

ORIGINAL RESEARCH

The Role of Antibiotic Prophylaxis in Port-Site Infection in Laparoscopic Cholecystectomy

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ABSTRACT

Background: Laparoscopic surgery has rapidly gained wide spread acceptance for the last couple of decades, yet it is marred with the occurrence of post-operative port site infections. One of the better ways of tackling port site infection is its prevention. Hence the present study was conducted to compare the efficacy of single dose antibiotic prophylaxis vis conventional multidose antibiotic therapy in patients of low risk elective laparoscopic cholecystectomy.

Materials and Methods: The patients were divided in two groups, Group A and Group B with 34 and 36 patients respectively. Patients were assessed for any post-operative fever at frequent intervals for 24-48 hours and noted down and port sites were assessed for any induration, discharge, erythema or tenderness.

Results: The age of the patients ranged from 19-55 years and 15-55 years in group A and group B respectively. Three patients in each group developed low grade fever in the post-operative period (day 1) that settled with paracetamol and didn't merit further evaluation. Two patients developed port site discharge with mild gaping at the epigastric port site in group A. One patient developed port site discharge in group B. The difference was statistically insignificant.

Conclusion: Hence, it is concluded that the efficacy of the single dose antibiotic prophylaxis is the same as the conventional multiple dose antibiotic prophylaxis therapy.

Keywords: Antibiotic, Port-Site Infection, Laparoscopic Cholecystectomy

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INTRODUCTION

Laparoscopic surgery has rapidly gained wide spread acceptance for the last couple of decades. Certain aspects of Laparoscopic Surgery like minimal access, better visualization of tissues aiding precise dissection, almost complete hemostasis under vision, less pain, early ambulation and return to activity has revolutionized the modern surgical domain. Also, minimal exposure to external environment and less impact on immune system reduce the incidence of infection. The other aspects that may influence surgical infection following laparoscopic surgery include the effect of pneumoperitoneum per se and the influence of gas used for pneumoperitoneum on the inflammatory response. The wide array of costly

equipment with different modes of sterilization exposes the patient to possible risk of infection.^[1-6]

Infections are the most common hospital dilemmas in patients undergoing surgery, which result in extended hospitalizations and increased healthcare system costs.^[7,8] Although the minimal access surgery has gained wide spread acceptance and attraction yet it is marred with the occurrence of post-operative port site infections. The incidence of post-operative port site infection ranges from 1.7 to 6.2 percent in various studies across the globe. It adds to the morbidity of the procedure, increases the hospital stay and the cost incurred and has a bearing on the patient satisfaction.^[9-11]

One of the better ways of tackling port site infection is its prevention. Antibiotic prophylaxis remains a corner stone for the prevention of port site infection apart from sterilization and sound surgical technique. At the same time the primary aim should be the minimized administration of antibiotics without compromising the patient's interest and limiting the adverse effects associated with the administration of antibiotics. Several studies report a statistically significant increase in the frequency of bacteremia and line infections in surgical patients who received prophylactic antibiotics for more than four days in comparison with those who received prophylaxis for one day or less.^[12,13]

Hence the present study was conducted to compare the efficacy of single dose antibiotic prophylaxis vis a vis conventional multidose antibiotic therapy in patients of low risk elective laparoscopic cholecystectomy.^[14]

MATERIALS & METHODS

The present study was conducted to compare single dose prophylactic antibiotic versus conventional antibiotic regimen in low risk elective laparoscopic cholecystectomy patients in terms of following parameters: 1. Incidence of port site infections in each group, 2. Post-operative fever. The prospective randomized study was carried out in the Department of General Surgery, ASCOMS, Jammu. A total 70 patients admitted for elective laparoscopic cholecystectomy were divided into two groups, 34 in group A and 36 in group B using computer randomization with following inclusion and exclusion criteria. The inclusion criteria are: Patients with USG proven cholelithiasis, Patients with multiple gall bladder polyp and ASA level 1. Exclusion criteria are: Patients with acute cholecystitis, Patients with recent history of pancreatitis or jaundice. All patients included in the study design were thoroughly evaluated. Detailed history was obtained and general physical examination was conducted as per the protocol.

The patients were divided in two groups, Group A and Group B with 34 and 36 patients respectively. Patients in both the group received injection cefuroxime 1.5 gm at the time of induction. No antibiotic was administered to group A patients post operatively while as patients in group B received post-operative intravenous antibiotics for first 24 hours and oral course of antibiotics (Tab cefuroxime 500 mg twice daily) for three days after discharge.

The Gallbladder were delivered through the epigastric port in all the cases. Any contamination of the peritoneal cavity was irrigated and sucked up with NS in both the groups. Port sites were also thoroughly washed with normal saline. Post-operative fever and other complications were evaluated and managed on conservative lines. The patients presenting with port site infections were subjected to culture sensitivity of the discharge and started on empirical antibiotics to which they responded well. The results were evaluated statistically and analyzed.

Result

The age of the patients ranged from 19-55 years and 15-55 years in group A and group B respectively. The difference in age of the two groups was statistically insignificant (table 1).

Percentage of females in group A and group B was 82.3 and 77.77 respectively which was again statistically insignificant.

Table 1: Distribution of Patients of two Groups According to Age (Years)

Group	No. of Cases	Age(Years Range)	Mean±Sd	t-Value	P-Value
A	34	19-55	31.97±6.89	.697	0.488
B	36	15-65	33.55±11.44		

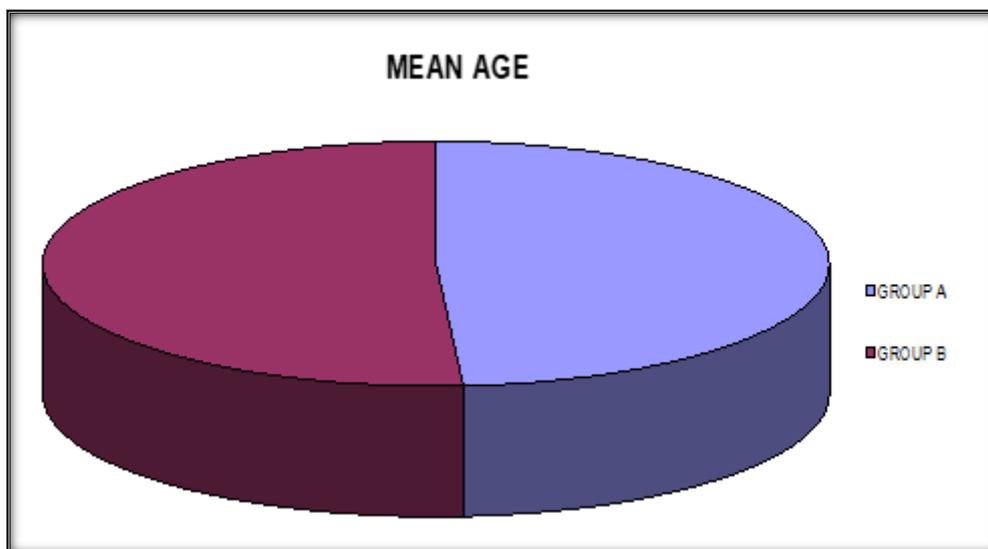


Figure 1: Pie Diagram Showing Age Measurement in Group A and B

The age of the patients ranged from 19-65 years. The difference in age of the two groups was statistically insignificant.

Three patients in each group developed low grade fever in the post-operative period (day 1) that settled with paracetamol and didn't merit further evaluation. Two patients developed port site discharge with mild gaping at the epigastric port site in group A. One patient developed port site discharge in group B. The difference was statistically insignificant. The discharge was subjected to culture and sensitivity and treated empirically with Tab. linezolid 600 mg twice daily to which the responded. Incidentally one of the two patients that developed port site infection was a known case of type-2 diabetes mellitus and had marginally raised blood sugar (150-200 mg percent) in the post-operative period on day 1. The patient that developed port site infection in group B had a difficult cholecystectomy with thick walled gall bladder. We presume that the cause of the infection may have been the port site contamination at the time of gall bladder retrieval.

Table 2: Distribution of Patients of two Groups According to the Development of Post-Operative Fever (in 1st 24 Hours).

Group	No. of Cases	Post-Operative Fever (%)	Chi Square	P-Value
A	34	3(8.8%)	0.01	0.94
B	36	3(8.3%)		

In group A and B the number of cases with post-operative fever was similar. There was an insignificant difference in the distribution of development of post-operative fever in the two groups.

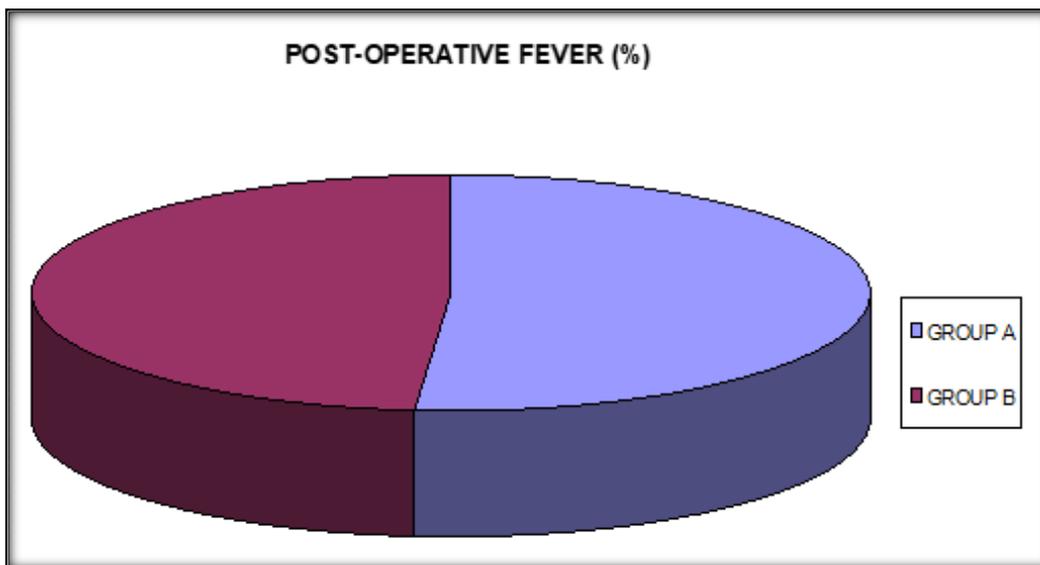


Figure 2: Pie Diagram Distribution of Patients of Different Groups According to Development of Post-Operative Fever

Table 3: Distribution of Patients of two Groups According to the Development Port-Site Infections

Group	No. of Cases	No. of Port-Site Infection	Chi Square	P-Value
A	34	2 (5.88 %)	0.41	0.52
B	36	1 (2.78 %)		

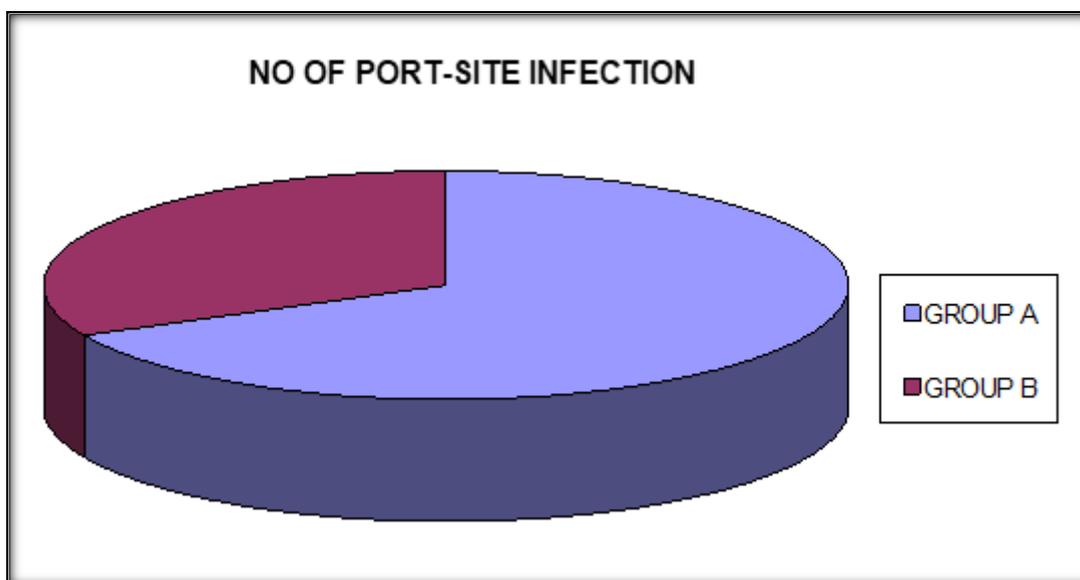


Figure 3: The Pie Diagram Showing Distribution of Patients who Developed Port Site Infection

The difference in the number of patients who had port site infection was insignificant in the both groups.

DISCUSSION

The use of antimicrobials has evolved greatly in the last 20 years. These agents are frequently prescribed drugs in hospitals, and approximately half of antimicrobial use is for surgical antimicrobial prophylaxis.^[11,12] The excessive use of antimicrobials leads to an alteration of

patients' endogenous flora, thus promoting the development and increasing prevalence of resistant bacteria.^[13] In this context, the rational use of prophylaxis is an important issue for the healthcare system. Improvements in the timing of initial administration, use of an appropriate antimicrobial regimen, and shorter duration of administration have defined more clearly the value of this technique in reducing the number of postoperative wound infections.^[12]

In our study we compared the effect of single shot antibiotic prophylaxis versus conventional antibiotic regimen in low risk elective laparoscopic cholecystectomy patients in terms of wound infections, post-operative fever and other complications. In this study the female to male ratio was 4.66:1 (82.3%) in group A and 3.5:1 (77.77%) in group B which is comparable and similar to the analysis. Also, the age interval in the two groups was comparable being 15-65 in group A and 19-55 in group B.^[15-19]

However, the standard sterilization protocol was strictly adhered to. Out the three patients that developed port site infection two were operated upfront (one in each group, A and B) and the third one at number two thereby ruling out any impact of serialization on the rate of surgical site infection post operatively and a "p" value of 0.09 and thus indicating that there was an insignificant difference among the two groups viz single shot prophylaxis v/s the conventional multiple dose prolonged antibiotic regime.^[20]

CONCLUSION

Hence, it is concluded that the efficacy of the single dose antibiotic prophylaxis is the same as the conventional multiple dose antibiotic prophylaxis therapy. At the same time single dose of antibiotic prophylaxis is relatively easy to administer, cheaper and it confers less burden on the nursing and paramedical staff and patient's compliance is high with little or no side effects.

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