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Original Research Article

A comparative study on antibiotics and no antibiotics in clean surgical cases

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ABSTRACT

Background: Surgical wound infection is one of the most commonly occurring complications and its incidence has been lowest in clean surgical cases. Prophylactic antibiotics are routinely used in all surgical cases. But this is not indicated in clean surgical cases. Due to undue fear of infections, many practicing surgeons use antibiotics in clean surgical cases. Misuse of antimicrobials leads to drug toxicity, super infections, high health care cost and colonization of wards by highly resistant microbes. Objective of the study is to compare the frequencies of wound site infections in patients undergoing clean elective general surgery operations with no antibiotics and single dose prophylactic antibiotics.
Methods: A comparative study of 100 patients undergoing elective clean surgeries at Victoria Hospital from November 2012 to October 2014 was undertaken. Data was collected by history taking, clinical examination, hematological and microbiological investigations and follow up.
Results: Two cases in each group had post-operative infections noticed on the day 2 wound examination. All the four cases had culture positive with isolates being *S. aureus* in three and *E. coli* in single case.
Conclusions: Post-operative wound infections noted in two cases in both the groups do not have any clinical and statistical significance; hence single dose of prophylactic antibiotics is not required in all the clean surgical cases. A simple size of large number is required in this area of research to conclude with statistical significance.

Keywords: Clean surgical cases, Prophylactic antibiotic, Post-operative wound infection

INTRODUCTION

Surgery is one of the streams where the patient is benefitted with the appropriate treatment to his ailments. No surgery is possible with absolute nil complications. Both the surgeon and patient would be always apprehensive on the outcome as well as the complications after a procedure performed.

One such complication is surgical site infection. It is one of the most commonly occurring complications in daily practice.[1] These hinder the quality of life, extension in hospital stay, financial burden etc. Incidence of post-operative surgical site infection has been lowest in clean surgical cases.[2,3] Prophylactic antibiotics are routinely used in all the cases. But the same is not indicated in clean surgical cases.[2-6]

The proper usage of antibiotics in patients undergoing surgery is necessary else misuse of antimicrobials leads to drug toxicity, super infections, colonization of highly resistant bacteria in the surgical wards as well as high healthcare cost.

So, this comparative study is indented to assess the effect of no administration of pre-operative prophylactic

antibiotics on wound site infections in clean surgical cases.

Objective of the study is to compare the frequencies of wound site infections in patients undergoing clean elective general surgery operations with no antibiotics and single dose prophylactic antibiotics in randomized controlled clean surgical cases.

METHODS

This study was conducted in the Victoria Hospital, Bangalore in Department of General Surgery during November 2012 to October 2014.

Inclusion criteria

All the patients under the age group 18 to 65 years, undergoing clean elective procedures, willing to give valid consent were included.

Exclusion criteria

Patients with co morbid conditions such as diabetes mellitus, systemic hypertension, anemia, cardiac or renal disorders, jaundice, malignancy, malnourishment and immunosuppression, break in aseptic measures; procedures lasting for more than two hours, recent antibiotic therapy, and allergy to antibiotics including cephalosporin were excluded from the study.

Procedure that would breach the respiratory, urinary, alimentary tract and presence of inflammation at operative site were strictly excluded.

Data was entered into MS Excel and was analyzed using SPSS software version 20 for descriptive and analytical statistics. Ethical clearance was taken to conduct the study from the Ethical committee of BMCRI, Bangalore.

After thorough clinical examination and relevant investigations, patient was considered for the study and study protocol initiated starting from inclusion and exclusion criteria to consent to participate in study. The patients were randomly allocated a group into random number table using computer generated software (www.randomization.com) into two groups where Group A was given preoperative prophylactic single dose antibiotic and group B with no antibiotics perioperatively. Group A patients received injection cefotaxim 1 gm intravenously 30 minutes before the surgery.

RESULTS

Majority of the cases seen were men with 62 and rest females 38 in number in total hundred cases. Most of the cases belonged to 41-50 year age group (Table 1).

Excision for cystic lesions formed the major part in the Table 2 and 3 followed by inguinal hernioplasty with 28 in number. Hydrocele and circumcision combined has a share of 13 cases with equal number of Trendelenburg procedure with flush ligation for varicose veins. Total number of excisions of benign breast diseases performed was 7 and thyroid surgeries being 5. Two ear lobe repairs have been included in the study (Table 2).

Table 1: Age wise distribution in both groups.

Age (in years)	Group A N (%)	Group B N (%)	Total N (%)
≤20	1 (2)	1 (2)	2
21-30	4 (8)	15 (30)	19
31-40	9 (18)	13 (26)	22
41-50	21 (42)	12 (24)	33
51-60	9 (18)	7 (14)	16
61-65	6 (12)	2 (4)	8

Table 2: Disease wise distribution of the cases.

Diseases	Group A (%)	Group B (%)	Total
Hernia	16 (32)	12 (24)	28
Varicose veins	6 (12)	7 (14)	13
Thyroid	1 (2)	4 (8)	5
Breast	2 (4)	5 (10)	7
Scrotum/penis	6 (12)	7 (14)	13
Ear	2 (4)	0 (0)	2
Cystic lesions	17 (34)	15 (30)	32
Total	50	50	100

According to the study design, wound inspection was carried out post operatively on post-operative day 2, day 5 and day 10 and day 30. Each time, thorough wound inspection was carried out to check for any signs of infection such as purulent discharge, induration, and redness. No seroma formation was noted in any cases. Due attention was given to temperature, pulse rate in each wound examination. All the patients were discharged between post-operative day 2 and day 5. Follow up was made in outpatient department.

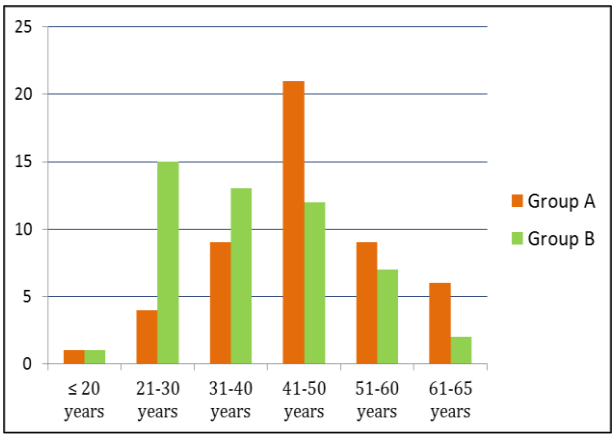

Figure 1: Age wise distribution in both the groups.

Table 3: Frequency of post-operative wound infections.

Infection	Present N (%)	Absent N (%)	Total N (%)
Group A	2 (4)	48 (96)	50 (100)
Group B	2 (4)	48 (96)	50 (100)

Authors found 4% of cases infected in both the groups (Table 3). All the four cases were categorized into superficial Incisional surgical site infection and were found on authors first wound inspection. Pus was sent for culture and drug sensitivity. 3 cases reported *S. aureus* and one had *E. coli*. Patients were started empirically on injection cefotaxim 1 gm intravenously till the drug sensitivity report was available. Later treatment was started according the drug sensitivity report. No cases developed septicemia. Infection resolved in all the cases by post-operative day 10. Chi square test showed a p value of 0.61 with Yates correction signifying no statistical significance.

DISCUSSION

Wound infection rate reported in literature for clean wound is between 1.5 to 4%.[7,8] This study shows wound infection rate of 4% in both the groups.

The study shows no clinical or statistically significant difference between both the groups. Most of the studies conducted have ruled out the role of prophylactic antibiotics in decreasing wound infections in clean surgical cases.[9-16] This study is in agreement with those.

However, prophylaxis should be employed under those conditions where there is potential risk of infections such as impaired host defense systems, presence of infective foci and cardiac or brain surgeries.

The NICE guidelines emphasize on no administration of prophylactic antibiotics in clean cases.[17]

The European Hernia Society too has formulated the guidelines and it recommends in its Grades 1A and 1B that antibiotic prophylaxis does not significantly reduce wound site infections in non-mesh and with mesh repair surgeries, respectively.[18]

All most all kinds of clean surgical cases are involved in the study including Hernioplasty, where the usage of mesh is done. Both the groups had almost equal number case distribution when type of procedure is considered excluding ear lobe repairs. Later was seen in group A alone.

All the cases of thyroid (4) and breast (5) in Group B who did not receive any antibiotics had no infection in post-operative period where the number of cases was more compared to other group.

Two cases were infected in both the groups; two cases of inguinal hernia and two cases of varicose vein surgeries. As only two cases were noticed, chi square test could not be applied. Hence, this study is neither clinically nor statistically significant. This area of research requires further studies with large sample size.

In Group B patients, hospital stay including the cost incurred on the antibiotics was less compared to the other group.

Authors do not recommend antibiotic prophylaxis routinely in clean elective surgical procedures. However, a large sample size is required to conclude with statistical significance.

The surgeon has to take the final decision in administration of antibiotics depending on the condition of the patient and the surgery. One should bear the adverse effects and possible benefits by using the antibiotics. Provision for emergence of antibiotic resistance is given limitlessly by using the antibiotics.

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