e - ISSN - 2348 - 2168
Print ISSN - 2348 - 215X

Acta Biomedica Scientia

Journal homepage: www.mcmed.us/journal/abs

EVALUATION AND MANAGEMENT OF SURGICAL SITE INFECTIONS DEPARTMENT BASED ON TYPE OF MICROORGANISM

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Article Info

Received 02/01/2020
Revised 16/01/2020
Accepted 28/01/2020

Keywords :- Surgical site infections, surgical gastroenterology, orthopedic surgery, gynec surgery and pediatric surgery

ABSTRACT

Introduction: Surgical site infections (SSIs) are infections that occur one month after a surgical operation or one year after implant surgery and a surgical procedure, either at the injury site or near the injury site. The second most common nosocomial infection that is reported in most of the tertiary care hospitals especially in developing countries like India. SSI's are seen in all types of surgeries of a tertiary care sector which include obstetrics and gynecology, dermatology, orthopedics and also gastrointestinal surgeries. To assess the prevalence of SSIs, bacterial etiologies, associated factors, and antimicrobial susceptibility patterns of isolates among post-operated patient Materials and Methods: Name of the institute: Bhaarath medical college and hospital, chennai, India. Department of study: surgical gastroenterology, orthopedic surgery, gynec surgery and pediatric surgery departments of the study hospital. Duration of study: study was carried out for a period of 6 months in 2018-2019. Results and Discussion: About 321 patients were enrolled into the study from all the departments of RVS Multi-Specialty Hospitals, Chittoor. All the patients enrolled into the study were undergone with surgery based on individual patient's clinical condition. Various trends of infection by microorganisms are analysed n laboratory settings in all the patients suspected to have an infection. Various trends of isolates observed were gram positive, gram negative, Candida species, and gram negative SSI. Conclusion: From this study it is concluded that nearly 10.9% of the overall patients are affected with nosocomial and this study, single and multiple drug resistance to the commonly used antibiotics was high. Therefore, intensifying the implementation of infection prevention and patient safety. Among various trends of infections, infection with gram negative bacteria were of high in incidence.

INTRODUCTION

The degree of surgical site contamination at the time of surgery affects the likelihood of SSI. Wounds are classified as clean, clean-contaminated, contaminated, or dirty or infected based on the presence and degree of contamination.

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The incidence of SSI varies widely, ranging from 5 to 30 percent depending upon the operative site and wound classification. It is estimated that SSI develops in 2 to 5 percent of patients undergoing inpatient surgical procedures each year in the United States [1-2].

Studies of the epidemiology of SSIs are problematic due to the diverse nature of these surgical infections. The prevalence differs widely between surgical

procedures, hospitals, patients, and surgeons. Due to unhygienic sanitation, surgical site infection (SSI) is the second most common nosocomial infection that is reported in most of the tertiary care hospitals especially in developing countries like India [3-4]. SSI's are seen in all types of surgeries of a tertiary care sector which include obstetrics and gynecology, dermatology, orthopedics and also gastrointestinal surgeries [5, 6]. These SSI's sometime directly and many times indirectly affects the reputation of the hospital [7]. This is because, lesser the incidents of nosocomial infection higher is the quality of service provided by the hospital [8-10]. In-turn incidence of nosocomial and non-nosocomial infections especially in surgery cases results in increased burden on patients in terms of economy and health [11].

It was estimated that nearly 500,000 surgical cite infections are caused yearly in U.S which was reported by The Centers for Disease Control and Prevention. The causative pathogens depend on the type of surgery; the most commonly isolated organisms are Staphylococcus aureus, coagulase-negative staphylococci, Enterococcus spp. and Escherichia coli. Numerous patient-related and procedure-related factors influence the risk of SSI, and hence prevention requires a 'bundle' approach, with systematic attention to multiple risk factors, in order to reduce the risk of bacterial contamination and improve the patient's defences [12]. Maintaining clear air in the operating room classically involves the use of ultra clean ventilation systems combining laminar airflow and high-efficiency particulate air filter.

Due to the above factors the present study was designed to analyse the frequency of infections especially surgical site infections in surgical department of a tertiary health care hospital to aid for clinical development and improved patient care [13, 14]. Several associated factors have been identified in the literature but the studies are not reproducible. Despite this fact, various authors have repeatedly identified, such as male gender, advanced age and significant blood loss5–8 were highly associated with SSIs. Other risk factors for SSI are typically separated into patient-related (pre-operative), procedure-related (peri-operative), and post-operative categories. Generally, patient-related risk factors for the development of SSI can be categorized as either unmodifiable or modifiable.

MATERIALS AND METHODS:

Name of the institute: Bhaarath Medical College And Hospital, Chennai, India. Department of study: surgical gastroenterology, orthopedic surgery, gynec surgery and pediatric surgery departments of the study hospital. Duration of study: study was carried out for a period of 6 months in 2018-2019. Study population: study was carried out in about 300 patients with their follow-up after getting discharge from the hospital.

Approval: Institutional Ethics Committee (IEC).

Inclusion criteria: there was no boundaries like age limitations and gender specifications for the study, all the patients who have undergone surgery in the hospital during the study period were included into the study after explaining the patient or the patient's guardian about details of the study.

Exclusion criteria: patients who were not willing to involve in the study and cases with lack of preferred data, and patients who lacked follow-up after discharge from the hospital were excluded from study, because this may affect the quality of report of the study.

Table 1: Procedure wise distribution of SSI's observed

Procedure	Number (n)[N=35]	Percentage (%)
Elective procedures	24	68.57
Emergency procedures	11	31.42

Table 2: Different isolates of infection noted with respect to their frequency

Isolates	Number	Percentage
Gram negative SSI	12	2.49%
Candida species	04	0.62%
Gram positive	10	3.11%
Gram negative	12	4.67%

RESULTS AND DISCUSSION:

The study addressed the prevalence of SSI, bacterial etiologies, associated factors, and antimicrobial susceptibility patterns of the bacterial isolates. About 300 patients were enrolled into the study from all the departments of Bhaarath Medical College And Hospital, Chennai, India. All the patients enrolled into the study were undergone with surgery based on individual patient's clinical condition.

The difference might be due to the presence of modern surgical techniques, surgery rooms, and sufficiently trained professionals in middle- and high-income countries. Such variation could also be ascribed to lack of adequate postoperative wound care, shortage of trained manpower, failure to preserve sterility during surgical procedures, insufficient infection control due to deprived hygiene, and water shortage. In this study, the prevalence of SSI was higher in patients who had a drain

or discharge on their operated site than those who did not. One possible explanation is that it is one of the criteria for physically diagnosing SSIs without the need of laboratory testing.

Various trends of infection by microorganisms are analysed n laboratory settings in all the patients suspected to have an infection. Various trends of isolates observed were gram positive, gram negative, Candida species, and gram negative SSI. All the observations noted are given in the TABLE 2. It was recorded that 2.49% of overall study population were diagnosed with gram negative SS infection, infection with Candida species was seen in 0.62% i.e., 2 patients of overall study population, 3.11% of study population shown gram positive infection, and 4.67% were diagnosed with gram negative infection. This is comparable to some studies and lower than others. The bacteria cultured reflected the sites of operation, with E. coli being the most commonly isolated bacteria in the perineal and abdominal operations.

As listed in TABLE 1, 35 cases were diagnosed with infection among overall population of 300 patients, which accounted for a percentage of about 10.90%. In these 35 cases of infection, 11 cases were of emergency procedures and 24 were of elective procedures. This difference in the distribution of bacterial species might be due to variation in common hospital-acquired pathogens, and infection prevention and control policies and guidelines across countries.

CONCLUSION:

The problem of postoperative wound infection is seen in both developed and developing countries, despite introduction of meticulous antiseptic regime in surgical practice. From this study it is concluded that nearly 10.9% of the overall patients are affected with nosocomial and non-nosocomial infections, thus, measure should be taken for better management of patients and to understand the route causes of infections leading to discomfort of patients. Among various trends of infections, infection with gram negative bacteria were of high in incidence. In addition apply infection prevention and control practices tailored to the specified health-care settings is recommended. Further study should be conducted on the prevalence, associated factors, bacterial etiologies and antibiotic susceptibility patterns to address the emerging and gradually evolving nature of antimicrobial resistance.

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