



General Surgery

A COMPARATIVE STUDY OF PREOPERATIVE ANTIBIOTIC PROPHYLAXIS IN PREVENTION OF POST OPERATIVE SURGICAL SITE INFECTIONS IN ELECTIVE GENERAL SURGICAL CASES

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ABSTRACT

Background and Objectives: Surgical site infection is considered as a very dreadful complication of surgery and is one of the most frequently noted nosocomial infections. It is associated with increased duration of hospital stay and increased effective cost of treatment. The main objective of study was to analyse role of preoperative antibiotics in prevention of post-operative surgical site infection. **Methodology:** The material was collected from 70 inpatients by systemic random sampling. Included patients were divided into two groups of 35 each, Group A included those patients who received prophylactic antibiotic pre-operatively and Group B included those who didn't receive any pre-operative prophylactic antibiotic. Emergency cases were excluded from this study. **Results:** Surgical site infection after 3 days of surgery was observed among 8.6% of study subjects in the Group A as compared to 34.3% of study subjects in the Group B. This difference was statistically significant. **Conclusion:** Incidence of surgical site infection can be reduced with a single dose of prophylactic antibiotic usage in the patients undergoing surgery

KEYWORDS : Antibiotic prophylaxis; Surgical site infection.**INTRODUCTION**

For performing any surgery, making skin incision can lead to an infection which is known as surgical site infections (SSIs) because these infections occur on the part of the body where the surgery took place. Surgical wound infections can be caused by both exogenous which includes the operation theatre environment or the surgical ward and endogenous microorganisms, from the patients' own skin or opened viscus which enter the operative wound while performing surgery. Any wound infection arises when the invasion of microorganism is sufficient to overcome the local host defence and it depends on several factors like virulence of invading pathogen, amount of local inoculum, the local environment, systemic factors, surgical technique, duration of surgery, comorbidities. Wound infections are responsible for extension of hospital stay on an average of 1 hour and also for increase in treatment costs by 20%¹

Surgical site infections are one of the most serious complication in surgery. Worldwide the estimated surgical site infection (SSI) rate varies from 0.5% to 15%, whereas studies in India on SSI have consistently shown comparatively higher rates ranging from 23% to 38%.² There are several factors which may influence the incidence of SSI, e.g., pre-operative care, the operation theatre (OT) environment, post-operative care, duration and the type of surgery, hospital stay duration, comorbidities of patient like Diabetes, obesity etc. Many other potential factors are responsible for healing of surgical site wound and determine the possibility for incidence of infection.

In this study comparison of preoperative antibiotic prophylaxis in prevention of post-operative surgical site infections in elective general surgical cases is done. This study involves pre-operative single dose of ceftriaxone, which is a broad spectrum cephalosporin given half an hour before surgery. Each post-operative wound infection is associated with increased hospital stay, the cost of procedure and is associated with significant morbidity and mortality.³ World Health Organization's (WHO) performed "Clean Care is Safer Care" program which shows that surgical site infection (SSI) is the most surveyed and frequent type of Hospital Acquired Infection (HAI) in low-and middle income countries (LMICs) and affects up to one-third of the patients who have undergone a surgical procedure.⁴ Site of surgical incision and type of surgery, type of surgical wound affects the incidence of infection. Cardiovascular^{5,6} and gastrointestinal surgery,^{7,8} carries the highest rate of surgical site infections.

METHODOLOGY

A hospital based Comparative Randomized clinical study where 70 patients were selected who were admitted as inpatients for elective major operations at a tertiary care hospital from November 2020 to May 2022 after undergoing the inclusion and exclusion criteria (patients below 20 years and those presenting as emergency).

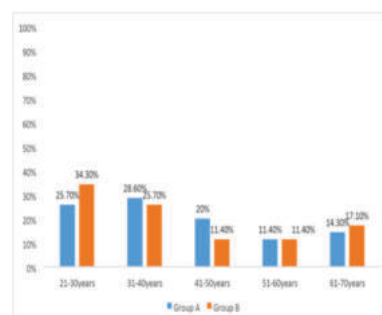
During this period, 70 cases will be selected for our study. The cases will be grouped in to two categories; Group A and Group B of 35 cases each.

1. Group A comprises patients who will receive a pre-operative single dose of ceftriaxone, a broad spectrum cephalosporin.
2. Group B will receive no such prophylactic antibiotic pre-operatively.

Drains will be removed on 3rd or 4th post-operative day. Wounds will be inspected on 3rd day for any signs of inflammation, infection will be noted down and findings will be entered in the proforma. In cases where soakage of dressing and abnormal smells suggest infection, dressings will be inspected earlier than 3 days. If infected, wound swab will be taken and sent for culture, and sensitivity and antibiotic will be started immediately in all infected cases.

RESULTS

Surgical site infection after 3 days of surgery was observed among 3 (8.6%) of study subjects in the Group A as compared to 12 (34.3%) of study subjects in the Group B. whereas, 32 (91.4%) of study subjects in the Group A and 23 (65.7%) of study subjects in Group B didn't had any infection. This difference was statistically significant (p value = 0.009).

**Figure 1- Age Wise Distribution Of Study Subjects.**

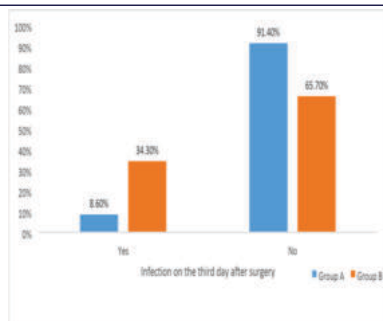


Figure 2- Surgical Site Infection On Day 3 Of Surgery.

Out of 35 study subjects in Group A, 4 (11.4%) of them had a culture growth and 31 (88.6%) of them did not have any growth in culture in the infected wound. Whereas in Group B, out of 35 study subjects 12 (34.3%) of them had a culture growth and 23 (65.7%) of them did not have any growth in culture in the infected wound. This difference was statistically significant (p value = 0.023).

DISCUSSION

Infection at the surgical site was seen on 3rd post-operative day in 11.4% of the study subjects who received pre-operative antibiotic, while 34.3% of the study subjects who did not receive the pre-operative antibiotic suffered from surgical wound infection. This difference was statistically significant. These findings were similar to the findings of other studies likes:

In the present study, culture growth from the surgical site infection was seen among 11.4% of the study subjects who received prophylactic antibiotics. Whereas surgical site infection was seen among 34.3% of the study subjects who did not receive any of the prophylactic antibiotics. This difference was even statistically significant. Similar findings were seen in the study conducted by Rajesh KB et al¹⁰⁵ which showed the culture growth from the surgical site infection among 3% of the study subjects who received prophylactic antibiotics.

No conflict of interest and ethical clearance taken.

CONCLUSION

The study on prophylactic antibiotic use surgeries has led me to this conclusion.

1. Surgical site infection is the condition that may increase the morbidity and hospital stay of the patient.
2. Incidence of surgical site infection can be reduced with a single dose of prophylactic antibiotic usage in the patients undergoing surgery.
3. When surgical site infection is diagnosed, wound / pus swab should be sent for culture sensitivity and antibiotic started on the basis of sensitivity to organism cultured.

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