

Incidence & Antibiotics Prophylaxis of Wound Infection in Postoperative Surgery: A Hospital Based Study

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ABSTRACT

Background: According to NNIS (National nosocomial infection surveillance study) study, the criteria should be for clean cases 2.1%, clean contaminated cases 3.3% contaminated cases 6.4% and dirty cases 7.1% Post-operative wound infection has been the greatest obstacle to advancement of surgery down the centuries. Lister introduced antiseptic methods for safe surgery.

Methods: All the patients were studied from the time of their admission, till their discharge from the wards, and up to second and fourth week of follow up. Details of individual cases were maintained in the proforma. Routine investigation were done pre-operatively in all the patients. In patients below 40 years complete hemogram, urine routine, blood urea, Serum creatinine and blood sugars were done. The details of the surgical procedure, the duration of surgery and any contamination on table were noted. A second dose of antibiotic was repeated at the end of two hours of operation where the surgery exceeds 2 hours

Results: In our study 50 patients were included in this study each of which belong to 10-50 group. 10% belong to 10-20 age group, 20% from 21-30 group, 44% from 31-40 age group and 26% belong to 40-60 age group. In our study 44% associated risk factor isolated, 13.6% anemia, DM 45.4%, 9% obesity, bronchitis and 22.7% hypertension. In our study *Staphylococcus aureus* isolated from two cases and *E. coli* and *P. aeruginosa* were isolated from one cases.

Conclusion: :- Our study conclude that, In the clean, clean non-contaminated, and contaminated surgeries, single dose of cefazolin with addition of metronidazole when there should be anaerobic coverage can be widely applied in the routine practice.

Key words: Antibiotics, prophylaxis, surgery, postoperative

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INTRODUCTION

Post-operative wound infection has been the greatest obstacle to advancement of surgery down the centuries. Lister introduced antiseptic methods for safe surgery. The advent of antibiotics did raise the hope of a permanent solution to this problem but later it has become the nightmare of the surgeon. Many considered and still now consider antibiotic as —wonder drug which could cover their lapses in surgical technique and asepsis. Over reliance on antibiotics led to their extensive and often indiscriminate use resulting into development of resistance by various organisms and the problem of —Hospital Infectionll has

boomeranged on us.^[1] Antibacterial agents administered as early as three hours after experimental contamination of wound, have no influence on the infection rate of the operative wounds. If the body already has adequate antibiotic concentration at the time of contamination, infection can be adequately prevented.^[2]

Surgical site infections (SSIs) are the second most common component of nosocomial infections.^[3] Surgical prophylaxis is important to prevent surgical site infections by using an antimicrobial agent that is safe, cost-effective and has a spectrum of activity that covers the most common pathogens

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for surgical procedures. Surgical prophylaxis is given to achieve appropriate serum and tissue concentrations of the antimicrobial agent prior to the time of incision and throughout the duration of the surgical procedure. Surgical prophylactic antibiotic treatment is defined as the use of antibiotics before, during, or after a diagnostic and therapeutic procedure to prevent infectious complications. [4] On the other hand, therapeutic antibiotic treatment is defined as the use of antibiotics that reduce the growth or reproduction of bacteria, including eradication therapy. [5] This term is used to describe antimicrobial therapy prescribed to clear infection by an organism or to clear an organism that is colonizing a patient but is not causing infection.

METHODS

STUDY POPULATION: - Fifty patients each from surgery unit were included in this study . All the surgeries in the study were elective cases and all the patients subjected to this study were healthy individuals with a general work up. **STUDY AREA:-** This study conducted in Department of Surgery, Geetanjali Medical College and Hospital, Udaipur. **STUDY DURATION:** - The duration of this study over a period of six month.

DATA COLLECTION:-

All the patients were studied from the time of their admission, till their discharge from the wards, and up to second and fourth week of follow up. Details of individual cases were maintained in the proforma. Routine investigation were done pre-operatively in all the patients. In patients below 40 years complete haemogram, urine routine, blood urea. Serum creatinine and blood sugars were done. The details of the surgical procedure, the duration of surgery and any contamination on table were noted. A second dose of antibiotic was repeated at the end of two hours of operation where the surgery exceeds 2 hours.

INCLUSION CRITERIA: -

- 1.Only clean, clean contaminated, and contaminated cases were accepted.
- 2.Patients preparation like control of diabetes, chest physiotherapy in geriatric age group and personal hygiene was ensured prior to elective surgery.

EXCLUSION CRITERIA: - 1.Age below 10 year
2.Age above 50 year
3.Cases which were posed as emergency surgical procedure and dirty cases were not taken in this study as they require the therapeutic long-term antibiotic.

DATA ANALYSIS: - Data were analyzed by using Microsoft excel.

RESULTS

In our study 50 patients were included in this study each of which belong to 10-50 group. 10% belong to 10-20 age group,20% from 21-30 group, 44% from 31-40 age group and 26% belong to 40-60 age group. In our study 44% associated risk factor isolated ,13.6% anemia, DM 45.4%, 9% obesity, bronchitis and 22.7% hypertension. In our study *Staphylococcus aureus* isolated from two cases and *E. coli* and *P. aeruginosa* were isolated from one cases.

Table 1. Gender-Wise Distribution

GENDER	NO OF PATIENTS	PERCENTAGE
MALE	33	66%
FEMALE	17	34%
TOTAL	50	100%

Table 2. Age-Wise Distribution

AGE	NO. OF PATIENTS	PERCENTAGE
10-20	5	10%
21-30	10	20%
31-40	22	44%
40-50	13	26%
TOTAL	50	100%

Table 3. Associated Risk Factor with Wound Infection

ASSOCIATED RISK FACTOR	NO. OF PATIENTS	PERCENTAGE
ANEMIA	3	13.6%
DIABETIC MELLITUS	10	45.4%
OBESITY	2	9%
BRONCHITES	2	9%
HYPERTENTION	5	22.7%
TOTAL	22	100%

Table 4. Classification of Wound

CLASSES OF WOUND	INFECTED CASES	NO. OF PATIENTS	PERCENTAGE
CLEAN	5	37	74%
CLEAN CONTAMINATED	1	7	14%
CONTAMINATED	1	6	12%
TOTAL	7	50	100%

Table 5. Distribution of Infected cases

Infected cases	FEVER	SEROUS DISCHARGE	PURULENT DISCHARGE
5	2	3	2
2	1	1	1
1	1	-	1

Table 6. Classification Of Wound According To With And Without Growth

CLASSES OF WOUND	GROWTH	NO GROWTH
CLEAN (5)	Staphylococcus aureus (2)	3
CLEAN COAMINATED (1)	Pseudomonas aureus (1)	-
CONTAMINATED (1)	E. coli (1)	-
TOTAL	4	3

DISCUSSION

According to NNISS (National nosocomial infection surveillance study) study, the criteria should be for clean cases 2.1%, clean contaminated cases 3.3% contaminated cases 6.4% and dirty cases 7.1%.^[6] In the present study, a single shot antibiotic prophylaxis can get a accepted post-operative infection rate of 14%. Use of prophylactic antibiotic in clean contaminated and contaminated cases are well advocated, but it is still controversial in clean cases.^[7] In this study even clean cases

(10%) showed infection. Hence at this stage single dose prophylactic antibiotic is recommended in all clean cases until a definite proof is available against its usefulness.

Cefazolin has most of characteristics of the ideal prophylactic antimicrobial drug [8]. Such as.

- Has the necessary spectrum of activity and is active against the pathogens causing post-operative surgical site infection in patients.
- Reaches adequate concentration in the tissues of the operative site.
- Has a half-life which permits single dose injection. Can be given by bolus injection at induction of anesthesia.
- Has no adverse effects associated with short term administration.
- Is not allergic.
- Does not interact with drugs given preoperatively.
- Does not select for resistant microorganisms in the patients.
- Is not an essential drug of the therapeutic arsenal.
- Is not expensive.

Cephalosporins of the second generation such as cefamandole, cefuroxime had no benefit over cefazolin in surgical prophylaxis, they have a little broad spectrum against the family of Enterobacteriaceae members. Which is not needed in elective surgery and they are too much costl.[5]

For all events for with anaerobic activity are needed, Metronidazole can be combined with the cephalosporins. Administration route of the antibiotic should be intravenously as a bolus dose as practiced in the present study and advise by other workers in order to get a quick therapeutic level.[2] Single dose timing of a prophylaxis is so much essential. In absence of infection post-operative pyrexia does not warrant any antibiotics.

As found in this study post-operative fever did not need for any treatment.

Though when there is any wound infection such as serous or Purulent discharge showed positive culture growth, required appropriate antibiotic according to culture sensitivity.

As in this study 8% showed frank wound infection with positive culture growth required antibiotic according to culture sensitivity. In my study even clean cases have shown infection. Therefore, at this stage single dose prophylactic antibiotic is suggested in all clean cases until a definite proof is available against its utility.

CONCLUSION

The over uses of antibiotic therapy should be avoided as it has got no advantage over single dose prophylaxis, though one should not forget a good and aseptic surgical technique to avoid post-operative wound sepsis.

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