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A PROSPECTIVE STUDY ON SURGICAL STIE INFECTIONS AT A TERTIARY CARE CENTRE

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ABSTRACT

Background: Wound infection is tissue invasion by micro organisms after disruption of systemic and local host defenses, causing lymphangitis, cellulitis, abscesses, bacteremia. **Aims &objectives:** This prospective study aims at estimating incidence of surgical site infections (SSI) and risk factors of SSIs in general surgical wards at a tertiary care center. **Methods:** Study design: Prospective study. Source of study: General Surgery Inpatients. Duration Of study: One and half year starting from December 2020 to May 2022. Number of patients:200. Inclusion criteria- Patients who developed surgical site infection following either elective or non-traumatic emergency surgery. Age>18years, Patients giving informed consent. Exclusion criteria: Pregnant women, Age<18years. **Results:** Data were presented in the form of tables, pie charts, and bar charts of descriptive categorical variables and were analyzed using Fisher's exact test. One-way analysis of variance performed using Kruskal-Wall for comparison of microbiological analysis values. **Conclusion:** Independent risk factors which are potentially modifiable including open surgical approach, contaminated wound class, and emergency surgery, need to be systematically addressed. In order to control SSI, quality surgical treatment is necessary which includes prompt patient assessment, resuscitative procedures, adequate patient preparation, and an aseptic atmosphere.

Keywords: Surgical site infections; Wound infection; Cellulitis

INTRODUCTION

Second Wound infection is tissue invasion by micro organisms after disruption of systemic and local host defenses, causing lymphangitis, cellulitis, abscesses, bacteremia [1]. Despite many best efforts to preserve sterility, most surgical wounds are infected to a few degree. However, with minimal contamination, the wound is created without undue damage, subcutaneous tissue is well perfused and oxygenated with no dead space, infection rarely occurs. It may be a superficial, deep infection, or an infection affecting the inter body space [2]. Increased infection incidence increases mortality and morbidity from clean to dirty wounds [3]. Higher mortality and morbidity have been observed in emergency surgery patients [4]. The risk of wound infection is influenced by the level of contamination but has not been fully determined [5].

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METHODOLOGY

Study design: Prospective study.

Source of study: General Surgery Inpatients, Government General Hospital, Anantapur.

Duration of study: One and half year starting from December 2020 to May 2022.

Number of patients: 200

Institution: Government General Hospital, Anantapur,

Inclusion criteria: Patients who developed surgical site infection following either elective or non-traumatic emergency surgery. Age>18years, patients giving Informed consent.

Exclusion criteria: Pregnant women. Traumatic conditions requiring surgery.

Patients not giving informed consent. After being admitted to Government General Hospital, Anantapuram, information about the patient's clinical characteristics and investigations was gathered from their records. Based on the condition of the patient, appropriate surgery was done. The patient's condition was evaluated after surgery, and any complications were noted. Patients were monitored on average for one month. Non-random and purposeful sampling methods were used. Each patient admitted to surgical wards was

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given a brief physical examination and history-taking following admission. Necessary investigations were done. Patients who required surgery and fulfilled the assigned inclusion criteria were invited to take part in our study. After adequate resuscitation (if applicable) and preparation, the patient was brought to the operating room for surgery. Strict aseptic precautions were taken during the operation. The course of surgery and relevant intra operative factors were directly observed and noted and analysed. All patients were closely monitored during the post operative period daily until patient discharge. If symptoms or signs of infection appeared during this period, an appropriate investigation was initiated to diagnose the infection and assess the nature and infection severity. Post-operative wound swabs or aspirated pus were collected from clinically infected surgical sites according o standard laboratory sampling procedures, if pus collection was noted. The swabs were immediately sent to a microbiology laboratory for analysis to prevent dehydration and the growth of several room-temperature species that could wipe out true pathogens. administered to the patient. Each patient with post operative wound infection was treated appropriately. If necessary, antibiotics were changed following reports of culture and susceptibility testing. Postoperative events were recorded on data sheets during daily follow-up. After data collection was completed, they were systematically summarized.

Ethical issue: Institutional Ethics committee issued ethical clearance for the study.

Statistical analysis: Data were presented in the form of tables, pie charts, and bar charts of descriptive categorical variables and were analyzed using Fisher's exact test. One-way analysis of variance performed using Kruskal-Wall for comparison of microbiological analysis value.

RESULT

Table 1: Table showing Age distribution of SSI

Age distribution	Total cases	Infected cases	%
18-19	26	1	3.84
20-29	22	2	9.09
30-39	58	17	29.31
40-49	30	4	7.40
>/= 50	64	12	18.75
Total	200	36	18

Table 2: Sex Distribution of SSI

Sex Distribution	Total cases	Infected cases	%
Male	126	26	20.6
Female	74	10	13.5
Total	200	36	18

Table 3: SSI Distribution based on Type of Operation

Surgical procedure	Total cases	Infected cases	%
Elective	110	12	10.90
Emergency	90	24	26.66
Total	200	36	18

Table 4: SSI Distribution based on Nature of Discharge from wound site

Nature of Discharge	Number of cases	Percentage
Serosanguineous	12	33.33
Seropurulent	17	47.22
Purulent	7	19.44
Total	36	18

Table 5: SSI Distribution based on Organism isolated

Name of organism	Infected cases	Percentage
No growth	12	33.33
Staphylococcus	10	27.7
Klebsiellasp.	6	16.6
Pseudomonas	4	11.1
E.coli	3	8.3
Actinobacter	1	2.7
TOTAL	36	18

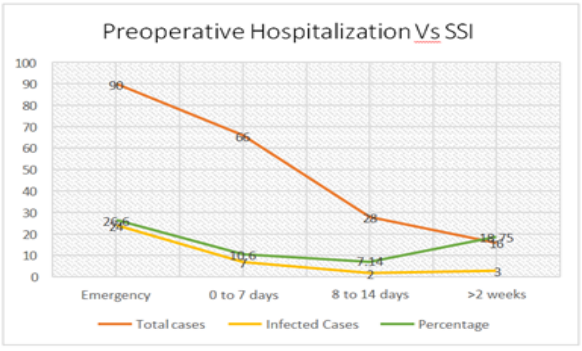

Fig 1: SSI Distribution based on Preoperative Hospitalization

DISCUSSION

Our study about surgical site infection was done in the patients who underwent surgery in Dept of General Surgery, Government Medical college & Government Gen-

eral Hospital, Anantapur. We studied total 200 patients out of which 86 were clean, 24were clean contaminated, 63 cases were contaminated and 27 were dirty wounds. Out of which 36 surgical site infections were there, hence the net infection rate was18%.In comparison to other studies, the infection rate of 2.8 to 25 %, hence infection rate of ourstudy18%is within these limits. [6-8] SSIs in our study, out of 200 cases, 110 cases were elective and 90 were emergency cases. Only 12 patients were infected in 110 elective cases, compared to 24 patients in 90 emergencies. In our study, out of 200 cases, 24 were clean, 63 were contaminated, 71 were dirty wounds, and 36 patients developed SSI where 5 were clean, 7 in clean contaminated, 14 were contaminated and 10 were dirty wounds. The infection rate was higher in dirty wounds (37.03%) than in contaminated wounds (22.22), clean contaminated wounds (29.16%) and 5.81% in clean cases. This indicates that type of wound also influences the risk of surgical site infection. 1996 Butalari, A., Ferri, M. et al. examined the probabilities of surgical mortality and morbidity in a large number of patients over 80 years of age. [9-11] Postoperative mortality and morbidity were 10.1% and 32.2%, respectively and mortality and morbidity in younger patients were higher than 1.2 and 12.4%, respectively. [12] In our study, the 14–29 year-old age group had 0.59% higher number of infected cases than the 50+ age group. Cases are 13% higher compared to 0.59% for the 14–29 year-old group. In our study of microbial antibiotic susceptibility, Gram-negative bacteria such as Klebsiella, E. coli, and Pseudomonas were more susceptible to ciprofloxacin, amikacin, cefoperazone, and sulbactam. In our study, the infection rate for clean wounds was 5.81%, and for clean contaminated, contaminated and dirty wounds was 29.16%, 22.22% and 37.03%, respectively. The high infection rate of contaminated, dirty wounds is due to endogenous contamination.[13]

On sending discharge for culture and sensitivity, it was found that 24 of the 36 infected showed signs of multiplication. Staphylococcus was the most frequently isolated at 27.7%, followed by Klebsiella -16.6%, Pseudomonas 11.11%, E.coli 8.3% and Actinobacter 2.7%. In about 12 cases, pus cultures showed no growth. Anvikar et al. gave a same pattern in a study with 200 cases.

CONCLUSION

Microbes that live in our body normally account for the majority of surgery site infections (SSI).A number of host factors, such as malnourishment, obesity, the patient's hygiene knowledge, patients' co-morbidities, etc. combined with environmental factors, such as the nature of the wounds, the length of the operation, the prolonged exposure of the peritoneal cavity to the environment, the prophylactic use of antibiotics, and factors related to surgery, such as preoperative Hospitalization and the type of operation greatly contribute to the occurrences of SSIs. Independent risk factors which are potentially modifiable including open surgical approach, contaminated wound class, and emergency surgery, need to be systematically addressed. In order to control SSI, quality surgical treatment is necessary which includes prompt patient assessment, resuscitative procedures, adequate patient preparation, and an aseptic atmosphere.

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