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Original Research Article

Prospective study on use of antibiotic prophylaxis on operative wound infections in south Indian population

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ABSTRACT

Background: Antibiotic prophylaxis can help to reduce surgical site infections in operative wound infections. Present work was done to study the use of antibiotic prophylaxis on operative wound infection.
Methods: A total of 120 patients under went various surgeries in the department of surgery, Fathima Institute of Medical Sciences, Kadapa, Andhra Pradesh utilized for the present study. Out of 120 patients utilized 86 were males and 34 females with elective surgeries and observed from their admission to discharge from the hospital and also followed up all the patients up to fifth week of post-surgery. Surgical wound types were observed and recorded.
Results: We have noted clean wound cases were 91, contaminated cases were 5 and clean contaminated were 24 noted. 11 infected cases were observed in clean wound type, 3 infected cases in clean contaminated were observed. 3 patients out of 120 patients had post-operative fever and subsided within 2 days without antibiotics. Out of 91 clean wound cases, 2 patients (2.19%) had post-operative fever, 10 patients (10.9%) developed with serous discharge and purulent discharge was developed in 1 (1.09%) case in present study. Bacteriology revealed 4 cases (4.29%) showed growth of staphylococcus aureus organism, 1 case (1.09%) with pseudomonas organism was noted. 2 cases (8.3%) developed with serous discharge and 1 case (4.16%) with purulent discharge and also growth of *E. coli* in 1 (4.16%) case was noted in 24 clean contaminated cases in present study.
Conclusions: Use of antibiotic prophylaxis has a vital role in pre and post-operative wound infections.

Keywords: Antibiotics, Infection, Prophylaxis, Wound

INTRODUCTION

Multiple antibiotic classes are recommended for use in operative antibiotic prophylaxis. Certain antibiotics can exhibit bacteriostatic or bactericidal properties depending on the bacterial sensitivity and antibiotic concentration.[1] Operative wound types can be classified as clean, clean-contaminated, contaminated according to the Centers for Disease Control and Prevention's (CDC) National Healthcare Safety Network (NHSN). Clean wounds are not infected, without inflammation, primarily closed, and do not include the organ systems that are outlined in a clean-contaminated wound. Clean-contaminated wounds involve the respiratory, alimentary, genital, and urinary tract as long as the tract is entered without unusual contamination. Open, fresh accidental wounds with non-purulent inflammation categorized under contaminated wounds.[2] The present study was undertaken to study the antibiotic prophylaxis on operative wound infection in south Indian population.

METHODS

A total of 120 patients with age group between 25-70 years admitted and underwent various surgeries between April 2015 to March 2016 in the department of surgery,

Fathima Institute of Medical Sciences, Kadapa, Andhra Pradesh were utilized for the present study. Out of 120 patients utilized 86 were males and 34 females with elective surgeries and observed from their admission to discharge from the hospital and also followed up all the patients up to fifth week of post-surgery. A single dose of cefixime 1 mg of cephalosporin group of antibiotics 1 mg was given intravenously at the time of anaesthesia. All the patients underwent routine investigations before operation. The details of surgical procedure and duration of surgery. Post-operative antibiotic dose was given in elective surgeries. All the patients were followed up post-operatively till the fifth week and observed the types of wound infections and classified them in to 3 groups. Clean, clean-contaminated and contaminated cases were noted and recorded. Consent of the subject was taken as per human ethical guidelines from Fathima Institute of Medical Sciences, Kadapa, AndhraPradesh (FIMS/KP/AP/21/12/2015).

RESULTS

We have utilized 120 patients (Male-86; Female-34) with elective surgeries admitted in department of surgery to study the use of antibiotic prophylaxis on wound infection (Table 1).

Table 1: Elective surgeries among patients in present study.

Type of surgery	No. of cases	Infected cases
Hernia	23	5
Hydrocole	39	4
Laparoscopy surgery	15	-
Haemorrhoidectomy	8	1
fistulotomy	6	-
Colorectal surgery	2	1
Thyroid surgery	9	-
Excision	3	-
others	9	1
Vascular surgery	6	2

Out of 120 patients, 3 patients with allergic bronchitis,34 patients with diabetes and 9 patients with hypertension was noted in the present study (Table 2).

Table 2: Associated clinical conditions among patients.

Associate clinical condition	No. of cases
Allergic bronchitis	3
Diabetes miletus	34
Hypertension	9

As per type of wound classification we have noted clean wound cases were 91, contaminated cases were 5 and clean contaminated were 24 noted. 11 infected cases were observed in clean wound type, 3 infected cases in clean contaminated were observed (Table 3).

Table 3: Incidence of wound type among patients.

Wound type	No. of cases	Infected cases
Clean	91	11
Contaminated	5	-
Clean-contaminated	24	3
Total	120	14

3 patients out of 120 patients had post-operative fever and subsided within 2 days without antibiotics. Out of 91 clean wound cases, 2 patients (2.19%) had post-operative fever, 10 patients (10.9%) developed with serous discharge and purulent discharge was developed in 1 (1.09%) case in present study. Bacteriology revealed 4 cases (4.29%) showed growth of *Staphylococcus aureus* organism, 1 case (1.09%) with pseudomonas organism was noted (Table 4).

Table 4: Sepsis and organism growth among patients.

Wound type	Serous discharge	Purulent discharge	Growth of organism
Clean	10	1	*Staphylococcus aureus* (4)
Contaminated	-	-	-
Clean-contaminated	2	1	*E. coli* (1)

2 cases (8.3%) developed with serous discharge and 1 case (4.16%) with purulent discharge and also growth of *E. coli* in 1 (4.16%) case was noted in 24 clean contaminated cases in present study. The most common organism grown in cultures of present study was staphylococcus aureus observed in 4 cases (4.29%).

DISCUSSION

Many studies stated that uses of prophylactic antibiotic in clean contaminated and contaminated cases are well established but still controversial relate to clean cases.[3] Infection rate should be for clean cases 2.1%, clean contaminated cases 3.3% contaminated cases 6.4% and dirty cases 7.1%.[4] Intravenous route administration of antibiotic in present study plays rapid therapeutic role in wound infection and morbidity in agreement with previous literatures.[5] The use of antibiotics should be individualized based on the degree of bacterial contamination, presence of infection-potentiating factors.[6,7] Pre-operative systemic antibiotics from 2 days until the second day of post-operative period having best antibiotic prophylaxis of wound infections in contamination-prone regions.[8,9] Prolongation of prophylaxis did not decrease the risk of wound infections, but was associated with a higher rate of isolation of pathogens with acquired resistance to first-and third-generation cephalosporin drugs. We have administered a single dose of cefixime; the third generation cephalosporin drug showed decreased risk of wound infection in the present study.[10] In the present study

antibiotic prophylaxis was administered intravenously along with anesthesia before surgery. Post-operative antibiotic prophylaxis is not associated with improved infectious outcomes in patients undergoing cardiac surgery.[11,12] The results of present study suggests that antibiotic prophylaxis has vital role in operative wound infections to reduce the morbidity are in agreement with previous literatures.

CONCLUSION

The use of antibiotic prophylaxis on operative wound infection reduced the incidence of operative morbidity and not having major side effects.

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