



## ROLE OF PROPHYLACTIC ANTIBIOTIC TO PREVENT SURGICAL SITE INFECTIONS IN CLEAN SURGERIES

**Dr.C.Ganga**

M.S Assistant professor, Department of Surgery, Madurai medical college, Madurai

**Dr.P. Rajaprabakaran\***

M.S Assistant professor, Department of Surgery, Madurai medical college, Madurai.  
\*Corresponding Author

**ABSTRACT** **AIM:** Surgical site infections are one of the most common hospital acquired infections. prevalent usage of prophylactic antibiotics in these clean procedures is due to the undue fear of infection in the minds of majority of our surgeons. Appropriate usage of antibiotics gains paramount importance due to emergence of multi drug resistant strains. compare the surgical site infection in two groups of patients, one receiving prophylactic antibiotics (Study group) and the other group without any prophylaxis before surgery. (Control group) the rate of infection in the study group i.e., the patients who received a prophylactic antibiotic was 6%. 3 out of 50 patients developed an infection among which 2 had superficial incisional SSI. In the group who never received an antibiotic prophylactically, 6 out of 50 patients (12%) developed an infection of which 4 developed a superficial incisional SSI and the remaining deep incisional SSI. None of the patients in both groups developed an organ or space SSI.

**Conclusion:** according to this study performed, prophylactic antibiotics, unless warranted, has no significant role in clean elective surgeries

**KEYWORDS :** surgical site infection, Antibiotics, Elective surgeries, Clean surgery

### 1. INTRODUCTION:

Surgical site infections are one of the most common hospital acquired infections, which constitute 38% of surgical infections.[1] It creates great burden to the patients by increasing hospital stay by 7-10 days. Also, it increases hospital expenditures creating an economic burden to the patient and country.[2]

The basis of prophylaxis is to obtain appropriate levels of the drugs in serum and tissues that exceed the Minimum Inhibitory Concentrations (MIC) for the likely micro organisms causing a specific surgical infection. It is considered optimal if the antibiotic is administered 30 minutes before putting a skin incision or at the time of induction of anaesthesia. Usually single dosage of antimicrobial agent is optimal for a surgical procedure unless it prolongs for more than three hours.

Surgical-site infection (SSI) rate in clean surgeries and clean contaminated surgeries are 2% to 5% and upto 20% respectively.[3] Usually prophylaxis is not used for clean surgeries. But prevalent usage of prophylactic antibiotics in these clean procedures is due to the undue fear of infection in the minds of majority of our surgeons. Appropriate usage of antibiotics gains paramount importance due to emergence of multi drug resistant strains.

### 2. AIMS AND OBJECTIVES:

The objective of the study was to evaluate the role of prophylactic antibiotics to prevent surgical site infections in clean and elective surgeries.

Surgeries included in the study were:

- Hernia repair
- Open hernioplasty
- Laparoscopic hernioplasty
- Neck
- Thyroid surgeries
- Lipoma nape of neck
- Breast
- Modified radical mastectomy
- Excision biopsy
- Scrotal surgeries
- Hydrocele
- Epididymal cyst excision

To compare the surgical site infection in two groups of patients,

- one receiving prophylactic antibiotics (Study group) and
- the other group without any prophylaxis before surgery. (Control group)

### 3. MATERIALS AND METHODS:

#### Source of data:

Patients admitted to Govt. Rajaji hospital Madurai for clean general

surgical operations were included with the

**Sample size:** Totally 100 patients were select Out of 100, 50 patients were allotted in study group and the remaining 50 in control group.

**Methods used for allocation:** Allocation of patients were done randomly. No specific selection of cases into study or control group was done.

**Inclusion criteria:** Patients who had to undergo the following procedures were included. Hernia repair (open and laparoscopic approaches), breast surgeries (modified radical mastectomy for carcinoma breast and excision biopsies for fibroadenoma breast), neck surgeries (total thyroidectomy for multinodular goitre and hemithyroidectomy for solitary nodular goitre, excision biopsy of lipoma nape of neck) and scrotal surgeries (eversion of sac for hydrocele and excision for epididymal cyst).

#### Administration of prophylaxis:

Study Group: Injection Cefotaxim 1g IV was given 30 minutes before operation.

Control group: No antibiotics were given pre operatively.

- Similar techniques were followed for both groups to rule out any bias.
- Strict asepsis were handled for both the groups.
- Blinding (which prevents patients from allocation into specific groups) was done again to rule out bias.

#### Exclusion criteria:

- Patients who are diabetic, hypertensive or consuming medications for any other specific medical conditions
- Patients who are Immunologically compromised
- Patients who are Chronic malnourished
- Patients undergoing contaminated or clean contaminated surgeries
- History of fever, cough with expectoration

Patients were examined for presence of

- Erythema & Redness +/-
- Induration
- Fever +/-
- Stitch Abscess / Granuloma +/-
- Wound gaping or discharge +/-
- Patients with above findings were investigated and Complete blood count and Pus Culture & Sensitivity were sent.
- Statistical analysis was done by standard statistical and clinical methods and data were analysed.

### 4. RESULTS:

**Figure 1 : Distribution Of Operated Cases**

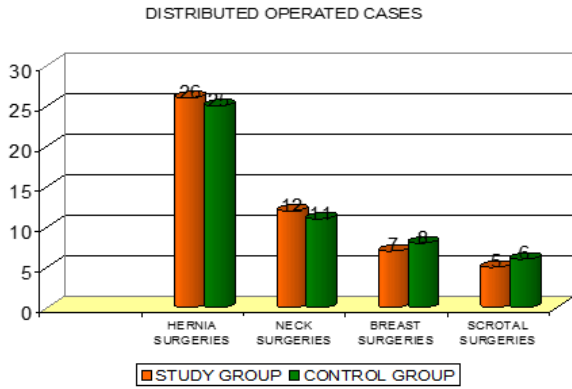


Figure 2: Wound Infection

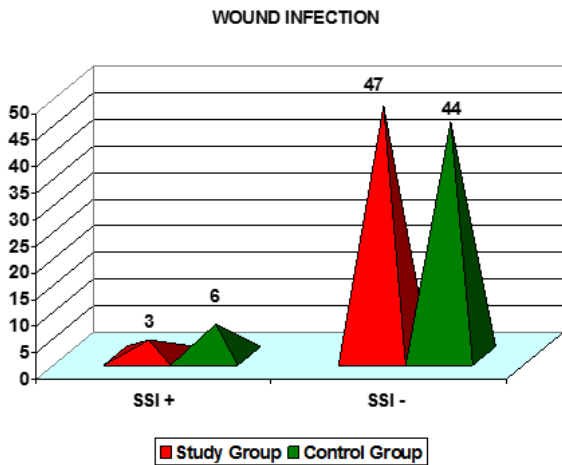


Table 1: Wound Infection Between Two Groups

Wound Infection	Study Group	Study %	Control Group	Control %
SSI+	3	6	6	12
SSI-	47	94	44	88

**5.DISCUSSION AND SUMMARY:**

The term Clean surgeries describes the procedures where in a sterile technique is strictly adopted and any of the tracts like GIT, respiratory and genitor-urinary tracts are not entered. Apart from the factors like the operating team and the risk factors of the patient which contributes to the risk of infection, the operating atmosphere and the sterility of the instruments and the effort which is taken to maintain asepsis also interferes with the rate of surgical infection.

It is rather not fair for a surgeon to prescribe an antibiotic when there is any breach in the technique of asepsis as it is never a substitute to asepsis. In a clean surgery, the infection is almost always entered the operative field from an exogenous source like skin of the patient or the nostrils of the operating team.

In this study the factors like hypertension, diabetes mellitus or any other co-morbidities, immunocompromised state, malnutrition, previous surgeries, hypersensitivity to any antimicrobial agents have been excluded. As per the literature, the rate of infection after a clean surgery is 1.5% and is hardly more than 4%.

According to the study performed in our institution, the rate of infection in the study group i.e., the patients who received a prophylactic antibiotic was 6%. 3 out of 50 patients developed an infection among which 2 had superficial incisional SSI. In the group who never received an antibiotic prophylactically, 6 out of 50 patients (12%) developed an infection of which 4 developed a superficial incisional SSI and the remaining deep incisional SSI. None of the patients in both groups developed an organ or space SSI. 48% of the patients in the study group and 54% of the patients in the control group were in the age group of 40 to 60 years with no significant co morbid conditions.

Organisms obtained from the isolates of patients from both the study group and the control group were predominantly staphylococcus aureus. Other organisms obtained were klebsiella pneumonia and escherichia coli. The difference in the infection rate of both the groups was not significant statistically as the p value obtained from the chi square test was 0.452 (p value becomes significant when it is less than 0.05). This was actually similar to study by Habte-Gabr Eet al. [4]

But according to Lecuona M et al,[5] who conducted a study to evaluate the use of perioperative prophylaxis in clean surgeries, there was an absolute decrease in the risk of surgical site infection to approximately 50%. In this study, the sample size ( n = 1000 ) was sufficiently larger than our study. More the number of procedures performed, more the sample size, more the power of study which makes the results of study considerably reliable. Also from such randomised trials performed the regimens for specific surgical infections can be devised. Regimens usually successful are those which are Available at a cheaper cost to the patient. Remains in the serum for a longer time (half life). Considerable activity against organisms which are usually found in the nostrils and skin of the health care personnels. Though the drug cefazolin serves the above purpose and been used nowadays for many clean and uncontaminated surgeries, the best agent for prophylaxis varies according to the type of surgery performed and the likely source of infection. Apart from the efficacy of the antibiotics used to treat or prevent a surgical site infection, the important factor which helps a surgeon to choose an antibiotic is its cost. Nowadays, antimicrobial agents have been misused in inpatient setup. This is also similar in an outpatient set up as 'over the counter' drugs. Antibiotic misuse gives an economic burden in a society due to increased costs in health care services. It also leads to newer infections like antibiotic associated diarrhoea caused by clostridium difficile. Emergence of multi drug resistant strains and organisms like " super bugs" which are resistant to all but few anti microbial agents makes the already worsened situated more sober. A responsible surgeon must weigh the potential risks and advantages of giving an antibiotic after a particular procedure, especially a clean and uncontaminated surgery where the chance of infection rate is very minimal and act accordingly.

Improvements in the quality of medical care can only be accomplished by proper usage of an antibiotic which is effective in preventing and controlling an infection. Optimal regimens for treating a surgical site infection must be tailored based on whom and what procedure is been performed as it takes a heavy toll on the economy.

**6.CONCLUSION:**

According to the results of this study which evaluated the role of prophylactic antibiotics to prevent surgical site infections in clean surgeries which included hernia repair (both open and laparoscopic), neck surgeries (thyroid surgeries and lipoma), breast surgeries (modified radical mastectomy and fibroadenoma excision) and scrotal surgeries (hydrocele and epididymal cyst excision), the rate of surgical site infection in the group which received prophylactic antibiotic (study group) was 6% and the one which did not receive any antibiotic prior to surgery developed 12% of wound infection rate. This difference in the rate of infection is not significant statistically as the p value was 0.452 (>0.05) obtained by the test of significance (chi square test).

Thus we come to a conclusion that for a clean and uncontaminated surgery, the use of antibiotics prophylactically does not cause a significant reduction in the rate of surgical site infection. Also in literature, it is not established that prophylactic antibiotics for clean surgeries in general surgery reduce the infection rate as in clean contaminated and contaminated surgeries where its role is extensively studied and its reduction in rate of surgical site infection is strongly established.

Thus to conclude, according to this study performed, prophylactic antibiotics, unless warranted, has no significant role in clean elective surgeries.

**7.REFERENCE:**

1. Abdominal surgical site infections: incidence and risk factors at an Iranian teaching hospital Seyed Mansour Razavi1, Mohammad Ibrahimpoor2, Ahmad SabouriKashani3 and AliJafarian4 BMC Surgery 2005, 5:2doi:10.1186/1471-2482-5-2
2. Troillet N, Petignat C, Matter M, Eisenring MC, Mosimann F, Francioli P: Surgical site infection surveillance: an effective preventive measure. Rev Med Suisse Romande 2001, 121(2):125-8.
3. BurkittJF: Identification of the sources of staphylococci contaminating the surgical

- wound during operation. *Ann Surg* 1963, 158:898-904.
4. Habte-Gabr E, Gedebau M, Kronvall G: Hospital-acquired infections among surgical patients in TikurAnbessa Hospital, Addis Ababa, Ethiopia. *Am J Infect Control* 1988, 7-13.
  5. Lecuona M, Torres Lana A, Delgado-Rodriguez M, Llorc J, Sierra A: Risk factors for surgical site infections diagnosed after hospital discharge. *J Hosp Infect* 1988, 39(1):71-4.