ANTIBIOTIC PROPHYLAXIS – IS IT NECESSARY IN CLEAN GENERAL SURGERY?

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ABSTRACT

Objective: The aim of this study was to compare the use of prophylactic antibiotics in reducing wound infection in clean elective general surgical operations with no use of prophylactic antibiotics in these operations.

Study Design: Randomized Controlled Trial (RCT)

Place and duration of study: Six months study from January 2007 to June 2007 conducted at surgical department of Combined Military Hospital Peshawar.

Patients and Method: One hundred and twenty patients were included in the study and divided into two groups A and B. Group A received prophylactic antibiotics and Group B did not both groups were compared for post operative wound infection.

Result: In Group A, one patient (1.6%) developed infection and in Group B, four patients (6.6%) developed infections. The results were not statistically significant by Chi-Square test ($P > 0.5$).

Conclusion: Preoperative antibiotic prophylaxis is not recommended routinely in clean general surgical operations.

Keywords: Antibiotics, Prophylaxis, Surgical wound infection.

INTRODUCTION

Wound infections are the commonest hospital acquired infections in surgical patients[1]. It is one of the oldest known ailments after trauma and amputations[2]. Post operative wound infections have an enormous impact on patient's quality of life and contribute substantially to the financial cost of patient care[3] as well as prolonged hospitalization[4]. Appropriately administered antibiotic prophylaxis reduces the incidence of surgical wound infection[5].

The optimum time for antibiotic administration is during the two hours before surgery. When antibiotics were given after this time, the infection rate increased progressively[6].

Postoperative wound infection constitutes the most common postoperative complication[7]. Approximately one million patients have such wound infections each year in the United States, with disability lasting more than six months in 18%, extending the average hospital stay by one week, and increasing the cost of hospitalization by 20%[3,8]. There is common consensus that antibiotic prophylaxis is not indicated in clean surgery[9-13], although a few still favor antibiotic prophylaxis in such cases[14-21].

The purpose of this study was to evaluate whether the use of prophylactic antibiotics has an effect on postoperative wound infection in clean general surgical operations in our setup.

PATIENTS AND METHODS

These randomized controlled trials (RCT) were conducted in surgical department of Combined Military Hospital Peshawar from January 2007 to June 2007. One hundred and twenty consecutive patients under going clean elective general surgical operations were included in the study. Patients reporting to surgical OPD of Combined Military Hospital Peshawar for indoor/out door treatment for clean elective general surgical operations were included.

Operations included herniotomies, herniorrhaphies, operations for varicose veins, thyroidectomies, excision of lipomata, neurofibromata, ganglia, skin biopsies, breast biopsies, testicular biopsies and excision biopsy of lymph nodes, operation for hydrocele, varicocele, testicular tumors and cysts.

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Patients with age less than five years and more than 65 years, patients suffering from systemic illnesses and operations lasting for more then two hours were excluded. Informed consent was obtained.

A total of 120 patients were randomly divided into two equal groups A and B, using random number tables. Patients in group A were given prophylactic antibiotics while patients in group B were not given prophylactic antibiotics. Both the groups were compared for the frequency of patients developing postoperative wound infection.

Patients in group A were given injection cefuroxime 750 mg eight hourly intravenously (doses adjusted according to body weight for children). The antibiotics were started half an hour before operation and were continued for first twenty four hours after operation i.e., a total of three doses were given. Patients in group B were not given any prophylactic antibiotics.

The surgical technique used was identical in both the groups with similar operation theater discipline. All wounds in both the groups of patients were closed by interrupted silk suture except in all thyroid operations. All thyroid operations were closed with prolene subcuticularly. Postoperatively the first dressing was changed on third postoperative day. All wounds were examined on 3rd and 6th day in wards and on 8th , 15th and 30th day after surgery as out door cases for the presence or absence of pus, serous fluid, redness and local oedema.

Statistical Analysis: Data was analyzed using SPSS version 10. Quantitative variables were expressed with mean and standard deviation (S.D). Qualitative variables were presented as frequencies and percentages. To test the significance between the two groups, chi square test was applied. *P*-value <0.05 was considered significant.

RESULTS

The mean age of patients was 34.4 years in group A was 34.75 years (SD±15.27) and in group B was 35.18 years (SD±15.83). Majority in both groups were in 3rd, 4th and 5th decades of their lives as shown in table 1. Male to female ratio was equal in both the groups i.e. 2:1. Both the groups were comparable with respect to age (*P*=0.196) and gender (*P*=0.106).

The breakdown of the operations in the two groups is depicted in table 2. *P*-value was 0.248/-.

In group A with chemoprophylaxis, one (1.6%) patient developed post operative wound infection. In group B without chemoprophylaxis, four (6.6%) patients developed postoperative wound infection (table 3).

The decreased frequency of post operative wound infection was seen in group A as compared to group B but this difference was insignificant (*P*=0.170).

Culture and sensitivity of fluid from infected wounds revealed that total of five patients developed post operative wound infections, one in group A and four in group B. *Staphylococcus aureus* was the causative organism in three patients, one in group A and two in group B. *E-coli* and *Paeruginosa* were the causative organisms in remaining two patients in group B.

DISCUSSION

Postoperative wound infections are the commonest postoperative complications in our setup. Surgical site infections (SSIs) are a real risk associated with any surgical procedure and represent a significant burden in terms of patient morbidity and mortality, and cost to health services around the world[22]. The incidence of infection varies from surgeon to surgeon, hospital to hospital, from one surgical procedure to another and – most importantly – from one patient to another[23]. Four main sources of infection are personnel, equipment, environment and patient's risk factors[24].

The majority of the patients were males (66.6%). The reason seems to be that in our military setup, the male patients are entitled for free indoor and outdoor treatment even if they are retired from service. However, families are no more entitled for free indoor and outdoor treatment when the male person is retired from

service. The rate of infection in group A receiving chemo prophylaxis as compared to group B (1/60 Vs 4/60) was not statistically significant. This study shows that antibiotic prophylaxis does not significantly influence the rate of postoperative wound infection in clean elective general surgical operations. The factors which came into play to cause infection in our patients were related to the surgical team or surgical environment, i.e., the cause was exogenous not endogenous.

Studies by Solangi[10], Terzi[11] and Ansari[12] have shown that preoperative antibiotic prophylaxis does not influence the rate of postoperative wound infection in clean general surgical operations whereas, studies by Abbasi[15] Ali[16], and Plonczynski[17] have demonstrated that there is a significant decrease in the rate of postoperative wound infection with prophylactic use of antibiotics in clean elective general surgical operations.

CONCLUSION

Preoperative antibiotic prophylaxis does not significantly reduce the frequency of postoperative wound infection in clean elective general surgical operations. So the routine prophylactic use of antibiotics in clean elective general surgical operations is not recommended.

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Table 1: Distribution of Age.

Age in Years	Group A (n=60)	Group B (n=60)
5-10	3(5%)	5(8.3%)
11-20	8(13.3%)	8(13.3%)
21-30	17(28.3%)	10(16.6%)
31-40	14(23.3%)	14(23.3%)
41-50	10(16.6%)	14(23.3%)
51-60	4(6.6%)	8(13.3%)
61-65	4(6.6%)	1(1.6%)

Table 2: Types of operations

Case	Group A (n=60)	Group B (n=60)
Hernia	10	16
Limb	16	9
Scrotal	11	11
Breast	4	4
Head	3	4
Face/Neck	12	9
Trunk	4	7

Table 3: Frequencies of Wound Infections

Wound Infection	Group A n = 60	Group B n = 60	P value
Yes	1(1.6%)	4(6.6%)	
No	59(98.4%)	56(93.3%)	0.170