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**ORIGINAL ARTICLE**

**ANTIMICROBIAL PROPHYLAXIS IN CLEAN GENERAL SURGERY CASE**

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**ABSTRACT**

**Objective:** To find out the incidence of surgical site infection in clean general surgery cases operated with a single dose of preoperative antibiotic and cases operated with both pre and postoperative antibiotic prophylaxis. The study was carried out in the Department of general surgery, Rajah Muthiah Medical College and Hospital from August 2012 to August 2014. Fifty clean surgical cases operated with a single dose of preoperative antibiotic prophylaxis between August 2012 to August 2014 were studied and these were compared with similar number of cases who received both pre and postoperative antibiotic prophylaxis antimicrobial prophylaxis. The data was collected and analyzed. Chi-square and student "t" test were used to analyze the association between antibiotics and wound infection. The most frequent operation done like hernia repair, circumcision, fibroadenoma excision and eversion of sac for hydrocele was used for the study. More operations were carried out between 20-40 years. Surgical site infection occurred in patients (4%) in each group. The "t" test applied on group A and B (t=0) also showed no significant difference between administration of antibiotics/ no antibiotics and infection (p > 0.05) not statistically significant. This proves that use of prophylactic antibiotic in clean elective cases is unnecessary.

**Keywords:** Mental health, Higher secondary students.

**1. INTRODUCTION**

Concepts of surgical wound infection and its prevention have been known to mankind from time immemorial. Infection forms the main aspect of human suffering and the drug to prevent or treat infection are the mainstay of the practice of medicine.

General surgical operations carry a significant risk of postoperative infection.<sup>1-6</sup> The primary pathogenic bacteria include the staph. aureus, e. coli and proteus. In spite of good operative technique with complete asepsis in the wards and operation theatre postoperative infection do occur complicating healing process.

When antimicrobials were discovered they were mainly used to treat the established infection. But now large percentage of antibiotic usage is for preventing infection rather than

treating established infection. This is a comparative study to highlight the misuse of antibiotics in a clean general surgery case.

**2. MATERIALS AND METHODS :**

This a comparative randomised study carried out in our department of general surgery. The duration of the study was for two years from August 2012 to August 2014. A series of 100 clean general surgery cases operated were randomised into two groups (Group A & Group B)

**Inclusion Criteria :**

- ❖ Only clean surgical cases were taken for the study.
- ❖ Age limit : 20 – 40 yrs of age ( Both male and female )

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- ❖ Cases include hernia , hydrocele , circumcision , fibroadenoma excision ect..

**Exclusion Criteria :**

- ❖ Contaminated cases like abscess, perforation, fistula in ano, appendicitis .
- ❖ Patients in immunocompromised state like Diabetes Mellitus, Pulmonary TB, HIV ,pt on steroids.
- ❖ Surgery lasting more than 3 hours.

**Procedure :**

- A total of 100 patients were randomized into two groups.
- Group A consists of patients in whom a single dose of preoperative antibiotic cefotaxime (1gm) were given preoperatively at the time of induction of anaesthesia .
- Group B consists of cases where cefotaxime (1gm) was given intravenously both pre and postoperatively.
- Necessary aseptic precautions were followed preop, intraop and postoperatively.
- Post operative wound care was given with aseptic precautions.
- Patients were followed up postoperatively for a period of two weeks.
- A data sheet was prepared to facilitate collection of data. It included information on the routine parameters like name age, sex etc. as well as the clinical diagnosis and investigations. The investigations taken into account were hemoglobin percentage and blood sugar level. The data sheet also includes a note on the surgery done post operative period ect. The data sheet was maintained for all cases.

**3.RESULT :**

Of the 100 cases operated in 2 cases in group A ( operated without antimicrobial prophylaxis ) and 2 cases in group B (operated with antimicrobial prophylaxis ) developed SSI .

|        | GROUP A | GROUP B | TOTAL |
|--------|---------|---------|-------|
| SSI    | 2       | 2       | 4     |
| NO SSI | 48      | 48      | 96    |
| TOTAL  | 50      | 50      | 100   |

**Definition:**

Antimicrobial prophylaxis is defined as the use of antibiotics to prevent infections at the surgical site[1].

**Introduction**

Wound infections are the commonest hospital-acquired infections in surgical patients. They result in increased antibiotic usage, increased costs and prolonged hospitalisation. Appropriate antibiotic prophylaxis can reduce the risk of postoperative wound infections, but additional antibiotic use also increases the selective pressure favouring the emergence of antimicrobial resistance [2].

Judicious use of antibiotics in the hospital environment is therefore essential.

A clean surgical case does not always require a prophylactic course of antibiotic. A classification system which ranks procedures according to their potential risk for infectious complications has greatly facilitated the study of surgical antibiotic prophylaxis and their use postoperatively . This system ranks procedures as:

- clean
- clean-contaminated
- contaminated.

This has become a widely accepted standard .

**Principles of surgical antibiotic prophylaxis**

Principles of antimicrobial prophylaxis are becoming an accepted part of surgical practice.[3].Approximately 30–50% of antibiotic use in hospital practice is now for surgical prophylaxis. However, between 30% and 90% of this prophylaxis is inappropriate. Most commonly, the antibiotic is either given at the wrong time or continued for too long .Controversy remains as to duration of prophylaxis and also as to which specific case should receive prophylaxis.

The surgeon should :-

- decide if prophylaxis is really needed for the case
- decide if prophylaxis is appropriate
- determine the bacterial flora most likely to cause postoperative
- choose the less expensive drug if two drugs are otherwise of equal antibacterial spectrum, efficacy, toxicity, and ease of administration
- administration of dose at the right time
- administer antibiotics for a short period (one dose if surgery of four hours duration or less)
- review antibiotic prophylaxis protocols regularly as both cost and hospital antibiotic resistance patterns may change.

The choice of the antibiotic for prophylaxis is based on several factors. Beta-lactams and penicillin are the commonest type of antibiotics used in prophylaxis. Most importantly, the antibiotic should be active against the bacteria most likely to cause an infection [4-6]. Most postoperative infections are due to the patient's own bacterial flora. Sometimes it may also be due to nosocomial infection. Broad spectrum antibiotics can be used for prophylaxis .

Commonly used surgical prophylactic antibiotics include:

- intravenous 'first generation' cephalosporin's– cephazolin or 'third generation' cephalosporin's – cefotaxim is commonly used.
- intravenous Gentamicin
- intravenous penicillin + beta lactamase inhibitor - amoxiclav

Parenteral 'third generation' cephalosporins such as cefotaxim have improved anaerobic and aerobic gram-negative cover compared to first generation cephalosporins.

**Route and timing of antibiotic administration**

Prophylactic antibiotics are usually given intravenously as a bolus on induction of anaesthesia to ensure adequate tissue concentrations at the time of surgical incision [7].

### Duration of antibiotic administration

Only a single dose of preoperative antibiotic cefotaxime (1gm) may be required if the operation lasts four hours or less in a clean general surgery case.

Continuing antibiotic prophylaxis depends upon the type and duration of surgery and a number of other factors like immuno compromised state like diabetes mellitus, HIV , patient on steroids, old age & contaminated cases like abscess, perforation, fistula in ano, appendicitis may require a prolonged antibiotic therapy[8].

### 3.CONCLUSION

Surgical antibiotic prophylaxis is an effective management strategy for reducing postoperative infections, provided that appropriate antibiotics are given at the correct time for appropriate durations and for appropriate surgical procedures. Unnecessary postoperative antibiotics should be avoided in a clean general surgery case which can be completed in less than four hours duration .

Unnecessary antibiotic usage prevents complications due to drugs like toxicity, drug-resistance and costs less . The practice of prolonged combination antibiotic therapy as surgical prophylaxis has be replaced by a short single course of appropriate antibiotic therapy given preoperatively in a clean surgical case provided the operation theater setup and the post op wound care is managed with a sterile and aseptic environment. Hospital surgical antibiotic prophylaxis protocols should be regularly reviewed, as both the cost of individual antibiotics and the endemicity of multi-resistant bacteria in certain units or hospitals are subject to frequent change.

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