

# Study of short course prophylactic antibiotic treatment (24hrs) in clean surgeries

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## Abstract

Surgical site infections are the third most common type of nosocomial infections (over 70%). In any hospital, perioperative antimicrobial prophylaxis constitutes the bulk of antimicrobial consumption. We need to adapt policies that decrease the incidence of such infections in order to bring the morbidity associated with surgeries to a lower level. A set of patients undergoing clean surgeries from July 2016 to February 2017 under Surgical 2<sup>nd</sup> unit of Bowring and Lady Curzon hospital (Affiliated to Bangalore Medical College and Research Institute) are included in our study. During this period, a total of 400 patients participated. 24hrs of antibiotic prophylaxis was used for the patients during this period. In our study surgical site infection rate is 3.25 % in clean surgeries. Our findings indicate that a short course of perioperative antimicrobial prophylaxis (24hrs) are sufficient and efficacious as well as cost-effective for prevention of surgical site infections in clean surgeries in Indian surgical set up.

**Keywords:** Contamination, wound, nosocomial, prophylaxis, antibiotic.

## 1. Introduction

Surgical site infections are the third most common type of nosocomial infections [1], they account for approximately 70% of nosocomial infections. Surgical site infections are responsible for increased morbidity and mortality [2-4]. Factors for SSI include host risk factors, surgical wound factors, virulence and pathogenicity of the microbe involved. With respect to our patient compromised immune system secondary to diabetes, chronic renal failure, hepatic insufficiency and neoplasia can increase the risk of infection. However the period of greatest risk remains the time between opening and closing the operating site [5-7].

Perioperative antimicrobial prophylaxis constitutes the bulk of antimicrobial consumption in any hospital. Success in surgery depends on prevention and proper management of the wound [8]. We need to adapt policies that decrease the incidence of postoperative wound infection. Timing of antibiotic administration is critical to

efficacy. The first dose should always be given before the procedure, preferably within 30 minutes before incision [9]. Principles of prophylaxis include providing effective levels of antibiotics in the decisive interval, and, in most instances, limiting the course to intraoperative coverage only [10].

Surgical wounds are classified as follows [11]:

### Clean Wounds

Operations in which no inflammation is encountered and the respiratory, alimentary or genitourinary tracts are not disturbed. There is no break in aseptic operating theatre technique.

### Clean-Contaminated Wounds

Operations in which the respiratory, alimentary or genitourinary are entered but without significant spillage.

### Contaminated Wounds

Operations where acute inflammation (without pus) is encountered, or where there is visible contamination

of the wound. Examples include gross spillage from a hollow viscus during the operation or compound/ open injuries operated on within four hours.

### Dirty Wounds

Operations in the presence of pus, where there is a previously perforated hollow viscus, or compound / open injuries more than four hours old.

### Aim and objectives

To determine the effectiveness of short course antibiotic prophylaxis (24 hrs) for clean surgeries and compare the same with the existing literature.

## 2. Methods

This is a prospective study. Patients undergoing elective surgeries for clean cases for various causes from July 2015 to October 2016 under surgical second unit of Bowring and Lady Curzon hospital (affiliated to Bangalore Medical College and Research Institute). During this period a total of patients participated in the study. Patients undergoing surgeries for clean contaminated, contaminated and dirty wounds were excluded from the study. 24 hrs of antibiotic prophylaxis was used for the patients during this period. The patients received inj. Ceftriaxone 1g IV once at the time of induction of anaesthesia before surgery and then about 6hrs after surgery. Surgical wounds were inspected on post operative day 3 and discharged on post operative day 4 and followed up in the outpatient department. The diagnosis of surgical site infection was made on clinical and bacteriological basis. Patients with surgical site wound infection were kept inpatient and treated accordingly.

## 3. Results

A total of 400 procedures performed with 24hrs of antibiotic prophylaxis. Of which 251 were males and 149 were females, age group ranging 20 to 80 yrs. Among 400 patients, 13 patients had wound infection. 1 patient had surgical site infection, detected on 3<sup>rd</sup> post-operative day who underwent circumcision, 3 patients who underwent Inguinal hernioplasty, 4 patients underwent mesh repair for paraumbilical hernia, 1 patient underwent breast surgery, 2 patients had undergone cholesectomy, 2 patients with hydrocoele. Patients with surgical site infection were debrided/ dressing was done and treated with oral antibiotics for about 5 days. Patients were discharged on 8<sup>th</sup> post-operative day after infection control with continuation of follow up in the OPD/ minor OT.

In our study surgical site infection rate in clean surgeries is 3.25%.

**Table 1: Various surgeries**

Name of the surgery	No. of surgeries
Inguinal hernioplasty	105
Paraumbilical hernia mesh repair	60
Breast surgeries	27
Appendicectomy	12
Thyroid/ midline neck swellings	23
Bowel swellings	8
Cholecystectomy	35
Vascular surgery	20
Circumsicion	10
Scrotal surgeries	35
Miscellaneous	65
<b>Total</b>	<b>400</b>

**Table 2: Age distribution**

Age group in years	No. of patients
21-30	99
31-40	130
41-50	101
51-60	55
61-70	7
71-80	2

**Table 3: Infections in various surgeries**

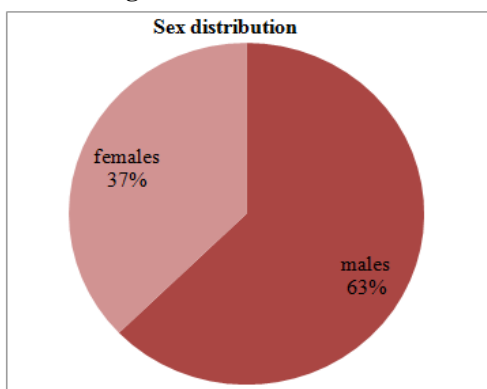
Infected cases	No. of cases
Inguinal hernioplasty	3
Paraumbilical hernia mesh repair	4
Breast surgery	1
Cholecystectomy	2
Hydrocoele	2
Circumsicion	1
<b>Total</b>	<b>13</b>

**Table 4: Surgical site infection from different studies in India**

Name of the college	No. of patients	No. of infected	Infection rate%
Grant Medical College, Mumbai, Maharashtra	132	4	3.03
B. J. Medical College, Ahmedabad, Gujarat	66	2	3.03

**Table 5: Surgical site infection in our study**

Number of patients	Number of infected	Infection rate%
400	13	3.25

**Figure 1: Sex distribution**

#### 4. Discussion

Antibiotic prophylaxis is a standard of care. No literature recommends prolonged use of antibiotic prophylaxis in clean surgeries. Most of the surgeons however use prolonged antibiotic prophylaxis for the fear of surgical site infections. Cost evaluation revealed that shorter course was less expensive than conventional longer course regimen. Implementation of short course antibiotic prophylaxis will go a long way in reducing antimicrobial resistance, cost and adverse reactions to antimicrobials.

In our study surgical site infection rate is 3.25% which is low compared to the earlier studies.

Antimicrobials used should cover the commonly expected organisms in the surgery. Maintaining aseptic precautions, incorporating appropriate operation theatre protocols and short course antibiotic prophylaxis and sterile dressings will reduce infections.

#### 5. Conclusion

Our findings show that short course use of perioperative antimicrobial prophylaxis (24 hrs) are sufficient and cost-effective for prevention of surgical site infections in Indian set up.

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