

Prophylactic Antibiotics in Elective Laparoscopic Cholecystectomy is it Necessary?

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ABSTRACT

Background: Elective laparoscopic cholecystectomy (LC) has a low risk for Surgical Site Infection (SSI). In spite many surgeons still use prophylactic antibiotics. The aim of this study was to find out the need of prophylactic antibiotics in elective LC. **Method:** This study was carried out from 2017 June to 2018 August in the Department of Surgery Nepalgunj Medical College and Teaching Hospital Kohalpur (NGMC). Patients were placed into two groups. Group A received a single dose of prophylactic antibiotic and group B patients did not receive any prophylactic antibiotic. In both groups the SSI were recorded and compared. **Results:** Overall SSI was 5 (3.33%) among 150. In group A 2 (2.66%) patients had SSI and in group B 3 (4%) had SSI. Using or not using prophylactic antibiotics did not correlate with SSI ($p = .154$). **Conclusions:** Prophylactic antibiotic is not recommended in elective LC. Prophylactic antibiotic does not reduce the rate of SSI.

Key words: Elective laparoscopic cholecystectomy, prophylactic antibiotic, surgical site infection

INTRODUCTION

Surgical Site Infection (SSI) is one of the commonest complications faced by surgeons. Prevention of SSI is necessary to improve the results of surgery. One of the methods to reduce SSI is prophylactic antibiotics. Laparoscopic cholecystectomy (LC) is the standard of treatment for symptomatic cholelithiasis and has a very low incidence of SSI as compared with open cholecystectomy (OC)¹⁻⁴. Despite of lot of evidences supporting a very low risk of SSI after Laparoscopic cholecystectomy, there is still a controversy and many surgeons still use prophylactic antibiotics in elective Laparoscopic cholecystectomy.

The United States centre for disease control and prevention recommends the single dose use of Cefazolin for patients undergoing biliary tract surgery like open cholecystectomy to reduce SSI^{5,6}. The minimum manipulation and the small incision in Laparoscopic cholecystectomy reduce the chance of wound contamination. Unnecessary use of antibiotics increases the cost as well as the risk of emergence of multidrug resistance. Hence to eliminate the controversy around the use of antibiotic prophylaxis in elective Laparoscopic cholecystectomy, this study was conducted.

MATERIAL AND METHODS

This prospective trial was carried out from 2017 June to 2018 August in the department of Surgery NGMC. Institutional

Research Ethics Committee approval was obtained. Informed written consent was taken from all Patients included in the study. Patients with symptomatic cholelithiasis were included. Patients with moderate and severe acute cholecystitis according to Tokyo guidelines⁷ (TG13) were excluded. Similarly, Patients with Choledocholithiasis, pancreatitis, Cholangitis were also excluded. Patients with diabetes mellitus (DM), patients requiring conversion to open cholecystectomy, those who are older than 60 years and those who took antibiotics in the 7 days prior to surgery were also excluded.

Patients were randomized in two groups by lottery. Group A patients received prophylactic antibiotic (Injection Ceftriaxone 1 gm) at the time of induction. Group B patients didn't receive any antibiotics. The skin was disinfected with 5% povidone iodine. Laparoscopic cholecystectomy was performed by using 4 ports in all patients. Pneumoperitoneum created by closed technique through a supraumbilical incision and other three ports were inserted under vision. The gall bladder was extracted through the epigastric port. In case of rupture of gall bladder and spillage of bile, local peritoneal lavage was done. A drain was placed in the hepatorenal pouch whenever required but these patients were not excluded. The postoperative course was monitored and any incidence such as fever, surgical site infection (SSI) and bile leak was recorded. Culture was sent in case of wound discharge. After discharge the patients were followed up at 1 week and at 1 month.

Statistical analysis

Data were analyzed using SPSS 20.0. Statistical analyses were performed using chi-square test and Fisher's exact test. A P-value <0.05 was considered as significant.

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RESULTS

184 Laparoscopic cholecystectomy were performed during the study period. 34 cases were excluded. The causes of exclusion were age >60, conversion to open, DM and incidental finding of empyema. In these case antibiotics were given. 150 cases were included with 75 patients in each group.

The mean age of the patients in group A (antibiotic) was 37.26±11.70 with an age ranging between 4 and 59 and there were 64(85.3%) females and 11(14.66%) males. Similarly the mean age of the patients in group B (no antibiotic) was 36.70±9.62 with an age ranging between 17 and 56 and there were 67 (89.33%) females and 8 (10.66%) males. There was no difference in characteristics of patients and surgical outcomes between two groups (Table I).

Overall SSI was 5 (3.33%). In group A 2 (2.66%) patients had SSI and in group B 3 (4%) had SSI. Using or not using prophylactic antibiotics did not correlate with SSI ($p = .154$). One patient had epigastric port site SSI rest all had umbilical port SSI. All SSI were superficial. Out of 2 patients with SSI in group A, both had bile spillage, but in group B among three patients with SSI none had bile spillage. There was no correlation between bile spillage and SSI ($p = .429$). Among 5 patients with SSI only one patient wound culture grew klebsiella, remaining were sterile.

The duration of surgery and length of hospital stay were also similar between two groups. No other systemic infection like sepsis, pneumonia, or urinary tract infection was found in either group. There was no mortality.

DISCUSSION

Overall SSI in the study was 3.33%. In group A (antibiotic) the SSI was 2.26% and group B (no antibiotic) SSI was 4%. The slightly higher SSI in those who did not receive antibiotic was statistically not significant ($p = .154$). This observation was similar to other studies^{2,3,8,9,10}.

In this study spillage of bile occurred in 42.66% in group A and 28% in group B. The incidence of spillage of Bile and stone both were 2.66% in group A and 8% in group B. The spillage of bile and stone did not lead to higher infection. In fact, in group B, none of the three patients having SSI had bile spillage. We did not find any significant correlation between the bile spillage and SSI ($p = .429$). Many studies have shown that SSI are not related to rupture of gallbladder, spillage of stone or bile^{8,11}. Mechanical tissue damage and skin flora contamination are important causes of SSI¹². The cause of SSI in this study may have been incomplete hemostasis, inadequate skin preparation or aseptic manipulation rather than the use or not use of antibiotics.

Other risk factors contributing to SSI such as age >60, DM, jaundice, acute cholecystitis, cholangitis are suggested by some authors^{8,13,14} but we excluded such factors to maintain the uniformity of clinical characteristics as well as surgical outcomes. There were no differences in duration of surgery and length of hospital stay in two groups (Table I). We didn't include the patients with acute cholecystitis, empyema, age >60, DM. So the finding of our study cannot be generalized. Perhaps this requires a separate study including only this high risk population.

CONCLUSIONS

The rate of SSI is low in elective LC. The use of prophylactic antibiotic didn't correlate with SSI. Therefore the use of prophylactic antibiotic is not recommended in elective LC.

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Characteristics	Group A (n=75)	Group B (n=75)	p value
Sex (M/F)	11/64	8/67	
Mean age	37.26±11.70*	36.70±9.62*	
Gallbladder stone	75	75	
Rupture of gallbladder (%)	34 (45.33%)	27(36%)	
Bile spillage (%)	32 (42.66%)	21(28%)	.429
Bile and stone spillage (%)	2 (2.66%)	6 (8%)	
Subhepatic drain (%)	11 (14.66%)	19 (25.33%)	
Duration of operation (min)	71.6±21.10*	70.64±21.88*	
Conversions (%)	5 (6.66%)	3 (4%)	
Length of stay (days)	3.21±0.86*	3.42±0.67*	.263
SSI (%)	2 (2.66%)	3 (4%)	.154

* Data given as mean ±SD

Table I: Characteristics of patients and outcomes

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