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Role of prophylactic antibiotics and prevalence of postoperative wound infection in surgery department in JLNMCH hospital

General Surgery

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ABSTRACT

Surgical site infection (SSI) remains one of the most important problems in infection control. SSIs increase the length of hospital stay and increase cost of care. The aim of this study is to find out the role of prophylactic antibiotics and prevalence of postoperative wound infection in surgery department. In this prospective study, 100 cases were studied in department of surgery, from January 2016 to June 2016. All patients were clinically evaluated and thoroughly investigated. During this period a total of 100 patients underwent major surgeries, out of which 07 cases developed post operative wound infections with rate being 07%.The rate was found to be higher among the emergency (34%) with the common risk factors being anaemia, prolonged operation and diabetes. Prophylactic Antibiotics played a major role in reducing the post-op wound infections. The common causative organism was found to be E. Coli.

KEYWORDS:

surgical site infection, antibiotics, preoperative, post-operative

Introduction

Surgical site infections (SSI) are the most common nosocomial infections in the general surgery departments and the second most common in hospitals. SSI are associated with morbidity, long hospitalization and antibiotic treatment, sometimes readmission, reoperation and mortality and associated with high economic costs. The Centers for Disease Control and Prevention (CDC) has developed criteria for defining SSIs, which have become the national standard and are widely used by surveillance and surgical personnel. These criteria define SSIs as infections related to the operative procedure that occur at or near the surgical incision (incisional or organ/space) within 30 days of an operative procedure or within one year if an implant is left in place. There are controversies in the measures and methods to control and reduce SSI rates. Standard control measures to reduce SSI rates include antimicrobial prophylaxis (timing, selection, duration), hair removal (timing, method, performer), diabetes and insulin therapy, temperature while the operation. Incorrect timing has been proven to increase SSI rates. Antimicrobial therapy should be administered within 60 minutes prior to the surgery to ensure adequate drug tissue levels at the time of initial incision. Antibiotic prophylaxis as an intervention is effective in reducing the risk of wound infection for all types of surgery. It is indicated for all clean–contaminated procedures.The use of prophylaxis in clean procedures that do not involve insertion of implants is controversial because the associated risk is quite low. Critical aspects of prophylaxis antibiotics administration are: giving an appropriate antibiotic, giving adequate dose, achieving proper timing before incision, and maintaining drug level throughout the operation. There is no benefit from antibiotic prophylaxis after wound closure and most studies conducted to compare single– dose versus multiple–dose regimens revealed no benefit of the multiple doses. Prolonged use of prophylactic antimicrobials has been associated with the emergence of resistant bacterial strains and predisposing the patient to infection. The concept of pre operative antibiotic was mooted by Stranchan in 1977, where he compared a single preoperative dose of Cefazolin with a regime of Cefazolin given for a period of 5 days post operatively. The infection rate seen in single dose was 3% and in multiple postoperative dose was 5%2. Prophylactic antibiotic therapy is clearly more effective where began preoperatively and continued through the intra operative period, with the aim of achieving therapeutic blood levels throughout the operative period3.In the current study, we want to emphasize on the risk factors that increase the SSI and role of prophylactic antibiotic administration to clean surgical cases in this institution.

Materials and Methods

In this prospective study, 100 cases were studied in department of surgery, from January 2016 to June 2016. All patients were clinically evaluated and thoroughly investigated.

This study involved elective and emergency surgeries. Pregnant women and very elderly (>60 yr) were excluded. The group was split into group A and group B of 100 cases each. Group A comprised of patients who received a pre-operative single dose of Ceftrioxone. Group B received no such prophylactic antibiotic. The groups were split into two, taking consideration the type of surgeries, the age of the patient, the presence or absence of risk factors for development of SSI, and associated medical conditions, all of which were represented in both the groups almost equally and a comparative clinical study was made.

All the patients were followed up to ten days post operatively. Wound swabs were sent for culture and sensitivity in infected cases and the results were compared and studied.

Results

Infection rate -

	Number of Cases	No. of cases infected	Rate of infection
Group A	100	07	07%
Group B	100	34	34%

In Group A, the post-op wound infection rate was 7% and in group B was 34%.

Age distribution with infection-

Age in Years	No. of cases	No. of Patients infected
10-20	5	0
21-30	25	11
31-40	50	14
41-50	20	16

Most commonly age group affected was 41-50 years.

Risk factor in affected groups-

Risk factors	Group A	Group B
Anemia	2	11
Prolonged duration of surgery	2	9

Diabetes mellitus	2	10
Obesity	1	4

Most common risk factors associated with post-op wound infection was anemia and diabetes mellitus.

The common causative organism was found to be E. Coli. Organisms Isolated from culture: 1. Staphylococcus aureus 2. E. Coli 3. Pseudomonas

Discussion

An effective prophylactic regimen should be directed against the most likely organisms. Infections can be prevented when effective concentrations of the drug are present in the blood and the tissue during and shortly after the procedure. Therefore, antibiotic prophylaxis should begin just before the operation. Rao et al, should in their study that SSI, incidence in doubled in the older age group 50-70 yrs and the incidence of severe complication following is increased in both extremes of ages i.e., < 10 yrs and > 60 yrs. Funary AP et al. in their study showed that when blood glucose level were kept strictly below 200 mg/dl during the preoperative period by continuous intravenous infusion of insulin reduced the incidence of SSI from 24% to 6.06% which was statistically significant. Richard J Ehrilchman et al, has confirmed by their studies that diabetes mellitus is associated with poor wound healing and high infection rates. Diabetes and the resultant hyperglycemia lead to decreased function of leucocytes, especially decreased cemotaxis and phagocytosis. In the present study, 12 patients were diabetic.

Conclusion

Prevention of surgical-site infections can be done effectively. Only if, Local and microbial factors should be borne in surgeon's mind and appropriate steps taken to avoid them. Meticulous surgical techniques should be practiced and undue delay in the procedure should be avoided to prevent postoperative wound infection. Prophylactic Antibiotics played a major role in reducing the post-op wound infections.

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