoulder tip pain, 3.3% had bradycardia, 3.3% had hypotension, 1.7% had bile spillage and 1.7% had bleeding.

Significant post-operative pain was reported by 15 % of the patients at 1st hour, 18.3% patients at 6th hour, 10% patients at 12th hour, and 10% patients at 24 hours. 10% patients had post-operative vomiting.

Post-operative pain was measured by VAS scoring system. 85% of patients reported pain of 0 scale, 8.3% had score of 2, 3.3% had score of 3 and 3.3 % had score of 4. None reported VAS more than 5.

Out of 60, 76.7% of patients had hospital stay of one day only, while 16.7%,5%, and 1.7% patients had to stay in hospital for 2,3, and 4 days respectively.

Around 68.3% of patients had KERNOSKY performance score of 100. Rest of 21.7%, 6.7%, and 3.3 % had a score of 90, 80, and 70 respectively .no patient had score of 60 or less.

Discussion

Though GA remains the gold standard for laproscopic procedures, if done meticulously keeping patient safety in mind, spinal anaesthesia (SA) can give advantage over GA. In carefully selected patients, SA is safe and feasible. It avoids many major complications attributed to GA. Also, in high risk patients (COPD), who are unfit for GA, spinal anaesthesia is better mode of anaesthesia for them. Intraoperative complications associated with spinal anaesthesia are easily manageable by keeping low intra-abdominal pressure during pneumoperitoneum (10 mm of hg in our study). Complications in our study, ranged from shoulder tip pain, abdominal discomfort, nausea, vomiting, anxiety, post-operative pain; which were manged by additional sedation in intraoperative period, LA spray to liver bed, IV analgesics and anti-emetics.

Few patients who were converted to GA were mainly due to surgical causes like dense adhesions, so required conversion to open procedure too.

Conclusions

Hence we conclude that laproscopic cholecystectomy under spinal anaesthesia , should be promoted more even in developing countries like ours , but we need to establish well evaluated safety guidelines that could be followed faithfully for minimising the risk of complications as it become even a greater responsibility for us to identify deficiencies , if any , that can have detrimental effect on patients health .

Also due to shorter hospital stay in these patients, there is a rapid turnover of hospital beds which adds to the OPD patient comfort that they easily get date for surgery. Also considering the low cost of spinal anaesthesia as compared to GA , it adds to the indirect benefit of the hospital in the form of better and more judicious use of resources for other patients in greater need and all that without jeopardizing the safety of the patients , rather offering them to get rid of the hospitals unfriendly environment much sooner than the conventional hospital stay . Patients get psychological sense of the well being as soon as they get back into their homely surroundings.

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