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A Comparative Study to Assess the Role of Prophylactic Antibiotics in Elective Laparoscopic Cholecystectomy

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ABSTRACT
To assess surgical site infections in patients undergoing elective laparoscopic cholecystectomy and to compare surgical site infections between those receiving prophylactic antibiotic and not receiving prophylactic antibiotic. A total of 52 cases with 26 patients each in group A (received prophylactic antibiotics) and group B (not received prophylactic antibiotics) were selected. Broad spectrum antibiotics was given preoperatively after giving test dose in Group A patients. Age, gender, wound infection, duration of stay and post-operative complications were noted. Mean age of patients in the group A and B was 44.09 and 45.63 years, respectively. are comparable. There were totally 36 (69.23%) females and 16 (30.77%) males. Wound infection is more in the group of patients where prophylactic antibiotics was not given. Duration of hospital stay is less in patients who received prophylactic antibiotics compared to the other group. There were 4 patients in group A and 10 patients in group B had postoperative complications. Comparison of wound infection, postoperative complications and duration of hospital stay between both groups showed statistically significance ($p<0.05$). In low-risk patients who undergo elective laparoscopic cholecystectomy, antibiotic prophylaxis is safe and helpful in lowering surgical site infections, systemic infections during hospitalisation or after release and postoperative length of hospital stay.

INTRODUCTION

Benign biliary tract diseases are one of the most common surgical problems in the world[1]. Gallstones especially affect millions of people worldwide. An increased risk of gallstone development is linked to female sex, obesity, pregnancy, fatty meals, terminal ileal resection, Crohn's disease, gastric surgery, genetic spherocytosis, sickle cell disease and thalassemia. Classic presenting symptoms of the majority of patients include stabbing (Colicky) pain in the right upper quadrant radiating to the back and to the shoulder. Frequently the pain is associated with nausea and vomiting but is rarely accompanied by jaundice, fever or chills, unless a cholecystitis or cholangitis is present[2].

Ultrasound of the abdomen is an extremely useful and accurate method for identifying gallstones and pathologic changes in the gallbladder consistent with acute cholecystitis. In addition to detecting gallstones, ultrasound can provide specific information about cholecystitis symptoms such gallbladder wall thickening, pericholecystic fluid and impacted stones in the gallbladder neck[3].

Surgery plays an important part in the treatment and over half a million cholecystectomies are performed worldwide. The gold standard for the final treatment of people with gallstones during the past 100 years has been open cholecystectomy. The advent of laparoscopic surgery ushered in a new era in general surgery. One of the main benefits of minimally invasive surgery is the reduced rates of surgical site infection[4]. Less postoperative pain, better cosmetic results, a shorter hospital stay, an earlier return to full activity and lower total costs were the benefits of laparoscopic cholecystectomy versus open cholecystectomy[5]. Laparoscopic cholecystectomy is associated with smaller wounds and minimal tissue damage and therefore presumably a lower risk of wound infection. Post-operative infection and the need for antibiotic prophylaxis are well documented in open biliary surgery. The use of antibiotic prophylaxis, however, for laparoscopic procedures is unfounded[6]. In this present study we would like to assess the role of prophylactic antibiotics in elective laparoscopic cholecystectomy.

MATERIALS AND METHODS

The present comparative observational study consisted of diagnosed case of symptomatic cholelithiasis aged between 18- 60 years.

Data such as name, age, gender etc., was recorded. Two groups were made:

- **Group A:** Received prophylactic antibiotics
- **Group B:** Not received prophylactic antibiotics

Patients underwent laproscopic cholecystectomy. All procedures were done under spinal or epidural or general anaesthesia.

The results were compiled and subjected for statistical analysis using Mann Whitney U test. p-value less than 0.05 was set significant.

RESULTS

In Table 1, there were totally 36 females and 16 males. Two groups are comparable with respect to sex (p>0.05).

Wound infection is more in the normal group compared to the antibiotic group. There was a statistically significant difference between groups (p<0.05) (Table 2).

Duration of hospital stay is less in antibiotic group compared to other group. There was a statistically significant difference between groups (p<0.05) (Table 3).

There were 4 patients with complications in group A and 10 patients with complications in group B. There was statistically significant difference between two groups (p<0.05) (Table 4).

There were 1 patient with fever in group A and 5 patients with fever in group B. There is statistically significant difference between two groups (p<0.05) (Table 5).

DISCUSSIONS

Cholelithiasis or Gall Stones is rare in the first two decades of life. Women are affected more frequently than men (4:1) as the incidence steadily rises after age 21 and peaks in the fifth and sixth decades[7]. The

Table 1: Gender wise distribution of patients

Groups	Male	Female	Total	p-value
Group A	10	16	26	0.82
Group B	6	20	26	
Total	16	36	52	

Table 2: Wound infection among study participants

Groups	Yes	No	Total	p-value
Group A	8	18	26	0.001
Group B	16	10	26	
Total	24	28	52	

Table 3: Duration of hospital stay among study participants

Groups	No.	Mean	SD	p-value
Group A	30	6.4	0.3	0.04
Group B	30	8.8	0.4	

SD: Standard deviation

Table 4: Postoperative complications among study participants

Groups	Present	Not present	Total	df	p-value
Group A	4	22	26	1	0.04
Group B	10	16	26		
Total	14	38	52		

df: Degree of freedom

Table 5: Postoperative fever among study participants

Groups	Present	Not present	Total	df	p-value
Group A	1	25	26	1	0.01
Group B	5	21	26		
Total	6	46	52		

df: Degree of freedom

presence of gallstones in young Egyptian women, which was discovered through archaeological excavations, is evidence that cholelithiasis has been a problem for humans for more than 2,000 years. In this present study we would like to assess the role of prophylactic antibiotics in elective laparoscopic cholecystectomy.

We found that there were totally 36 females and 16 males. Ullah *et al*.[8] in their study found that the overall mean age was 40.81±5.11 years.

We observed that wound infection is more in the normal group compared to the antibiotic group. Duration of hospital stay is less in antibiotic group compared to other group. den Hoed *et al*.[9] studied 637 patients undergoing cholecystectomy. Minor wound infection rates were 10% (66637), major wound infection rates were 6% (23637) and total incidence was 14%. (89637). After a laparoscopic cholecystectomy, there were 53% (10189) mild wound infections. Emergency surgery and acute cholecystitis were significant individual risk factors for acquiring a wound infection following laparoscopic cholecystectomy (p = 0046 and p = 0014, respectively).

We found that there were 4 patients with complications in group A and 10 patients with complications in group B. There were 1 patient with fever in group A and 5 patients with fever in group B. A 2-year research by Shindholimath *et al*.[10] involved 113 low-risk patients having elective laparoscopic cholecystectomy. A swab from the epigastric port and gallbladder bile was obtained intraoperatively for aerobic and anaerobic culture. During surgery, a wound swab was taken from the infected port site to identify any anaerobic and aerobic organisms. On post-operative days 1, 7, 14 and 30, the patients were examined to search for any indications of a wound infection. To assess the variables affecting the likelihood of wound infection, stepwise logistic regression analysis was used. Infection of the wound occurred in 7/113 patients (6.3%).

Chang *et al*.[11] conducted a prospective randomised research. Group A patients (n = 141) got 1 g of cefazolin at the moment anaesthesia was induced, whereas group B patients (the control group, n = 136) who received 10 mL of isotonic sodium chloride. The features of the patients and the overall results of the operation were compared and examined. For a total of 277 patients, the infection rate was 1.1% (0.7% for group A patients and 1.5% for group B patients). Between these 2 groups, there was no discernible difference in the consequences caused by infections. Additionally, no risk indicators for infection complications were identified. Triantafyllidis *et al*.[12] conducted a retrospective study was performed on 1009 patients, who underwent laparoscopic cholecystectomy for symptomatic gallstone disease. wound infection occurred in 14 patients (1.39%).

CONCLUSION

In low-risk patients who undergo elective laparoscopic cholecystectomy, antibiotic prophylaxis is safe and helpful in lowering surgical site infections, systemic infections during hospitalisation or after release and postoperative length of hospital stay.

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