

Antibiotic Prophylaxis in Laparoscopic Cholecystectomy: A Retrospective Study

Santosh Shrestha¹, Binod Bade Shrestha², Pradip Ghimire³

Fishtail Hospital and Research Center Pvt. Ltd, Pokhara

Correspondence

Dr Santosh Shrestha
Fishtail Hospital and Research Center Pvt.Ltd

Email: santos.stha@gmail.com

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ABSTRACT

Introduction: Laparoscopic cholecystectomy is considered as the gold standard treatment for gallstone disease. There has remained a controversy on use of peri operative prophylactic antibiotics during laparoscopic cholecystectomy in reducing perioperative prophylaxis surgical site infections. Various studies has been done to evaluate whether single dose/ three doses or multiple doses are needed to decrease the incidence of surgical site infections. The objective of this study was to identify the incidence of postoperative surgical site infections with three doses of perioperative antibiotics after laparoscopic cholecystectomy.

Metrials and Methods: This is a retrospective observational study conducted at a private hospital from November 2017 to March 2020. All the patients received three doses of ceftriaxone 1 gram within the first 24 hours of surgery. The incidence of surgical site infection was noted.

Results: A total of 449 patients who fulfilled the inclusion criteria were studied. The age ranged from 16 to 88 years. Male to female ratio was 1:4. Seven cases (1.55%) developed postoperative surgical site infections.

Conclusion: Three doses of perioperative antibiotics are recommended in laparoscopic cholecystectomy to prevent postoperative surgical site infections.

Keywords: Laparoscopic Cholecystectomy, Perioperative Antibiotics, Surgical site infections.

INTRODUCTION

Cholelithiasis is one of the most common surgical problem encountered worldwide, cholecystectomy being a very frequent surgical procedure. Langenbach was the first to perform open cholecystectomy in 1892. With the advent of laparoscopic cholecystectomy by Philip Mouret, due to its less invasiveness, less postoperative pain, less hospital stay, better cosmesis, reduced cost, it has become the gold standard treatment for symptomatic cholelithiasis.¹⁻⁵

Surgical site infection (SSI) is a major postoperative complication associated with any surgery resulting into more morbidity. Despite its less invasiveness, laparoscopic cholecystectomy still has incidence of SSI depending on the intraoperative findings, comorbidities of the patient. The use of prophylactic antibiotics after surgery has impact in reducing the incidence of SSI.^{6,7} However, the protocol of giving antibiotics varies with institutes and has changed with time. In developing countries like ours, antibiotics are given throughout the admission with switch over to oral antibiotics during discharge, but

with time the duration has decreased to three doses to single dose in uncomplicated cases.

Our institute is a private hospital and has a protocol of giving total of three doses of third generation cephalosporin within twenty four hours of surgery. This study was conducted to find out the incidence of SSI after laparoscopic cholecystectomy with this protocol.

MATERIALS AND METHODS

This is a retrospective observational study conducted from November 2017 to March 2020 at Fishtail Hospital and Research Center Private Limited. All patients who underwent laparoscopic cholecystectomy were identified using operating theatre, inpatient records and outpatient follow up record books. The records were reviewed for demographic data, associated co-morbidities, intraoperative findings and postoperative complications.

Inclusion and exclusion criteria

All consecutive patients of all age group and both sexes were included in the study.

Patients admitted as acute calculous cholecystitis receiving antibiotics preoperatively, associated with co-morbidities like diabetes mellitus, renal impairment, immunosuppressed, cases converted to open and intraoperative findings like empyema, with gross bile spillage were excluded from the study.

Surgical Procedure

All the patients received intravenous Ceftriaxone 1gm during induction. The abdominal skin was prepared with 10% povidone-iodine solution. Laparoscopic instruments were sterilized as per hospital protocol before procedures via high level disinfectant solution. All the patients underwent standard three or four ports technique either by close or Hassans technique. Aseptic precaution was maintained throughout the procedure. The gallbladder was taken out mostly through epigastric port; those found difficult due to large stone size and number and due to thick wall were retrieved through umbilical port.

All the patients were kept in postoperative ward for the next twenty four hours. Two more doses of antibiotics (Ceftriaxone 1 gm) were given at 8 hours apart. Oral feeding was started after 6 to 8 hours. All the intravenous medications were stopped after 24

hours and oral analgesics were prescribed. Dressing was changed on 2nd postoperative day and patients were discharged according to their convenience. The patients were called on 6th postoperative for dressing change and wound inspection. Staple removal was done on 10th postoperative day after inspecting the wound. Portsite redness and tenderness, wound discharge, wound abscess associated with or without fever were considered as SSI. The complications and patient's personal data were recorded in a separate outpatient record book. The wound swab was sent for microbiological culture sensitivity test and empirical antibiotic was started. The patients were kept under regular followup till wounds got healed. The patients were advised to follow up on 30th postoperative day with histopathology reports of resected gallbladder specimen.

RESULTS

In the above mentioned time period, 449 cases of laparoscopic cholecystectomy fulfilled the inclusion criteria. The age of the patients ranged between 14-88 years, with 109 males and 340 females. The patient's demographics are shown in Table 1.

Age (years)	No. (%)
<20	9 (2%)
20-39	172 (38.3%)
40-59	163 (36.3%)
≥60	105 (23.3%)

Out of 449 cases, 7 cases (1.55%) developed surgical site infection. Five cases (1.1%) were found to have portsite redness and tenderness (4 in umbilical and 1 in epigastric) on 6th Postoperative day with two cases having wound abscess. Out of five cases three cases improved with empirical antibiotics while in two cases of wound abscess, it was drained removing the staples, one in each umbilical and epigastric port. It was associated with fever in one case. The patients improved with daily dressing, empirical antibiotics, and while secondary suturing was needed in one case of epigastric port site abscess. Two cases (0.44%) were found to have discharge from the umbilical port after removing the staple on 10th postoperative day. In both the cases, wound healed with saline dressing.

Table 2. Occurrence of SSI

Type of SSI	2 nd POD (n)	6 th POD (n)	10 th POD (n)	30 th POD (n)
Port site redness and tenderness	0	3	0	0
Wound discharge	0	0	2	0
Wound abscess	0	2	0	0

DISCUSSION

The prevalence of gall stone disease is considerably high in many parts of the world and cholecystectomy being one of the most frequently performed surgical procedure. Due to the advantages of minimal invasive surgery, laparoscopic cholecystectomy has replaced open cholecystectomy worldwide though open procedure is still practiced in our part of the world.

Gall stone disease commonly affects female population in their 4th decade of life. In our study, 75.72 % of patients were female with male to female ratio 1:4 which is similar to a study by Koirala et al.⁸ In our study, age range of patients varied between 16 – 88 years with maximum patients in the age range between 20 - 39 years(38.3%). Age has not been identified as an independent risk factor in relation to SSI in laparoscopic cholecystectomy.

Cholecystectomy wound comes under clean contaminated type with the incidence of SSI upto 20% without chemoprophylaxis.⁹⁻¹² Considering the high incidence of SSI without antibiotic prophylaxis and huge number of evidence based data, perioperative antibiotic prophylaxis is practiced worldwide.^{9,13-16} Several protocols (single dose/ three doses/ multiple doses throughout hospital stay) of antibiotic prophylaxis are practiced varying with different institutes. In our study group, all the patients had received three doses of antibiotics (Ceftriaxone 1 gram) within the first 24 hours of surgery. Among 449 cases, seven patients (1.55%) developed surgical site infection. Five patients were diagnosed to have surgical site infection during follow up at sixth postoperative day. Four out of five patients improved with dressing and empirical antibiotics while one patient with epigastric port infection needed secondary suturing. Two patients were diagnosed at 10th postoperative day during staple removal. They improved with dressing only. A study done by Abro et al concluded three doses

of antibiotics should be used instead of single dose antibiotics in all clean contaminated and contaminated wounds.¹⁷ In a randomized controlled trial done by Matsui et al comparing three doses of antibiotics versus no antibiotics after laparoscopic cholecystectomy in 1037 patients concluded that perioperative administration of prophylactic antibiotics should be recommended in elective low risk laparoscopic cholecystectomy to prevent postoperative infectious complications and to reduce medical costs.¹⁸

A study conducted by Koirala et al comparing single dose versus three doses perioperative antibiotics after laparoscopic cholecystectomy showed higher incidence of wound infection in single dose group though statistically insignificant.⁸ A study conducted by Sutaria et al comparing single dose versus multiple dose perioperative antibiotics showed postoperative infection rate of 4.4% and 3.3% respectively.¹¹ The cost difference between single dose and three doses of ceftriaxone is very nominal in our part of the world so even a slightest decrease in the incidence of postoperative complications with three doses of antibiotics would benefit the patient.

CONCLUSION

Use of three doses of perioperative antibiotics for laparoscopic cholecystectomy is very much rationale in decreasing the incidence of surgical site infections considering the low cost of the drug in our part of the world.

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