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A CLINICO-BACTERIOLOGICAL STUDY OF POST-OPERATIVE WOUND INFECTIONS IN GENEARAL HOSPITAL

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Conflicts of Interest: Nil
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Abstract:
According to World Health Organization (WHO) hospital acquired infections is describes to be one of the major infectious diseases having a huge economic impact worldwide. Surgical site infections (SSIs) are known as most common causes of nosocomial infections in worldwide which are account for about 20% to 25% of all nosocomial infections. In a world approximately 2% to 5% of the 16 million people undergoing surgical procedures each year develop surgical site infection and according to recent data two-thirds of patients who undergo operations. In developing countries the situation is more severe where resources are scarce and staffs are always in short supply. SSI still continues to be a major problem in infection control and surgical practices even in hospitals with most modern facilities. Post operative infection are usually caused by exogenous and/ or endogenous micro organisms enter the operative wound after the surgery or during the surgery which are usually more serious, appearing within five to seven days of surgery. In addition to these risk factors there is also involvement of virulence and the invasiveness of the organism physiological state of the wound tissue and the immunological integrity of the host are also important factors that determine whether infection can occurs or not. Therefore in developing countries problem gets more complicated due to poor infection control practices, inappropriate use of antimicrobials and overcrowded hospitals.
Aim: The main aim of this study is to study factors associated with the infection occurrence of SSI and their antibiotic sensitivities in surgery wards of hospital.
Material and methods: Present study was conducted in the department of surgery in collaboration with the department of microbiology in our hospital. Total 200 patients having operative surgery with various problems were taken in this study attending to hospital as in patient department (IPD) of our hospital. A clinical study of patients undergoing surgery were selected which has to come across this surgical emergency and treatment and skillful management in surgery department of our hospital. The patients with all age group were included in this study.
Result: Of the total 200 patients, 116 (58%) suffered from wound infections. in routine and emergency surgery the infection rate was calculated and it was observed that the infection rate was high in emergency surgery. The effect of infection and pre-operative antibiotic therapy showed 74 out of 200 (37%) patients without pre-operative antibiotic prophylaxis developed infection which compare to 42 (21%) out of 200 patients under antibiotic coverage.
Conclusion: Post-operative wound infections are serious problem which has to be tackled due to its increased morbidity, mortality and medical care costs. Guidelines and protocols for basic infection control practices such as hand washing, written protocols of perioperative, intraoperative and post operative infection control practices should be widely available. Hence, active surveillance program is recommended to each and every hospital.

Keywords: Post-operative infections, Surgical Site Infection, Wound infections, Infection Control.

Introduction

According to World Health Organization (WHO) hospital acquired infections is describes to be one of the major infectious diseases having a huge economic impact worldwide[i]. Annually about 2 million people were infections affect resulting in 5% to 15% of them requiring hospitalization[ii]. Surgical site infections (SSIs) are known as most common causes of nosocomial infections in worldwide which are account for about 20% to 25% of all nosocomial infections[iii]. For increased postoperative morbidity worldwide Post operative wound infection is one of the major causes[iv]. However SSIs are not associated with a high case fatality rate but they cause significant morbidity and huge economic burden for prolonged hospital stay[v]. In a world approximately 2% to 5% of the 16 million people undergoing surgical procedures each year develop surgical site infection and according to recent data two-thirds of patients who undergo operations[vi,vii&viii]. In developing countries the situation is more severe where resources are scarce and staffs are always in short supply[ix]. In nosocomial infection surgical site infections (SSI) are the third most commonly reported which approximately a quarter of all nosocomial infections[x]. SSI still continues to be a major problem in infection control and surgical practices even in hospitals with most modern facilities[xi]. Post operative infection are usually caused by exogenous and/ or endogenous micro organisms enter the operative wound after the surgery or during the surgery which are usually more serious, appearing within five to seven days of surgery[xii]. SSIs are uncomplicated in which mainly involving skin and subcutaneous tissue or sometimes can progress to necrotizing infections. Surgical wound infection can be characterized by pain, tenderness, warmth, erythema, swelling and pus formation[xiii]. In addition to these risk factors there is also involvement of virulence and the invasiveness of the organism physiological state of the wound tissue and the immunological integrity of the host are also important factors which determine whether infection can occurs or not[xiv]. Therefore in developing countries problem gets more complicated due to poor infection control practices, inappropriate use of antimicrobials and overcrowded hospitals. The main aim of this study is to study factors associated with the infection occurrence of SSI and their antibiotic sensitivities in surgery wards of hospital.

MATERIAL AND METHODS:

Present study was conducted in the department of surgery in collaboration with the department of microbiology in SSPM Medical College and Hospital Padave. Total 200 patients having operative surgery with various problems were taken in this study attending to hospital as in patient department (IPD) of our hospital. A clinical study of patients undergoing surgery were selected which has to come across this surgical emergency and treatment and skillful management in surgery department of our hospital. The patients with all age group were included in this study. From all the patients complete clinical history was collected and also physical examinations were done. All patients' data with the operative and discharge record were correlated with the case notes wherever necessary. Patients who had recent onset of irreducibility, pain, vomiting and constipation were included in this study. Surgery stabilization of patients with shock, correction of electrolyte imbalance and nasogastric decompression was done with prior. Appropriate surgical procedure was carried out. Of the 200 patients, 125 were male and 75 were female.

For clinical evidence of infection operative wound was inspected at frequent intervals. Samples were taken and send to microbiology laboratory for investigation of operative infections for the antibiotic policy of the Hospital. According to Centre for Disease control (CDC) criteria were used for defined the type of surgical wound[xv].

OBSERVATIONS AND RESULTS:

Of the total 200 patients, 116 (58%) suffered from wound infections. in routine and emergency surgery the infection rate was calculated and it was observed that the infection rate was high in emergency surgery. The effect of infection and pre-operative antibiotic therapy showed 74 out of 200 (37%) patients without pre-operative antibiotic prophylaxis developed infection which compare to 42 (21%) out of 200 patients under antibiotic coverage.

Tables 1 show the infection rates in various surgeries including Urological surgeries (92.3%) and orthopedic surgeries (88.9%). Post operative infection rate was high among patients with medical illnesses such as malignancy, diabetes mellitus and others that are depicted. Large no of different bacteria were isolated from the different sample send to microbiology laboratory as **shown in table no 2 and 3 below.**

Table: 1. Infection rates in various surgeries.

Surgery	Total no of cases	No of cases infected	%
Lower segment caesarean section	45	18	40.0
ENT surgeries	25	11	44.0
Hysterectomy	23	15	65.2
Orthopedic surgeries	27	24	88.9
Bowel surgeries	20	14	70.0
Urological surgeries	13	12	92.3
Appendicectomy	15	5	33.3
Cholecystectomy	9	3	33.3
Hernia surgeries	6	4	66.7
Hydrocele surgeries	5	3	60.0
Cataract surgeries	8	5	62.5
Others	4	2	50.0
Total	200	116	58.0

Table: 2. Correlation of predisposing factors with infection rate

Predisposing factors	Total no. of cases	No. of cases infected	Percentage
Malignancy	54	22	40.7
Diabetes	47	29	61.7
Anemia	23	14	60.9
Chronic illness	19	10	52.6
Immunodeficiency state	5	3	60.0
Others	21	13	61.9
Total	169	91	53.8

(Others include Hypertension, dehydration, UTI and obesity)

Table: 3. Isolation of different type of bacteria and their frequency

Organism	No. isolated (%)
Staphylococcus aureus	26(26.5)
Coagulase neg. Staphylococcus	9 (6.8)
Pseudomonas aeruginosa	24 (18.8)
Escherichia coli	21 (15.9)
Klebsiella pneumoniae	15 (11.3)
Proteus mirabilis	6 (4.5)
Proteus vulgaris	3 (2.7)
Citrobacter species	3 (2.2)
Beta haemolytic Streptococci	5 (3.7)

DISCUSSION:

Post-operative wound infection still remains one of the most important causes of morbidity as well as most common nosocomial infection in surgically treated patients[xvi]. The rate of SSI varies greatly worldwide and from hospital to hospital with different areas. The rate of SSI varies from 2.5% to 41.9% as per different studies[xvii, xviii] which is almost equivalent or bit more in this study. The most common organism isolated from SSI cases in the present study was Staphylococcus aureus 26.5% followed by Psuedomonas aeruginosa (18.8%) and E.coli (15.9%) respectively. According to the studied by Ramesh et al[xix] reported E. coli (20.8%) as the most common organism isolated followed by S. aureus (16.1%) from SSI cases which is opposite to this study. Whereas some studies also revealed Staphylococcus aureus as the most common organism isolated from SSI[xx] which is similar to this study. Post-operative wound infections in study could be attributed to the progressive trend towards operating and performing more complicated procedures including operations on contaminated and dirty surgical sites. Preoperative prophylactic antibiotic significantly prevents the post-operative wound infections. However, the use of antibiotics in the preoperative period may destroy susceptible organisms and permit colonization with resistant virulent organisms[xxi]. In different kinds of surgeries overall infection rate was higher when compared to that of study of Yalcin et al[xxii] and Anvilkar et al[xxiii]. This may be due to low general resistance of lower socioeconomic, complicated cases referred from rural areas, performing more number of emergency surgeries with contaminated wounds and unhealthy living conditions as another contributory factor. In different studies shows with different kind of surgery higher infection rates were recorded as after bowel surgeries (38.46%), orthopaedic surgeries (29%), urological surgeries (25%), cholecystectomy (21.05%) & appendectomy (18.18%) which was expected and the reasons are well known[xxiv]. Antibiotic sensitivity profile of isolates revealed that a large number of multidrug resistant strains were prevalent in the hospital environment. Predisposing and risk factors are responsible for these infections. Hence, more stringent steps are needed to reduce the incidence. Therefore sensitivity profile must be obtained to treat the patient with proper antibiotics as well as to keep a watching whether causing crossinfection or resulting in spread as a hospital infection.

CONCLUSION:

Post-operative wound infections are serious problem which has to be tackled due to its increased morbidity, mortality and medical care costs. Hence, better Surveillance system for surgical site infection with appropriate feedback of data to surgeons is highly recommended to reduce the SSI rate in health care centres. Thus, every hospital needs to organize its infection control program. Guidelines and protocols for basic infection control practices such as hand washing, written protocols of perioperative, intraoperative and post operative infection control practices should be widely available. Therefore antiobotic policy also recommended to gram negative organism are sensitive, should be considered for antibiotic prophylaxis. Hence, active surveillance program is recommended to each and every hospital.

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