ORIGINAL ARTICLE

STUDY OF SHORT COURSE PROPHYLACTIC ANTIBIOTIC TREATMENT (48HRS) IN CLEAN AND CLEAN CONTAMINATED SURGERIES

Vivek S. Revankar¹, Janakirama S. J², Mohammed Shahid Ali³, S. I. S. Khadri⁴

HOW TO CITE THIS ARTICLE:

Vivek S. Revankar, Janakirama S. J, Mohammed Shahid Ali, S. I. S. Khadri. "Study of Short Course Prophylactic Antibiotic Treatment (48hrs) in Clean and Clean Contaminated Surgeries". Journal of Evolution of Medical and Dental Sciences 2014; Vol. 3, Issue 56, October 27; Page: 12780-12785, DOI: 10.14260/jemds/2014/3696

ABSTRACT: BACKGROUND: Surgical site infections are the third most common type of nosocomial infections. Perioperative antimicrobial prophylaxis constitutes the bulk of antimicrobial consumption in any hospital. We need to adapt the policies that decrease the incidence of postoperative wound infection. **METHODS:** Patients undergoing elective surgeries for clean and clean contaminated cases for various causes from July 2012 to October 2014 under Surgical 1st 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 650 patients participated. 48hrs of antibiotic prophylaxis was used for the patients during this period. **RESULTS:** In our study surgical site infection rate is 0.73% in clean surgeries and is 1.86% in clean-contaminated surgeries. Over all infection rate is 0.92% for clean and clean contaminated surgeries. **CONCLUSION:** Our findings indicate that a short course of perioperative antimicrobial prophylaxis(48hrs) are sufficient and efficacious as well as cost-effective for prevention of surgical site infections in clean and clean-contaminated surgeries in Indian surgical setup.

KEYWORDS: Surgical site infections, antibiotic prophylaxis, clean surgeries, clean-contaminated surgeries.

INTRODUCTION: Surgical site infections are the third most common type of nosocomial infections and they account for approximately a quarter of all nosocomial infections.^[1] They have been responsible for increasing cost, morbidity and mortality related to surgical operations and continue to be major problem.^[2-4] Pathogens that cause SSI are acquired either endogenously from the patient's own flora or exogenously from contact with operative room personnel or the environment. 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. Usually, long courses (conventional course) of antibiotic prophylaxis are administered, which are often associated with increasing antimicrobial resistance, super infection with resistant pathogens, toxicity and unnecessary cost. Success in surgery depends on prevention and proper management of the wound.^[8] We need to adapt the policies that decrease the incidence of postoperative wound infection.

Surgical Wounds can be divided into 4 Classes:^[9]

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

ORIGINAL ARTICLE

- **Clean-contaminated wounds** Operations in which the respiratory, alimentary or genitourinary tracts 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.

AIMS AND OBJECTIVES: To determine the effectiveness of short course antibiotic prophylaxis (48hrs) for clean and clean contaminated cases and to compare with the existing literature.

METHODS: This is a prospective study. Patients undergoing elective surgeries for clean and clean contaminated cases for various causes from July 2012 to October 2014 under Surgical 1st Unit of BOWRING AND LADY CURZON HOSPITAL (affiliated to BANGALORE MEDICAL COLLEGE AND RESEARCH INSTITUTE). During this period, a total of 650 patients participated in the study.

Patients undergoing surgeries for contaminated and dirty wounds were excluded from the study. 48hrs of antibiotic prophylaxis was used for the patients during this period. Patients received Inj. Ceftriaxone 1g IV after test dose 1 to 2hrs before the surgery and 3 more doses of ceftriaxone at 12hrs apart. For clean contaminated cases, metronidazole was added. Surgical wounds were inspected on post-operative day 3, 6 and 10 or until suture removal and at the end of 30days. Most of the patients were discharged on post-operative day 3 and followed up in out-patient department.

The diagnosis of surgical site infection was made on clinical and bacteriological basis. Patient with surgical site wound infection were kept inpatient and treated accordingly. The study protocol, pro-forma, and other documents like patient information sheet and informed consent were taken according to standard protocol.

RESULTS: A total of 650 procedures performed with 48hrs of antibiotic prophylaxis. Of which 375 were males and 275 were females. Patient's age ranged from 14 to 70 yrs.

Among 650 patients, 6 patients had wound infection. 1 patient had surgical site infection, detected on 3rd post-operative day who underwent hernioplasty for Right inguinal hernia, pus drained and sent for culture and sensitivity and the organism was MRSA and treated accordingly with intravenous antibiotics. Patient was discharged on 14th post-operative day. 4 patients had surgical site infection, 2 patients who underwent laparoscopic cholecystectomy, 2 patients who underwent mesh repair for umbilical hernia, managed conservatively. 1 patient had surgical site infection, detected on 3rd post-operative day who underwent Jabouleys procedure for hydrocele, pus drained and sent for culture and sensitivity and the organism was MSSA and treated accordingly with intravenous antibiotics. Patient was discharged on 10th post-operative day.

In our study surgical site infection rate is 0.73% in clean surgeries and is 1.86% in clean-contaminated surgeries. Over all infection rate is 0.92% for clean and clean contaminated surgeries.

DISCUSSION: No literature recommends prolonged usage of antibiotic prophylaxis in clean and clean contaminated surgeries. Most surgeons however use prolonged antibiotic prophylaxis for the fear of surgical site infections. Many studies have shown short course of antibiotic prophylaxis is sufficient for clean and clean contaminated surgeries.

ORIGINAL ARTICLE

Linani in his study in 2005 showed that surgical site infection rate is 3.03% in clean surgeries and is 22.41% in clean-contaminated surgeries.^[1] In a study conducted in western India in 2012 showed that that surgical site infection rate is 3.03% in clean surgeries and is 11.4% in clean-contaminated surgeries.^[5]

In our study surgical site infection rate is 0.73% in clean surgeries which is very low compared to the earlier studies of 2%-6%. surgical site infection rate is 1.86% in clean-contaminated surgeries and the earlier studies show 6%-15% of infection rate. Over all infection rate is 0.92% for clean and clean contaminated surgeries.

Antimicrobial prophylaxis for General surgeries is a standard protocol in Indian surgical setup. 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 SSI.

CONCLUSION: Our findings indicate that a short course of perioperative antimicrobial prophylaxis (48 hrs) are sufficient and efficacious as well as cost-effective for prevention of surgical site infections in clean and clean-contaminated surgeries in Indian surgical setup.

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. *Infect 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. Pp189-210.
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*. Vol 3 issue 2 April- June 2012.
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.

ORIGINAL ARTICLE

Infection in various surgeries

Operations	Number of performed	Number of infected
Inguinal hernias	172	1
Other hernias	114	2
Recurrent appendicitis*	60	0
Breast surgeries	75	0
Thyroid surgeries	24	0
Small bowel and large bowel surgeries*	18	0
Gall bladder surgeries*	29	2
Varicose veins surgeries	15	0
Phimosis	14	0
Hydrocele	22	1
Others	107	0
TOTAL	650	6

*clean contaminated cases

Surgical site infection from different studies in India

	Grant Medical College, Mumbai Maharashtra			B. J. Medical College, Ahmedabad, Gujarat		
Wound class	No. of patients	No. of infected	Infection rate%	No. of patients	No. of infected	Infection rate%
Clean	132	4	3.03	66	02	3.03
Clean-contaminated	58	13	22.41	70	08	11.4
Total	190	17	8.95	136	10	7.3

Studies involved 24hrs of antibiotic prophylaxis

Surgical site wound infection by wound classification in our study

Wound class	No. of patients	No. of infected	Infection rate%
Clean	543	4	0.73
Clean-contaminated	107	2	1.86
Total	650	6	0.92

ORIGINAL ARTICLE

Surgical site wound infection rates according to various studies

Wound class	Lilani et al	Patel Sachin et al	Our study
clean	3.03%	3.03%	0.73
Clean-contaminated	22.41%	11.4%	1.86

AUTHORS:

1. Vivek S. Revankar
2. Janakirama S. J.
3. Mohammed Shahid Ali
4. S. I. S. Khadri

PARTICULARS OF CONTRIBUTORS:

1. Assistant Professor, Department of Surgery, BMCRI, RGUHS.
2. Final Year Post Graduate, Department of Surgery, BMCRI, RGUHS.
3. Final Year Post Graduate, Department of Surgery, BMCRI, RGUHS.
4. Professor, Department of Surgery, BMCRI, RGUHS.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Janakirama S. J,
Room No. 313,
BMCRI PG Men's Hostel,
Behind Shivajinagar Bus Stand,
Beside Amanath Co-operative Bank,
Bowring Hospital Road, Shivaji Nagar,
Bangalore-560001.
Email: janakiram599@yahoo.co.in

Date of Submission: 18/10/2014.
Date of Peer Review: 20/10/2014.
Date of Acceptance: 25/10/2014.
Date of Publishing: 27/10/2014.