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STUDY OF SHORT COURSE PROPHYLACTIC ANTIBIOTICS IN CLEAN SURGERIES - 48 HOURS

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ABSTRACT

Background and Objectives: 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 various surgical site infection (SSI) cases. A study conducted under MEDICON health services (pvt. ltd.) are included in our study. During this period, a total of 400 patients participated. 24hrs of antibiotic prophylaxis (CEFTRIAXONE 1g I.V.) was used for the patients during this period. **Results:** In our study surgical site infection rate is 3.25 % in clean surgeries. **Conclusion:** Our findings indicate that a short course of perioperative antimicrobial prophylaxis(24hours) are sufficient and efficacious as well as cost-effective for prevention of surgical site infections in clean surgeries in Indian surgical set up.

KEYWORDS: antibiotic prophylaxis, nosocomial infections, surgical site infection.

INTRODUCTION

Surgical site infections are the third most common type of nosocomial infections, they account for approximately 70% of nosocomial infections. Surgical site infections are responsible for increased morbidity and mortality. Factors for SSI include host risk factors, surgical wound factors, virulence and pathogenecity 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.

Perioperative antimicrobial prophylaxis constitutes the bulk of antimicrobial consumption in any hospital. Success in surgery depends on prevention and proper management of the wound. We need to adapt policies that decrease the incidence of postoperative wound infection.

Surgical wounds are classified as follows:

- **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.

1. Antibiotic prophylaxis should be given at right time.
2. Duration of administration of the prophylactic antibiotic should be shortest possible but long enough till necessary
3. Antibiotic to be used should be effective against potential pathogen.
4. Administration should be systemic.

Usually, long courses of antibiotic prophylaxis are administered, which are often associated with increasing antimicrobial resistance, super infection with resistant pathogens, toxicity and unnecessary cost8. Rampant and unnecessary administration of antibiotics is one of the major contributors for development of drug resistance.

- SSIs occur in 2%–5% of patients undergoing inpatient surgery.
- SSI is now the most common and most costly HAI.
- Up to 60% of SSIs have been estimated to be preventable by using evidence-based guidelines.
- SSIs account for 20% of all HAIs in hospitalized patients.
- Each SSI is associated with approximately 7–11 additional postoperative hospital-days.
- Patients with an SSI have a 2–11-times higher risk of death compared with operative patients without an SSI.
- Seventy-seven percent of deaths in patients with SSI are directly attributable to SSI.

AIMS AND OBJECTIVES

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

METHODS

This is a prospective study. During this period a total of 400 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. Ceftrioxone 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.

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 200 patients, 13 patients had wound infection.1 patient had surgical site infection , detected on 3rd post-operative day who underwent circumsicion, 3 patients who underwent Inguinal hernioplasty, 4 patients underwent mesh repair for paraumbilical hernia, 1patient underwent breast surgery, 2 patients had undergone cholesestectomy,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 8th post-operative day after infection control with continuation of follow up in the OPD/ minor ot.
In this study surgical site infection rate in clean surgeries is 3.25%.

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 this 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.

CONCLUSION

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

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
Total	400

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

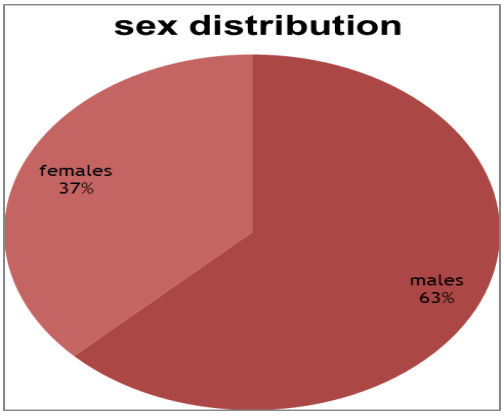
Total	13

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

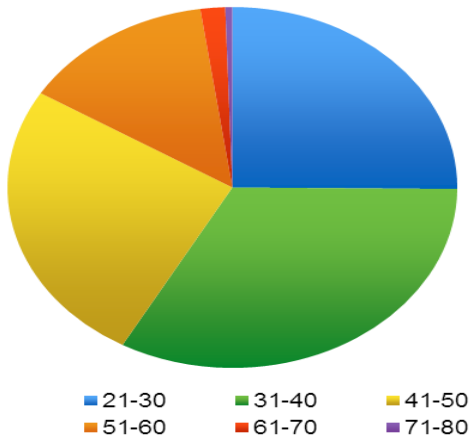
Name of the college	Number of patients	Number of infected	Infection rate%
Grant Medical College, Mumbai, Maharashtra	132	4	3.03
B. J. Medical College, Ahmedabad, Gujarat	66	2	3.03

Table 5: Surgical site infection in our study.

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



Age Distribution



REFERENCES

1. *Mangram AJ, Horan TC, Pearson ML, silver LC, Jarvis WR.* The hospital infection control practices advisory committee guideline for prevention of surgical site infection, 1999. Infection control HOSP epidemiol, 1999; 20: 247-78.
2. *Lilani SP.* Surgical site infection in clean and clean contaminated cases. Indian journal of medical microbiology, 2005; 23(4): 249-52.
3. *Edward S Wong*. Surgical site infections. In: *C. Glen Mayhall*, editors. Hospital Epidemiology and Infection control. 2nd ed. Philadelphia: Lippincott Williams & Wilkins, 1999; 189-210.
4. *David H Culver, Teresa Horan.* Surgical wound infection rates by wound class, operative procedure & patient risk index. Tr. American J of Medicine, 1991; 91(supp 3B): 152-157.
5. *Patel Sachin M.* Surgical infections: Incidence and risk factors in a tertiary care hospital, Western India. National journal of community medicine, April-June 2012; 3(2).
6. *Barnard B.* Prevention of surgical site infections. Infection Control Today, 2003; 7: 57-60.
7. *Desa L. A., Sathe MJ.* Factors influencing wound infection. Journal of Postgraduate Medicine, 1984; 30(4): 231-236.
8. *Classen DC, Evans RS, Pestotnik SL,* et al. The timing of prophylactic administration of antibiotics and the risk of surgical-wound infection. New England Journal of Medicine, 1992; 326: 281–6.
9. *Norman S Williams, Christopher J K Bulstrode and Ronan O'Connell*. "Surgical Infection", Bailey and Love's Short Practice of Surgery, Hodder Arnold, 25th Edition, 2008; 63-64.
10. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3657872/.
11. Wendy Munckhof Antibioties for surgical prophylaxes. Aus Prescr, 2005; 28: 38–40.
12. Mathur P, Kapil A, Das B, Dhawan B. Prevalence of extended spectrum beta lactamase producing Gram-negative bacteria in a tertiary care hospital. Indian J Med Res, 2002; 115: 153–7. [PubMed].
13. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4267723/.
14. Cruse P. Wound infection surveillance. Rev Infect Dis., 1981; 3(4): 734–737. [PubMed].
15. Graves EJ. National Hospital Discharge Survey: Annual Summary. National Center for Health Statistics; Hyattsville, MD, 1987-1989; 13: 99.
16. Zimlichman E, Henderson D, Tamir O, et al. Health care– associated infections: a meta-analysis of costs and financial impact on the us health care system. JAMA Intern Med, 2013; 173(22): 2039–2046. [PubMed].
17. Meeks DW, Lally KP, Carrick MM, et al. Compliance with guidelines to prevent surgical site infections: as simple as 1-2-3? Am J Surg, 2011; 201(1): 76–83. [PubMed].
18. Umscheid CA, Mitchell MD, Doshi JA, Agarwal R, Williams K, Brennan PJ. Estimating the proportion of healthcare-associated infections that are reasonably preventable and the related mortality and costs. Infect Control Hosp Epidemiol, 2011; 32(2): 101–114. [PubMed].
19. Klevens RM, Edwards JR, Richards CL, Jr, et al. Estimating health care–associated infections and

deaths in U.S. hospitals, 2002. Public Health Rep, 2007; 122(2): 160–166. [PMC free article] [PubMed].
20. Cruse PJ, Foord R. The epidemiology of wound infection: a 10-year prospective study of 62,939 wounds. Surg Clin North Am, 1980; 60(1): 27–40. [PubMed].
21. Anderson DJ, Kaye KS, Chen LF, et al. Clinical and financial outcomes due to methicillin resistant Staphylococcus aureus surgical site infection: a multi-center matched outcomes study. PloS ONE, 2009; 4(12): 8305. [PMC free article] [PubMed]}.
22. [http://medind.nic.in/jav/t13/i4/javt13i4p207.pdf].