

A STUDY ON ANTIBIOTIC PROFILE IN SURGICAL SITE INFECTIONS AT K R HOSPITAL, MYSURU***Dr. Basavanna P. L., Dr. Ajmal Sadique C., Dr. Anju Raj M. K., Dr. Chethana H. T., Dr. Vanitha A. S.**

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ABSTRACT

Surgical site infections (SSI's) are the most common healthcare associated infections (HCAI's). Globally, surgical site infection rates have been found to be 2.5 to 41.9%. The prophylactic administration of antibiotics decreases the risk of infection after many surgical procedures. This study was designed to evaluate the antibiotic profile and to assess the rationality of antibiotic utilisation pattern in SSI's in patients who are admitted to general surgery department in K R Hospital, Mysuru. SSI's are usually seen in between the age group 31-60 years. The study involves a total number of 200 patients. Males are predominant while comparing to females. Type 2 diabetes mellitus and hyperalbuminaemia are the major risk factors of SSI's. Ceftriaxone was the predominant antimicrobial used as chemoprophylaxis. Increased infection rate was seen in patients administered with Inj. Ceftriaxone alone than with combination of other antibiotics. Inj. Ceftriaxone + Metronidazole combination were the most commonly administered post-operative antibiotics followed by Inj. Ceftriaxone.

KEY WORDS: SSI's, HCAI's, diabetes mellitus, hyperalbuminaemia, chemoprophylaxis**INTRODUCTION**

Infections that occur in the wound created by an invasive surgical procedure are generally referred to as surgical site infections (SSI's). SSI's are the second most common healthcare associated (HCAI's). The prophylactic administration of antibiotics decreases the risk of infection after many surgical procedures. The goal of therapy is to prevent an infection from developing.^[1] Globally, SSI rates have been found to be from 2.5 to 41.9%. In Africa, SSIs were the leading infections in hospitals (pooled cumulative incidence of 5.6 per 100 surgical procedures), striking higher than proportions recorded in developed countries as 13, 20.6, 10.9-75% rate of SSIs were reported in Nigeria, Cameroon, Tanzania and Ethiopia studies respectively. Patient characteristics possibly associated with increased risk of SSIs include coincident remote site infections or colonization, diabetes, cigarette smoking, systemic steroid use, obesity (>20% ideal body weight), extremes of age, poor nutritional status and perioperative transfusion of certain blood products.^[2] Post-operative wound infections are the major cause of morbidity in surgical patients. SSI's remain significant problem following an operation and the third most frequently reported nosocomial infections. The use of pre and perioperative antibiotics with appropriate principles of prophylaxis are applied can result in a reduced risk of post-operative infections.^[3] Initially, the antibiotics were only used for post operatively for treatment of already established SSI. Later the concept of antibiotic

prophylaxis was introduced. Many studies established the fact that preoperative prophylaxis with antibiotics reduces wound infection.^[4]

The current study was undertaken to observe and document the antibiotic use before and after surgery and to investigate and evaluate the current prescribing trends of most commonly used antibiotics in preoperative and post-operative surgery departments of K R Hospital, Mysuru.

MATERIALS AND METHODS

A prospective observational study on antibiotic profile in surgical site infections at K R Hospital, Mysuru.

Ethical approval: The work was approved by Institutional Ethics Committee, Mysore Medical College and Research Institute, Mysuru.

Study site: The study was conducted in General Surgery department at K R Hospital, Mysuru.

Selection of patients**Inclusion criteria**

- In-patients who have undergone surgery (15-60yrs).
- Patients with treated co-morbid conditions.
- Patients with the history of social habits.
- Patients who is willing to take part in the study and given consent for it.

Exclusion criteria

- Paediatric and psychiatric patients.
- Patients who are not ready to cooperate to the study conducted.
- Patient’s case files with incomplete data.

Sources of data: All the relevant and necessary data was collected from case records and other relevant sources.

Informed consent form: Patient consent was retrieved from all the subjects participated in the study; it is attached as annexure II.

Materials used: Patient profile form attached as annexure I.

RESULTS AND DISCUSSION

The proposed work carried out in a 1330 bedded tertiary care hospital. A total of 200 patients who are met inclusion criteria were enrolled during a 6 months of study period. Among 200 patients 73 had surgical site infection.

Distribution of study population based on gender

Among the 200 patients included for the study, 63% were males (n=126) and 37% were females (n=74). The details of gender distribution are represented in fig 1.

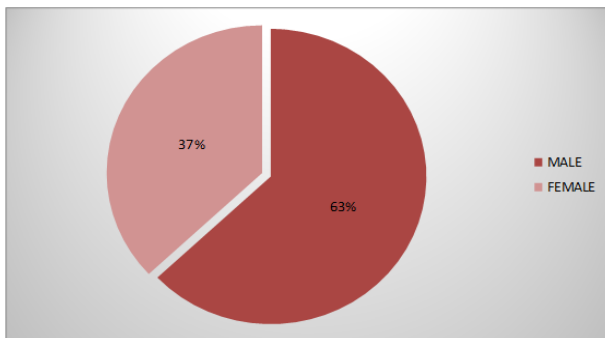


Figure 1: Distribution of study population based on gender.

Categorization of infected study population based on gender

In our study we observed that the prevalence of SSI was high among Males (61.64%) than Females (38.35%). Similarly, a study conducted by Kumar A.^[5] et al., which showed that out of 2233 male patients, 301 (13.5%) were infected and out of 1540 female patients, 185 (12%) were infected.

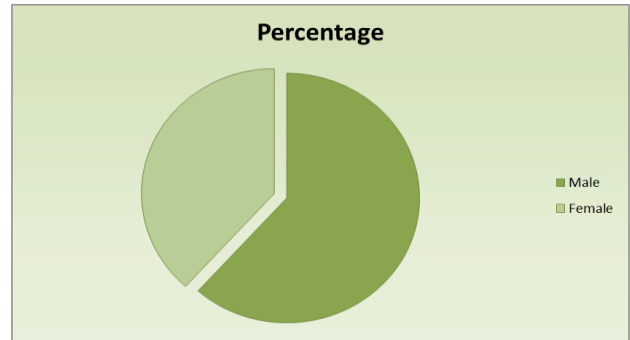


Figure 2: Categorization of infected study population based on gender.

Categorization of infected study population based on age and gender

This study showed a high frequency of infected samples from age group 46-60 years over 54.79% followed by 31-45years over 31.5%. A similar study conducted by Kumar A.^[5] et al., reported there was 13.2% infection rate between the age group 31-60years.

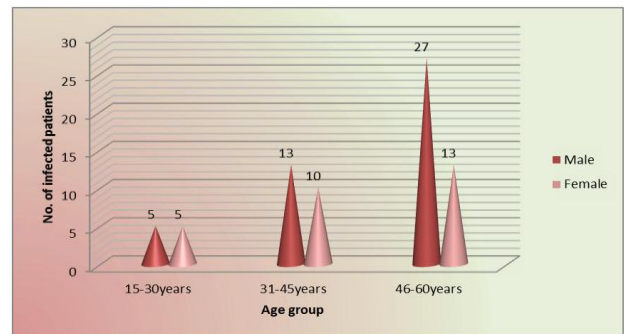


Fig 3: Categorization of infected study population based on age and gender.

Comorbidities

In our study co morbid conditions identified among SSI patients were 24.65% of T₂ DM. The study observed that T₂ DM is one of the risk factor of SSI due to impaired immune system and elevated glucose level. Similarly, Bansal D.^[6] et al., reported a 66.66% prevalence rate of SSI among diabetic patients.

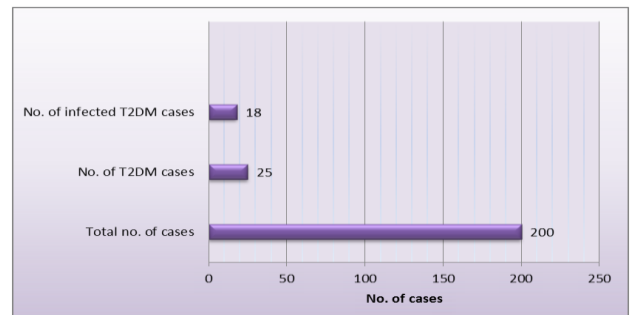


Figure 4: No. of Comorbidities in study population.

Distribution of patients based on the serum albumin test

In our study, out of 200 patients, 10.5% (n=21) were reported with decrease in Serum Albumin. Out of 21 patients, 71.42% (n=15) were infected. This study showed that decrease in serum albumin is a risk factor of SSI. Another study conducted by Sindgikar V.^[7] et al., reported that surgical site infection was detected in 24 (72.7%) patients out of which 83 patients with hypoalbuminemia (<3.5g/dl).

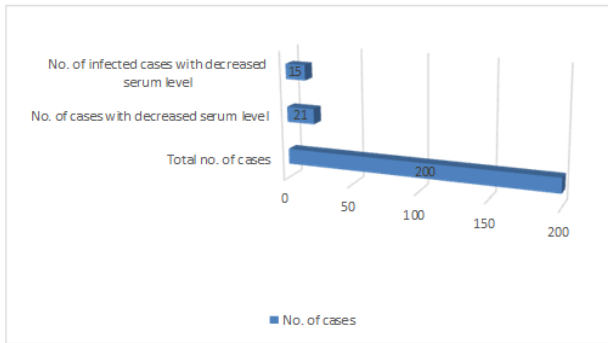


Figure 5: Distribution of patients based on the serum albumin test.

Distribution based on type of surgeries performed in infected study population

The study showed that the infection rate was high among hernia patients. A similar study conducted by Kumar A.^[5] et al., reported that out of 16 hernia repair cases 3% were infected and out of 78 appendectomy cases 16% were infected.

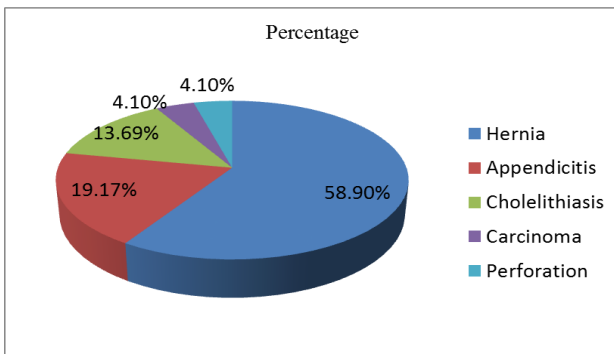


Figure 6: Type of surgery performed in infected study population.

Table 1: Distribution of infected patients based on the pre-medication received.

| Pre-surgical antibiotic | No. of infected cases (n=73) | Percentage (%) |
|------------------------------|------------------------------|----------------|
| Ceftriaxone | 65 | 89.04 |
| Cefotaxime | 6 | 8.21 |
| Ceftriaxone+ Metronidazole | 1 | 1.36 |
| Ceftriaxone+ Azithromycin | 1 | 1.36 |
| Amoxicillin+ Clavulanic acid | 0 | 0 |

Prescribing pattern of antibiotic in pre-operative patients

Out of 200 study population, 79% (n=158) were administered with Ceftriaxone, 19% (n=38) were administered with Cefotaxime, 1% (n=2) were administered with Ceftriaxone+ Metronidazole. 0.5% (n=1) were administered with Ceftriaxone+ Azithromycin. 0.5% (n=1) were administered with Amoxicillin+ Clavulanic acid.

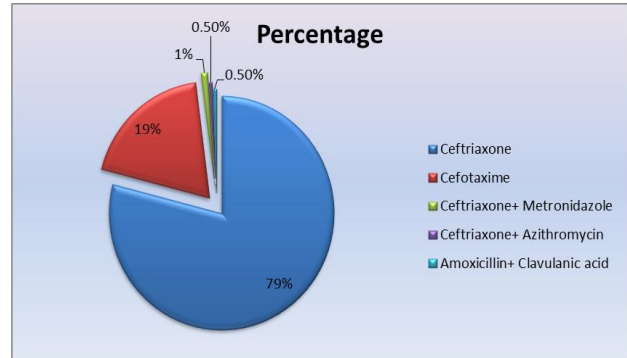


Figure 7: Antibiotics prescribed in pre-operative patients.

Distribution of infected patients based on the pre-medication received

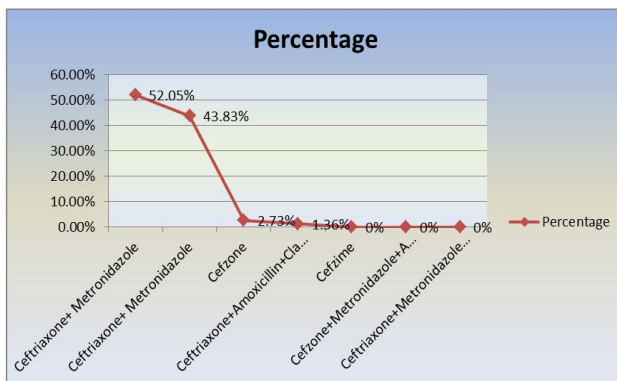
It was observed that the most commonly used pre-surgical antibiotic was Inj. ceftriaxone (79%) out of which 89.04% were infected. A similar report was observed in a study conducted by Halawi.^[2] et al., which showed Ceftriaxone was the most 84.5% prescribed agent for prophylaxis out of which 20.6% patients developed SSI's. One more study conducted by Wokuma T A.^[8] et al., which showed most commonly prescribed antibiotics in the patients was ceftriaxone followed by metronidazole.

Prescribing pattern of antibiotic in post-operative patients**Table 2: Prescribing pattern of antibiotic in post-operative patients.**

| Post-operative antibiotic | No. of cases (n=200) | Percentage (%) | No. of infected cases | Percentage (%) |
|--|----------------------|----------------|-----------------------|----------------|
| Ceftriaxone+ Metronidazole | 109 | 54.5 | 38 | 34.86 |
| Ceftriaxone | 82 | 41 | 32 | 39.02 |
| Ceftriaxone+ Amoxicillin+ Clavulanic acid | 3 | 1.5 | 2 | 66.66 |
| Cefzone | 3 | 1.5 | 1 | 33.33 |
| Cefzime | 1 | 0.5 | 0 | 0 |
| Cefzone+ Metronidazole+ Amikacin | 1 | 0.5 | 0 | 0 |
| Ceftriaxone+ Metronidazole+ Amoxicillin+ Clavulanic acid | 1 | 0.5 | 0 | 0 |

Prescribing pattern of antibiotic in post-operative infected patients

Out of 73 infected study population, 52.05% (n=38) were administered with Ceftriaxone+ Metronidazole. 43.83% (n=32) were administered with Ceftriaxone. 2.73% (n=2) were administered with Cefzone. 1.36% (n=1) were administered with Ceftriaxone+ Amoxicillin+ Clavulanic acid. No infection was found in patients administered with Cefzime, Cefzone+ Metronidazole+ Amikacin, Ceftriaxone+ Metronidazole+ Amoxicillin+ Clavulanic acid.

**Figure 8: Prescribing pattern of antibiotics in post-operative infected patients.****CONCLUSION**

This study was designed to evaluate the antibiotic profile in SSIs in patients who are admitted to general surgery department in K R Hospital, Mysuru. SSIs are usually seen in patients between the age group 31-60 yrs.

The study involves a total number of 200 patients who are identified and enrolled according to study procedure and the relevant data are collected that are required for the study from the patient profile and personal interview.

Males are predominant while comparing to females. Diabetes mellitus and hyperalbuminemia are the major common risk factors of SSIs. Patients present with symptoms like redness, pain, pus, serum, fever, itching.

A total number of 73 infected cases were reported out of total study population. Ceftriaxone was the predominant pre-surgical antibiotic. Increased infection rate was seen in patients administered with Inj. Ceftriaxone alone than with combination of other antibiotics. Inj Ceftriaxone + Metronidazole combination were the most commonly administered post-operative antibiotics. Inj. Ceftriaxone was the second most administered post-operative antibiotic.

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