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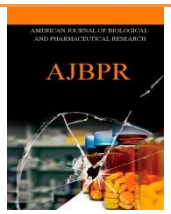

MICROBOLOGICAL POFILE OF INFECTION FOLLOWING SURGERY: A HOSPITAL BASED STUDY

Retina Paul[1], Soumen Das[2*], Prakash Bhagat[3], ML Saha[4]

[1]Assistant Professor, Department of Microbiology, College of Medicine & J N M Hospital, Kalyani, Nadia, West Bengal, India.
[2]Assistant Professor, Department of Surgery, IPGMER, SSKMH, Kolkata, West Bengal, India.
[3]RMO cum Clinical tutor, Department of Surgery, IPGMER, SSKMH, Kolkata, West Bengal, India.
[4]Professor, Department of Surgery, IPGMER, SSKMH, Kolkata, West Bengal, India.

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ABSTRACT

Surgical Site Infection (SSI) is the second most common cause of nososcomial infection . Despite advanced prophylactic measures its incidence is significant with considerable mobidity and mortality rate. Need exists for further identification of risk factors, developing improved prophylactic measures. This study aims at the measurement of incidence of SSI in a tertiary care institution in eastern India and identification of disease and intervention specific risk factors. A total of 1716 patients were included in the study. An overall incidence of 23.31% was observed. Patients with malignancy and patients who underwent emergency operation showed increased incidence of SSI. Thus these groups need special attention and appropriate prophylaxis.

INTRODUCTION

Infection in any location along the surgical tract after a surgical procedure is known as Surgical Site Infection (SSI) [1]. SSIs were the second most common healthcare-associated infection, accounting for 17% of all hospital acquired infections [2] with significant morbidity and mortality rate.

Different risk factors have been identified and evaluated for better prevention. Bacteriological profile has an institutional variation. This study aimed at the measuring the incidence of SSI and identification of risk factors pertaining to disease factors and to develop bacteriological profile of this part of India.

Corresponding Author

Soumen Das
Email:- soumendoc.das@gmail.com

Aims and Objectives

This observational study measures the incidence of SSI in a tertiary care centre of eastern India.

Furthermore it tries to identify any variation of incidence related to the disease process and the mode of operation. Bacteriological profile development was another prime objective of this study.

MATERIAL AND METHOD

This hospital based observational study was conducted in the department of Surgery of a tertiary care hospital in Kolkata, West Bengal. Patients attending surgery department requiring operative intervention (emergency or planned) for gastro-intestinal disorders (benign or malignant) were included in this study. Patients with known immunosuppressive diseases (HIV, Diabetes) were excluded from the study. Total 1716 patients were included in this study, among them 515 patients had gastro-intestinal malignancy. 936 patients underwent emergency operation rest underwent planned operation. Identification

of SSI was done following Centre for Disease Control (CDC) criteria and management done accordingly. Bacteriological culture done from wound swab or drained pus.

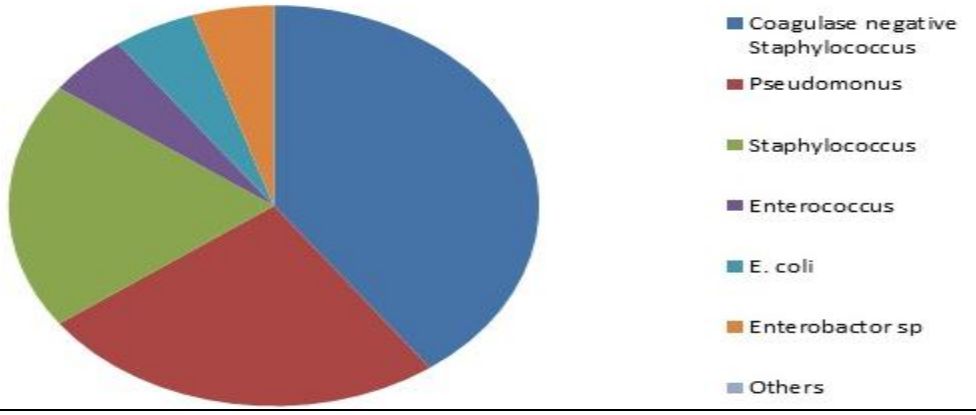
RESULTS

Out of 1716 patients, 400 developed SSI (23.31%). Incidence of SSI in patients underwent emergency operation is 26.70 (250/936) whereas in patients underwent planned operation 19.23 (150/780) (Table 1). Patients with gastro-intestinal carcinoma had an incidence of 30.09 (155/515). In benign diseases it is 20.39 (245/1201). Amongst the organisms identified, commonest is coagulase negative Staphylococcus followed by Pseudomonas, Staphylococcus aureus, Enterococcus, E. coli, Enterobactor species (Figure 1).

Table 1. Incidence of SSI

Group	Incidence (%)
Overall	23.31
Emergency	26.70
Elective	19.23
Malignancy	30.09
Benign	20.39

Figure 1. Bacteriology of surgical site infection



DISCUSSION AND CONCLUSION

Despite the advances in infection control practices, including improved operating room ventilation, sterilization methods, barriers, surgical technique, and availability of antimicrobial prophylaxis, SSIs remain a substantial cause of morbidity and mortality among hospitalized patients [3].

Different risk factors have been identified, based on them several scoring system have been developed [4]. All these were aimed at identification of high risk group and contemplating appropriate prophylactic measures. NNIS scoring system is the prototype among them [5]. This incorporates procedure time, type of wound (clean, clean-contaminated, contaminated, dirty) and American Society of Anesthesiologists (ASA) grade. The CDC criteria describes the diagnosis of SSI as superficial incisional, deep incisional, organ/space SSI [6].

The incidence of SSI is much higher (23.31%) in this study in comparison to published western data [7]. The high rate perhaps can be explained, by the fact that the operating rooms (OR) in the hospital only have natural ventilation and, therefore, are not directly comparable to the hospitals in the developed countries where Plenum (conventional) ventilation system is the universal standard [8]. The incidence of SSI is higher in patients underwent emergency operation (26.70) compared to planned operation (19.23%). This is possibly due to the better sterility of the elective operation theatres [9].

Interestingly the incidence of SSI in cancer patients is much higher (30.09%) than benign group (20.39%) with an odds ratio of 0.46. This variation holds true for both elective and emergency group. This finding proposes carcinoma as a dominant risk factor of SSI.

Coagulase negative Staphylococcus has been identified as the predominant organism causing SSI as opposed to the published data. In clean surgical procedures in which the GI tract has not been entered, *Staphylococcus aureus* is the most common cause of infection [10]. The most common infecting organisms in CRS, however, originate from the bowel lumen. By far, the most frequently isolated of these is the anaerobe *Bacillus fragilis*, while the most common aerobic member of the bowel flora is the gram-negative bacillus *Escherichia coli* [11]. Other microbes may be seeded from a distant source, such as the

skin or nares, or from an implant. These pathogens include *S aureus,* coagulase-negative staphylococci, *Candida albicans*, and, increasingly, methicillin-resistant *S aureus* [12]. From this study this can be concluded that operations done in emergency are more prone to develop SSI , thus need special attention. Cancer patients require appropriate prophylaxis since they have a propensity to develop SSI. Finally every institution should have their own microbiological profile for empirical antimicrobial therapy, because it varies largely.

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