ORIGINAL RESEARCH PAPER

General Surgery

KEY WORDS: Laparoscopic cholecystectomy. Prophylactic antibiotics.

# ROLE OF PROPHYLACTIC ANTIBIOTICS IN LOW RISK ELECTIVE LAPAROSCOPIC CHOLECYSTECTOMY: A STUDY OF 50 CASES

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ABSTRACT

**Background :** Elective laparoscopic cholecystectomy for symptomatic cholelithiasis has low risk of postoperative infective complications. Although antibiotics prophylaxis is routinely administered in laparoscopic cholecystectomy, its role is debatable. Our objective of this study was to explore the adequacy of anti-microbial prophylaxis in avoiding postoperative infective intricacies in low risk elective laparoscopic cholecystectomy patients

**Methods:** From January 2019 to June 2019, 50 patients were randomized into 25 in antibiotic group (ABG) and 25 in non antibiotics group (NABG). AG received single dose of injection Ceftriaxone 1 gram as prophylactic antibiotics at the time of induction of anesthesia. NAG was given only intravenous fluids. Besides routine care in both groups age, gender, surgical duration, ASA classification, and duration of stay in hospital were documented. Patients were followed-up week by week for 4 weeks and rates of shallow surgical site contaminations and in addition intra-abdominal infections were assessed.

**Results:** Both groups were analogous in patient's clinico-demographic characteristics such as average Age (46.4 vs. 45.1 years) and sex (female 19 vs. 17). There was no significant difference observed in wound infections among the different groups ABG and NABG .

**Conclusions:** Antibiotics prophylaxis is not needed for low risk laparoscopic cholecystectomy

## INTRODUCTION

Antibiotic prophylaxis can prevent infection in contaminated wounds but are clearly not indicated for most patients undergoing straightforward clean surgical operations in which no obvious bacterial contamination or insertion of a foreign body has occurred [1]. The infective complications of open cholecystectomy are well known, and prophylactic antibiotics are a routine practice. However, the wounds created after open cholecystectomy behave differently as compared to laparoscopic cholecystectomy. First, the wounds created are smaller as compared to the open surgery. Secondly, it has been proved that the immune system is better preserved in laparoscopic surgery since the tissue trauma is less [2]. These results in lesser activation of the inflammatory response following the laparoscopic procedure [2] Furthermore, laparoscopic cholecystectomy per se does not violate the mucosal defense barrier of the respiratory, gastro-intestinal or genital epithelium. Observing the low incidence of infections following laparoscopic cholecystectomy, the need for antibiotics is now frequently questioned. The over-use of antibiotics can result in a rising frequency of adverse effects, emergence of drug resistant organisms, as well as increased cost [3, 4]

It is not clear whether antibiotic prophylaxis in laparoscopic cholecystectomy is of any advantage to the patient in terms of preventing infection. Thus, the present study was undertaken to evaluate the rate of infection in laparoscopic cholecystectomies, and to assess the usefulness and efficacy of antibiotic prophylaxis in laparoscopic cholecystectomy.

## MATERIAL AND METHODS

This randomised controlled trial prospective study was conducted on 50 patients who underwent elective Laparoscopic cholecystectomy (LC). Informed written consent from the patients after explaining the study protocol was taken before the commencement of study.

Patients with high danger of perioperative diseases, i.e., diabetes mellitus, utilization of immunosuppressive treatment, corticosteroids and and biliary hindrance, i.e., jaundice, alkaline phosphatase or direct bilirubin levels double the reference levels, anti-microbial intake 7 days preceding surgery, dynamic or intense cholecystitis 6 weeks before surgery and crisis cholecystectomy were excluded from study. After confirmation of the presence of gall stone using ultrasound (USG), all the patients were evaluated with haemogram, urea, creatinine, liver function test (LFT), blood sugar, electrocardiography (ECG) and chest radiography.

Elective LC was done after overnight fasting in the hospital. All surgeries were done under general anaesthesia (GA). Antibiotic group (ABG) group was given single dose of Inj. Ceftriaxone 1 gm intravenously at the time of induction of anaesthesia, whereas nonantibiotic group (NABG) group was given only intravenous fluids. LC was performed in both gatherings utilizing the standard four ports. Gall bladder was taken out from the umbilical port and a specimen for bile culture was taken at the time of gall bladder recovery. Any blood or bile in the Calot's triangle and subhepatic space was wiped utilizing suction and water system cannula. We considered bile spillage when there was leak from the puncture site, gallbladder side, cystic duct or gallbladder perforation during dissection. Any drop of stone to the peritoneal cavity was termed 'stone spill' wherein irrigation suction was done after retrieval of stones. Wounds were sutured with 3/0 non-absorbable monofilament suture. Age, sex, intra-operative observations, ASA scoring, spillage of bile or gall stones in operative field, were documented in every patient.

Any occurrence of fever was recorded post operatively. Asymptomatic patients were released on first or second postoperative day when taking and enduring food orally. USG of abdomen was done in all symptomatic patients and at least once during the 30 days postoperative period of all other cases.

## RESULTS

A total of 50 patients underwent LC in the study period; 25 patients were in antibiotic group (ABG) and 25 were in non-antibiotic group (NABG). There were 36 (72%) females and 14 (28%) males. Mean age of the patients was 46.4 years in ABG and 45.1 years in NABG.

**Table 1: Age and sex distribution**

| | ABG | NABG |
|---|---|---|
| Number of patients | 25 | 25 |
| Male : Female ratio | 6 : 19 | 8 : 17 |
| Mean age ( years ) | 46.4 | 45.1 |

Both groups were homogeneous for sex and age and ASA score. Mean duration of surgery in ABG was 43.5 minutes and in NABG was 42.9 minutes. Mean length of hospital stay in ABG was 1.48±0.6 days where as NABG in 1.64±0.8 days.

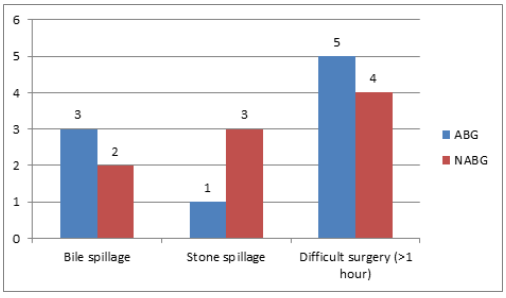
**Table 2 : Distribution according to mean duration of surgery and mean length of hospital stay post operatively.**

| | ABG | NABG |
|---|---|---|
| Mean duration of surgery (minutes) | 43.5 | 42.9 |
| Mean length of hospital stay post operatively | 1.48 | 1.64 |

Perforation and spillage of bile occurred in 5 cases and 4 also had dismissal of stones. Spilled stones were selected and irrigated with normal saline until there was clear aspiration. Distended gall bladder leading to difficulty in grasping and dissection were aspirated. 9 patients were categorized as difficult surgery which took more time for dissection of calots triangle.

**Table 3 : Procedure related events**

| Procedure related events | ABG | NABG |
|---|---|---|
| Bile spillage | 3 | 2 |
| Stone spillage | 1 | 3 |
| Difficult surgery (>1 hour) | 5 | 4 |




**Graph 1 : Procedure related events**

There was no case of sub-hepatic abscess/deep infection was seen in either group. 2 cases of superficial surgical, i.e., trocar site infection were noted in ABG and 3 in non-antibiotic group (NABG). The most common site of infection was umbilical trocar site in both the group. Fever was recorded in 3 cases of ABG and 5 cases of NABG. In 7 cases fever subsided on the next day. Therefore, no statistical difference was observed among both the groups in deep and superficial infections.

**Table 4 : Post operative events**

| Complications | ABG | NABG |
|---|---|---|
| Post operative fever | 3 | 5 |
| Deep abscess | 0 | 0 |
| Superficial surgical site infections | 2 | 3 |

## DISCUSSION

LC is associated with a lower risk of wound sepsis than open cholecystectomy [5]. The main benefits of LC is less postoperative pain, shorter hospital stays, a rapid come back to work, and a decrease in perioperative infections [6]. Even in the light of these guidelines and documentations, the same basis of prophylactic antibiotic use previously applied to conventional surgery are routinely used for laparoscopic surgeries as well [7].

Antibiotic prophylaxis in LC is not only unnecessary but also increases the overall cost of surgery and hospitalization [8]. It is important to follow the guidelines for antibiotic prophylaxis for cholecystectomy in coordination with infection control policy of the hospital. This will result in a more suitable utilisation of the prophylactic agents [9]. Higgins et al [10] also conducted a identical study where they did comparative evaluation of single dose prophylactic antibiotics with no antibiotics and also had similar kind of results. McGuckin et al [11], Tocchi et al[12] recognized that the use of prophylactic antibiotic is only suggested for those patients who are at higher risk for developing infective problems, e.g., diabetic people with increased chances of bactobilia.

Frantzides and Sykes [13] carried out a comparative study among preoperative antibiotic prophylaxis using single dose intravenous Cefotetan with preoperative chlorhexidine gluconate scrub without induction antibiotics. They verified that a well-executed surgical scrub or providing induction antibiotic prophylaxis has equivalent incidence of post operative infective complication rates. Our study also confirmed that number of post operative infective complications were analogous to both the groups whether antibiotics prophylaxis is used or not. As in our study, others have also reported umbilicus as the commonest site for sepsis [14]. Even though most studies have found no role of antibiotics in elective LC, they still recommend larger studies [15].

## CONCLUSION

It may be concluded that antibiotic prophylaxis is not recommended in all elective LC. However, the hospital infection control policy and merits of individual case may dictate otherwise. Larger trials will give further evidence and help formulate guidelines for universal acceptance.

**Acknowledgement:** none
**Conflict of interest:** none
**Funding:** none

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