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To Evaluate The Incidence Of Postoperative Wound Infection And Associated Risk Factors In Patients With Orthopaedic Surgery.

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Abstract:

Introduction:

Major surgical procedures could be performed with a reasonable expectation of primary wound healing and recovery. Despite major advances in infection prevention strategies, health care-associated infections (HAI) still remain a major public health problem globally. Understanding the incidence of postoperative wound infection in various healthcare settings would help us analyse the contributing factors and improve healthcare. Since the rates of postoperative wound infection in various orthopaedic settings in India are lacking, this study aimed at analysing them and various associated factors in a tertiary medical institute in India.

Materials and Methods:

This was a prospective, observational study conducted in the department of Orthopedics Sancheti Institute for Orthopedics & Rehabilitation Pune. The study was undertaken from August 2018 to July 2019. Total 150 patients based on inclusion and exclusion criteria included in the study. The inclusion criteria were patients aged above 18 years were taken up for elective surgeries. Patients were evaluated signs of infection, loosening of implant and blood investigation at third day, 12th day, at the end of 03 months and 06 months were studied.

Results: Out of 150 patients 90 males and 60 females. Total 08 (05 female and 03 male) had infection on 3rd postoperative day. Maximum incidence was seen in females. The incidence of infection by gram–ve bacteria was higher than that of gram +ve bacteria. The mean preoperative stay in infected cases was 4.50 days, when compared to 3.06 days in non-infected cases whereas mean post-operative stay in infected cases was 7.75 days, when compared to 10.16 days

Conclusion: Prophylactic regimens should be recommended for a wide variety of surgical procedures. Marked variations exist in the spectrum of infecting pathogens and in the degree of antimicrobial resistance. Surgical site infections affect patients undergoing surgery and are associated with longer hospital stays than patients with no surgical site infections

Key Words: post-operative wound infection, incidence, Orthopaedic surgery.

Introduction:

Many factors determines surgical wound healing and influence the risk of infection as well as the rate of infection.[1] The amount of bacterial load is the most significant risk factor, but this risk has been lowered because to contemporary surgical procedures and the use of prophylactic antibiotics.[2] Essential enhancements for preventing and controlling wound "sepsis" were provided by the antibiotic revolution of the 1940s,highly invasive, and highly successful era of modern surgery.[3] Surgery would be impossible in an environment in which infection was likely or, once established, untreatable.[4]

Joseph Lister (Professor of Surgery, London, 1827-1912) and Louis Pasteur (French bacteriologist, 1822-1895) revolutionized the entire concept of wound infection. The patient's risk index points are assigned based on the surgical wound classifications, ASA classification system, and length of the surgical procedure.[5] The objective was to evaluate the efficacy of different measures taken by surgeons prior to Surgery to prevent infection by evaluating the effectiveness of usage of preoperative and postoperative systemic antibiotics, the role of sterile measures such as scrub suits, masks, sterile gloves, gowns, drapes and operation theatre environments, in reducing the surgical site infection and in assessing the efficacy of surgical asepsis in Orthopaedic surgeries.

Materials and Methods:
This is a prospective study which was conducted in the Department of Orthopaedics Sancheti Institute for Orthopedics & Rehabilitation Pune. The study was undertaken from August 2018 to July 2019. A total of 150 patients who underwent surgeries were included in the study patients aged 18 years and above and patients that were taken up for elective surgeries (major or minor procedures). Patients who were immunocompromised patients on long term corticosteroids, immunosuppressive treatment and patients with open fractures needing external fixation devices were excluded. Patients were informed about the study in their vernacular language. CDC's National Nosocomial Infections Surveillance (NNIS) system developed and uses an SSI risk index ranging from zero to three points Aseptic precautions in the operation theatre. All precaution protocols of operative procedures were taken. The principles of surgery were followed. Drains were used whenever necessary. Betadine ointment or Neosporin ointment was used to cover the sutures followed by adhesive dressing. Third generation Cephalosporin, i.e; Ceftriaxone and a combination of Ceftriaxone and Sulbactam were used for all the patients. All patients received Injection Ceftriaxone 1.5 gm the day of the surgery. All routine aseptic precautions were taken like using autoclaved gowns, drapes, sterile gloves and instruments. Standard surgical scrub is done for 5 minutes before performing the operation. Injection Ceftriaxone was continued in the postoperative period. The wound was inspected for any evidence of infection starting from the 3rd day and then 12th post-operative day. Patients were followed up till discharge and 03 months and 06 months interval.

Results: Total of 150 patients were enrolled for this study, Total 08 (05 female and 03 male) had infection on 3rd postoperative day. Maximum incidence was seen in females. 5.3% incidences reported from the study. It was found that maximum incidence was in 41-50 age group (63%), the
next largest group being 21-30 yrs (25%) and 61-80 yrs (12%) had least incidence. The mean preoperative stay in infected cases was 4.50 days, when compared to 3.06 days in non-infected cases whereas mean post-operative stay in infected cases was 7.75 days, when compared to 10.16 days.

Discussion:
Musculoskeletal sepsis results in an unhappy patient, guilty surgeon and high cost to the hospital. Since the time of Lister and the use of carbolic spray, great strides have been made in the reduction of the incidence of post-operative infection over the years. Infection following an orthopaedic procedure where an implant is used (internal ftxation/joint replacement) remains one of the most dreaded complications which can lead to severe morbidity and even mortality. Several factors affect the infection rate including wound contamination,skin preparation, length of pre-operative hospital stay, duration of surgery, air handling, drainage of wounds, age of patient and skill and technique of the surgeon[6]. In our study we found 5.3% incidences which is in similar with study by Marston[7] who reported 5% superficial and 0.25% deep infection and study by K S Dhillon[8] who found overall post-operative 6.8%. The average infection rate for operations involving the bone is 4.2% and is of concern because it is infections that involve the bone that is a major problem. Infection rates for individual surgical procedures in this study are not of much signiftcance because the numbers involved are simply too small to be of statistical significance.

The rate of postoperative wound infection without prophylactic antibiotic is high as compared to the use of prophylactic antibiotic. In terms of the incidence of infection in relation to sex, no obvious or specific reason could be found to explain why there was marginal though statistically not significant higher incidence in females[9]. Literature shows that timing of administration is critically important because the concentration of the antibiotic should be at therapeutic levels at the time of incision during surgical procedure, and ideally, for few hours post operatively (CDC1996). There was no significant relationship noted between the incidence of infection and the length of hospital stay. There was significant correlation noted between antibiotic administration and timing of surgery similar to guidelines stipulated by Woods RK, Dellinger EP et al[10]
Early re-explorations for postoperative bleeding, a history of penicillin or cephalosporin allergy, trauma and other emergency surgery and existing preoperative infections of non wound sites are important variables that may influence the choice and duration of perioperative prophylaxis

Conclusion:
Our study shows that the incidence of infection is not very high in our hospital. Pathogens isolated are often resistant to commonly used antimicrobials. Physicians and individual health care
institutions must tailor routine prophylactic regimens based on carefully collected epidemiologic data regardingsurgical wound infection. Equally important, many surgical procedures are far from routine, and numerous variations in perioperative circumstances will dictate deviations from established prophylactic regimens.

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